American Psychosomatic Society 73rd Annual Meeting
Savannah, Georgia – March 18 - 21, 2015 ~ Submitted Abstracts
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HEART RATE VARIABILITY AND FALSE MEMORIES: IMPLICATIONS FOR MEMORY RETRIEVAL AND ENCODING
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Recent research provides evidence that resting vagally-mediated heart rate variability (vmHRV), a psychophysiological index of executive and cognitive control, predicts memory retrieval such that individuals with higher vmHRV showed better recall of memories in comparison to individuals with lower vmHRV. However, little is known about how vmHRV is related to memory encoding, that is, how individuals store memories for later recall. Both memory retrieval and encoding are thought to play an important role in correctly identifying true memories, while correctly rejecting false ones. Thus, the current study aimed to examine the relationship between performance on a task that involves both memory encoding and retrieval, and resting vmHRV. Continuous HRV data was recorded as 94 undergraduate students (51 Female, Mean age 18.71) completed a 5-minute baseline-resting period. Participants then completed the Deese-Roeger-McDermott (DRM) task, where participants viewed 18 word lists (12 words per list), and following the lists, were instructed to correctly identify previously shown words (true memories), while rejecting the lure words (false memories). While controlling for potential confounds, regression results showed that those with higher vmHRV at baseline were better able to reject false memories (β = -3.54, p<.001) and discriminate between true and false memories (β = .332, p<.01), as indexed by d-prime (D’). Overall, these results extend previous work on HRV and memory, suggesting that resting vmHRV may also play a role in how individuals encode memories. These results have many real world implications as individuals - especially those who have experienced previous traumatic events and/or who must provide an eyewitness testimony – are often required to distinguish between true and false memories. Overall, the current investigation lends support to the Neurovisceral Integration Model, suggesting that resting vmHRV is indeed an index of cognitive control, and in particular, control over memory encoding and retrieval – findings with implications for both cognition and health and potential encoding strategies and mechanisms underlying this relationship will be discussed.

DIURNAL CORTISOL AS A MECHANISM OF DEPRESSIVE SYMPTOMS ON SLEEP DISTURBANCE IN PROSTATE CANCER SURVIVORS
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Background: Prostate cancer treatment place patients at high risk for sleep disturbance, including radical prostatectomy (e.g., urinary and bowel problems), radiation therapy (e.g., bladder irritation and frequent voiding), and hormonal therapy (e.g., hot flashes and night sweats). For instance, insomnia is a clinically significant symptom occurring in 32% of surgical patients (Savard et al., 2005). Yet, few studies have examined relationships of depressive symptoms and sleep quality in men with prostate cancer and the potential biological mechanisms. It is plausible that depressive symptoms drive dysregulation in diurnal cortisol rhythm, which together contribute to the onset and/or progression of disturbance sleep or poor sleep quality (see Irwin et al., 2012). Methods: Men (N=67; M age=66.33, SD=9.66) treated for localized prostate cancer in the preceding two years were enrolled in a study of “health-related quality of life.” Depressive symptoms were assessed at study entry (T1) with the CESD (Radloff, 1977) and the Pittsburgh Sleep Quality Index (Buysse et al., 1989) was completed four months later (T2). At T1 participants provided saliva samples (4 times per day over 3 days) for measurement of diurnal rhythm. Results: A path model was conducted in Mplus to examine hypothesized relationships among depressive symptoms, cortisol slope, and sleep quality. Analyses revealed that depressive symptoms (T1) was negatively associated with cortisol slope (B = .37, p<.01) and positively associated with sleep problems (B = .34, p<.05) four months later. Further, cortisol slope was negatively associated with sleep problems (B = -3.9, p<.01). Examination of indirect effects suggested that cortisol slope mediates the effect of depressive symptoms on sleep (p<.05). All analyses controlled for participant age and body mass index. Discussion: These results support the possibility of a biological mechanism for understanding the role of depressive symptoms in perceptions of sleep quality in men with prostate cancer. It may be that emotional disturbance associated with depressive symptoms contributes to the dysregulation of diurnal patterns which may ultimately interrupt standard sleep cycles.
CHANGES IN SERUM BIOMARKERS OF AGING ARE ASSOCIATED WITH RELAXATION PRACTICE DURING STRESS MANAGEMENT
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Chronic psychological stress has previously been associated with an increased rate of cellular aging. The purpose of this study was to examine the effect of psychological stress on two age-associated biomarkers: interleukin-6 (IL-6), an inflammatory cytokine associated with both age and stress, and macropage inhibitory cytokine-1 (MIC-1), a biomarker associated with aging and mortality. Serum and psychological data from 43 women reporting elevated stress and a family history of breast cancer were collected as part of a larger trial of a cognitive behavioral stress management (CBSM) intervention. ELISAs were used to measure serum concentrations of IL-6 and MIC-1 before and after the 10-week intervention or a similar waiting period for the comparison group. A repeated measures MANCOVA was conducted to determine the effects of CBSM on IL-6 and MIC-1 serum concentrations. Age and BMI, statistically significant predictors of MIC-1 and IL-6, were controlled in all analyses. Perceived stress and depressive symptoms were the only psychological variables to have significant differences between cohorts at time point one so these variables were also controlled for during analysis. Results indicated that relaxation practice moderated the effect of the intervention on both IL-6 and MIC-1. The two intervention groups who spent more time practicing having a greater decrease in MIC-1 (Wilks’ Lambda = 0.765, F(2,36)=5.533, p=.008) and IL-6 (Wilks’ Lambda = 0.76, F(2,36)=5.692, p=.007) compared to intervention participants who practiced less or wait-list comparison participants. Thus, increased relaxation practice within the intervention was associated with a greater decrease in biomarkers of age. These results are consistent with our previous research, which found that high practice participants in this intervention reported greater psychological benefits, including decreased levels of stress and depressive symptoms. Future studies with larger samples should evaluate how intervention-related changes in psychological function may mediate changes in these objective measures of health and aging.
SOCIAL RHYTHMICITY AND CELLULAR AGING: A PRELIMINARY EVALUATION OF SOCIAL CONTACT PATTERNS AND TELOMERE LENGTH
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Background: Regular timing of social contact may contribute to the health benefits associated with social connectedness. Features of social connectedness, such as social integration and perceived social support have been associated with longer telomere length, a measure of telomere aging. Daily rhythmicity of social contact may also contribute to longevity by providing external time cues that help to entrain biological and behavioral rhythms that underlie health and functioning. Day-to-day timing of social contact, herein termed “social rhythmicity,” may constitute a chronobiological pathway linking social contact and health. Here, we examine one rhythm of social contact in relation to telomere length in a sample of middle adults. Methods: One group of 62 participants (49 men, 13 women, age 51.84 years, SD=9.84 years; 62). Results: We found no significant correlation between social rhythmicity and telomere length. Discussion: The lack of a relationship between social rhythmicity and telomere length may be due to the limited variability in the social rhythmicity measures. Future research should explore the role of social rhythmicity in the aging process by examining a wider range of social rhythmicity measures and telomere length.
was determined from a buffy coat and measured via Southern blot following peripheral blood sample. Hierarchical linear regression was used to evaluate the association between social rhythmicity and telomere length after controlling for age, sex, BMI, marital status, symptoms of depression, social network diversity and social support.

Results: Social rhythmicity was a significant correlate of telomere length (F(8,53)=2.908, p=.011), independently contributing to 8.0% of the variance in telomere length above and beyond age and sex. Future studies should examine social rhythmicity in relation to biological mediators of aging and should consider how qualitative differences in social interaction modulate physiology at different circadian times.

5) Abstract 2583
ADOLESCENT BODY WEIGHT MISPERCEPTION AND INCIDENT ADULT OBESITY
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Background: Adolescents of normal weight who misperceive themselves as overweight engage in high-risk dietary practices and behaviors conducive to obesity that contribute to weight gain. We examine whether misperceived overweight in adolescence is associated with social perceptions of overweight in adulthood and the development of obesity.

Methods: During adolescence (mean age 16), participants in the National Longitudinal Study of Adolescent Health (ADD Health) reported how they perceived their body weight (from very underweight to very overweight) and were weighed and measured by research staff. At the most recent ADD Health assessment (mean age 29), participants were weighed and measured again. We tested whether adolescents who measured overweight but misperceived themselves as overweight at age 16 had a greater risk of becoming obese between the two assessments, controlling for sex, age, race/ethnicity, adolescent BMI, and adult education. Results: Across follow-up, 20% of the sample became obese. Participants who perceived themselves as heavier than their measured BMI in adolescence had a 40% increased risk of becoming obese between adolescence and young adulthood (OR=1.41, CI=1.21-1.63). This effect was surprisingly stronger among boys (OR=1.84, CI=1.40-2.43) than girls (OR=1.28, CI=1.07-1.54). Conclusion: Misperceived overweight in adolescence is a risk factor for incident adult obesity. This association may be mediated through unhealthy behaviors that are linked with risk of obesity (e.g., unhealthy eating practices, sedentary behavior). There is also growing evidence that social stigmatization of body weight, such as weight discrimination, increases risk for obesity; our results suggest that the label does not need to be applied by someone else; self-stigmatization is just as powerful. Further, although research and practice usually focus on the consequences of body image for girls, the present research suggests that boys may be more vulnerable to distorted perceptions that contribute to adult obesity.

6) Abstract 3111
CHRONIC STRESS AND CHILDHOOD ADVERSITY MODULATE VAGAL AND STRESS-IMMUNE RESPONSE TO THE TRIER SOCIAL STRESS TEST IN WOMEN WITH BREAST CANCER
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In response to a diagnosis of breast cancer a substantial number of women exhibit a stress-vulnerable phenotype, characterized by greater levels of proinflammatory cytokines in response to stress. An anti-inflammatory vagal pathway reduces stress-associated production of proinflammatory cytokines, and this may reduce inflammation-related behavioral symptoms, as well as favor cancer control mechanisms. This study evaluated whether vagal-mediated anti-inflammatory processes, chronic stress, fatigue and childhood adversity influence cortisol and cytokine response to the Trier Social Stress Test (TSST). Women with early stage breast cancer, who were assessed for fatigue, chronic stress, and childhood adversity completed the TSST while wearing Holter monitors to capture vagal tone. Salivary cortisol, cytokines, anxiety and affect were measured before, throughout, and after the TSST. Anxiety, tension, cortisol, and proinflammatory cytokines increased in response to the TSST and returned to baseline 60-min post-TSST. Greater physical fatigue, social chronic stress and childhood emotional abuse were associated with decreased vagal tone in response to TSST. Women with suppressed vagal tone during the TSST exhibited greater levels of cortisol, as well as a greater levels of IL-6 post-TSST. In addition, a more suppressed vagal tone at baseline predicted greater increases in IL-1 beta after the TSST. Women with greater social chronic stress demonstrated an exaggerated IL-1 beta response to TSST, while emotional and physical neglect were associated with a greater IL-6 and IL-1 beta levels during the post-TSST recovery phase. These results demonstrate that women with breast cancer who report greater fatigue, chronic stress and exposure to childhood adversity exhibit a more intense stress-induced proinflammatory response, which may be mediated by prior life stress suppression of vagal tone.

7) Abstract 3095
DEPRESSION AND ANXIETY SCREENS AS PREDICTORS OF 8-YEAR INCIDENCE OF TOTAL DEMENTIA, ALZHEIMER'S DISEASE, AND VASCULAR DEMENTIA
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Evidence suggests that depression and anxiety predict future dementia; however, little is known about the relative importance or joint effect of these overlapping emotional factors. Thus, we simultaneously examined depression and anxiety screens as predictors of incident dementia over 8 years in 3,082 older, primary care patients initially free of dementia (mean age=69 years, 69% female, 56% African American). At baseline (1999-2001), patients completed the PRIME-MD, a diagnostic instrument that assessed current or lifetime cases of the two depression or anxiety items were coded as screening positive for depression (13%) or anxiety (44%). The Regenstrief Medical Record System and Medicare/Medicaid data were used to identify incident dementia cases, defined as a new dementia diagnosis (ICD-9 code) or dementia death (death certificate) between baseline and 12/31/08. There were 512 (17%), 342 (11%), and 133 (4%) cases of incident total dementia, Alzheimer's disease, and vascular dementia, respectively. Depression and anxiety symptoms were assessed via self-report as a new demographic or vascular dementia case, and that the depression anxiety was associated with a greater IL-6 and IL-1 beta levels during the post-TSST recovery phase. These results demonstrate that women with breast cancer who report greater fatigue, chronic stress and exposure to childhood adversity exhibit a more intense stress-induced proinflammatory response, which may be mediated by prior life stress suppression of vagal tone.

8) Abstract 2567
THE RELATION OF WEIGHT DISCRIMINATION TO WELL-BEING, SELF-CARE, AND DISEASE STATUS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS
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Type 2 diabetes mellitus (T2DM) affects over 23 million people in the United States and 370 million people worldwide, and increases risk for a wide range of adverse health outcomes including, but not limited to, cardiovascular disease, blindness, nerve damage, kidney failure, and premature death. Being overweight/obese is common in patients with T2DM and also places individuals at risk for weight-related discrimination. Previous research has documented a particular relationship between weight-related discrimination and poor health outcomes, but evidence specific to patients with T2DM is lacking. We hypothesized that the attribution of perceived discrimination to weight would be associated with poor diabetes outcomes, including diabetes related distress, self-care behaviors, and a marker of disease status, above and beyond the influence of BMI and overall amount of reported discrimination. A community dwelling
sample of 185 adults (mean age = 55.4; 80% White, 65% Female) with poorly
treated T2DM provided demographic and self-report measures (including diabetes-related distress, diabetes self-care activities, overall perceived discrimination, and attributions of discrimination), and had BMI and glycated hemoglobin (HbA1c) assessed by trained research staff as part of a larger research study. Individuals who attributed perceived discrimination to weight, and BMI and overall reported discrimination, had significantly higher levels of diabetes-related distress (p < 0.01), and higher HbA1c levels (p < 0.001) compared to individuals who did not attribute maladjustment to weight. Results indicate that the perception of weight stigma among individuals with T2DM, above and beyond actual weight status and overall levels of discrimination, is strongly associated with a wide range of poor diabetes outcomes. This suggests that efforts to reduce exposure and/or reaction to weight stigma may promote positive outcomes in patients with T2DM.

9) Abstract 2513
DEPRESSIVE SYMPTOMS AS A NOVEL RISK FACTOR FOR
RECURRENT VENOUS THROMBOEMBOLISM: A LONGITUDINAL
OBSERVATIONAL STUDY IN PATIENTS REFERRED FOR
THROMBOPHILIA INVESTIGATION
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Background: Increasing evidence suggests that psychosocial factors, including depression, predict incident venous thromboembolism (VTE) against a background of genetic and acquired risk factors. The role of psychosocial factors for the risk of recurrent VTE has not been previously examined. We hypothesized that depressive symptoms in patients with prior VTE are associated with an increased risk of recurrent VTE.
Methods: In this longitudinal observational study, we investigated a cohort of 271 consecutive patients, aged 18 years or older, referred for thrombophilia investigation with an objectively diagnosed episode of VTE (i.e., deep venous thrombosis and/or pulmonary embolism). Patients completed the depression subscale of the Hospital Anxiety and Depression Scale (HADS-D). During the observation period, they were contacted by phone and information on recurrent VTE, anticoagulation therapy, and thrombophraxis in risk situations was collected.
Results: Clinically relevant depressive symptoms (HADS-D score ≥28) were present in 10% of patients. During a median observation period of 13 months (range 5-48), 27 (10%) patients experienced recurrent VTE. After controlling for sociodemographic and clinical factors, a 3-point increase on the HADS-D score was associated with a 44% greater risk of recurrent VTE (OR 1.44, 95% CI 1.02, 2.06). Compared to patients with lower levels of depressive symptoms (HADS-D score: range 0-2), those with higher levels (HADS-D score: range 3-16) had a 4-times greater risk of recurrent VTE (OR 4.07, 95% CI 1.55, 10.66).
Conclusions: The findings from this longitudinal study suggest that depressive symptoms may contribute to an increased risk of recurrent VTE independent of other prognostic factors. Moreover, an increased risk might already be present at subclinical levels of depressive symptoms.

10) Abstract 2667
PLACEBO RESPONSE IN PRIMARY INSONMIA
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Little is known about the role of placebo response in the pharmacotherapy of primary insomnia even though previous reviews showed evidence for a placebo response in subjective data gathered from sleep diaries. Our aim was to conduct an effect size analysis of placebo conditions in randomized controlled drug trials addressing primary insomnia, with a special emphasis on objective data assessed by polysomnography. We conducted a comprehensive literature search using PubMed, Cochrane Library, PSYCHINFO, PsycINFO, Embase, OpenGrey, and Google Scholar. Knowledge, Cochrane Clinical Trials and the WHO International Clinical Trials Registry Platform. Our meta-analysis used a random effects model and was based on 32 studies reporting 82 treatment conditions covering a total of 3,969 participants. Special emphasis was given to the comparison of objective and subjective outcomes and the proportion of the placebo response to the drug response. Effect sizes estimates (Hedges’ g) suggest that there is a small to moderate placebo effect in primary insomnia in terms of sleep onset latency (-0.35), total sleep time (0.42), wake after sleep onset (-0.29), sleep efficiency (0.31), subjective sleep onset latency (-0.29), subjective total sleep time (0.43), subjective wake after sleep onset (-0.32), subjective sleep efficiency (0.25) and sleep quality (0.31). Thus the placebo response was also evident in objective, physiological variables. Our results indicated that 63.56% of the drug responses are achieved even in the placebo groups. In light of these strong placebo responses and potential risks and side effects in the pharmacological treatment of primary insomnia, future studies should investigate how to exploit placebo mechanisms in clinical practice.

11) Abstract 2625
HOW MOMENTARY POSITIVE AND NEGATIVE MOOD AND DEPRESSIVE SYMPTOMS PREDICT PAIN IN DAILY LIFE AMONG RHEUMATOID ARTHRITIS PATIENTS
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This work examined whether depressive symptoms at baseline and within-person negative and positive mood assessed repeatedly in daily life predicted daily measurements of pain among individuals with rheumatoid arthritis (RA), a group for whom connections between pain and mood are common and problematic. Although relationships between depression, mood, and pain are well-established, very little work has examined these relationships in daily life, in the same individuals across time. We hypothesized that differences in momentary mood states wouldmediate any relationship between baseline depressive symptoms and within-person momentary pain, over and above the effects of momentary perceived stress. Method. Data were drawn from an intensive baseline measurement interval conducted for a larger intervention study that included adults with physician-confirmed RA (N = 31). Ecological momentary assessment (EMA) was conducted daily for seven consecutive days using a pseudo-random signal-conditional design. EMA data were analyzed using multi-level models, and controlled for gender, age, time of day, weekday vs weekend, and perceived momentary stress. Results. Greater depressive symptoms at baseline predicted more within-person momentary pain. Greater momentary positive mood was associated with less momentary pain, whereas negative momentary mood was associated with more momentary pain. Momentary mood did not account for the association between depressive symptoms and pain. However, among the 11 participants who met the cut-off for clinical depression, momentary negative mood appeared to have a particularly strong effect on momentary pain. Discussion. This research supports the common (but largely untested) contention that within-day fluctuations in negative mood can exacerbate momentary pain, and that positive mood can mitigate momentary pain. The within-person effects of depressive symptomatology on momentary pain appear to be largely independent of momentary mood. These results can inform the development of more effective chronic pain interventions, as they suggest that both depressive symptomatology and mood have independent effects on pain and that multi-arm interventions are likely needed.

12) Abstract 2613
OPTIMISM AND RECOVERY FOLLOWING ACUTE CORONARY SYNDROME: A CLINICAL COHORT STUDY
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Objective: Optimism is associated with reduced cardiovascular mortality, but its impact on recovery following acute coronary syndrome (ACS) is poorly understood. We hypothesized that greater optimism would lead to more effective physical and emotional adaptation after ACS, and would buffer the impact of persistent depressive symptoms on clinical outcomes. Methods: This prospective observational clinical study took place in an urban general hospital and involved 369 patients admitted with a documented ACS. Optimism was assessed with a standardised questionnaire. The main outcomes were physical health status, depressive symptoms, smoking, physical activity and fruit and vegetable consumption measured 12 months after ACS, and composite major adverse cardiac events (cardiovascular death, readmission with reinfarction, unstable angina and coronary artery bypass graft surgery) assessed over an average 45.7 months. Results: We found that optimism predicted better physical health status 12 months after ACS independently of baseline physical health, age, sex, ethnicity, social deprivation, and clinical risk factors (B = 0.65, 95% CI. 0.10 – 1.20). Greater optimism also predicted reduced risk of depressive symptoms (odds
ratio=0.82, 95% CI: 0.74 – 0.90), more smoking cessation and more fruit and vegetable consumption at 12 months. Persistent depressive symptoms 12 months after ACS predicted major adverse cardiac events over subsequent years (odds ratio = 2.56, 95% CI: 1.16 – 5.67), but only among individuals low in optimism (optimism x depression interaction; P = 0.020).

Conclusions: Optimism predicts better physical and emotional health following ACS. Measuring optimism may help identify individuals at risk. Pessimistic outlooks can be modified, potentially leading to improved recovery after major cardiac events.

13) Abstract 2951
LEAD ENHANCES THE EFFECT OF TRAUMA ON HPA-ASSOCIATED GENE EXPRESSION
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Methods: Women (N=136) recently diagnosed with breast cancer completed the Functional Assessment of Cancer Therapy: Physical Well-Being (e.g., amount of energy, pain, nausea), and Acceptance of Emotion Scale (e.g., extent to which patients are accepting and nurturing toward their own feelings) every 3 months for 2 years. Plasma samples at each time point were tested for IL-1β, IL-2, IL-6, IL-8, IL-10, TNF-α, and IFN-γ utilizing a high sensitivity bead-based (Luminex) multiplex assay (R&D Systems). Preliminary analyses focused on IL-6, IL-8, and TNF-α: analyses of other cytokines are pending. Multilevel models were used to test within-person associations of cytokines predicting physical well-being/symptoms over time, moderated by emotional acceptance (controlling for cancer treatments and mean levels of cytokines and emotional acceptance).

Results: For a given person, time-points with higher IL-6, IL-8, and TNF-α than average were associated with higher self-reported physical symptoms than average for that person (IL-6: p=0.001; IL-8: p=0.001; TNF-α: p=0.017). Additionally, emotional acceptance moderated the effects of IL-8 (p=0.006) and TNF-α (p=0.039) on physical well-being (Figure 1). For a given person, higher than average IL-8 and TNF-α were more strongly associated with higher symptoms than average (i.e., worse physical well-being) at times when emotional acceptance was lower than average for that person.

Discussion: Within-person models demonstrate higher symptoms when pro-inflammatory cytokines are higher. Importantly, emotional acceptance buffers the adverse relation between pro-inflammatory cytokines (IL-8 and TNF-α) and physical symptoms. Greater emotional acceptance may, therefore, be beneficial for women with breast cancer, which suggests that interventions that target emotion regulation may break the cycle between inflammation and physical symptom induction.

14) Abstract 2551
ASSOCIATIONS BETWEEN PRO-INFLAMMATORY CYKOTINES AND PHYSICAL SYMPTOMS ARE MODERATED BY EMOTIONAL ACCEPTANCE IN WOMEN WITH BREAST CANCER
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Purpose: Pro-inflammatory cytokines can induce sickness behavior (e.g., feeling physically ill). This association is particularly relevant in breast cancer patients because cancer and its treatment may result in perturbations in pro-inflammatory cytokines. Identifying ways to lessen the vicious cycle of inflammation leading to poorer physical and emotional well-being, which in turn, elevates inflammation and leads to more symptoms, is needed. The present study examines whether an adaptive emotion regulation strategy (emotional acceptance) moderates the associations between pro-inflammatory cytokines and physical symptoms in women with breast cancer.

Methods: Women (N=136) recently diagnosed with breast cancer completed the Functional Assessment of Cancer Therapy: Physical Well-Being (e.g., amount of energy, pain, nausea), and Acceptance of Emotion Scale (e.g., extent to which patients are accepting and nurturing toward their own feelings) every 3 months for 2 years. Plasma samples at each time point were tested for IL-1β, IL-2, IL-6, IL-8, IL-10, TNF-α, and IFN-γ utilizing a high sensitivity bead-based (Luminex) multiplex assay (R&D Systems). Preliminary analyses focused on IL-6, IL-8, and TNF-α: analyses of other cytokines are pending. Multilevel models were used to test within-person associations of cytokines predicting physical well-being/symptoms over time, moderated by emotional acceptance (controlling for cancer treatments and mean levels of cytokines and emotional acceptance).

Results: For a given person, time-points with higher IL-6, IL-8, and TNF-α than average were associated with higher self-reported physical symptoms than average for that person (IL-6: p=0.001; IL-8: p=0.001; TNF-α: p=0.017). Additionally, emotional acceptance moderated the effects of IL-8 (p=0.006) and TNF-α (p=0.039) on physical well-being (Figure 1). For a given person, higher than average IL-8 and TNF-α were more strongly associated with higher symptoms than average (i.e., worse physical well-being) at times when emotional acceptance was lower than average for that person.

Discussion: Within-person models demonstrate higher symptoms when pro-inflammatory cytokines are higher. Importantly, emotional acceptance buffers the adverse relation between pro-inflammatory cytokines (IL-8 and TNF-α) and physical symptoms. Greater emotional acceptance may, therefore, be beneficial for women with breast cancer, which suggests that interventions that target emotion regulation may break the cycle between inflammation and physical symptom induction.
Abnormalities in sleep architecture and/or sleep apnea link to subclinical metabolic dysfunction and ultimately development of Type 2 diabetes mellitus. However, it is not clear which aspects of sleep and metabolic function are associated in those at risk of developing diabetes. The present study of 25 healthy non-diabetic adult men and women, aged 18-55 years, examined metabolic function, including beta-cell metabolic regulation using an oral glucose tolerance test and indices of sleep architecture and sleep-disordered breathing using polysomnography. Besides fasting glucose and insulin levels, quantitative modeling methods were used to derive indices of beta cell function including glucose sensitivity, early-secretion rate sensitivity, and insulin secretion potentiation factor, total insulin-secretion rate. Regression analyses proceeded in three steps with model 1 including sociodemographic variables and BMI, model 2 including sleep architecture variables, and model 3 including the apnea-hypopnea index (AHI). Findings indicated that diminished insulin sensitivity was associated with more prolonged Stage 2 (β=.420, p=0.054) and Stage 3 (β=.461, p=0.036) sleep duration, and was related to shorter rapid eye movement (REM) (β=.652, p=0.005) sleep duration. In addition, greater insulin secretion rate was associated with less REM (β=.572, p=0.009) duration, but also with a higher AHI (β=.459, p=0.016). Notably, these associations were independently significant, suggesting a sleep-metabolic interaction that is driven by both REM and NREM sleep. Among individuals with increased sleep apnea and altered sleep architecture display poorer metabolic function, specifically linked to diminished insulin sensitivity and heightened postprandial insulin secretion rate. These findings suggest that possible mechanisms mediating the preclinical development of abnormal metabolic function may be linked to breathing dysfunction during sleep and/or the impact of sleep architecture.

16) Abstract 2973
PERCEIVED SOCIAL SUPPORT IS RELEVANT IN THE MANAGEMENT OF PAIN AND DEPRESSION AMONG ADULTS WITH SICKLE CELL DISEASE (SCD)
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Sickle cell disease (SCD) is an understudied, lifelong condition that produces elevated pain and distress. Despite known benefits of social support for chronic illness, there has been minimal research on how social support may affect individuals living with SCD. In a sample of 181 adults with SCD, an exploratory study was conducted to examine the associations of social support with pain and depression, two common comorbidities among SCD patients. The Alford-Edwards Social Support Inventory (AESII) was used to measure perceived social support (overall support; emotional, instrumental, informational, and comparative subtypes of support). Current pain levels were indexed using the Short Form McGill Pain Inventory, and depressive symptomatology was assessed using the Beck Depression Inventory (BDI) and the depression subscale of the Symptom Checklist-90-Revised (SCL-90-R).

Backwards stepwise regression analyses (with age and gender entered as covariates) revealed that overall perceived social support was inversely associated with current pain, B=-11, p=0.02, as well as depressive symptoms, B=-25, p=0.02 (BDI); B=-22, p<0.03 (SCL-90-R). Among the four subtypes of social support considered in follow-up analyses, only instrumental support was inversely associated with pain, B=-30, p<0.01, while only comparative support was inversely associated with depressive symptoms, B=-37, p<0.01 (BDI); B=-23, p=0.03 (SCL-90-R).

Findings suggest that among adults with SCD, perceived social support may reduce risk for pain and depression. More specifically, satisfying instrumental needs and coordinating resources to resolve daily challenges may reduce SCD-related pain, while the ability to gain support from other individuals who share a similar health condition (e.g., through support groups) may enhance coping and result in reduced emotional distress. Addressing social support as a protective factor for pain and distress among adults with SCD may open additional avenues for intervention and illness management in this population.
proposed as one of the many mechanisms linking inhibitory control with anxiety. Moreover, it is posited that rumination is not a unitary construct, but composed of at least three distinct components: (i) depressive rumination (maladaptive – sadness and despair); (ii) brooding rumination (maladaptive – wallowing and sulking); and (iii) reflective rumination (adaptive – problem solving and analytical thinking). However to date, research has yet to examine the differential mediating effects of the various forms of rumination on the link between resting HRV and anxiety outcomes. Thus, the following investigation attempted to rectify this in 183 undergraduate students (98 female, 60 minority, Mean Age = 19.34). Baseline-resting HRV data was collected during a 5-minute resting period. High frequency power estimates of HRV were obtained according to Task Force (1996) guidelines as an index of vagally-mediated HRV. Trait anxiety was assessed via the respective subscale of the Spielberger State-Trait Anxiety Inventory (STAI-T). Rumination was assessed using the Ruminative Responses Scale (RRS), including three subscales assessing three aforementioned rumination components. Three separate mediation analyses showed that there is a significant indirect effect of resting HRV on STAI-T scores as a function of brooding rumination ($\beta = -0.848$, Bootstrapping confidence interval [BootCI] [-1.637, -0.024], p<.05) and depressive rumination ($\beta = -1.225$, BootCI [-2.026, -.397], p<.05), but not reflective rumination ($\beta = -0.371$, BootCI [-0.908, -0.50], p>.05). Our results are consistent with previous research, showing that maladaptive forms of rumination (depressive and brooding) serve as potential mechanisms linking HRV to anxiety. However, reflective rumination did not mediate the association of resting HRV and trait anxiety. While the present results do not support the adaptive nature of reflective rumination, they do suggest that individuals are able to engage in reflective rumination without experiencing negative outcomes (e.g. anxiety) that are related to maladaptive forms of rumination. Future studies should identify potential moderators of the association between reflective rumination and anxiety outcomes.

20) Abstract 2821
NEGATIVE LIFE EVENTS MODERATE ASSOCIATIONS OF SUBJECTIVE CHILDHOOD SOCIOECONOMIC STATUS WITH INFLAMMATION AMONG MIDLIFE ADULTS
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It is suggested that childhood adversity programs an inflammatory phenotype characterized by higher inflammatory responses to stress that contribute to increased health risk in later life. To date, evidence supports an inverse association of childhood socioeconomic status (SES) with systemic inflammation in adulthood. However, it remains to be determined whether this association is moderated by exposure to stressful experiences. Here, we examined associations of subjective and objective indices of childhood and adult SES and negative life events with both circulating levels and lipopolysaccharide-stimulated production of interleukin (IL)-6 among a sample of middle-aged adults (47% female). Levels of IL-6 were measured by ELISA. Subjective SES was measured using the MacArthur Scale of Subjective Social Status, a visual ladder on which participants indicated the perceived social standing of their parents during childhood, and of themselves as an adult, relative to others in the USA. Negative life events in the past year were assessed using the Life Event List. Results of linear regression models that controlled for age, sex, body mass index (BMI), race, and current subjective and objective SES showed no significant main effects of subjective childhood SES or negative life events on circulating or stimulated levels of IL-6. However, there was a significant interaction between subjective childhood SES and negative life events in predicting circulating IL-6 ($B = .03$, $t(411) = -1.93$, p<.05). A simple slope decomposition revealed that among people who reported a high number of negative life events, low subjective childhood SES predicted higher levels of circulating IL-6. A similar pattern of results was observed on analysis of stimulated levels of IL-6, with a trend towards an interaction between subjective childhood SES and negative life events ($B = .03$, $t(378) = -1.84$, p=.07). These findings suggest that while low childhood SES environments may provide an underlying vulnerability for increased risk for disease in adulthood, the inflammatory phenotype may only become apparent in the presence of ongoing life stress. Supported by HL4096Z.

21) Abstract 2666
SHORT-TERM SUPPLEMENTATION OF LONG-CHAIN OMEGA-3 POLYSATURATED FATTY ACIDS REDUCES DEPRESSION SYMPTOMATOLOGY AMONG YOUNG ADULTS WITH DEPRESSION: A PRELIMINARY RANDOMIZED, DOUBLE BLIND, AND PLACEBO CONTROLLED TRIAL.

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Background: Previous research has established the mental health benefits of low-dose long-chain omega-3 polysaturated fatty acids (LCPUFAs). For example, clinical trials using LCPUFAs have reported a reduction in depressive symptomology. However, some suggest that the complexity of combining LCPUFAs with traditional antidepressant agents makes it difficult to interpret these results. There has been scant research examining how LCPUFAs influence mood in unmedicated individuals who currently meet criteria for depression. Aim: The current study sought to examine the psychological effects of acute and low-dose, the equivalent of adding two fatty fish meals per week to their diet, LCPUFAs supplementation on young adults with depression who were not receiving any other treatment. Methods: Participants (N = 23, M age (SD) =20.2 (6.7)) were randomized to a Beck Depression Inventory (BDI) score of greater than nine, were randomly assigned to a control (corn oil) or LCPUFAs group (1.4g of eicosapentaenoic and docosahexaenoic acids) and were instructed to consume the capsules daily for 21 days. LCPUFAs and Placebos were blinded with mint oil and packaged in identical packages; the blind was broken by the manufacturer at the end of the study. BDI was completed prior to supplementation and at day 21. Group differences in depression status on day 21 were analyzed using chi-square tests and differences in BDI score changes were analyzed using mixed design ANOVA. Results: After 21 days of supplementation there was a significant difference in depression status between groups. Whilst 67% of the LCPUFAs no longer met the criteria for being depressed, the same was only applicable to 20% of the placebo group. There was also a significant group x time interaction for BDI scores, F(1,19) = 4.72, p = .043, eta2 = .199. Post hoc analyses revealed the LCPUFAs group had a significant reduction in depression over time, whereas the placebo group did not significantly change. Conclusion: These findings suggest that LCPUFAs, or increasing consumption of fatty fish, may alter depression and depressive symptomology in young adults in a relatively short amount of time.

22) Abstract 2497
SUBCLINICAL CARDIOVASCULAR DISEASE AND MOBILITY CHANGES IN THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS (MESA)
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Declines in physical function and mobility, which contribute to mortality, loss of independence and poor quality of life in older adults, are not restricted to later life. Such declines may occur among younger individuals without overt clinical disease, but few studies have directly examined the association between subclinical cardiovascular disease and changes in these functional outcomes in non-patient samples. Using data from the Multi-Ethnic Study of Atherosclerosis (MESA), a population-based cohort study of subclinical cardiovascular disease, we examined the association between three markers of subclinical cardiovascular disease (intimal-medial thickening (IMT); coronary artery calcification (CAC); and ankle-brachial index (ABI)) at baseline and changes in self-reported walking pace over follow-up, an indicator of overall mobility changes. Analyses included 6,490 adults (52.7% female; 39.1% white; 26.4% black; 22.2% Hispanic; 12.3% Chinese), mean (SD) age, 62.0 (10.2) years (range, 44-84). The primary outcome was self-reported walking pace, assessed by the question, “When you want to walk, how fast can you walk most of the time?” Response options were: casual strolling (<2 mph); average or normal (2-3 mph); fairly briskly (4-5 mph); brisk or striding (>5 mph). Walking pace was assessed at visit 1 (baseline) and visits 2, 3, and 5 in MESA, covering a period of up to 11 years. Persons with missing walking data or who reported at baseline that they did no walking were excluded. Linear GEE models were estimated for walking pace, modeled continuously (range, 0-4), with baseline IMT (z-scored), CAC (arterial units), and ABI (systolic blood pressure divided by brachial blood pressure measured in the ankle divided by SBP measured in the arm) as predictors in separate analyses. Covariates included demographics, standard behavioral and biologic cardiovascular risk factors, and relevant covariate x time interactions. A significant IMT*time interaction showed that greater IMT at baseline was related to faster yearly declines in walking pace [b = -.004 (95% CI: -.008, -.000) p = .01]. The CAC*time [b = -.003 (95% CI: -.009, .003)] and ABI*time [b = -.001 (95% CI: -.004, .002)] interactions for walking pace were non-significant (p>.15). Subclinical cardiovascular disease in midlife may contribute to declining mobility over time but further research is needed to understand how specific disease processes affect functional outcomes with aging.
23) Abstract 2923
THE COMPASSIONATE MIRROR: MIRROR EXPOSURE INCREASES
THE EFFICACY OF A SELF-COMPASSION TECHNIQUE IN
REDUCING SELF-CRITICISM AND ENHANCING POSITIVE
AFFECT.
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The aim of this study was to test whether a 5-minute exposure to a small mirror could increase the effect of a self-compassion technique on reducing self-criticism and increasing positive affect. Healthy participants (N = 90, 46 females, Mage = 26.70, SD = 7.53) were first instructed to generate four phrases that they would use to soothe and encourage their best friend in an upsetting situation. They were then asked to describe a recent episode when they criticized themselves and then randomly assigned to one of three experimental conditions where they had to: (a) repeat the 4 phrases to themselves while looking at the mirror (n = 30), (b) repeat the 4 phrases to themselves without the mirror (n= 30); (c) looking at themselves in the mirror without repeating the phrases (n = 30). Before and after the intervention, affect ratings were obtained, along with state measures of self-compassion and self-criticism. The electrocardiogram was continuously recorded to derive heart rate (HR) and variability (HRV) measures. Participants in both the “phrases at the mirror”, and “phrases-only” conditions reported significantly higher levels of positive emotions (p<0.01), lower levels of negative emotions and self-criticism (p<0.001), and higher HRV (p<0.001), compared to participants in the “mirror-only” condition. Participants in the “phrases at the mirror” condition reported significantly higher levels of calmness, loveliness, self-confidence, and serenity (all statistically significant at p<0.05) compared during the intervention to those in the “phrases-only” condition. The effect of the “phrases at the mirror” intervention on those positive emotions was mediated by increased self-awareness and common humanity. Moreover, persons with higher baseline self-critical trait responded to the “phrases at the mirror” intervention with a significantly stronger reduction of negative emotions and self-criticism than persons with low or medium baseline scores. Results suggest that the mirror enhances the efficacy of this self-compassion intervention, specifically increasing the levels of the emotions of the “contentment system” (Depue & Morrone-Strupinsky, 2005; Gilbert, 2005a) connected to the activation of the parasympathetic nervous system.

24) Abstract 2534
ANGER EXPRESSION AND ILL-HEALTH IN TWO CULTURES: AN EXAMINATION OF INFLAMMATION AND CARDIOVASCULAR RISK
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Background. Anger expression has been associated with biological health risk (BHR) in Western cultures. However, little is known about the cross-cultural generality of this association. In Western cultures, anger is typically construed as frustration in the pursuit of personal goals. In contrast, in Japanese culture, anger expression is typically construed as a display of social privilege because only high-status individuals are culturally permitted to show this emotion. In Japan, therefore, anger expression may reflect social privilege rather than frustrating personal experience. Accordingly, we predicted that culture would moderate the association between anger expression and BHR: anger expression would be associated with higher BHR among American adults, but with lower BHR among Japanese adults. Method. Data from the Midlife in the United States (MIDUS) and Midlife in Japan (MIDJA) Studies included survey and biological assessments. The sample size for the MIDUS sample was 1,054 (54.7% female; M±SD: age = 58.0±11.6 years), and was 382 for the MIDJA sample (56.6% female; M±SD: age = 55.5±14.0 years). BHR was assessed as an index of pro-inflammatory markers (interleukin-6 and C-reactive protein) and indices of vascular disease (e.g., blood pressure, body mass index, waist circumference, low-density lipoprotein, high-density lipoprotein, cholesterol ratio), all measured from a fasting blood draw. Models adjusted for age, gender, educational attainment, smoking, alcohol, chronic conditions, and body mass index. Results. We found that the positive link between anger expression and increased BHR was robust for Americans. As predicted, however, this association was diametrically reversed for Japanese, with anger expression predicting reduced BHR. The pattern was specific to the expressive facet of anger expression and remained after controlling for covariates as well as reported experience of negative emotions. Conclusions. Thus, the findings support a cultural moderation interpretation of the link between anger expression and BHR. Whereas anger expression was associated with increased BHR in Americans, it was associated with reduced BHR among Japanese. This study highlights the importance of incorporating cultural perspectives when probing relationships between anger expression and physical health.

25) Abstract 2715
THE OXYTOCIN RECEPTOR IN RESPONSE TO INFLAMMATION IN HUMAN MACROPHAGES
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Background: Social environment influences the progression of atherosclerosis, a chronic inflammatory process. Oxytocin (OT) has been associated with pro-social behavior; however, plasma OT levels are not elevated in a pro-social environment in animal models of disease. Infusion of exogenous OT in these disease models attenuates inflammation and arterial plaque, which raises the possibility that OT’s anti-inflammatory effects may be regulated at the level of the OT receptor (OTR) rather than by changes in plasma OT titers as a function of social environment.

Purpose: The current study investigates OTR and signaling pathways in human macrophages to understand how inflammation affects the OTR/OTR system at the molecular level. We hypothesize that OTR is an acute phase protein, whose expression is regulated during the inflammatory response through a nuclear factor xB (NF-xB) mediated pathway. We further evaluated whether inflammation alters OTR signaling pathways, which can occur through either the phosphatidylinositol (PI) (Gqa/11) or the cAMP (Gsa) pathways.

Methods: Inflammation was induced by treating THP-1 macrophages with lipopolysaccharide (LPS) and monitored by the inflammatory cytokine, interleukin-6 (IL-6). Cells were treated with exogenous IL-6 and NF-xB inhibitors and OTR gene expression was measured by RT-PCR. OTR signaling was evaluated by phosphorylation of downstream targets, ERK1/2 from the PI pathway, and CREB from the cAMP pathway, by immunoblotting after LPS and OT treatments.

Results: Induction of inflammation by LPS stimulation of macrophages significantly up-regulated OTR transcription 150-fold relative to control cell, however IL-6 had no effect on OTR expression. Blocking NF-xB activation prevented the increase in OTR transcription. Our data also confirmed OT-treatment of macrophages inhibits LPS stimulated IL-6 secretion. Incubation of LPS-treated cells with OT caused increased phosphorylation of ERK1/2 and CREB demonstrating receptor function through both Gqa/11 and Gsa signaling pathways during inflammation.

Conclusions: OTR is an acute phase protein, whose expression is regulated by NF-xB. Current data suggest both the PI and cAMP signaling pathways are activated and work in inflammation the macrophage and that the receptor may be responsible for attenuating the extent of injury within the human macrophage. This study demonstrates the importance of OTR in regulating inflammation, and suggests OTR regulation/function should be considered in addition to measurement of plasma OT.

26) Abstract 3053
REDUCED STRESSOR-EVOKED PERIULAR ANTERIOR CINGULATE ACTIVITY AND FUNCTIONAL CONNECTIVITY IN INSOMNIA Thomas E. Kraynak, BA, Greg J. Siegle, PhD, Martica H. Hall, PhD, Psychiatry, School of Medicine, University of Pittsburgh, Pittsburgh, PA

Objective: Current concepts of insomnia pathophysiology posit that central nervous system regulators of the sleep-wake cycle are biased away from sleep, as evidenced by studies demonstrating increased physiological arousal during sleep in people with insomnia. In this study we aimed to determine whether distinct neural processes and peripheral autonomic activity in response to shifting environmental demands have been identified using neuroimaging, but it is not known whether such mechanisms are compromised in insomnia. Methods: Healthy participants (N = 18) were exposed to light at different times of day and C-fos and OTR gene expression was measured by RT-PCR. 0TR signaling was measured by phosphorylation of downstream targets, ERK1/2 from the PI pathway, and CREB from the cAMP pathway, by immunoblotting after LPS and OT treatments. Results: Induction of inflammation by LPS stimulation of macrophages significantly up-regulated OTR transcription 150-fold relative to control cell, however IL-6 had no effect on OTR expression. Blocking NF-xB activation prevented the increase in OTR transcription. Our data also confirmed OT-treatment of macrophages inhibits LPS stimulated IL-6 secretion. Incubation of LPS-treated cells with OT caused increased phosphorylation of ERK1/2 and CREB demonstrating receptor function through both Gqa/11 and Gsa signaling pathways during inflammation.

Conclusions: OTR is an acute phase protein, whose expression is regulated by NF-xB. Current data suggest both the PI and cAMP signaling pathways are activated and work in inflammation the macrophage and that the receptor may be responsible for attenuating the extent of injury within the human macrophage. This study demonstrates the importance of OTR in regulating inflammation, and suggests OTR regulation/function should be considered in addition to measurement of plasma OT.
pulse plethysmography while they performed the Multi-Source Interference Task, which reliably provokes subjective distress and identifies individual differences in neural and cardiovascular reactivity. In each participant, we calculated condition-related changes in neural and autonomic activity, focusing our analyses on the anterior cingulate cortex and HF-HRV, and assessed group differences.

Results: Although groups did not differ in task-evoked HF-HRV, OAi demonstrated relatively decreased task-evoked reactivity compared to GS within the perigenual anterior cingulate cortex (pgACC), a region previously associated with HF-HRV control. Activity within this region was associated with task-evoked changes in HF-HRV within the OAi but not GS group, and HF-HRV significantly moderated group differences in pgACC reactivity. Furthermore, psychophysiological interaction analyses revealed decreased task-related functional connectivity from the pgACC to insular, limbic, and midbrain regions in OAi.

Conclusions: These results suggest that insomnia involves a relative dysfunction within brain networks tasked with assembling and regulating appropriate changes in autonomic arousal. Specifically, decreased pgACC control over brainstem autonomic regulation could account for altered autonomic physiology reported in individuals with insomnia.

Support: Research support provided by P01 AG020677.

27) Abstract 2607
ISOMETRIC YOGA REDUCES FATIGUE AND PAIN IN PATIENTS WITH CHRONIC FATIGUE SYNDROME WHO ARE RESISTANT TO CONVENTIONAL THERAPY: A RANDOMIZED, CONTROLLED TRIAL
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Background: Patients with chronic fatigue syndrome (CFS) often complain of persistent fatigue even after conventional therapies. The aim of this study was to investigate the feasibility and efficacy of isometric yoga in patients with CFS who are resistant to conventional treatments in a randomized, controlled trial.

Methods: This trial enrolled 30 patients with CFS who did not have satisfactory improvement after receiving conventional therapy for at least six months. They were randomly divided into two groups and were treated with either conventional pharmacotherapy (control group, n=15) or conventional therapy together with isometric yoga practice, which consisted of biweekly, 20-minute sessions with a yoga instructor and daily in-home sessions (yoga group, n=15) for approximately two months. The short-term effect of isometric yoga on fatigue was assessed by administering the profile of mood status (POMS) questionnaire immediately before and after the final 20-minute session with the instructor. The long-term effect of isometric yoga on fatigue was assessed by administering the Chalder’s fatigue scale (FS) questionnaire to both groups before and after the intervention. Adverse events and changes in subjective symptoms were recorded for subjects in the yoga group.

Results: All subjects completed the intervention. The mean POMS fatigue score decreased significantly (from 21.9 ± 7.7 to 13.8 ± 6.7, P<0.001) after a yoga session. The Chalder’s FS score decreased significantly (from 25.9 ± 6.1 to 19.2 ± 7.5, P=0.002) in the yoga group but not in the control group. In addition to the improvement of fatigue, two patients with CFS and fibromyalgia syndrome in the yoga group also reported pain relief. Furthermore, many subjects reported that their bodies became warmer and lighter after practicing isometric yoga.

Conclusions: Add-on therapy of isometric yoga is both feasible and successful at relieving the fatigue and pain of a subset of therapy-resistant patients with CFS.

28) Abstract 2727
THE BIG 5 PERSONALITY TRAITS AND ALLOSTATIC LOAD IN THE MIDLIFE IN THE U.S. STUDY (MIDUS)
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Recent attention has been devoted to understanding how personality traits influence physiological health. The current study tested whether the Big 5 personality traits predicted multi-system physiological health as measured by an allostatic load (AL) index. Analyses utilize data on demographics, personality, health, fat-free mass and cortisol measures from 24 biomarkers from 7 different physiological systems (sympathetic and parasympathetic nervous systems, hypothalamic-pituitary-adrenal axis, cardiovascular, lipid metabolism, glucose metabolism, and inflammatory activity). A total AL score ranging from 0 (no AL) to 7 (highest possible AL) was created by summing the proportion of biomarker indicators for each of the 7 physiological systems that fell into the high-risk quartiles of biomarker distributions (i.e., each physiological subsystem could have from 0-100% of biomarker indicators in high-risk quartiles for a possible subsystem score from 0-1). Model covariates included: age (M = 58.05; SD = 11.63; range = 35-86), sex (55% female), race (93% Caucasian), education levels, alcohol, tobacco, and leisure-time physical activity, and chronic pain. Analyses for demographic factors indicated that Conscientiousness (β = -0.07; SE = .03; p < .01) and Agreeableness (β = 0.08; SE = .04; p < .05) were significant predictors of the AL index. Although the inclusion of health covariates attenuated the Agreeableness association to non-significance, the Conscientiousness effect remained essentially unchanged. Sensitivity analyses revealed that the effects of Conscientiousness and Agreeableness were significant only for lipid metabolism, glucose metabolism, and parasympathetic subsystem AL scores.

Findings support the hypothesis that personality traits are associated with the activity of multiple physiological pathways. Such information is useful in determining how psychological characteristics might shape physiological processes and health over time.

29) Abstract 2956
ACUTE NEGATIVE EMOTIONS AND PHYSICAL ACTIVITY AS RISK FACTORS FOR CARDIAC AND NON-CARDIAC HOSPITAL ADMISSION
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Background: Physical and psychological stressors can trigger cardiovascular events. This study determined the prevalence and relative risk of acute exposure to negative emotions and high levels of physical exertion preceding hospital admission. We also examined whether risks differ between patients with cardiac versus non-cardiac diagnoses.

Methods: This case-crossover study involved 521 patients (mean age 61.8±11.2, 51.5% women) admitted with acute cardiac complaints. Negative emotions and physical activity levels were assessed using structured interview. A 7-point rating scale was used and scores ≥5 identified patients exposed to high pre-admission levels of anger, anxiety or sadness or physical activity. Two physicians independently retrieved discharge diagnoses (cardiac vs. non-cardiac). Case crossover analysis was used to calculate relative risks (RR) and 95% confidence intervals (CI) for the two-hour pre-admission hazard period compared to usual free levels over the past year.

Results: Negative emotions were high in 32 patients (6.1%) during the 2-hour hazard period, and 43 patients (8.3%) reported exposure to high physical exertion. Exposure to negative emotions was associated with a relative risk of hospital admission of 7.98 (95%CI=5.51-11.56). The RR was higher for patients with a non-cardiac diagnosis (RR=12.37, 95%CI=6.78-22.54) compared to patients with a cardiac diagnosis (RR=6.40, 95%CI=3.97-10.30, p interaction=0.00). Risk estimates per separate emotion revealed similar results with wider confidence intervals, with the highest RR for anxiety (cardiac RR=11.57, 95%CI=6.80-19.68; non-cardiac RR=19.78, 95%CI=7.34-40.20). For physical exertion, the RR was 4.95 (95%CI=3.64-6.75) and no differences were found for cardiac (RR=4.89, 95%CI=3.35-7.14) vs. non-cardiac (RR=5.07, 95%CI=2.96-8.69) diagnoses (p interaction=0.951).

Conclusion: High levels of negative emotions (anger, anxiety and sadness) and physical exertion are associated with a heightened risk of hospital admission for both cardiac and non-cardiac conditions. These findings suggest that emotional factors can be potential triggers of acute coronary syndromes and other cardiac conditions. In addition, negative emotions also precede hospital admission for cardiac complaints that ultimately do not reflect underlying heart disease. Future research is needed to disentangle the biobehavioral mechanisms that differentially account for acute triggers of cardiac versus non-cardiac conditions.

30) Abstract 3132
LATENT PROFILES OF DEPRESSION IN SLEEP APNEA
William Wohlgemuth, Ph.D., Sleep Center, Miami VA Medical Center, Miami, FL, Douglas Wallace, M.D., Neurology, University of Miami, Miami, FL
Obstructive Sleep Apnea (OSA) is a chronic condition characterized by repeated episodes of partial or complete upper airway collapse during sleep, leading to intermittent cyclic hypoxemia and sleep fragmentation. OSA increases the risk of heart failure, coronary artery disease and metabolic dysfunction. Subjective daytime symptoms of OSA include fatigue and sleepiness. Recent research is beginning to explore the association between OSA and depression. The present research was undertaken to determine if profiles of depression could be identified in OSA patients and if nighttime sleep parameters could predict these profiles.
Eighty-five recently diagnosed OSA patients attended the sleep clinic to receive continuous positive airway pressure to treat OSA. During this visit patients completed the PHQ-9 which is a brief paper and pencil assessment of depression symptoms. Sleep related covariates included the Insomnia Severity Index (ISI), which is a self-report of subjective sleep difficulty. Objective overnight sleep study variables, including the apnea-hypopnea index (AHI) and oxygen saturation indices were also included.

Latent profile analysis was used to find underlying clusters of depression in this cohort of OSA patients. Information criteria identified a three cluster solution as best fitting. The three latent clusters were identified as: 1) severely depressed, 2) not depressed and 3) sleep specific depression. Contrary to the ‘not depressed’, the ‘severely depressed’ cluster was elevated on all items of the PHQ-9. The ‘sleep specific’ depression cluster had the highest elevations on sleep related items.

The covariates showed that higher elevations of the ISI predicted membership in the ‘sleep specific’ and ‘severely depressed’ clusters. A more elevated AHI and reduced objective sleep efficiency predicted membership in the ‘severely depressed’ cluster. Overall, multiple covariate indicators of poor sleep functioning predicted the ‘severely depressed’ cluster. However, only elevations of subjective insomnia predicted membership in ‘sleep specific’ depression cluster. These results indicate that both subjective report of insomnia as well as objectively determined sleep-related breathing dysfunction are related to severe depression in OSA patients.
SYMPOSIA
Symposium 3060
Thursday, March 19 from 8:30 to 9:30 am
Biopsychosocial Balancing in Medically-Unexplained Symptoms: Clinical and Research Implications
Xavier F. Jimenez, MD, Psychiatry and Psychology, Cleveland Clinic, Cleveland, OH, Gregory Thorkelson, MD, Psychiatry, University of Pittsburgh Medical Center / Western Psychiatric Institute and Clinic, Pittsburgh, PA, Eva Szigiethy, MD, PhD, Psychiatry, Pediatrics, University of Pittsburgh Medical Center / Western Psychiatric Institute and Clinic, Pittsburgh, PA, Joel E. Dimsdale, MD, Psychiatry, University of California San Diego, La Jolla, CA
Medically-unexplained symptoms (MUS) are rather common in clinical practice, yet frustrating to patient and provider alike. Although increasing research attention is being devoted to this broad realm, an improved conceptualization of MUS will benefit future investigations into pathophysiology and potential treatment paradigms. MUS are most often experienced as pain, gastrointestinal dysregulation, and/or pseudo-neurological disturbance, paralleling the phenotypic domains of the traditional DSM construct of “somatization disorder.” Although a biopsychosocial (BPS) conceptualization of MUS demands integration of a host of variables, according to the current state of knowledge, the relative contributions of each BPS component (biological, psychological, or social) to the pathophysiology of MUS differ across said phenotypic domains. This symposium aims to examine these relative BPS contributions, with three clinically-experienced presenters elucidating what is actively known regarding the biological, psychological, and social determinants of pain, gastrointestinal, and pseudo-neurological MUS. The purpose of demonstrating the weighted, mechanistic relevance of each BPS component across these MUS phenotypes is to more accurately inform both clinical and investigational needs moving forward in the approach to MUS.

By the end of this symposium, the audience will be able to cite current scientific knowledge of what drives MUS across the three physiological systems mentioned. In addition, although the audience will have an increased appreciation of the interplay between various BPS components, more importantly the presenters will provide focused attention to system-specific and weighted BPS inputs. Ultimately, pain, gastrointestinal, and pseudo-neurological MUS will be presented along a BPS continuum, with chronic pain syndromes demonstrating the most “biological” of underpinnings, pseudo-neurological disorders the most “psychosocial,” and gastrointestinal symptoms a complex blend of all components. This categorization of the MUS into contiguous yet distinct BPS domains is integrative yet focused, calling for nuanced attention to symptom-specific clinical and investigational priorities while remaining attuned to the various mechanistic commonalities amongst the most common MUS. Weighted distributions of BPS contributions to MUS pathophysiology will raise important questions as to whether a particular BPS domain warrants more (or less) clinical or research attention.

Individual Abstract Number: 3066
Biopsychosocial Balancing in Medically- Unexplained Symptoms: Gastrointestinal Symptoms
Gregory Thorkelson, MD, Psychiatry, University of Pittsburgh Medical Center / Western Psychiatric Institute and Clinic, Pittsburgh, PA
BACKGROUND: Gastrointestinal (GI) symptoms encompass a number of domains, including pain, bloating, and stool changes. These symptoms are rather common and can often be attributed to a wide variety of medical conditions, from inflammatory bowel disease to lactose intolerance. Unexplained GI symptoms occur along a spectrum from purely functional to entirely physical or structural; often, especially in the case of irritable bowel syndrome (IBS) or gastroparesis, the symptoms are a mixture of both structural and functional factors. A number of mechanisms appear to be involved depending on the symptom cluster including inflammatory, mitochondrial, structural, microbiological, social, and psychiatric.

OBJECTIVE: The purpose of this section is to review state of knowledge regarding the BPS underpinnings of gastrointestinal symptoms in order to explore the interplay between function, structure, and environment in symptom presentation.

METHODS: This is a literature review incorporating state of the art clinical knowledge. Special emphasis will be placed on IBS as a prototypical model incorporating the complexities of GI symptom production.

CONCLUSIONS: Gastrointestinal (GI) symptoms often result from a complex interplay of psychological, social, and environmental factors and structural, genetic, inflammatory, dietary and other aspects of the patient. Unlike MUS in other body systems, GI symptoms generally have a more robust biological component and frequently include vagal involvement, both central and peripheral pain perception, and local mechanisms such as smooth muscle tone and gut microflora composition. The psychosocial aspects unique to the individual patient often account for the diversity of symptom presentation.

FUTURE DIRECTIONS: As appreciation for potential physical and environmental contributions to GI issues and study of the human gut microecosystem progresses we will further clarify the organic, structural components to GI symptom presentation. With these developments comes the unique and beneficial opportunity to better understand the relationship between BPS components and specific structural abnormalities to best guide both physical and psychological interventions for these patients in great need.

Individual Abstract Number: 3068
Biopsychosocial Balancing in Medically- Unexplained Symptoms: Chronic Pain Syndromes
Eva Szigiethy, MD, PhD, Psychiatry, Pediatrics, University of Pittsburgh Medical Center / Western Psychiatric Institute and Clinic, Pittsburgh, PA
BACKGROUND: Chronic non-cancer pain is common, costly, and associated with increased prescription opioid use. The three most common categories of chronic pain are nociceptive (e.g. damage in peripheral tissue), neuropathic (damage to peripheral nerves), and central (e.g., a disturbance in the central nervous system pain processing). Pain management remains a challenge, particularly when chronic central pain syndromes (CCPS) like fibromyalgia, tension headaches, or irritable bowel disorder are present. While certain risk factors for CCPS have been identified across several studies including early trauma, and psychopathology, there is a paucity of literature organizing this information into a biopsychosocial (BPS) model that can help inform treatment planning.

OBJECTIVE: The purpose of this presentation is to review the BPS underpinnings of CCPS to identify predisposing and precipitating factors as the targets for multidimensional treatment plans.

METHODS: Review of literature and state of knowledge, with emphasis on diagnosis and treatment approaches to CCPS.

CONCLUSIONS: CCPS remain inadequately treated in most medical settings, particularly because pharmacotherapy alone has not been particularly effective. Predisposing factors include both state and trait psychiatric disorders, cognitive predisposition (e.g. neuroticism, catastrophizing), child trauma, and genetic factors leading to lower mechanical pain thresholds or paradoxical response to pain medications (e.g., hyperalgesia). Precipitating events include exposure to stressors, acute peripheral nociceptive input, neurogenic inflammation, and epigenetic changes leading to central sensitization. There is growing evidence of brain changes consistent with maladaptive neuroplasticity and neurotoxic changes. Psychological and behavioral responses to the pain can lead to intensification of existing chronic pain or new regions of pain. An intensive multidisciplinary team approach based on the BPS model which treats the “chronification” of pain as a disease is most likely to reduce the associated suffering and disability.

FUTURE DIRECTIONS: With the advent of better central nervous system proton MRI and the use of functional genetics, the neurobiological underpinnings of CCPS will allow for more targeted interventions. Pharmacogenomic approaches can lead to personalized pharmacotherapy along with psychosocial interventions with neurobiological pain targets will have the greatest impact and prevent high medical utilization and overuse of chronic opioids.

Individual Abstract Number: 3069
Biopsychosocial Balancing in Medically- Unexplained Symptoms: Neurological Symptoms
Xavier F. Jimenez, MD, Psychiatry, Cleveland Clinic, Cleveland, OH
BACKGROUND: Pseudo-neurological symptoms, also referred to as functional neurological symptoms, are medically-unexplained symptoms (MUS) accounting for significant amounts of disability, distress, clinician frustration, and financial burden. Traditionally referred to as “conversion disorder,” such symptoms lack discernible structural or anatomical abnormalities by definition; classic examples include functional movement disorders and psychogenic nonepileptic seizures. Various biological, psychological, and social (BPS) explanations have been offered for pseudo-neurological symptoms, though it is unclear which explanatory model best accounts for these syndromes.

OBJECTIVE: The purpose of this presentation is to review state of knowledge regarding the BPS underpinnings of pseudo-neurological symptoms in order to identify their most relevant components.

METHODS: Review of literature and state of knowledge, with special emphasis on PNES as the prototypical pseudo-neurological symptom.

CONCLUSIONS: Although various biological abnormalities (including hypothalamic-pituitary-adrenocortical dysregulation, adrenergic activation, and parietal cortex dysfunction) theoretically contribute to pseudo-neurological presentations, the preponderance of evidence suggest a host of psychological
(trauma, alexithymia, dissociation, somatization, denial-suppression, attachment insecurity, psychiatric comorbidities) and social (abnormal illness behavior/sick role, cultural norms, secondary gain/disability, family dysfunction) mechanisms informing neurological MUS, unlike other MUS including pain and gastrointestinal in which more biologically-determined variables are currently known to drive presentation. FUTURE DIRECTIONS: Both clinical and research approaches to pseudo-neurological disturbances are inadequate, often focusing on the rigorous medical exclusion of rather improbable functional disorders (mitochondrial disorders, postural hypotension tachycardia syndrome, chronic Lyme/post-infectious diseases, vitamin/mineral deficiencies, etc). While psychobiological validation studies are continuously warranted, including CNS imaging and other biomarkers, specific treatment interventions and investigational resources aimed at the psychosocial processes at play in pseudo-neurological disorders are desperately needed.

Symposium 2763
Thursday, March 19 from 9:45 to 11:00 am

Biopsychosocial frontiers in perinatal health: Effects of sleep, race, and stress on inflammation and cardiovascular function
Chris Dunkel Schetter, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Lisa M. Christian, PhD, Psychiatry, Ohio State University, Columbus, OH, Julian Thayer, PhD, Psychology, The Ohio State University, Columbus, OH, 43210, Lisa Christian, PhD, Psychiatry, The Ohio State University, Columbus, OH, Michele Okan, Ph.D., Biofrontiers, University of Colorado at Colorado Springs, Colorado Springs, CO, Christine M. Guardino, PhD, Psychology, UCLA, Los Angeles, CA
The goal of this symposium is to present new data utilizing complementary biopsychosocial approaches to examine stress and health during pregnancy and postpartum, with a primary focus on race and sleep as predictors of cardiovascular and inflammatory processes. There are marked racial disparities in cardiovascular disorders as well as adverse birth outcomes. Novel data presented in this symposium by our first speaker demonstrate that cardiovascular adaptation to pregnancy is impaired among African Americans versus European Americans, and racial discrimination has moderating effects. In addition, data presented by the second speaker from a racially diverse sample of 128 pregnant women show that associations between poor sleep quality and elevations in serum proinflammatory cytokines, as well as poor birth outcomes, are more robust among African Americans compared to Whites. Related are new data presented by the third speaker showing that daytime napping may provide a useful countermeasure to sleep disruption during pregnancy. Our final speaker will present biopsychosocial associations in postpartum using data on stress and inflammation from a racially diverse low income sample of over 1,200 women assessed across the first year after childbirth. In sum, this symposium will provide an overview of a set of novel, interrelated, and clinically meaningful research on psychosocial stress and perinatal health in high risk populations. Ample time for questions is planned to highlight connections among previous and frontiers in perinatal biopsychosocial research including translational perspectives.

Individual Abstract Number: 2767
Impaired Vasodilation in Pregnant African Americans: Potential Antecedents and Consequences
Julian Thayer, PhD, Psychology, The Ohio State University, Columbus, OH, 43210, Julian Koenig, PhD, DeWayne Williams, MA, Psychology, The Ohio State University, Columbus, OH, Gassan Kapaku, MD, PhD, Georgia Prevention Institute, Georgia Health Sciences University, Augusta, GA, Lisa M. Christian, PhD, Psychiatry, The Ohio State University, Columbus, OH
Objective: Significant health disparities exist between African Americans and European Americans in hypertension and hypertension-related disorders. Emerging evidence suggests that this is due to impaired vasodilation in African Americans. Pregnancy is a potent systemic vasodilatory state. However, to date, differences in vasodilation between African Americans and European Americans have not been investigated in pregnancy. In addition, racial discrimination has been implicated in this health disparity and low birth weight may be a consequence. Therefore we sought to examine the effects of pregnancy on vasodilation in African American and European American women and how this might be related to discrimination and low birth weight in their offspring. Methods: Hemodynamics [blood pressure (MAP), cardiac output (CO), and total peripheral resistance (TPR)] were assessed at baseline in 40 pregnant African Americans and European Americans and 40 matched non-pregnant women. Participants also completed the Experiences of Discrimination scale and birth weight was measured in the offspring of the pregnant participants. Results: Whereas pregnancy was associated with decreased MAP independent of ethnicity, African American women showed impaired vasodilation independent of pregnancy status as indicated by greater TPR in spite of greater RSA. In African Americans but not European Americans reports of fewer incidences of discrimination were associated with greater TPR. Finally, the offspring of African American women had lower birth weights compared to European Americans. Conclusion: We report for the first time evidence of impaired vasodilation to an endogenous vasodilatory stimulus in African Americans. This impairment was related to discrimination and low birth weight. These findings have implications for understanding the intergenerational transmission of impaired vasodilation in African Americans.

Individual Abstract Number: 2766
Poor sleep quality and inflammation predict preterm birth: Heightened risk among African Americans
Lisa Christian, PhD, Psychology, Lisa M. Blair, BSN, RNC, Nursing, Kyle Porter, MAS, Biostatistics, Bonnie Leblichciglio, DDS, PhD, Dentistry, The Ohio State University, Columbus, OH
Objectives: Poor sleep promotes inflammation. In turn, inflammation is a causal mechanism in term as well as preterm parturition. In the US, a persistent racial disparity in preterm birth exists, with African Americans showing approximately 1.5 times greater risk. This study examined associations among sleep quality, serum proinflammatory cytokines, and length of gestation in a racially diverse sample of 139 pregnant women. Methods: Pregnant women were assessed in the 2nd trimester. Each completed the Pittsburgh Sleep Quality Index (PSQI) and other psychosocial and behavioral measures. Serum levels of interleukin(IL)-6, IL-8, IL-1β, and tumor necrosis factor(TNF)-α were determined by high sensitivity assays. Gestational length was determined via medical record review. Results: Among African American women (n=79), shorter gestation was predicted by poorer overall sleep (rs=-0.35, p=0.002) as well the following PSQI subscales: subjective sleep quality (rs=-0.30, p=0.01), sleep latency (rs=-0.27, p=0.02), and sleep efficiency (rs=-0.27, p=0.02). African American women with poor sleep quality (PSQI > 5) had 3.12 times the odds of preterm birth compared to those with good sleep quality. In contrast, among European American women (n=53), gestational length was not significantly predicted by sleep quality (ps>0.12). Moreover, a significant association between overall sleep quality and IL-8 was present among African American women (rs = 0.30, p = 0.01) but not European Americans (rs = 0.13, p = 0.35). Further, among African American women only, a modest mediating effect of IL-8 in the relationship between poor sleep and length of gestation was evidenced. Conclusions: These data provide novel evidence that, as compared to European American women, African Americans exhibit greater inflammation in response to sleep disturbance and these effects correspond with length of gestation. Racial differences in susceptibility to sleep-induced immune dysregulation may contribute to marked racial disparities in preterm birth.

Individual Abstract Number: 2797
Daytime Napping Behavior Hardly Impacts Nocturnal Sleep in Pregnant Women
Michele Okan, Ph.D., Biofrontiers, University of Colorado at Colorado Springs, Colorado Springs, CO, Rebecca Ebert, BA, Psychology, Annette Wood, BS, Psychiatry, University of Pennsylvania, Philadelphia, PA
Objectives: Significant health disparities exist between African Americans and European Americans in hypertension and hypertension-related disorders. Emerging evidence indicates that insufficient quantity and poor sleep quality are associated with adverse pregnancy outcomes, such as preterm birth and gestational diabetes. When sufficient nighttime sleep is not possible or unattainable, certain strategies, such as daytime naps, can be implemented to counteract the negative effects of disrupted nocturnal sleep. The current study we assessed self-reported napping behavior collected longitudinally via sleep diaries from women in early gestation (10-20 weeks). We identified the frequency and length of naps and whether there were any associations with both diary and actigraphy assessed nocturnal sleep parameters. Participants included 161 pregnant women recruited and evaluated in early gestation. Daily sleep information was collected in three two-week periods, at T1 (10-12), T2 (14-16), and T3 (18-20 weeks gestation) with a daily sleep diary and an actigraph. The average number of naps, as well as the average length of each nap, were calculated from sleep diaries. Women were categorized first as Non-nappers (0 Naps/2-weeks); Moderate Nappers (1-3 Naps/2-weeks); or Frequent Nappers (≥4 Naps/2-weeks); then based on the average nap length as short (<90 minutes) or long (≥90 minutes). Nocturnal sleep parameters included SOL, WASO, SE and TST. SAS procedure MIXED was used for modeling the main effects of NAP group and time, and time by NAP group interaction. There were no significant main or interaction effects on nocturnal TST, but not actigraphy-assessed TST. This observation was group and time specific. There were no other group differences. Women who napped >90 minutes had poorer diary-assessed SE and lower diary-assessed TST compared to those who took shorter naps. Length of nap was not associated with any other sleep measures. Daytime naps slightly impact nocturnal sleep
Permanent complaints of sleeplessness, but not sleep duration, are associated with increased risk of chronic distress and immunocompetence. The present paper addresses whether the effect of early stressors is reduced (from $z=2.9$, $p=0.004$ to $z=2.3$, $p=0.023$).

Analyses: Predictors in regression analyses included (1) the highest level of stressor exposure between 19 and 26. Notably, the subjective appraisal of Financial Stress were stronger predictors of depression than more objective resource indicators such as income and education. Study findings suggest that financial stress stemming from subjective appraisals of financial stress is related to high depressive symptoms in midlife. The next paper examines another potential biomarker, elevated Epstein Barr virus antibodies, serves as a partial mediator of how chronic stress in childhood and adolescence leads to the development of psychiatric disorders in young adulthood. The next paper addresses social mobility from early childhood to adulthood impacts risk for blood pressure and whether the relationship varies by race. The final paper addresses how childhood social disadvantage related to inflammation and hemoestasis in adulthood and whether obesity associated with childhood social disadvantage accounts for the associations. The discussion will bring his perspectives on gene-environment interactions and evolutionary theory to bear in understanding how early life experiences may have a long-lasting impact on adult health.

Individual Abstract Number: 2602

Predictors of C-reactive protein in mothers during the postpartum year

Christine M. Guardino, PhD, Psychology, UCLA, Los Angeles, CA, Christine Dankel Schetter, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Calvin J. Hobel, MD, Obstetrics & Gynecology, UCLA Geffen School of Medicine, Los Angeles, CA, Robin Gaines Lanzi, PhD, Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, AL, Peter Schoendorf, BS, Health Policy, New York Academy of Medicine, New York, NY, Madeleine U. Shalowitz, MD, MBA, Pediatrics, NorthShore University HealthSystem, Evanston, IL, John M. Thorp, MD, Obstetrics and Gynecology, University of North Carolina, Chapel Hill, NC, NIH/NICHD Community Child Health Network, Eunice Kennedy Shriver National Institute of Child and Health Development, Bethesda, MD.

Objectives: Elevated levels of C-reactive protein (CRP), a marker of systemic inflammation, predict increased risk of cardiovascular and metabolic disease. Systemic inflammation in mothers during the year after the birth of a child may have consequences for maternal risk later in life and possibly future pregnancy outcomes but correlates and predictors of this key biomarker during the postpartum period have not been established. The current study explored associations between psychosocial stress and CRP in a large and predominantly low-income sample of women during the first postpartum year. Methods: We analyzed data on 4,171 mothers who completed the multi-site Community Child Health Network Community Health Survey in their homes at 1 month, 6 months, and 1 year post partum. CRP was measured in dried blood spots collected at the 6 month and 1 year study visits. Multiple linear regression analyses tested associations of psychosocial stress in several life domains (financial, neighborhood, family, co-parenting, partner relationship, discrimination, and interpersonal violence) with log-transformed CRP concentrations at 6 months and 1 year postpartum. Results: Forty-eight percent of participants showed evidence of elevated CRP ($\geq 3$ mg/L) at 6 months postpartum, and 46% had elevated CRP at 12 months postpartum. Financial Stress at 1 month postpartum was associated with higher levels of CRP at 6 and 12 months postpartum and these relationships remained significant after controlling for race/ethnicity, income, education, parity, health behaviors, and chronic health conditions. Financial Stress was the only one of the seven stress variables associated with CRP levels at either time point. Conclusion: This study is the first to report detailed descriptive information about levels of CRP at two time points during the year after a birth of a child. In this sample of women from five sites across the U.S., a striking number of participants had clinically elevated levels of CRP. Women with higher Financial Stress one month after the birth of child had higher CRP at both six months and one year postpartum. Notably, the subjective appraisals of financial stress are stronger predictors of inflammation than more objective resource indicators such as income and education. Study findings suggest that financial stress stemming from socioeconomic disadvantage may be a particular deleterious form of stress during the year after the birth of a child.

Symposium 2509

Early life experiences, physiological pathways, and adult health

Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Katri Raikkonen, PhD, Psychology, University of Helsinki, Helsinki, Finland, Finland, Jane Costello, PhD, Psychiatry and Behavioral Sciences, Duke University, Durham, NC, Jenny M. Cuddiff, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Stephen B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA.

The objectives are to update findings regarding the long-lasting influence of early life experiences on adult health in four large prospective studies and to examine possible physiological pathways involved in their influence. The papers are based on a variety of populations, Finnish middle-aged and men, young adults in the Great Smoky Mountain Study, mid-life black and white women, and early-childhood adversity. The first paper examines whether early life stress, namely being separated from parents at a young age due to evacuation, is related to high depressive symptoms in men and women in their sixties and whether protein markers involved in the hypothalamic-pituitary-adrenal axis regulation acts as a vulnerability factor. The second paper examines another potential biomarker, elevated Epstein Barr virus antibodies, serves as a partial mediator of how chronic stress in childhood and adolescence leads to the development of psychiatric disorders in young adulthood. The next paper addresses social mobility from early childhood to adulthood impacts risk for blood pressure and whether the relationship varies by race. The final paper addresses how childhood social disadvantage related to inflammation and hemoestasis in adulthood and whether obesity associated with childhood social disadvantage accounts for the associations. The discussion will bring his perspectives on gene-environment interactions and evolutionary theory to bear in understanding how early life experiences may have a long-lasting impact on adult health.

Individual Abstract Number: 2603

Early life stress, FKBP5 and depressive symptoms in midlife

Karen A. Matthews, PhD, Jane Lahti, PhD, Psychology, Johan G. Eriksson, MD, General Practice and Primary Health Care, University of Helsinki, Helsinki, Finland.

Objective: FK506-binding protein 5, FKBP5, is involved in the hypothalamic-pituitary-adrenal axis regulation. Single nucleotide polymorphisms (SNPs) in FKBP5 gene have been shown to interact with retrospectively self-reported early life stress (ELS) on mental disorders. This study examined associations between three SNPs in the FKBP5 gene ($r^2$1360780, rs4974080, and rs9394309), objectively-defined ELS, and depressive symptoms in midlife.

Methods: At age 61.3 years, 1453 participants of the Helsinki Birth Cohort Study born 1934-44 underwent a clinical examination including a blood sample for DNA and filled in the Beck Depression Inventory (BDI). A re-test of BDI was conducted at age 63.1 years. According to Finnish National Archives’ register 252 of them were exposed to ELS, namely were evacuated abroad unaccompanied by their parents during the World War II at mean age of 4.8 years for a mean duration of 1.7 years. Results: ELS moderated the association between FKBP5 SNPs and depressive symptoms (p-values for interactions < 0.05). Those exposed to ELS and who had a higher number of risk alleles in the three FKBP5 SNPs scored higher on BDI (p-values < 0.05) and had an increased odds for recurrent high BDI scores (p-values < 0.02).

Conclusions: FKBP5 polymorphisms in combination with objectively-defined ELS predict more pronounced depressive symptomatology in midlife. Our findings support previous findings using retrospectively self-reported ELS.

Individual Abstract Number: 2599

Early environmental exposures and adult psychiatric disorder: Epstein-Barr virus antibodies as a biomarker of stressor exposure.

Jane Costello, PhD, William Copeland, PhD, Psychiatry and Behavioral Sciences, Duke University, Durham, NC, Robin Gaines Lanzi, PhD, Department of Community Health, University of Pittsburgh, Pittsburgh, PA.

Background: Cell mediated immunity holds resident infections in check, but stress compromises immunocompetence and results in increased appearance in circulation of viral coat proteins from reactivated EBV. Levels of antibodies against EBV coat antigens, which rise with age, providing an indirect, integrated measure of cellular-mediated immune function. This relationship of immunocompetence to stressors means that EBV antibodies represent an unsung ally of chronic stress and immunocompetence. We use this relationship to test the importance of stressors in the development of psychiatric disorders in young adulthood.

Methods: We measured EBV antibodies up to 8 times in a sample of 1420 (51% males), between ages 9 and 16. At the same time, and again up to 4 times between 19 and 26, we measured self-reported exposure to stressors, and assessed participants for DSM-IV disorders using a structured interview. Ten blood spots were collected from fingersticks at each interview, and frozen at -80. The assay method was based on the Incatar ELISA for the semiquantitative determination of human p18-viral capsid antigen (VCA) IgG antibodies in serum and plasma. Analyses: Predictors in regression analyses included (1) the highest EBV antibody level between ages 9 and 16; (2) the highest level of stressor exposure between ages 9 and 16. The outcome was the presence of one or more psychiatric disorders at one or more occasions between ages 19 and 26. Analyses controlled for sex, ethnicity, any psychiatric disorder aged 9-16, and highest stressor exposure between 19 and 26.

Results: Past stressor levels and EBV antibody levels separately predicted adult psychopathology, and past stressor levels were correlated with EBV antibody levels. In a mediational regression model, EBV continued to predict adult psychopathology, while the effect of early stressors was reduced (from $z=2.9$, $p=0.004$ to $z=2.3$, $p=0.023$).

Conclusions: The results suggest partial mediation; i.e., that the immunosuppression marked by elevated EBV titers may provide a bioassay of stress-related psychopathology.
Social Mobility in Early Life and Adult Health in Black and White Men

Jenny M. Cundiff, PhD, Jennifer M. Boylan, PhD, Dustin A. Pardini, PhD, Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Low socioeconomic status (SES) in childhood confers risk for poor physical health later in life, although almost all the evidence is based on whites. However, SES is mutable, and few studies have examined whether changes in family SES during childhood and adolescence can ameliorate the otherwise increased health risk associated with lower SES earlier in life. Examining not only early childhood SES, but also how SES trajectories from childhood through adolescence relate to adult health, allows us to test if socioeconomic resources increase so will health. Using latent growth curve modeling, the current study prospectively examined whether increases in family Hollingshead SES scores (based on parental education and occupation) measured during ages 6 and 16 were associated with fewer self-reported medical conditions in adulthood in a population-based sample of urban black and white males (N=283). Medical conditions were total number of conditions out of 31 reported during a health history interview. Results revealed that SES increased over time on average in our sample in both blacks and whites (β = 1.26, p <.02). Greater positive change in SES during childhood was associated with fewer self-reported medical conditions in adulthood (β = −.15, p <.05). The protective effects of upward mobility were independent of initial childhood SES or current adult levels of SES. These results suggest that if SES improves in childhood and adolescence, so can later physical health. Observed race differences in the pattern of results will also be discussed and findings updated with additional participants. This work was supported by grant # HL111802 and grant # HL07560.

Individual Abstract Number: 2584

Childhood socioeconomic disadvantage is related to inflammation/hemostasis in mid-life women through adiposity

Karen A. Matthews, PhD, Psychiatry, Joyce T. Bromberger, PhD, Epidemiology, Yuefang Chang, PhD, Neurological Surgery, University of Pittsburgh, Pittsburgh, PA, Carrie A. Karvonen-Gutierrez, PhD, Epidemiology, University of Michigan, Ann Arbor, MI, Howard M. Kravitz, DO, Preventive Medicine, Rush University, Chicago, IL, Jennifer K. Montez, PhD, Sociology, Case Western Reserve University, Cleveland, OH, Rebecca C. Thurston, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Introduction: It is well established that adult socioeconomic status (SES) is related to chronic diseases that are associated with inflammation and hemostasis. However, few studies have evaluated their relationships with childhood SES. The objectives of this paper are to examine the associations between indicators of childhood SES and repeated assessments in adulthood of C-reactive protein (CRP), fibrinogen, Factor VIIc, PAI-1, and tPA antigen among mid-life women. Methods: Black and white women (N=1109) at four sites of the Study of Women’s Health across the Nation completed a 10 item questionnaire on childhood SES and perceived childhood health and had measures of inflammation, hemostasis, and relevant covariates across 7 years. Latent class analysis classified women into 3 distinctive subgroups based on parental education and extent of economic resources, e.g. difficult paying for basics, home ownership. Mixed models controlled for SWAN site and ethnicity, and other covariates. Results: Women’s level of CRP, Factor VIIc, fibrinogen, and PAI-1 varied by childhood SES, p < .02, with the lowest childhood SES group having the most adverse levels. Further analysis for adult education (high school, some college, college degree) and child health showed that adverse levels of CRP and PAI-1 remained significant according to childhood SES group. Childhood SES groups were strongly related to adult BMI over time, p < .001. Adjustments for BMI as a time varying covariate removed all significant associations for childhood SES groups. Tests for the interaction between childhood SES groups and race were nonsignificant.

Conclusions: Childhood SES is related to adult inflammatory and hemostatic markers and adiposity. Obesity accounts in part for the impact of childhood SES.

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Symposium 2660

Thursday, March 19 from 1:45 to 3:00 pm

Stress Reactivity and Health: From Exaggerated to Diminished Reactivity, Implications For Disease Risk

Anna C. Phillips, PhD, School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham, Birmingham, West Midlands, England, William Lavoie, PhD, Psychiatry and Behavioral Sciences, University of Oklahoma, Oklahoma City, Oklahoma, J. R. Jennings, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, Annie T. Ginty, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Kristen Salomon, PhD, Psychology, University of South Florida, Tampa, Florida, James McPhadin, PhD, Psychology and Public Health Sciences, Clemson University, Clemson, South Carolina

Both exaggerated and diminished biological stress reactivity have serious consequences for health. Exaggerated cardiovascular reactions are associated with the development of hypertension, systemic atherosclerosis, and cardiovascular disease, whereas low or blunted reactivity is related to depression, obesity, and a range of addictions. It has been proposed that an interaction between genetics and the environment contributes to individuals’ reactivity to stress. The objective of this innovative symposium is to explore the antecedents, correlates, and health consequences of extremes in biological stress reactivity. We will first examine childhood adversity as a potential source of the emergence of blunted responses to acute stress. Second, we will challenge the accepted understanding of how personality traits, such as hostility, convert to cardiovascular risk in later life. Third, presenting data from four different populations, we will show that although high cardiovascular stress reactivity consistently predicts a greater risk of hypertension in later life, higher stress reactivity is in fact associated with better cognitive function and slower cognitive decline. Finally, we will present data using a well-established measure of effort, pupil diameter, to demonstrate that reactivity in general, including blunted reactivity, is not merely a measure of behavioural engagement in the task. We aim to use cardiovascular stress reactivity as a model to demonstrate an increased understanding of key pathways, from genetics to behaviour, underlying the development of a range of diseases across the lifespan. We will illustrate stress reactivity can be used as a biomarker of current and future disease risk, and those in the community most at risk.

Individual Abstract Number: 2661

Early Life Adversity as a Pathway to Reduced Stress Reactivity, Disinhibited Behavior, and Risk for Substance Use Disorders

William Lavoie, PhD, Psychiatry and Behavioral Sciences, University of Oklahoma, Oklahoma City, Oklahoma

Exaggerated stress responses are widely thought to contribute to risk of psychosomatic disorders, and by extension it is assumed that diminished responses are benign or beneficial to health. In contrast, we have proposed that stress reactions that deviate from the norm in either direction may signal a systems dysregulation with negative consequences for health. How might individual differences in stress reactivity arise, and how might reactivity differences operate in a model of automatic, endocrine, and behavioral regulation that may impair health? We have recently shown that exposure to early life adverse events, including an abusive upbringing and emotional distress associated with parental separation, can lead to diminished reactivity to mental stress in early adulthood and also contribute to antisocial behavioral characteristics, poor cognitive performance, and behavioral impulsivity in healthy young adults. Accordingly, we have proposed a heuristic model to guide research on adversity and health outcomes that incorporates altered autonomic function, changes in decision-making criteria, and altered mood stability. Adverse experience during development can therefore result in a risk-prone phenotype that can contribute to a lifelong negative bias in health behaviors. By extension, adverse experience may have greater health impact in persons with specific genetic vulnerabilities. Persons with a family history of alcoholism, who experience elevated levels of adversity, may show increased behavioral consequences if they possess specific variants of the serotonin transporter gene. Accordingly, a model of lifelong adversity and elevated behavioral risk for disease suggests that a search for genetic vulnerabilities may be a fruitful way forward.

Individual Abstract Number: 2662

Varieties of Hostility and Risk: Cardiac Predictors from Teen and Adult Years

J. R. Jennings, PhD, Dustin Pardini, PhD, Psychiatry, Karen Matthews, PhD, Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania

Hostility is a known risk for cardiovascular events with the best predictor identified as the Cook Medley Hostility scale. Though evidence is lacking, many suggest that hostility may induce physiological arousal and through this contribute to cardiovascular pathology. Increases in psychophysiological indices
are related positively to hostility when hostile reactions are induced experimentally. Such reactions in adults, however, contrast with a literature showing that low mean resting heart rate across development from infancy to young adulthood is related to greater hostility/aggressivity. A longitudinal community sample of 196 men with preferential selection from areas with relatively high risk for antisocial behavior permitted us to ask whether heart rate levels and reactivity were related to concurrent and future hostility in the teen years (mean age=16.3(9)) and concurrent hostility in adult years (mean age=32.0 (9)). Both Buss-Perry and Cook-Medley measures of hostility were available at the adult sampling point; ratings of hostility and physical aggression were available at the teen sampling point. Mean resting heart rate and heart rate reactivity to a speech challenge were significantly correlated between teen and adult years. Teen mean heart rate, but not reactivity, was negatively related to hostility and physical aggression. Neither mean heart rate nor heart rate reactivity from teen years, however, predicted either Buss-Perry or Cook-Medley hostility scores at the adult age (though there was a relationship with Buss-Perry physical aggression). Lower adult mean heart rate was related to greater Buss-Perry hostility; while lower heart rate reactivity to the speech challenge was related to greater Cook-Medley hostility. These regression analyses results controlled for race, body mass index, physical activity, and presence or absence of blood pressure medication. Interestingly teen, but not adult, higher mean heart rate predicted greater prevalence of medical conditions in adult years. These results suggest that hostility and aggressivity may relate to lower baseline and reactive heart rate. As such, these results provide a possible explanation why heart rate may not indicate how hostility gets ‘under the skin’ and predicts later cardiovascular risk.

Individual Abstract Number: 2807
Cardiovascular Reactions to Acute Psychological Stress and Cognitive Function: Results From Four Independent Studies
Annie T. Ginty, PhD, Psychiatry, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Susanne R. de Rooy, PhD, Clinical Epidemiology, Biostatistics & Bioinformatics, University of Amsterdam, Amsterdam, Amsterdam, Netherlands, Douglas Carroll, PhD, Sport, Exercise & Rehabilitation Sciences, University of Birmingham, Birmingham, West Midlands, UK, and J R. Jennings, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA
Large magnitude cardiovascular reactions to acute psychological stressors confer risk for hypertension. Hypertension predicts poorer cognitive function and greater cognitive decline. Therefore, higher cardiovascular reactivity would be expected to predict poorer cognitive function, but this has not been well tested. Aim: To test associations between stressor-evoked cardiovascular reactivity and cognitive function in four independent studies. Study 1 examined the relationship between cardiovascular (BP, HR) stress reactivity and future cognitive function in the West of Scotland Twenty-07 Study (N = 1647, M age = 42.2, SD = 15.4 years). Study 2 tested the association between cardiovascular reactivity (BP, HR), general intelligence, and memory in the Dutch Famine Birth Cohort Study (N = 724, M age = 58.3, SD = 9.9 years). Study 3 tested the association between cardiovascular (HR, RMSSD) reactivity and A-level exam performance, which is strongly related to cognitive function, in final year high school students (N = 133, M age = 18.0, SD = 0.4 years) from England. Study 4 examined the relationship between cardiovascular reactivity and cognitive function, assessed by a comprehensive neuropsychological assessment, in a middle-aged American population (N = 196, M age = 48.2, SD = 7.1 years). Importantly, studies 1 and 2 confirmed the expected relationship between higher cardiovascular reactivity and later hypertension. All studies were analyzed using hierarchical linear regression with cognitive function as the dependent variable. In all studies, greater cardiovascular reactivity was associated with better cognitive performance and less cognitive decline. All outcomes survived adjustment for putative confounding variables (e.g., age, sex, SES, baseline cardiovascular activity). Greater cardiovascular reactivity appears to be consistently associated with better cognition and less age-related cognitive decline. Further work is needed to better understand the unexpected and contrasting associations between cardiovascular reactivity, hypertension, and cognition.

Individual Abstract Number: 2875
Cardiovascular Reactivity During a Cognitive Task is Not Related to Measures of Effort
Kristen Salomon, PhD, Psychology, University of South Florida, Tampa, Florida, Alvin B. Jin, MA, Psychology, University of South Florida, Tampa, FL, Amanda K. Webb, PhD, (none), Charles Stark Draper Laboratory, Cambridge, MA
Blunted reactivity has been proposed as an index of motivational dysregulation and a marker of disease risk. On the other hand, blunted reactivity may indicate a lack of task effort. In the present study we examined the relationship between reactivity on a cognitive task and measures of pupil diameter, a widely accepted index of cognitive effort that is controlled by the autonomic nervous system. Eighty-nine undergraduate participants (68% female, Age M = 20.28 years, SD = 2.53). Participants were given either poor or good feedback on a working memory task prior to engaging in a digit span task. Participants were also given a high or low incentive for performing well on the digit span task. Blood pressure, EKG, impedance cardiography, and pupil diameter were measured during the digit span task. Participants were asked to refrain from smoking, caffeine, and exercise for 2 hours prior to the study. Pupil luminance was controlled during the task. For the most part, feedback and incentive did not have an effect on reactivity. Overall, pupil diameter reactivity was similar to what is generally observed when 13-digits are memorized; pupil diameter reactivity peaked with presentation of the 10th digit. Partial correlations with cardiovascular reactivity measures (change from baseline) and effort variables (pupil size, self-reported effort, performance) controlling for age, body mass index, and sex were conducted. In general, reactivity measures were not related to pupil diameter (partial |rs| < .11, ps > .39), although the correlation with TPR reactivity approached significance (partial r = -.21, p = .08). Further, reactivity was unrelated to self-reported effort on the task (partial |rs| < .13, ps > .28) and objective task performance (partial |rs| < .13, ps > .28). Overall, these findings suggest that cardiovascular reactivity in general, and blunted reactivity in particular, are not merely indicative of effort.

Symposium 2538
Thursday, March 19 from 3:15 to 4:15 pm
Beyond risk factors & disease: Positive psychological well-being and cardiovascular health
Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Rosalba Hernandez, PhD, School of Social Work, University of Illinois at Urbana-Champaign, Urbana, IL, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Jeffery C. Huffman, MD, Psychiatry, Harvard Medical School/Massachusetts General Hospital, Boston, MA, Timothy W. Smith, PhD, Psychology, University of Utah, Salt Lake City, UT
Most health-related research has been conducted from a disease perspective. In other words, the presence of health is implied by the absence of unhealthy psychological functioning (e.g., depression), biological functioning (e.g., hypercholesterolemia), behaviors (e.g., smoking), or conditions (e.g., heart disease). However, health is more than the absence of disease. Compared with the number of studies investigating how poor psychological functioning relates to health, fewer studies have used diverse participants and rigorous designs to investigate how healthy psychological functioning relates to health. This symposium expands focus beyond risk factors by exploring whether positive psychological factors such as well-being, optimism, and gratitude promote health and protect against disease. We consider these issues in the context of cardiovascular disease because it is the leading cause of death worldwide. Drawing on expertise from the fields of public health, psychology, and behavioral cardiology, the specific objective of this symposium is to investigate the role of positive psychological factors in cardiovascular health. The first speaker presents findings suggesting that optimism is associated with a healthy cardiovascular profile in ethnically diverse adults. The second speaker builds on those findings and describes evidence indicating that psychological well-being helps older adults maintain favorable cardiovascular health across time. The third speaker shows that positive psychological factors are associated with greater functional, behavioral, and biological outcomes in individuals with acute coronary syndrome. Finally, an expert on the interplay between psychological characteristics and cardiovascular disease critically evaluates and integrates the findings, as well as provides suggestions for future research. In sum, the empirical evidence described in this symposium demonstrates that positive psychological factors coincide with better cardiovascular health, which has implications for clinical outcomes and successful aging. Such work not only expands what it means to be psychologically healthy, but also contributes to a more comprehensive understanding of cardiovascular health.

Individual Abstract Number: 2568
Relationship of Dispositional Optimism and Cardiovascular Health: Cross-sectional Findings from the Multi-Ethnic Study of Atherosclerosis
Rosalba Hernandez, PhD, School of Social Work, University of Illinois at Urbana-Champaign, Urbana, IL, Kiarri N. Kershaw, PhD, Juned Siddique, PhD, Preventive Medicine, Northwestern University, Chicago, IL, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Laura D. Kaluznys, PhD, Social and Community Sciences, Howard University School of Public Health, Boston, MA, Ana Diez-Roux, MD, PhD, School of Public Health, Drexel University, Philadelphia, PA, Hongyan Ning, MD, Donald M. Lloyd-Jones, MD, ScM, Preventive Medicine, Northwestern University, Chicago, IL
There is increasing interest in the role of positive emotions and psychological well-being—particularly the related construct of dispositional optimism—
cardiovascular health. This study examined the cross-sectional association of optimism with cardiovascular health (CVH). We used data collected from adults aged 52-84 who participated in the Multi-Ethnic Study of Atherosclerosis (MESA) (n=5,134) during the first follow-up visit (2002-2004). Dispositional optimism was assessed using the Life-Orientation Test-Revised. American Heart Association standards were used to classify each of the seven CVH metrics—diet, body mass index, physical activity, serum cholesterol, blood pressure, fasting glucose, and smoking status—into categories of poor, intermediate, or ideal, using an associated point allocation ranging from 0 (poor) to 2 (ideal). A composite CVH score was derived by summing points across the seven metrics with classification as follows: poor (0-7 points), intermediate (8-11 points), and ideal (12-14 points). Age-, sex-, and race-adjusted mean optimism scores were computed for individual metrics across classification groups (i.e., ideal, intermediate, poor); F-tests were used for comparison across groups. Multinomial logistic regression was used to examine associations of optimism with ideal and intermediate CVH (with reference being poor CVH), after adjusting for socio-demographic factors (age, gender, race/ethnicity, marital status, education, income, insurance status) and psychological ill-being (i.e., Mental Health Composite Scale of 12-item Short Form Health Survey [SF-12]). In multivariable-adjusted models, participants in the highest quartile of optimism were more likely to have intermediate [OR=1.51;95%CI=1.25,1.82] and ideal [OR=1.92;95%CI=1.30,2.85] CVH when compared to the least optimistic group. Individual CVH metrics of diet, physical activity, BMI, smoking, blood sugar and total cholesterol contributed to the overall association. This study offers evidence for a cross-sectional association between optimism and CVH, independent of socio-demographic factors and psychological ill-being.

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<th>Table 1, Multivariable Association Between Optimism and Cardiovascular Health (N=5,134)</th>
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<tr>
<td><strong>Cardiovascular Health</strong></td>
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<td>G-item LOT-R</td>
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<td>M1: Unadjusted</td>
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<td>Quartile I–Lowest</td>
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<td>M2: Minimally Adjusted</td>
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<td>Quartile IV–Highest</td>
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<td>M3: Multivariable Adjusted</td>
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<td>Quartile IV–Highest</td>
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Individual Abstract Number: 2540

Healthy aging: Does psychological well-being increase the likelihood of maintaining favorable cardiovascular health?

Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA. Jackie A. Soo, MPH, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard School of Public Health, Boston, MA

Favorable cardiovascular health (FCH) is associated with greater longevity. However, the factors that promote FCH have not been identified. We investigated whether psychological well-being precedes FCH in older men and women from the English Longitudinal Study of Ageing. The first study wave occurred in 2002-03 with 11,392 individuals aged 50 and older. Follow-ups occurred in 2004-05 (Wave 2), 2006-07 (Wave 3), 2008-09 (Wave 4), and 2010-11 (Wave 5). Clinical health examinations were performed during Waves 2 and 4, so our sample was restricted to individuals with clinical data from those waves. The sample was further restricted to individuals with complete data on Wave 1 well-being and covariates, and to individuals without existing cardiovascular conditions in Wave 1 (N=2,281). Psychological well-being was assessed with 17 items from the Control, Autonomy, Satisfaction, and Pleasure (CASP) scale. FCH was defined by 1) no high blood pressure diagnosis, systolic blood pressure ≤120, diastolic blood pressure ≤80; 2) no high cholesterol diagnosis, total cholesterol <200; 3) body mass index <25; 4) non-diabetic; and 5) non-smoker. Total FCH was determined at Waves 2 and 4 by totaling the number of favorable components (out of 5) each participant had. A FCH rank score was created to capture direction and magnitude of change in FCH between Waves 2 and 4. Individuals with FCH 0 at both waves had the lowest rank score; individuals with FCH 5 at both waves had the highest rank score; declines or gains had ranks in-between. Linear regression was used to examine associations between well-being and the FCH rank score; logistic regression was used to model the odds of decline in Wave 4 total FCH among individuals with Wave 2 total FCH ≥4 (N=275). Consistent with expectations, greater well-being was associated with higher FCH rank scores (β=0.13, 95% CI=0.02-0.24) and reduced risk of FCH decline (OR=0.72, 95% CI=0.52-1.00) during follow-up, adjusting for baseline covariates (sociodemographic factors, non-cardiovascular chronic conditions, and depression). Findings suggest that well-being is longitudinally associated with FCH, and add to knowledge of positive health and adaptive aging.

Individual Abstract Number: 2573

The connection between positive psychological constructs, biology, and behavior: results from the GRACE study

Jeffery C. Huffman, MD, Psychiatry, Harvard Medical School/Massachusetts General Hospital, Boston, MA. Eleazar E. Rutledge, BA, Shilpa Hunmore, BS, Psychiatry, Arianna M. Belcher, BS, Cardiology, Laura Suarez, MD, Psychiatry, Massachusetts General Hospital, Boston, MA, Scott R. Beach, MD, Christopher M. Celano, MD, Psychiatry, Hanna K. Gaggin, MD, Cardiology, Harvard Medical School/Massachusetts General Hospital, Boston, MA, Shweta R. Motiwala, MD, Cardiology, Beth Israel Deaconess Medical Center, Boston, MA, Parul U. Gandhi, MD, Cardiology, Massachusetts General Hospital, Boston, MA, James L. Januzzi, MD, Medicine/Cardiology, Harvard Medical School/Massachusetts General Hospital, Boston, MA

Optimism and other positive psychological characteristics have been linked to superior cardiac outcomes. However, there has been minimal study of these characteristics in patients suffering an acute coronary syndrome (ACS), despite the fact that the post-ACS period is a critical and high-risk period of recovery. Second, gratitude is common after ACS, but gratitude's prospective effects on post-ACS outcomes has not been examined. Finally, few studies have simultaneously examined the effects of multiple positive psychological constructs within the same study. The GRACE (Gratitude Research in Acute Coronary Events) study was a prospective observational study in 166 post-ACS patients. Participants completed baseline assessments, including ratings of dispositional gratitude (Gratitude Questionnaire-6), state gratitude, and dispositional optimism (Life Orientation Test-Revised [LOT-R]), 2 weeks after discharge. Self-report measures of cardiac health behavior (MOS Specific Adherence Scale), cardiac symptoms, health-related quality of life (HRQoL; SF-12), and function (Duke Activity Status Index) were obtained at baseline, 3 months and 6 months. In addition, measures of inflammation (C-reactive protein [CRP]) and endothelial function (iCAM and vCAM) were obtained at baseline and 6 months. Pearson correlation and linear regression were used to assess relationships between positive states and the outcomes of interest via univariate and multivariate (controlling for age, sex, and multiple medical variables) analysis. All three positive psychological measures were significantly associated with greater health behavior adherence, mental HRQoL, cardiac symptoms, and function at 6 months on univariate and multivariate analysis; LOT-R had the strongest association with outcomes and was also associated with physical HRQoL [betas=.41; p=.012]. There were no significant associations between positive measures and change from baseline scores on the outcome measures. Regarding the biomarkers, higher LOT-R was associated with lower iCAM at 6 months (betas=.00; p=.010) but not vCAM (p=.19) or CRP (p=.15). In sum, optimism and gratitude were associated with greater functional and health behavior outcomes at 6 months in post-ACS patients, though not greater improvement from baseline scores. Optimism was also associated with lower scores on one of two markers of endothelial function. Additional study analyses (to be reported at the symposium) will describe the association of these positive psychological constructs with additional cardiac biomarkers and accelerometry-measured physical activity.
Abstract 3100

USE AND BENEFITS OF COMPUTERIZED CBT INTEGRATED IN A COLLABORATIVE CARE PROGRAM FOR ANXIOUS AND DEPRESSED PRIMARY CARE PATIENTS
Bea Herbeck Belnap, DrBioHum, Kalaeb Z. Abebe, PhD, Internal Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA, Jordan Karp, MD, Department of Psychiatry, University of Pittsburgh, Pittsburgh, PA, Bruce L. Rollman, MD, Internal Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA

Background: Numerous trials have demonstrated the effectiveness of Collaborative Care (CC) strategies at treating depressed and anxious primary care patients, yet providing expeditious access to psychotherapy within this setting remains challenging. Computerized CBT (cCBT) programs could overcome this impediment, but studies have not evaluated the effectiveness of this treatment that can be conveniently provided 24/7 within the context of a CC program.

Methods: PCPs from 26 Pittsburgh-area primary care offices were encouraged to refer their depressed and anxious patients aged 18-75 to our NIH-funded trial of online CC, in response to an electronic medical record system prompt. Consentting patients with at least moderate levels of mood and/or anxiety symptoms (PHQ-9 or GAD-7 ≥10) and Internet access were randomized to one of three groups, including two with access to the proven-effective cCBT program. Study care managers guided patients through the use of the program and encouraged completion of all eight 50-minute sessions within a 6-months period.

Results: From 8/12-9/14, we randomized 603 patients to cCBT. Of these, 92% started the program and 36% completed all 8 sessions (mean number of sessions completed: 5.2). Whites were more likely than non-whites to complete all 8 cCBT sessions (38% vs. 26%, p=0.02), but completion rates were similar by gender, age, educational level, baseline working status and symptom severity. Patients who completed all 8 sessions self-reported mean decreases in PHQ-9 and GAD-7 scores of 5.8 and 5.7, respectively, regardless of sociodemographic subgroup, and 71% self-reported a ≥50% decline in anxiety and symptomatology from baseline.

Conclusions: Depressed and anxious primary care patients will engage with and benefit from use of a cCBT program provided within a CC intervention. We will present updated data and outcome results after we open our study blind next spring.

Abstract 2742

BREATHING MEDITATION SMARTPHONE APP: INITIAL FINDINGS OF DOSE RESPONSE TRIAL UPTO BLOOD PRESSURE (BP) CHANGES AMONG PREHYPERTENSIVE ADULTS
Zachary Adams, PhD, Psychiatry, April Favela, B.S., Sachin Patel, MS, Spencer Wilder, HS, Brenda Brunner-Jackson, MPH, Nursing, Frank Treiber, PhD, Nursing and Psychiatry, Medical University of South Carolina, Charleston, South Carolina

Pre-existing hypertension (preEH) affects 30-37% of US adults and is a leading risk factor for EH and cardiovascular disease (CVD) events. Prevention programs are needed that can be sustained by people with preEH and readily disseminated by healthcare providers. Psychological stress is also a risk factor for future EH and CVD. Stress reduction via breathing awareness meditation (BAM) has shown promise in reducing BP, but studies have not determined optimal dosage level, or evaluated dosage adherence objectively. The goal of this three-arm feasibility trial is to assess acceptability and efficacy signals of 3 dosages of Tension Tamer (TT), an Android and iOS smartphone BAM app, previously shown to lower BP. TT integrates BAM written/audio instructions with proprietary embedded, validated reflective photoplethysmography (PPG) software, enabling real-time capture of heart rate (HR). Users receive BAM audio instructions and place an index finger over the camera lens, which is activated during BAM sessions. Pulsatile blood flow changes are detected and processed. At the end of the TT session, users receive a feedback graph depicting HR changes over the session. Continuous HR data are sent to remote devices for time stamped adherence monitoring. Based on levels of adherence, users receive tailored motivational and reinforcement messages and references to relevant educational information and research based benefits of BAM in the app. Thirty adults (mean age: 31.1 yrs; 19 males; 21 White; 9 Black, 1 Other) had preEH status confirmed via systolic BP measurements on 3 occasions (mean=128.8 mmHg). They were then given the TT app and randomly assigned to 5, 10, or 15 min sessions twice per day for 3 mos. Average adherence rates during the first month were: 92%, 90%, and 84% for 5, 10, and 15 min dosages, respectively. Clinically meaningful reductions in SBP were observed at the first evaluation at 1 mo of -6.2, -12.0, and -12.3 mmHg for 5, 10, and 15 min dosage groups, respectively. The TT application appears to be acceptable and useful in objectively tracking BAM adherence. Data collection is ongoing; 1 and 3 mo results will be presented. Additional results will clarify whether the observed SBP reductions are maintained. A most effective dose will be determined and further patient guided refinements made in the TT app for an efficacy RCT.

Abstract 3035

BOTH DEVICE-GUIDED BREATHING AND A RELAXATION CONTROL CONDITION REDUCE AMBULATORY BP IN HYPERTENSIVES: REPORT OF AN RCT
Lynn P. Clemow, PhD, Toya Simmons, MPH, Beatrix Roemheld-Hamm, MD, PhD, Family Medicine, Rutgers - Robert Wood Johnson Medical School, New Brunswick, NJ

The use of device-guided breathing as a stress reduction method is a promising approach to reducing blood pressure (BP), though some studies have had mixed results. This is a preliminary report of the findings of those who completed a randomized controlled trial (RCT) using the RESPeRate device, a device that guides 15 minutes of daily home practice, using musical tones to gradually guide the breathing rate from the baseline rate into the range of 6-10 breaths per minute. This 4-arm study had 2 treatment conditions (8-week and 16-week duration) and 2 control conditions (usual care and a relaxation control using an identical device that paced the breathing at a fixed13 breaths/minute rate. Participants (n=171) were recruited from primary care practices and were diagnosed hypertensives who were taking at least one BP medication, but whose BP was still uncontrolled per Ambulatory BP. The primary outcomes were the change in waking daytime averages of Systolic BP (SBP) and Diastolic BP (DBP) measured by Ambulatory BP monitoring (ABPM) at 8 weeks.

The analysis of change scores showed significant group differences:

- Mean change in waking mean from baseline:
  - SBP: -6.4 (0.7) mmHg
  - DBP: -4.7 (0.6) mmHg

Mean reductions were larger in the BAM and Rel conditions than the Usual Care and Control conditions. These clinically significant findings indicate both that the intervention group (using the RESPeRate device guiding the breathing into the neighborhood of 6 breaths per minute (BPM)) and the relaxation control group (using the same device pacing the breathing at a fixed 13 BPM) were superior to the Usual Care condition in reducing SBP and DBP in treated but uncontrolled hypertensives. The results suggest that specific low breathing rate is not the primary mechanism for BP reduction. Further analyses will examine the stricter intention to treat analysis and explore the impact of the level of adherence to device use, medication change effects, psychophysiological mechanisms, and other variables on these results.

Abstract 2745

LOWER ANXIETY ASSOCIATED WITH GREATER PHYSICAL ACTIVITY IN A Pedometer-BASED INTERVENTION AMONG CARDIAC PATIENTS
Derek R. Anderson, M.A., Kristie M. Harris, M.S., Jacob Landers, B.A., Charles F. Emery, Ph.D., Psychology, The Ohio State University, Columbus, OH

Past studies indicate that exercise-based cardiac rehabilitation (CR) is associated with improved physical and psychological functioning among patients with cardiac disease who attend CR. However, less than 50% of patients continue regular physical activity (PA) following CR completion, thereby losing the gains achieved in CR. Using pedometers to track ongoing PA following CR completion offers a low-cost means of providing behavioral feedback to patients and may help increase motivation to continue PA. Studies have found pedometer tracking useful among medical patients, but the results are inconsistent (Butler & Dwyer, 2004) and no studies have specifically examined the moderating influence of psychological factors (e.g., anxiety) in the relationship of pedometer tracking to exercise adherence following CR. This study evaluated PA changes in patients randomly assigned to either pedometer tracking or usual care following CR completion offers a low-cost means of providing behavioral feedback to patients and may help increase motivation to continue PA. Studies have found pedometer tracking useful among medical patients, but the results are inconsistent (Butler & Dwyer, 2004) and no studies have specifically examined the moderating influence of psychological factors (e.g., anxiety) in the relationship of pedometer tracking to exercise adherence following CR. This study evaluated PA changes in patients randomly assigned to either pedometer tracking or usual care following CR; and investigated the moderating influence of anxiety on objective health outcomes (e.g., number of steps, 6-minute walk test, blood pressure, and body mass index). Thirty-eight participants (11 women; mean age 58.1, SD=11.8; 61% Caucasian; 39% African-American) completed CR and were assigned to a 3-month pedometer tracking intervention (n = 18) or usual care control group (n = 20). No demographic or health differences were observed between groups at baseline. All participants completed questionnaires and physical functioning tests at the conclusion of CR (baseline) and, again, following the 3-month intervention. Results of a repeated measures MANOVA revealed a significant multivariate Time x Group interaction (F(5, 20) = 3.68, p
Socioeconomic disparities in sleep problems have been documented, and are a potential mediator of other SES disparities in health (Van Cauter & Spiegel, 1999). Greater stress exposure is one likely contributor to disparities in sleep (Mezick et al., 2008), but lower SES individuals may also be more reactive to daily stressors. Empirical findings support the idea that those of lower SES are more responsive to stress and exhibit greater recovery (e.g., cardiovascular and immune reactivity; Owen et al., 2003). To our knowledge, SES differences in the effects of stress on sleep have not been studied, despite sleep being a plausible biological pathway linking psychosocial stress and health. In the current study, we hypothesized that educational attainment would moderate the effects of daily stress on sleep. Also, substance use coping was considered as an explanation for the moderating role of education (Sadock, Keinan, & Daon, 2004)

Online nightly diaries were collected over a fourteen-day period by 292 participants (Mage=31 yrs; 67% female; 42% black, 47% white, 11% other race), during the 8th wave of MADICS. SES was defined by educational attainment, and it was measured via self-report. SES was measured as the mean of two items: school graduation status and overall daily challenge (r = .47). Substance use coping was computed from three items assessing whether alcohol, cigarettes, or marijuana were used to cope with the major daily stressor. Substance use coping was considered as an explanation for the moderating role of education (Sadock, Keinan, & Daon, 2004).

Results confirmed that educational attainment moderated the effects of daily stress on sleep problems (B=.005, p=.007), such that higher education buffered negative effects of daily stress (see Figure 1). Moreover, education accounted for 22% of the variance in the daily stress slope, and its effects were independent of income. Substance use coping was directly associated with sleep problems (B=.049, p=.006), but did not mediate the effects of education on the stress slope. These findings suggest that heightened reactivity to stress among less educated individuals represents one pathway through which SES disparities in sleep and health may develop.

Note. Indented variables are at level two.
*p < .05. **p < .01. ***p < .001.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimate (SE)</th>
<th>Estimate (SE)</th>
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<td>Intercept</td>
<td>.568 (.011)***</td>
<td>.568 (.011)***</td>
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<tr>
<td>Education</td>
<td>-.004 (.003)</td>
<td>-.004 (.003)</td>
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<tr>
<td>Income</td>
<td>-.004 (.001)***</td>
<td>-.004 (.001)***</td>
</tr>
<tr>
<td>Daily stress</td>
<td>.017 (.007)*</td>
<td>.015 (.007)*</td>
</tr>
<tr>
<td>Education</td>
<td>-.005 (.002)**</td>
<td>-.004 (.002)*</td>
</tr>
<tr>
<td>Income</td>
<td>.000 (.001)</td>
<td>.001 (.001)</td>
</tr>
<tr>
<td>Substance use</td>
<td>.049 (.018)**</td>
<td>.049 (.018)**</td>
</tr>
</tbody>
</table>

Figure 1. Fitted plot depicting educational attainment as a moderator of the association between daily stress and sleep problems.

Abstract 2873
SOCIAL STATUS INTERACTS WITH SOCIAL UNCERTAINTY TO INFLUENCE PRO-INFLAMMATORY CYTOKINE LEVELS AND VIRAL ANTIBODY LEVELS IN RHESUS MONKEYS
Jessica J. Vandeleeest, Ph.D., California National Primate Research Center, Brianne A. Beisser, Ph.D., Population Health and Reproduction, University of California-Davis, Davis, California, Darcy L. Hannibal, Ph.D., California National Primate Research Center, Brenda McCowan, Ph.D., Population Health and Reproduction, University of California-Davis, Davis, CA

Both low social status and uncertainty have been associated with negative health outcomes in both humans and non-human primates. Because unpredictability and low social status often co-occur, it is difficult to disentangle their independent contributions to health. The current study uses new social network techniques to quantify both dominance rank as well as uncertainty in dominance relationships to examine their impact on pro-inflammatory cytokine levels and latent virus reactivation.

Subjects were observed for 6 weeks and included 154 rhesus monkeys (48 male) living in two large naturalistic social groups housed at the California National Primate Research Center. Using a new social network method developed by our team, we calculated dyadic dominance probabilities that combine direct interaction data from weekly observation of aggressive interactions with information from multiple indirect pathways in the network (via common third parties). This method yields both an absolute rank as well as an average certainty for that rank. We fit multilevel models, using AIC scores to select the best.
best-fit models. Blood samples were drawn at week 4 and serum levels of cytokines (IL-6, TNF-α) and relative expression of viral antibody (Herpes-B virus (HBV), Rhesus Cytomegalovirus (CMV), and Lymphocryptovirus (LCV) an EBV-like virus) were quantified. Results indicate that high rank is associated with higher antibody levels for HBV and greater dominance uncertainty is associated with higher antibody levels for both HBV and CMV. Results for IL-6 and LCV indicate a significant rank by dominance certainty interaction where higher rank is associated with higher IL-6 and LCV antibody levels, but only for animals that have more ambiguous dominance relationships with their group members. A significant interaction between rank and dominance certainty for TNF-α indicates that among animals with more certain dominance relationships, it was the low ranking animals exhibiting higher levels of TNF-α, whereas the opposite was true for animals with less certain dominance relationships. These results demonstrate that the impact of social status on health is dependent, in part, on the certainty of social relationships.

Abstract 2972
PERCEIVED SUPPORT MODERATES THE ASSOCIATION OF SUBJECTIVE SOCIOECONOMIC STATUS WITH CORTISOL RESPONSES TO A STRESSOR
Emily D. Hooker, B.A., Sally S. Dickerson, Ph.D., Psychology and Social Behavior, Belinda Campos, Ph. D., Chicano and Latino Studies, University of California, Irvine, Irvine, CA

The current study explored the potential moderating role of perceived social support on the association between subjective socioeconomic status (SES) and stressor appraisals and cortisol responses to an acute stressor. One-hundred and eighteen healthy college participants (56% female; mean age 19.4) completed a 40-minute resting period, followed by a 15-minute social interactional stressor and then a 40-minute recovery period. Prior to the stressor, participants reported how threatened they felt and how able to cope with the stressor they felt. Salivary cortisol was collected five times during the course of the study. Consistent with hypotheses, the interaction between subjective SES and support was significant, β = .08, p = .02. Those who reported lower subjective SES and higher support exhibited cortisol responses to the stressor that were comparable to those who reported higher subjective SES and higher support. Additionally, the interaction between subjective SES and perceived support marginally predicted threat and coping appraisals such that those who reported lower SES and higher perceived support, also reported lower threat and higher coping appraisals, β = .16, p = .083 and β = .131, p = .095 respectively. These findings provide preliminary evidence that perceived support may buffer cortisol responses to stressors in those from lower socioeconomic backgrounds, which has implications for future health.

Abstract 3146
TWO WAYS TO THE TOP: DOMINANCE AND PRESTIGE AS CARDIOVASCULAR RISK FACTORS RELATED TO SOCIAL STATUS
Timothy W. Smith, PhD, Psychology, University of Utah, Salt Lake City, UT, Jenny C. Cundiff, PhD, Psychiatry and Psychology, University of Pittsburgh, Pittsburgh, PA, Jennifer Getz, BA, Caroline E. Barton, MA, Psychology, University of Utah, Salt Lake City, UT, Kevin D. Jordan, PhD, Family Medicine, University of Mississippi Medical Center, Oxford, MS, Wendy Birmingham, PhD, Psychology, Brigham Young University, Provo, UT, Cynthia Berg, PhD, Bert N. Uchino, PhD, Psychology, University of Utah, Salt Lake City, UT

Having higher social status confers reduced cardiovascular disease (CVD) risk, but personality traits indicative of aggressive pursuit of status (e.g., dominance, anger) confer increased risk. This may reflect distinct health consequences of having versus pursuing social status, but it may also reflect the relative health effects of different styles in acquiring status. Recent theory and research indicate that aggressive, competitive striving (i.e., dominance) and status and respect freely granted by others (i.e., prestige) are distinct styles related to social standing, assessed via questionnaires. Differences between dominance and prestige were examined in four studies. In Study 1 (3 samples of undergraduates, total N > 5000), the Dominance and Prestige Scales were associated with hostile-dominance and warm-dominance, respectively, in the interpersonal circumplex. Both dominance and prestige predicted higher personal sense of power, but only prestige predicted subjective social status. Dominance was associated with greater hostility and interpersonal stress, whereas prestige was associated with lower hostility and higher levels of social support. In Study 2 (180 undergraduates, 90 women), dominance moderated systolic blood pressure (SBP) reactivity during a competitive interaction with a dominant versus deferential partner; dominance was positive associated with reactivity when interacting with a dominant partner, but not a deferential partner, F(1,164) = 10.5, p = .001. In Study 3 (94 married couples, mean age = 29), actor-partner analyses indicated that the hostile-dominant interpersonal style was associated with greater ambulatory systolic blood pressure (ASBP) in men but not women, t(694) = 3.91, p = .001. The warm-dominant style was associated with lower ASBP in women, but not men, t(684) = -2.31, p = .021. In Study 4 (154 healthy older married couples, mean age = 63), the hostile-dominant style predicted greater coronary artery calcification (CAC) std B = .18, p <.05, but warm-dominance was unrelated to CAC. Further, hostile-dominance was associated with greater marital conflict and lower marital support, whereas warm-dominance was associated with the opposite pattern. Thus, pursuit of higher social status through characteristic aggressive dominant and competitive behavior may be a risk factor for CVD, whereas having higher social status as the result of respect and prestige freely given by others does not confer risk and may have protective effects. Gender differences in these associations warrant additional research.

Paper Session: Correlates of Cognitive Function
Thursday, March 19 from 8:30 to 9:30 am

Abstract 2517
ENDOGENOUS CORTISOL EXPOSURE AND NEUROPSYCHOLOGICAL FUNCTIONING: A LONGITUDINAL STUDY OF SHORT- AND LONG-TERM EFFECTS IN OLDER ADULTS
Suzanne C. Segerstrom, Ph.D., Paul J. Geiger, M.A., Ian A. Boggero, M.A., Psychology, University of Kentucky, Lexington, KY, Sandra E. Sepliton, Ph.D., Psychology, University of Louisville, Louisville, KY

Exposure to endogenous cortisol is associated with hippocampal degeneration and may contribute to problems with declarative memory, but effects of persistent vs. phasic cortisol elevations have not been established. The present longitudinal investigation examined persistent individual differences and phasic changes in cortisol as they related to verbal memory, executive functions, and subjective cognitive function. Older adults (N = 132, mean age = 74) were followed for up to 5 years. They were assessed annually for verbal memory and every 6 months for executive functions, subjective cognitive function, and cortisol area under the curve (AUC; averaged over 3 days). In multilevel models, persistently but not phasically higher cortisol was associated with worse verbal memory (gamma = -3.3 (1.1), p = .003). This effect withstood controls for stress, depression, metabolic health, and age. There was evidence for attenuated reactivity but not attenuatedency effects in memory with higher persistent cortisol. Phasic increases in cortisol were not associated with changes in memory, and cortisol was not related to executive functions or subjective cognitive function. Higher secretion of cortisol may, over time, contribute to neurodegeneration and memory difficulties. Larger cortisol AUC was particularly associated with attenuated primacy in memory, a pattern associated with Alzheimer’s disease; long periods of elevated cortisol may increase risk for the disease.

Abstract 3134
INDIVIDUAL DIFFERENCES REFLECTING NEUROVISCERAL INTEGRATION: COMPOSITE SCORES ON NEUROPSYCHOLOGICAL TESTS OF EXECUTIVE FUNCTION ARE SIGNIFICANTLY ASSOCIATED WITH RESTING HIGH FREQUENCY HEART RATE VARIABILITY
Paula G. Williams, Ph.D., Holly K. Rau, M.S., Psychology, University of Utah, Salt Lake City, UT, Matthew R. Cribbet, Ph.D., Psychiatry, University of Pittsburgh, Pittsburgh, PA, Daniel L. Bride, B.S., Yana Suchy, Ph.D., Psychology, University of Utah, Salt Lake City, UT

Recent models of self-regulation emphasize connections between brain regions sub-serving the executive functions (EF) and the parasympathetic nervous system, suggesting that performance on executive tasks should be associated with resting heart rate variability (HRV). The current study examined associations between EF, measured with individually-administered neuropsychological tests, and resting physiology in 79 healthy community adults (32% male; mean age = 27 years, SD = 6.5). Assessment of EF involved standard administration and scoring of four subtests from the Delis-Kaplan Executive Function System (D-KEFS): Design Fluency, Verbal Fluency, Color Word Interference, and Trail Making. These four tests were used to form a composite EF score—a methodology that results in a reliable assessment of EF reflecting the primary components of the construct. Resting HF-HRV and pre-ejection period (PEP) were measured using impedance cardiographs (MindWare 1000A, MindWare Technologies Ltd.) and calculated by averaging the last five minutes of a 10 minute resting baseline period. Results indicated that the EF composite score was significantly associated with resting HR-HRV, r = .33, p = .005, but was unrelated to resting PEP, p > .05, supporting the specificity of associations involving frequency heart rate variability (HF-HRV) in EF functioning vs. tonic sympathetic nervous system activation. These associations remained in regression analyses controlling for age. Examination of EF subcomponents indicated that the strongest associations were with Design Fluency, r = .34, p = .004, and Color Word Interference, r = .25, p = .04. These findings are consistent with the Neurovisceral Integration Model which outlines a functional
and structural network integrating cognitive, autonomic and affective systems. The current study supports the supposition that prefrontal cognitive functioning and resting HF-HRV represent related individual difference endophenotypes for self-regulatory capacity.

Abstract 3103
COGNITIVE PROCESSING SPEED IS RELATED WITH INFLAMMATORY RESPONSES TO REPEATED STRESS
Jonah E. Price, BA in Progress, Alina Gusev, BA, Lauren Speert, BA, Stefan Agrigoroaei, PHD, Nicolas Rohleder, PHD, Psychology, Brandeis University, Waltham, Massachusetts

Rationale: Sensitization of plasma inflammatory responses to repeated stress exposure have been suggested to be a maladaptive stress response pattern, thought to be associated with negative long-term health outcomes. Therefore, knowledge of factors related with lesser inflammatory stress responses and or lesser sensitization might open up avenues for prevention strategies. Cognitive abilities have been found related with lower responses to daily stressors, but have not been tested with regard to plasma inflammatory stress responses.

Methods: We recruited a sample of n=54 adults (48.5% male; mean age=29.18 years, SD = 11.47) from Brandeis University and the local community (Waltham, MA). Participants were exposed to the Trier Social Stress Test (TSST) twice, and plasma interleukin-6 (IL-6) was measured repeatedly at time points -1, +30, and 120 minutes relative to TSST exposure. Cognitive function was assessed using a processing speed task (backwards counting with time limit).

Results: Stress exposure induced significant increases in IL-6 on both days (time effect: F=2.39; p =0.05). Controlling for age, sex, and body fat percentage, we found that faster processing speed was related with lower IL-6 responses to the second (β = 0.40, p = 0.011) but not the first (β = -0.20, p = 0.14) TSST. Furthermore, higher processing speed was related with lower sensitization of IL-6 responses (β = 0.36, p = 0.011)

Discussion: Taken together these results show that better cognitive ability, as measured by faster processing speed, was related with lower IL-6 responses to repeated stress, and with lower sensitization of IL-6 responses to repeated stress. These results are in line with the hypothesis that better cognitive function is associated with less taxing biological stress responses, and therefore might be a predictor of lower vulnerability to stress-related diseases. Future studies will have to show whether inflammatory stress responses are related with negative health outcomes in the long term, and whether modification of response patterns can counteract this.

Abstract 3077
CHILDHOOD TRAUMA EXPOSURE, INFLAMMATION, AND COGNITIVE FUNCTION IN MIDDLE-AGE
Mary C. Davis, Ph.D., Linda Luecken, Ph.D., Kathryn Lemery-Chalfant, Ph.D., Alex Zautra, Ph.D., Psychology, Arizona State University, Tempe, AZ

Childhood trauma is a major risk factor for the development in adulthood of a host of health consequences, including cognitive deficits. Among the potential mechanisms linking early trauma with cognitive dysfunction are chronic heightened inflammation and poor metabolic control. We tested the hypothesis that the links between childhood trauma and cognitive decline in middle-adulthood are mediated by inflammation and metabolic dysregulation in a community sample of 706 adults aged 40 to 65 recruited to participate in a study of healthy aging. Measures included: self-reported retrospective assessment of exposure to physical, sexual, and emotional abuse prior to age 18; plasma levels of fibrinogen, C-reactive protein, and interleukin-6 as indicators of inflammation; plasma levels of fasting insulin and glucose; and waist-to-hip ratio as indicators of metabolic control, and cognitive function assessed via the Telephone Interview for Cognitive Status. Structural equation modeling yielded fit indices indicating that the model adequately fit the data [chi-square (30) = 66.70, p < .0001; CFI = .971, RMSEA = .042 (90% CI: 0.028 – 0.055), SRMR = .031]. As depicted in Figure 1, early trauma was related to heightened inflammation, which in turn, predicted poorer cognitive function. Early trauma also predicted poorer metabolic control, but metabolic control was unrelated to cognitive function. These associations held when controlling for gender, income, and depressive symptoms. Thus, early trauma may contribute to subsequent physiological dysregulation that, in turn, predicts cognitive dysfunction in middle-age among community-dwelling adults.

Paper Session: Integrative Medicine
Thursday, March 19 from 9:45 to 11:00 am

Abstract 3104
FISH OIL SUPPLEMENTATION DOES NOT LOWER CHRONIC INFLAMMATION OR ALTER AUTONOMIC NERVOUS SYSTEM FUNCTION IN HEALTHY ADULTS
Matthew F. Muldoon, MD, Heart and Vascular Institute, University of Pittsburgh School of Medicine, Pittsburgh, PA, Bahar Laderian, MD, Medicine, University of Miami, Miami, FL, Dora C. Kuan, MD, Psychology, University of Pittsburgh, Pittsburgh, PA, Susan M. Sereika, PhD, Biostatistics, University of Pittsburgh School of Nursing, Pittsburgh, PA, Anna L. Marsland, PhD, Peter J. Gianaros, PhD, J. R. Jennings, PhD, Stephen B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

The long-chain, n-3 polyunsaturated fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are hypothesized to prevent a range of chronic diseases, and are believed to act through anti-inflammatory actions, increased parasympathetic autonomic tone, or both. However, evidence of primary prevention is largely observational, and the biological plausibility of disease prevention would be bolstered by demonstrable effects on biological mechanisms in healthy individuals. This randomized, placebo-controlled and double-blind clinical trial enrolled healthy adults to test whether supplementation with a moderate dose EPA+DHA reduces common biomarkers of chronic, systemic inflammation and alters cardiac autonomic control. Subjects were 272 healthy individuals 30-54 years of age who consumed <300 mg of EPA+DHA daily. Each was randomly assigned to 18 weeks of either fish oil supplementation providing 1400 mg/day of EPA+DHA or matching soybean oil placebo. Serum C-reactive protein (CRP) and interleukin (IL)-6 and resting heart rate variability were measured at baseline and post-intervention. In a subsyudy, ex vivo lipopolysaccharide-stimulated production of four cytokines was measured. Data analyses conformed to intention-to-treat principles. Post-supplementation participant blinding was verified, and red blood cell EPA+DHA increased 64% in the active treatment group. Serum CRP and IL-6 were not affected by supplementation (ps > 0.10). Similarly, EPA+DHA supplementation did not alter ex vivo cytokine production(ps > 0.10). Neither time-domain variables (SD of normal-to-normal interbeat intervals and root mean square of successive interbeat intervals) nor frequency domain measures of heart rate variability (high and low frequency power) were altered in the fish oil group, compared to placebo-treated controls. This investigation found no evidence that 18 weeks of 1400 mg of EPA+DHA affected common markers of systemic inflammation or cardiac autonomic control in healthy adults. This research leaves unaddressed potential effects of larger doses, effects in patient populations, and alterations in other inflammatory and immune parameters.

Abstract 2668
A PILOT RANDOMIZED CONTROLLED TRIAL OF THE CLINICAL AND COST EFFECTIVENESS OF A SKYPE DELIVERED GROUP MINDFULNESS INTERVENTION FOR DISTRESSED PEOPLE WITH PROGRESSIVE MULTIPLE SCLEROSIS.
Rona Moss-Morris, PhD, Section of Health Psychology, King’s College London, London, Greater London, UK, Angeliki Bogosian, PhD, Section of Health Psychology, KCL, London, Greater London, UK, Paul Chadwick, PhD, Psychology, Paul McCrone, PhD, Centre for the Economics of Mental and Health Outcomes in the Long Term, and whether modification of response patterns can counteract this.
EFFECTS OF A GRATITUDE JOURNALING INTERVENTION ON HEART RATE VARIABILITY AND PRO-INFLAMMATORY BIOMARKERS IN ASYMPTOMATIC STAGE B HEART FAILURE PATIENTS

Laura Redwine, PhD, Brook Henry, PhD, Meredith Pung, PhD, Kathleen Williams, MS, Kelly Chinn, Master of Physician Assistant Studies, lunar Knight, MS, Medicine, J C. Wells, MS, Shamin Jain, PhD, Psychology, University of California, San Diego, CA, Alex Wood, PhD, Behavioral Science Centre, University of Stirling, Stirling, UK, Scotland, Paul J. Mills, PhD, Psychiatry, University of California, San Diego, CA

Gratitude interventions are often referred to as a key positive psychology intervention, although their evidence base is lacking, with proper RCTs conducted only in psychiatric populations for mental health outcomes. We provide preliminary evidence that gratitude interventions may improve cardiovascular outcomes, but as yet they have not been shown to improve cardiovascular health. In this study, we aimed to investigate the effects of a gratitude journaling intervention on autonomic and proinflammatory biomarkers. Heart rate variability (HRV) is increasingly used to detect impairment in autonomic function and assess risk for morbidity and mortality relating to cardiovascular pathology. Increased inflammation is associated with cardiovascular remodeling and worse prognosis in HF. Participants included 33 Stage B HF patients randomly assigned to an 8-week gratitude journaling condition (n = 16) or usual care (n = 17). Plasma cytokines and HRV were assessed at baseline and again after the 8-week intervention period. Also, after the post-intervention period both groups were asked to write about 3-5 things they were grateful for while HRV was assessed. For HRV (time, frequency and non-linear domains), after adjusting for baseline resting HRV, significant group by time interactions and medium Cohen’s d effect size differences were found in the post-intervention group compared to controls, with medium to large effect size differences (p = .048, d = 1.10 ; p = .05, d = .60 ; p = .064, d = .47 respectively). Significant reductions in plasma cytokine levels IL-1, and IL-6 and a trend for sTNFR1 were found in the gratitude intervention group compared to controls, with medium to large effect size differences (p = .048, d = 1.10 ; p = .05, d = .60 ; p = .064, d = .47 respectively). In Stage B HF patients there may be clinical benefits of gratitude journaling by improving autonomic function (suggests the potential for better cardiac function) and reducing inflammation. Gratitude journaling is a low-cost, easily implementable intervention that may have significant impact on enhancing physiological health and attenuating the progression of CVD. However, clinical implications for morbidity and mortality still need to be determined.

ABSTRACT 3073

PSYCHOBIOLOGICAL RESPONSES TO GROUP DRUMMING INTERVENTIONS FOR MENTAL HEALTH PATIENTS

Daisy Fancourt, MM, Livia A. Carvalho, PhD, Andrew Steptoe, DSc, Psychobiology Group, Department of Epidemiology and Health Care, University College London (UCL), London, London, England

Background: Growing numbers of mental health organisations are developing music-making interventions for service users. However, to date there has been limited research into their efficacy. The present study assessed the impact of group drumming interventions on combined psychological, physiological and psychobiological responses of mental health patients both across individual sessions and longitudinally. Methods: 51 participants (mean 49.9 yrs) receiving psychological support took part in a six-week group drumming intervention. Blood pressure, heart rate, salivary cortisol, IL2, IL4, IL6, IL10, MCP1, TNFα, TGFβ and IFNγ, and visual analogue mood scales were assessed before and after individual sessions as well as across the six-week intervention, alongside scales including Hospital Anxiety and Depression Scale (HADS) and Warwick-Edinburgh Mental Wellbeing Scale (WEMWS).

Results: Psychological wellbeing improved across the study, with reductions in HADS (p=0.004) and improvements in WEMWS (p=0.008). From before to after individual sessions, stress and tiredness decreased (p=0.001-0.002) and happiness, relaxation and energy increased (all p<0.001). Inflammation tended to increase from before to after individual sessions, but fell across the six weeks. Across the first session, three cytokines significantly increased: IL4, IFNγ and TGFβ (p=0.003 - 0.008). Across the sixth session, stronger results were noted: cortisol was reduced (p=0.004) while seven cytokines increased: IL2, IL4, IL6, IL10, IFNγ, TNFα and MCP1 (p=0.0004-0.028). Neither systolic nor diastolic blood pressure was reduced, but heart rate decreased across individual sessions (p=0.001). Across the entire six-week intervention, four cytokines were significantly lowered: IL6, IFNγ, TNFα, MCP1 (p=0.006-0.017). Cardiorespiratory Group drumming associated with stress hormone and increased immune activity across an individual session, and reduced pro-inflammatory responses across the entire intervention, along with improvements in depression and wellbeing. Further research is needed to elucidate the underlying social and biological mechanisms and assess the therapeutic potential of drumming interventions for mental health.

ABSTRACT 3013

EFFECT OF A MINDFULNESS-ENHANCED WEIGHT LOSS PROGRAM ON SEASONAL INFLUENZA VACCINE-MEDIATED IMMUNE RESPONSES

Jeffrey M. Milash, Ph.D., Experimental Medicine, Blake T. Garfin, Ph.D., Other Center for Integrative Medicine, Vanessa A. York, B.S., Experimental Medicine, Jennifer Daubenberger, Ph.D., Other Center for Integrative Medicine, Elissa S. Epel, Ph.D., Psychiatry, Patricia Moran, Ph.D., Michael Acree, Ph.D., Other Center for Integrative Medicine, Peter Bacchetti, Ph.D., Biostatistics, Margaret Kemeny, Ph.D., Psychology, University of California San Francisco, San Francisco, CA, Douglas F. Nixon, M.D., Ph.D., Microbiology, Immunology and Tropical Medicine, George Washington University, Washington, DC, Frederick M. Hecht, M.D., Other Center for Integrative Medicine, University of California San Francisco, San Francisco, CA

Chronic stress and obesity are prevalent in modern society. Chronic stress is associated with impaired immune responses leading to increased susceptibility to influenza. Moreover, obesity is an independent risk factor for morbidity and mortality from influenza infection. The use of mindfulness-based programs to address a variety of chronic stress-related diseases continues to increase, but the biological impact of these interventions on vaccine efficacy has not been thoroughly investigated. We measured influenza vaccine responses among obese study participants (BMI ≥ 30 - 45) who were randomized to standard diet and exercise (TLC) or a mindfulness enhanced approach (SWA). The groups were closely matched for diet information and number of group sessions (17 over 22 weeks), but the SWA group received instruction in mindful eating and emotion management, including content drawn from mindfulness-based stress reduction. We aimed to assess whether the SWA group would develop a greater influenza-specific immune response. Of the 194 participants, 82 (TLC=43, SWA=39) participated in this substudy. Blood was obtained at the time of vaccination, 1 week and 3 months post-vaccination to examine humoral and cell-mediated immune responses. The SWA group had a 24-fold increase in HAI titers from baseline to 3 months somewhat more often than the TLC group (34% vs 22%, difference +12%, exact 95% CI: −12% to +34%, p=0.30). For ELISPOT-measured flu-specific T cell responses, the SWA group had a greater fold-change (mean difference 1.74 fold-change (95% CI 0.90-3.37 fold-change)) in interferon gamma secreting cells (p=0.099) from baseline to 7 days post-vaccination and from baseline to 3 months post-vaccination (mean difference 2.11 fold-change (95% CI 0.86-5.17 fold-change)). The SWA group had a greater fold-change in IFNγ, TNFα and MCP1 (p=0.0004) from baseline to 3 months post-vaccination (mean difference 2.11 fold-change (95% CI −0.48-6.58 fold-change)). From before to after individual sessions, the differences were modest in magnitude and not statistically significant. We conclude that the mindfulness intervention, as implemented, is unlikely to provide a clinically significant enhancement of flu-specific immune responses in the population tested.
HEART RATE VARIABILITY PREDICTS LEVELS OF INFLAMMATORY MARKERS: EVIDENCE FOR THE VAGAL ANTI-INFLAMMATORY PATHWAY

Timothy M. Cooper, B.S., Department of Medicine, Columbia University College of Physicians and Surgeons, New York, NY, Paula S. McKinley, Ph.D., Department of Psychiatry, Columbia University Medical Center, New York State Psychiatric Institute, New York, NY, Teresa E. Seeman, Ph.D., Department of Medicine, University of California at Los Angeles, Los Angeles, CA, Tse-Hwei Choo, M.P.H., Department of Psychiatry, New York State Psychiatric Institute, New York, NY, Seonjoo Lee, Ph.D., Richard P. Sloan, Ph.D., Department of Psychiatry, Columbia University Medical Center, New York State Psychiatric Institute, New York, NY

Evidence from numerous animal models shows that vagal activity regulates inflammatory responses by decreasing cytokine release. Heart rate variability (HRV) is a reliable index of cardiac vagal regulation and should be inversely related to levels of inflammatory markers. Inflammation is also regulated by sympathetic inputs, but only one previous paper by Thayer and Fischer controlled for this. We sought to replicate those results and examine potential sex differences in the relationship between HRV and inflammatory markers. Using data from the MIDUS II study, we analyzed the relationship between 6 inflammatory markers and both HF-HRV and LF-HRV. After controlling for sympathetic effects by urinary norepinephrine as well as a host of other factors, LF-HRV was found to be inversely associated with fibrinogen, CRP and IL-6, while HF-HRV was inversely associated with fibrinogen and CRP. We did not observe consistent sex differences. These results suggest that the vagal anti-inflammatory pathway and suggest that it has similar effects in men and women.

Abstract 2947
CIRCADIAN VARIATION OF CARDIAC AUTONOMIC MODULATION AND LOW-GRADE INFLAMMATION IN WORKING ADULTS

Marc N. Jarczok, Dr. sc. hum., Mannheim Institute of Public Health, Social and Preventive Medicine, Mannheim Medical Faculty, Heidelberg University, Mannheim, BW, Germany, Julian Koenig, Dr. sc. hum., Department of Psychology, The Ohio State University, Columbus, OH, Jos A. Bosch, PhD, Clinical Psychology, University of Amsterdam, Amsterdam, MA, Netherlands, Joachim E. Fischer, MD, MSc, Mannheim Institute of Public Health, Social and Preventive Medicine, Mannheim Medical Faculty, Heidelberg University, Mannheim, BW, Germany, Julian F. Thayer, PhD, Department of Psychology, The Ohio State University, Columbus, Ohio

Introduction: Heart rate variability (HRV) fluctuates in a pattern of diurnal variation, with a peak of parasympathetic dominance during night time. Blunted increases at night are associated with decreased vagal tone and unfavorable health outcomes. We previously demonstrated that decreased HRV at baseline predicted for increased low-grade inflammation (a marker of CHD risk) in healthy working adults 4 years later. We aim to examine the association of circadian patterns of cardiac autonomic modulation with systemic inflammation.

Methods: We analyzed four HRV indices (RMSSD; SDNN; LF; HF) from 3131 (mean age 42±11; 80% males) 24-h HR-recordings collected at 4 distinct study sites of the Mannheim Industrial Cohort Study (MICS) in healthy working adults. Low-grade inflammation was measured by high-sensitive C-reactive protein (hsCRP). Participants with acute inflammation (hsCRP>10mg/L) were excluded. First, 3 individual-level cosine function parameters were estimated to quantify the circadian variation: Mesor (M, the 24hour mean), amplitude (A, the distance between M and the highest value of the cosine curve, and acrophase (τ, the time of the highest value of the cosine curve). Second, linear regression models and partial correlations were used to estimate the impact of M, A and τ on hsCRP. Covariates were age, sex, shift work (Y/N), doing sweat-rich activities 3 or more/week (Y/N) smoking (Current/Past/Never), beta blocker intake (Y/N), and fulfilling the criteria for the metabolic syndrome (Y/N) as defined by the joint interim statement of the IDF, AHA & NHLBI.

Results: Figure one shows the diurnal variation of RMSSD by CRP-risk group as defined by the AHA. The overall mean (M) was negatively associated, the oscillation (A) positively to CRP in both, adjusted and unadjusted models. Separating the cosine parameters to distinct models, M and A were both negatively associated with CRP. Cosine parameters explained 4-5% of the variance of hsCRP (R2). Regular sweat-rich activities decreased and current smoking increased low-grade inflammation.

Conclusions: Decreased circadian variation in physiology is associated with poorer health. In the present study lower M and higher A were associated with higher low-grade inflammation.

Abstract 2641
PSYCHO-MENTAL-PHYSIOPHYSIOLOGICAL PATHWAYS OF SELF-REGULATION: HEART RATE VARIABILITY PREDICTS EGO-DEPLETION

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Self-regulation (SR) is pivotal in emotional, cognitive, behavioral, and autonomic control; thus, SR is an important piece in maintaining good mental and physical health. Interestingly, previous work suggests that SR is a limited resource and when depleted, the individual experiences ego-depletion – a state where SR is operating at less than full capacity. However, research has yet to examine the association between ego-depletion and psychophysiological indices of SR capacity. Within their Neurovisceral Integration Model, Thayer and Lane (2000) proposed that vagally-mediated heart rate variability (vmHRV) is a biomarker of SR capacity and that individuals with higher vmHRV show better SR abilities. Thus, the following investigation attempts to link resting-baseline vmHRV, a psychophysiological measure of both SR capacity and overall health, with ego-depletion. Using an electrocardiogram (EKG), baseline-resting HRV was recorded in 61 (42 White, 42 Women) participants who later completed a depletion manipulation task and the Stroop task. The participants were randomly assigned to a depletion or non-depletion group: in the depletion manipulation, participants completed a task that required SR, presumably, depleting resources for later use during the subsequent SR task (Stroop task). Those in the non-depletion manipulation completed a task that did not require SR. All participants then completed the Stroop task. Accuracy on this secondary SR task was used to assess depletion. A regression model showed that, in line with previous studies, individuals in the depletion condition performed worse on the secondary task (Stroop) than those in the non-depletion condition (β=-.671 (standard error: .015), p = .001). As hypothesized, this effect was moderated by resting-baseline vmHRV (R2change: .140, β=-.165 (SE: .033), p = .001). Individuals with lower resting vmHRV show the ego-depletion effect (β=-.123 (SE: .033), p < .001), while individuals with higher resting vmHRV do not show depletion effects (β=.038 (SE: .035), p = .278). These data extend previous work on ego-depletion, suggesting that resting-vmHRV, as a proxy of SR abilities, may represent the psychophysiological pathway linking repeated SR behaviors with the phenomenon of ego-depletion. Overall, these results suggest that lower resting-vmHRV seems to be detrimental in the face of repeated self-regulatory behaviors, as these individuals are more likely to experience ego-depletion – a temporary state that can be detrimental to SR processes that maintain both mental and physical health.

Abstract 2843
EXERCISE AND HEART RATE VARIABILITY ON THE ANTIBODY RESPONSE TO INFLUENZA VACCINATION

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Objective: Evidence suggests that chronic aerobic exercise acts as a behavioral adjunct to vaccination mainly in the elderly although the mechanisms are uncertain. Aging is associated with immunosenescence largely attributed to low-grade chronic inflammation. Efferent vagal signaling has anti-inflammatory effects and high frequency heart rate variability (HF-HRV) is a noninvasive measure of vagal activity. In this pilot RCT, we examine whether exercise training, cardiorespiratory fitness (VO2max), and HF-HRV relate to the antibody response to influenza vaccination.

Methods: 22 healthy, sedentary adults (23-56 years, mean age 37.1±10.3) were randomly assigned to an exercise group (n=10) or waitlist control group (n=12). Subjects exercised at 65-80% of their maximum heart rate for 30 minutes, 4 days/week for 12 weeks prior to and continuing for 4 weeks after trivalent influenza vaccination. Controls did not change activity and were also immunized at 12 weeks. HF-HRV, VO2max, and antibody titters were measured before intervention, at the time of vaccination, and 4 weeks later.

Results: Antibody titter values were logged transformed and antibody-response was calculated as increase relative to pre-vaccination titters. Exercisers significantly increased their mean VO2max values compared to controls (6.24 to 1.13 ml/kg/min, p=0.0274) after 16 weeks but there was no group effect on HF-HRV. Titters increased significantly (all 3 strains) post-vaccination, but no group difference was observed in antibody response or seroreporting (hemagglutination inhibition titer ≥240). Regression analysis showed neither higher levels of VO2max nor HF-HRV at time of immunization predicted a greater antibody response. Similarly, greater increases of VO2max and HF-HRV, measured at both 12-week pre-vaccination period and 4-week post-vaccination period, did not predict a greater antibody response.

Conclusion: A 16-week exercise intervention did not enhance the antibody response to the flu vaccine in healthy sedentary young adults. Higher levels and greater increases of VO2max and HF-HRV were not predictive of a greater antibody response. In addition to small sample size, this trial is limited by studying mainly younger participants, in whom exercise may not further enhance antibody responses due to a possible ceiling effect. Future studies, preferably in older individuals, are needed to assess if greater exercise-induced HF-HRV as an index of vagal regulation is associated with the antibody response to immunization.

Abstract 2493

VAGALLY-MEDIATED HEART RATE VARIABILITY AND INDICES OF WELLBEING: RESULTS OF A NATIONALLY REPRESENTATIVE STUDY

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Objective: High frequency (HF) heart rate variability (HRV) has long been accepted as an index of cardiac vagal control. More recent studies report relationships between HF-HRV and indices of positive and negative emotional states, personality traits and wellbeing but these studies generally are based on small and selective samples. Method: These relationships were examined using data from 967 participants in the second Midlife in the US study. Participants completed survey questionnaires on wellbeing and affect. HRV was measured at rest. A hierarchical series of regression analyses examined relationships between these various indices and HF HRV before and after adjustment for relevant demographic and biometrical factors. Results: Significant inverse relationships were found only between indices of negative affect and HF HRV. Relationships between indices of psychological and hedonic wellbeing and positive affect failed to reach significance. Conclusions: These findings raise questions about relationships between cardiac parasympathetic modulation, emotion regulation, and indices of wellbeing.

Paper Session: Obesity

Thursday, March 19 from 1:45 to 3:00 pm

Abstract 3130

DEPRESSIVE DISORDER SUBTYPES AS PREDICTORS OF INCIDENT OBESITY: DATA FROM THE NATIONAL EPIDEMIOLOGIC SURVEY ON ALCOHOL AND RELATED CONDITIONS (NESARC)

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It is well established that major depressive disorder (MDD) is predictive of future obesity; however, few prospective studies have evaluated the relative importance of depressive disorder subtypes in predicting obesity risk. Therefore, we examined dysthymic disorder and MDD subtypes as predictors of incident obesity among 17,787 initially non-obese adults aged 18-64 (mean age=40.3 years, 52% female, 41% non-white) who participated in Wave 1 (2001-2002) and Wave 2 (2004-2005) of the NESARC study. Respondents who reported being pregnant in the past 12 months at Wave 1 or 2 or who had a body mass index (BMI) <18.5 at Wave 1 were excluded from analyses. The structured Alcohol Use Disorders Identification Test (AUDIT) and Bariatric Use Disorder Identification Schedule-IV was administered at Wave 1 to assess lifetime history of DSM-IV depressive disorders. Using these data, we computed a 4-level depression variable: no lifetime depressive disorder (n=14,570), dysthymic disorder only (n=143), atypical MDD (cases with reversed vegetative symptoms of hypersomnia and hyperphagia; n=528), and nonatypical MDD (the remaining MDD cases; n=2,546). Incident obesity was defined as a Wave 2 BMI ≥30 kg/m2, computed from self-reported height and weight. During the follow-up period, there were 1,952 (10.9%) cases of incident obesity. Logistic regression models (adjusted for Wave 1 BMI, age, sex, race/ethnicity, education, alcohol use disorders, tobacco use, cardiovascular disease, liver disease, and arthritism) revealed that dysthymic disorder (OR=1.61, 95%CI:1.28-2.03, p<0.001) and atypical MDD (OR=1.63, 95%CI:1.39-1.92, p<0.001) predicted incident obesity. However, nonatypical MDD fell just short of significance (OR=1.09, 95%CI:0.99-1.19, p=0.85). Because we detected significant interactions between depression variable and race/ethnicity, we reran the models after stratifying by race/ethnicity. Dysthymic disorder predicted incident obesity in Black (OR=1.62, 95%CI:1.08-2.41, p=0.018), Hispanic (OR=2.72, 95%CI:2.48-2.98, p<0.001), and Other (OR=4.55, 95%CI:1.89-10.97, p<0.001) groups. Atypical MDD predicted in all groups: White (OR=1.46, 95%CI:1.17-1.82, p<0.001), Black (OR=1.37, 95%CI:1.26-1.47, p<0.001), Hispanic (OR=1.85, 95%CI:1.66-2.06, p<0.001), and Other (OR=2.92, 95%CI:2.49-3.43, p<0.001) groups. Finally, nonatypical MDD predicted only in the Hispanic (OR=1.30, 95%CI:1.14-1.47, p<0.001) and Other (OR=1.87, 95%CI:1.20-2.92, p=0.006) groups. Findings from this large, nationally representative sample suggest that adults with dysthymic disorder or atypical MDD may be subgroups of depressed patients at particularly increased risk of obesity.

Abstract 2791

INCREASED ALEXITHYMIA IN CASES OF UNSUCCESSFUL BARIATRIC SURGERY

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Background: Higher levels of alexithymia in obese patients have already been described in cross-sectional studies, but it is unclear whether alexithymia represents a risk factor of weight gain, via eating disorders or emotional eating in such clinical situations, rather than a consequence. We aimed to study the role of weight loss and its impact on alexithymia.

Objective: To examine changes in alexithymia scores in candidates to bariatric surgery prospectively followed up for at least one year, and to test the role of excess weight loss (EWL) in this change. Methods: 308 obese patients (82.8% females), aged 40.5 (SD: 12.1), with a mean Body Mass Index (BMI) of 45.2 (6.4) were assessed prior to bariatric surgery with several psychosocial questionnaires including the Toronto Alexithymia Scale (TAS). 102 of them completed the same questionnaires again 14.1 (2.5) months after surgery. Analyses were performed using the mixed effect method in order to consider the possibility of having follow-up random data, computed via a logistic regression based on baseline characteristics. EWL was defined as the ratio of weight loss to the difference between baseline weight and the weight corresponding to a BMI of 25.Results: At baseline 31.6% of the patients could be considered as alexithymic, according to the French cutoff ≥56. For 65.7% of the operated patients bariatric surgery could be considered as successful (at least 50% of EWL). Most of psychosocial scores improved from pre to follow-up. Postoperatively, alexithymia scores were positively associated with EWL. No significant changes of TAS scores, and even an increase of its Difficulty in Describing Feelings (DDF) component, were observed. Adjusting for EWL, TAS total score, as well as Difficulty in Identifying Feelings (DIF) and DDF components, increased after surgery (P=0.004, 0.022 and 0.002, respectively). Separate analyses found no change of TAS subscales or components in case of successful EWL and significant improvements only for total TAS, DIF and DDF, in case of insufficient EWL (P=0.005, 0.010 and 0.004, respectively, with eta2=0.22, 0.19 and 0.24, for effect size).

Discussion: Results suggest that at least a part of the alexithymia observed in obese patients could be a state rather a trait, potentially helping these patients to deal with the discomfort induced by their overweight and its psychosocial consequences.
AN ANGIOGENIC MONOCYTE PHENOTYPE IS ASSOCIATED WITH DISTRESS AND LONGITUDINAL INCREASES IN WAISTLINE CIRCUMFERENCE
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Background: Data addressing stress-associated biomarkers that consistently lack weight gain are lacking. Infiltrating macrophages and local angiogetic activity both play important roles in adipose tissue expansion and obesity. We investigated whether an angiogenic monocyte (AM) phenotype might be associated with both stress and changes in waistline. Objective: To test associations of an AM phenotype with (1) measures of chronic psychological stress and distress, and (2) with longitudinal changes in waistline circumference. Methods: 27 post-menopausal women, including 11 dementia caregivers and 16 non-caregiving controls, completed the perceived stress scale (PSS), and the inventory for depressive symptoms (IDS). We collected blood samples, follicled for PBMCs, and assayed for gene expression using Affymetrix U133A high-density oligonucleotide arrays. We aggregated normalized scores of 19 genes identified in a previously published gene tree analysis to form the AM phenotype. Gene expression was assayed at the end of the study (final assessment and baseline); hence, we examined whether changes in waistline over the preceding two years were associated with the AM phenotype. Results: Caregivers had significant upregulated AM phenotypes compared to non-caregivers (β = .61, p = .001), after controlling for age and exercise. Upregulated expression of genes in the AM phenotype was also associated with borderline higher concurrent scores on the PSS (β = .36, p = .069) and significantly higher scores on the IDS (β = .52, p = .006), when controlling for age and exercise, but these became non-significant on additional controlling for caregiving. An upregulated AM phenotype was also associated with greater 2-year increases in waistline circumference (β = .51, p = .042), while controlling for caregiver status, age, and exercise. Conclusions: Though we need further prospective studies, preliminary results suggest that the AM phenotype may be a useful marker of chronic psychological stress and waistline increases.

ASSOCIATIONS OF DISPOSITIONAL MINDFULNESS WITH OBESITY AND CENTRAL ADIPOSY: THE NEW ENGLAND FAMILY STUDY
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BACKGROUND/OBJECTIVES: Obesity and excess central adiposity are important risk factors for diseases such as type 2 diabetes and cardiovascular disease. Objectives were to evaluate whether dispositional mindfulness (defined as the ability to attend nonjudgmentally to one's own physical and mental processes) is associated with obesity and central adiposity. SUBJECTS/METHODS: Study participants (n=400) were from the New England Family Study, a prospective birth cohort, with median age 47 years. Dispositional mindfulness was assessed using the Mindful Attention Awareness Scale (MAAS), which appears to emphasize an element related to dissociation and absent-mindedness. Central adiposity was assessed using dual energy X-ray absorptiometry (DXA) scans with primary outcomes android fat mass and android:gonadal ratio. Obesity was defined as body mass index ≥ 30 kg/m2. Secondary analyses evaluated waist circumference and waist:hip ratio. Multivariable-adjusted regression analyses were performed. RESULTS: Analyses demonstrated that participants with low vs. high MAAS scores were more likely to be obese (prevalence ratio for obesity=1.34 (95% confidence limit (CL): 1.02, 1.77)), adjusted for age, gender, race/ethnicity, birth weight, childhood socioeconomic status, and childhood intelligence. Furthermore, participants with low vs. high MAAS level had mean 448 (95% CL: 1.02, 1.77), adjusted for age, gender, race/ethnicity, birth weight, childhood socioeconomic status, and childhood intelligence, child birth weight.

THE ASSOCIATION OF METABOLIC SYNDROME AND SLEEP QUALITY WITH INFLAMMATION: RESULTS FROM THE MIDUS II STUDY
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Data from the biomarker substudy of the MIDUS II project were used. Data for a total of 1225 people were included in this analysis. Sleep quality was assessed using the Pittsburgh sleep quality index (overall sleep score ≥ 6), and Mets determined using the International Diabetes Federation criteria (abdominal obesity plus at least two other risk factors). Four groups were created based on presence of sleep disturbance and Mets (see table). Data were assessed using one-way ANOVA for descriptive statistics. A logistic regression was run to assess the association of Mets and sleep disturbance with high levels of CRP (≥ 3). The regression was adjusted for sociodemographic factors, chronic conditions and lifestyle. Synergetic interaction of Mets and sleep disturbance was assessed with Rothman's synergy index. Results showed that people with Mets and sleep disturbance had significantly higher levels of serum CRP than all other groups (see table). Results from the fully adjusted logistic regression showed that both Mets with no sleep disturbance (OR 2.40, 1.53-3.77) and Mets plus sleep disturbance (OR 3.58, 2.27-5.64) were associated with a greater likelihood of having high CRP. The association between no Mets with sleep disturbance was not significant after adjustment (OR 1.49, 0.92-2.43). However, results from Rothmans synergy index indicated a value of 1.37 which is indicative of a synergetic interaction between sleep and Mets for high CRP. Results from this study indicate that co-occurring metabolic syndrome and sleep disturbance is associated with high levels of CRP. The results also point to an interactive effect of Mets and sleep disturbance for high levels of CRP. As Mets, sleep disturbance and CRP also represent independent risk factors for CVD, it will be important for future studies to examine if Mets and sleep disturbance increase the risk of developing CVD.
DEFINING ELECTROPHYSIOLOGICAL MECHANISMS OF ACUPUNCTURE IN HEAD AND NECK CANCER PATIENTS WITH XEROSTOMIA

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Background: We investigated the electrophysiological mechanisms of a single session of acupuncture to treat xerostomia in head and neck cancer patients undergoing radiotherapy. Methods: Head and neck cancer patients (N=14) were recruited 3 to 5 weeks into radiotherapy and received either real acupuncture (RA) or sham acupuncture (SA). EEG data was collected with eyes closed for 5 minutes before needle insertion, throughout acupuncture, and then 5 minutes after removal of the needles. We compared EEG differences between each condition. Results: Whole brain analysis yielded maximal power differences in two bandwidths. For RA, we observed increased delta (1-3.5Hz) activity in Brodmann areas (BAs) 47, 37, 9, & 10 compared to SA. Maximal delta decreases were found in BAs 40, 37, 2, 1, 7, & 5. Maximal increases in alpha (8-12.5 Hz) activity were found for RA compared to the SA in BAs 20, 5, 40, 9, 13, & 4, while decreases were found in BAs 47, 13, & 39. Group comparisons within specific regions of interest (ROIs) revealed decreased alpha and beta 1 (13-21.5Hz) activity in RA while both bands increased in SA along the cingulate. Surface analysis of frontal lobe activity revealed statistically significantly greater alpha amplitude in SA during (p=0.003) as well as after acupuncture (p=0.003). There was decreased activity in all hypothesized ROIs associated with saliva production and perception for RA (BA 3, BA 6, BA11, BA13, BA33, and amygdala). Conclusions: This is the first study to report EEG changes associated with real and sham acupuncture treatments for xerostomia. We found differences in activity in specific ROIs that were common to a previous study of acupuncture for salivary production using fMRI, including the inferior, frontal gyrus, middle frontal gyrus, insula, and postcentral gyrus. Our results indicate a differential effect between RA and SA as determined by whole brain, ROI, and surface analyses.

Abstract 3135
ALEXITHMIA INFLUENCES BRAIN ACTIVITY DURING RECTAL DISTENTION IN SUBJECTS WITH IRRITABLE BOWEL SYNDROME

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Background: Alexithymia is a personality construct characterized by deficits in cognitive processing and regulation of emotions. Research has shown an association between alexithymia and chronic pain syndromes including irritable bowel syndrome (IBS). We previously reported that alexithymia tendency positively correlated with the brain activity in the visceral pain areas including insula and brainstem in normal population. We aim to investigate the influence of alexithymia on the brain activity during visceral perception in IBS subjects.

Methods: Twenty six IBS subjects (13 women, mean age was 23 year old) diagnosed according to ROME III criteria participated in the study. Functional magnetic resonance imaging was used to acquire blood oxygen level dependent contrast images. Data was collected whilst subjects received balloon distensions to the rectum as well as during anticipation of the distension. Mechanical balloon distension at 40 – 60 % level of discomfort for each subject was adopted as visceral stimulation. Alexithymia was assessed in each subject using the 20-item of Toronto alexithymia scale (TAS-20).

Results: The averaged TAS-20 score of the 26 IBS subjects was 50.1 ± 10.7 (mean ± SEM). During anticipation, analysis revealed TAS-20 score was correlated positively with the brain activity in the pregenual anterior cingulate cortex, mid cingulate cortex (MCC), parahippocampal gyrus, bilateral rolandic opeculum, orbitofrontal cortex, superior temporal gyrus and cerebellum. In the contrast of balloon distention against no distention condition, TAS-20 score was correlated positively with the activity in the bilateral insula, thalamus, right pallidum, right amygdala, MCC, inferior frontal gyrus, precuneus, temporal pole, brainstem and cerebellum. All brain data was significant at p<0.001, uncorrected.

Conclusion: Alexithymia was associated with the brain activity during anticipation of visceral sensation and visceral perception in IBS subjects. Alexithymia may contribute to abnormal visceral pain processing in the brain of IBS.

Paper Session: Depression and Cancer
Thursday, March 19 from 3:15 to 4:15 pm

DEPRESSIVE SYMPTOMS DURING PRIMARY TREATMENT IN WOMEN WITH NON-METASTATIC BREAST CANCER PREDICT MORTALITY OVER 8-15 YEARS: BIOBEHAVIORAL MECHANISMS

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Objective: Women with breast cancer (BCa) report elevated levels of depressive symptoms, which are linked to poorer health outcomes and mortality. Depression is related to elevations in inflammatory processes, which have in turn been related to processes promoting disease progression. We examined relations between depressive symptoms and inflammatory processes in BCa patients undergoing primary treatment, and followed them for longer-term health outcomes. Methods: Women with non-metastatic Stage 0 – III BCa were recruited < 12 weeks after surgery but before they had commenced adjuvant therapy during the period 1998 - 2005. They underwent a clinical interview for depression using the Hamilton Rating Scale for Depression (HRSD), provided blood samples, and reported demographic and health information. We followed this cohort for clinical outcomes at 8 – 15 year follow-up (mnd = 11yrs, N = 231) using Florida Tumor Registry Data Systems (State Tumor Registry). We compared women scoring above the cut-off for depression on the HRSD (≥7) vs those in the non-depressed range (≤7) on clinical outcomes with Kaplan-Meier and Cox regression analyses controlling for relevant demographic and medical covariates. We also examined associations between depressive symptoms at study entry and serum inflammatory cytokines IL-1β, TNF-a, and IL-6, determined by ELISA among women who provided this information using analysis of co-variation and regression analyses.

Results: Women scoring in the depressed range at study entry (N = 95) showed about 54% greater risk of all-cause mortality at follow-up compared to women in the non-depressed range (N= 136), low depression HR = .459, 95% CI: .22 - .97, p = .042. Findings held in a subset of women with invasive cancer only (Stage 1 – III, N = 197). Women scoring in the depressed range on the HRSD also showed significantly greater levels of IL-1β, IL-6, and TNF-a than their non-depressed counterparts in the weeks after surgery, after controlling for age, time since surgery, and Body Mass Index (all p's < .01 - .05). Greater magnitude of depressive symptoms related to greater levels of IL-1β (p=0.006), TNF-a (p=0.013), and IL-6 (p=0.05). Greater baseline HRSD and TNF-a levels predicted less survival time. Conclusions: Greater depressive symptoms are related to greater inflammation in women with BCa post-surgery even before starting adjuvant treatment. Depression at this point in treatment also predicts greater odds of mortality 8 – 15 years later. These findings have clinical implications for targeting depressive symptoms in the post-surgical period.

DEPRESSION AND SOCIAL ATTACHMENT PREDICT CD14+ MONOCYTE GENE EXPRESSION PROFILES AMONG INDIVIDUALS WITH MULTIPLE MYELOMA UNDERGOING AUTOLOGOUS STEM CELL TRANSPLANTATION

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Monocytes (Mo) and macrophages play a role in angiogenesis, apoptosis, and production of disease-promoting cytokines in multiple myeloma. They also influence the recovery of adaptive immunity following hematopoietic stem cell transplants. We examined gene expression profiles of Mo in individuals undergoing autologous hematopoietic stem cell transplantation (HSCT) and compared gene expression profiles of Mo precursors of individuals with multiple myeloma undergoing autologous hematopoietic stem cell transplantation (Mo) with those of healthy controls. We conducted a genome-wide transcriptional profiling of peripheral blood CD14+ Mo, and compared the results with those obtained using peripheral blood Mo isolated from healthy controls. Microarray analysis of Mo samples identified a number of differentially expressed genes that were associated with social attachment. We also assessed the relationship between social attachment and gene expression profiles of Mo in individuals undergoing HSCT. We found that social attachment was associated with the expression of a number of genes that were related to the immune response. In conclusion, our findings suggest that social attachment has a positive influence on gene expression profiles of Mo in individuals undergoing HSCT.
CARDIAC VAGAL CONTROL AND COPING STRATEGIES AS PREDICTORS OF DEPRESSION IN BREAST CANCER

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Background: Depression is related to poorer outcomes in breast cancer patients. Cardiac vagal control is an important physiological variable involved in affect regulation, coping with stressors, and depression. This study examined whether cardiac vagal control, as measured by respiratory sinus arrhythmia (RSA), and coping strategies were associated with depressive symptoms over 12 months following breast cancer diagnosis. Methods: The sample included 114 women with Stage 1-4 breast cancer (months since diagnosis = 2.02 +/- 0.78; range 5 to 42), taking no medications that affect cardiac function. At study entry, a 5-minute electrocardiogram segment was recorded. Participants completed the Center for Epidemiologic Studies Depression (CES-D) scale and a measure of cancer-related coping (COPE) at study entry and at 6, 12, 18, 24, and 36 weeks. Different coping strategies were examined separately in multilevel models along with RSA to predict CES-D. Mean levels of coping responses across study assessments were used in the analyses. Age, education, employment and treatment variables were included. Results: There were no associations between RSA and coping strategies (r < 0.11, ns). At study entry, women with high RSA exhibited lower depressive symptoms (b = -0.27, p < 0.04), but lower avoidance-orientation coping was associated with higher initial depressive symptoms (b = 0.30, p < 0.01). Women who endorsed high use of problem-focused coping, emotional expression and emotional processing coping strategies exhibited higher initial depression severity (b = 4.93, 6.22, 6.62 respectively, p < 0.05), but recovered faster, and the difference in depressive symptoms between women with high and low use of these coping strategies reduced over time. In separate multilevel models, RSA and problem-focused coping, as well as RSA and seeking social support, interacted to predict the quadratic trajectory of change in depressive symptoms over time (b = -0.04, -0.06 respectively, p < .05) (See Figure). Conclusion: These findings suggest that over time, most women return to a relatively low level of depression, and coping and RSA play a role in determining initial depressive symptoms and the rate of recovery.
BLOOD PRESSURE REACTIVITY MODERATES THE EFFECTS OF DAILY LIFE STRAIN ON SUBCLINICAL ATHEROSCLEROSIS: EXAMINING DIATHESIS-STRESS INTERACTIONS USING AMBULATORY MONITORING METHODS

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High strain jobs, marked by high demands and low control, may elevate risk for cardiovascular disease (CVD). Similarly, those who rate their ongoing daily activities as high in Demand or low in Control may demonstrate elevated risk for subclinical atherosclerosis. Here, we examine whether such effects are moderated by cardiovascular reactivity (CVR) to daily life strain. 473 healthy, employed adults, ages 30-54 (54 % female, 16 % Black) monitored their daily experiences, using electronic diary and ambulatory blood pressure (ABP) methods during each waking hour for 4 days. Hourly diary entries included 6-point Likert ratings of momentary Demand and Control. Daily life strain was assessed using these momentary ratings averaged over the 4-day period. CVR to strain was assessed using multilevel models, regressing hourly ABP readings on hourly indices of momentary strain (1=high Demand, low Control, 0=all other observations) for each person, with activity, posture, and substance use as time-varying covariates. Subclinical atherosclerosis was assessed using carotid ultrasonography. Regression models involved demographic and biological risk factor covariates. We found a significant 3-way interaction between mean momentary Demand, mean momentary Control, and SBP reactivity to momentary strain on IMT (F (1, 454) =5.58, p=.02), reflecting an association between daily life strain (high mean Demand, low mean Control) and IMT only for high (+1 sd) reactive individuals (F (1,458) =9.50, bs=0.5, p=.0022); (for low reactors, p=.62). A similar 3-way interaction emerged for DBP reactivity to daily life strain (F(1,454)=3.56, p=.06); once again, with significant effects of daily life strain and IMT for high reactive individuals only (F(1,458)=7.38, bs=0.04, p=.01); (p=.97 for low reactors). Daily life strain may be linked with atherosclerosis only among those who are most physiologically reactive to episodes of momentary strain in the natural environment. Ambulatory monitoring methods, designed to capture simultaneous fluctuations in behavior and physiology in real time, may be particularly well suited to detect these types of diathesis-stress interactions. Supported by HL40962.

DEPRESSION AND PREFERENCE FOR SHARED DECISION MAKING AMONGST PATIENTS WITH UNCONTROLLED HYPERTENSION

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Objective: Since 2001, the Institute of Medicine has emphasized shared decision making (SDM) as a central aspect of patient centered care. However, few studies have examined whether preferences for SDM differ for patients with mental disorders such as depression. We hypothesized that patients with depression would prefer clinician-directed decision-making due to the effect of mood on heuristic-systematic processing and to the cognitive symptoms of depression.

Methods: Between 2011 and 2014, we enrolled a convenience sample of 201 patients with uncontrolled hypertension from two urban, academic hospital-based primary care clinics. Eligible patients were ≥18 years old, prescribed ≥1 blood pressure (BP) medication, and had a BP ≥140/90 mmHg (≥1/30/80 mmHg if diabetic or with chronic kidney disease) on at least two consecutive primary care visits. Depression was defined as a score ≥10 on the 8-item Patient Health Questionnaire. Preference for SDM was based on a 5 point Likert scale (clinician-directed to patient directed decision making). Ordinal logistic regression was used to test the association between depression and SDM preference, adjusting for age, gender, race, ethnicity, years of schooling, Medicaid status, and Charlson Comorbidity Index. Mixed effects analyses were used to account for clustering within primary care physicians.

Results: The mean age was 64.2 (9.1) years; 71% were women, 77% Hispanic, 40% Black, 83% carried Medicaid insurance and 33% had depressive symptoms. Sixty-three percent of depressed individuals (vs. 49% non-depressed) preferred that the clinician make all or most of the decisions (Figure). In the unadjusted model, compared to those without, participants with elevated depressive symptoms expressed higher preference for clinician-directed decision-making (OR =1.80, 95% CI 1.22, 2.67; p=0.003) and the effect remained after adjusting for all covariates and clustering within clinician (OR = 2.5, 95% CI 1.3-4.9, p=0.002). Older age (OR 1.04, 95% CI 1.00, 1.07), black race (OR 2.06, 95% CI 1.02, 4.13), lower years of schooling (OR 0.90, 95% CI 0.83, 0.97), and lower Charlson scores (OR 0.88, 95% CI 0.77, 0.95) were also associated with preference for clinician directed decision-making.

Discussion: In our multi-ethnic cohort, depressive symptoms were associated with preference for clinician directed decision-making. Clinicians are increasingly trained to engage patients in SDM. This may unwittingly foster a lack of congruence with preferences for decision-making in patients with depressive symptoms. Future research should determine whether there is, indeed, a mismatch between patients and providers, and whether discordance influences satisfaction with clinician communication and adherence to treatment recommendations in patients with depressive symptoms.
Abstract 3097

EFFECTS OF EXPECTANCY ON COGNITIVE PERFORMANCE AND MOOD IN CHILDREN AND THEIR PARENTS
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High placebo response rates on cognitive performance and mood were found in children, adolescents and adults in experimental and clinical studies about the efficacy of methylphenidate on attention-deficit/hyperactivity disorder. A review revealed that placebo effects are higher in children than in adults and may be influenced by high expectations of their parents. To investigate effects of expectancy on cognitive performance and mood in children and their parents, 23 healthy children between 12 and 17 years old (33.7 ± 1.5 years, 12 girls) and one parent (47.4 ± 4.6 years, 14 mothers, 5 fathers; 4 mothers with 2 children) participated in this study. On two occasions, a placebo patch was applied to the hip of both child and parent but they were informed in randomized order that it contained a Ginkgo biloba preparation or was a placebo. Cognitive performance was assessed with a parametric go/no-go task with 3 difficulty levels. Participants were asked about their expectations about Ginkgo, to fill in psychometric questionnaires and physiological stress markers, e.g. heart rate and saliva cortisol levels, were measured. Contrary to our hypothesis, there was no correlation between expectations of children and their parents. There was no placebo response in adults, but positive mood (p=.033) and the ability for response inhibition (p=.005) significantly increased and correct responses in level 3 significantly decreased (p=.014) in children when they received the Ginkgo information. A 2x2 ANOVA (repeated measures: Ginkgo vs. placebo information; parents vs. children) revealed significantly more positive mood, shorter reaction times, and more correct responses, but fewer correctly inhibited responses in children compared to parents but no effect of the information received. Preliminary results of this study indicate that children are more prone to show a placebo response than adults in general, but expectations of children and their parents are not related to each other. However, we will further investigate how psychometric and psychophysiological measures assessed influence the placebo response in children. The study will be continued and final results presented at the Meeting of the APS

Abstract 3007

TEST-RETEST RELIABILITY OF PEDIATRIC HEART RATE VARIABILITY: A META-ANALYSIS
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Heart rate variability (HRV), an index of autonomic functioning, is associated with health outcomes, including obesity, diabetes, and even mortality risk. Time- and frequency-domain HRV measures are increasingly reported in longitudinal studies of health. While test-retest reliability has been established among adults, less is known about its psychometric properties among infants, children, and adolescents. Objective. To conduct a meta-analysis of the test-retest reliability of time- and frequency-domain HRV measures from infancy to adolescence. Method. Electronic searches (PubMed, PsycINFO, Jan 1970-Dec 2013) identified studies with non-clinical samples aged ≤18 years; ≥2 baseline conditions separated by ≥1 day; and, sufficient data for effect size computation. Forty-six studies (N=4790) met inclusion criteria. Methodological variables coded included demographics, study design (e.g., follow-up length, posture), ECG signal acquisition/processing (e.g., sampling rate, recording duration), and HRV analytical decisions (e.g., epoch length, frequency bands). Fisher’s Z was derived as the common effect size. Analyses were age-stratified and were stratified (infant/toddler vs. children) revealed significantly more positive mood, shorter reaction times, and more correct responses, but fewer correctly inhibited responses in children compared to parents but no effect of the information received. Preliminary results of this study indicate that children are more prone to show a placebo response than adults in general, but expectations of children and their parents are not related to each other. However, we will further investigate how psychometric and psychophysiological measures assessed influence the placebo response in children. The study will be continued and final results presented at the Meeting of the APS

Abstract 2970

INTER-RELATION OF HRV AND CORTISOL AND ITS ASSOCIATION WITH CARDIOVASCULAR PRECURSORS IN CHILDREN
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Dysregulated autonomic and HPA axis activity in children have each been independently associated with early cardiovascular disease precursors (e.g., blood pressure, cholesterol). Yet, these singular associations do not sufficiently describe their complex physiological interconnections (e.g., reciprocal innervation) and are incongruent with current theoretical models emphasizing the role of a multi-system perspective (e.g., Bauer et al.’s 2000 Additive Model). Objective. To examine whether the inter-relation between autonomic and HPA axis activity was better associated with cardiovascular precursors than their singular association, and whether this association was moderated by stressful life events. Method. Children (N=29) were assessed at baseline (mean age=0.14 yr) and at follow-up (mean age=0.43 yr) in the 10th wave of the Quebec Longitudinal Study of Child Development, a population-based birth cohort in Canada. Children answered questionnaires about stressful life events. Resting blood pressure (SBP, DBP), cholesterol (total, LDL, HDL), and waist circumference were measured. Children collected salivary samples to measure the cortisol awakening response (AUCI) and wore ambulatory Holter monitors. ECG data were visually inspected, manually edited, and analyzed to derive short-term (LF, HF) and low-frequency parameters (LF/HF). General linear models tested the singular and inter-relation models; covariates included age, sex, adrenarche, BMI Z-score, parental education, and household income. Multiple analyses examined the role of stressful life events. Results. The inter-relations of HRV and cortisol were significantly associated with LDL (β SDNN=AUCI = -.32, β LF+AUCl= -.19, β LF+AUCC= -.15) and total cholesterol (β LF+AUCl= -.16). Stressful life events significantly modulated these relations; specifically, these associations were amplified among children with greater stressful life events. The singular association of HRV was best associated with blood pressure (SBP βSDNN= -.15, βLF= -.17, βHF= -.14; DBP βSDNN= -.20, βLF= -.19, βHF= -.17) and cortisol (βSDNN= .08, βLF= -.12); cortisol awakening was best associated with waist circumference (βAUCI= -.09). Discussion. Among children with greater reported stressful life events, the inter-relation of autonomic and HPA-axis activity may better explain some cardiovascular precursors. Findings partly support Bauer et al.'s Additive Model of risk, which posits that children are at the greatest risk for adverse outcomes when both autonomic and HPA axis systems are activated.

Abstract 2555

PSYCHOSOCIAL QUALITY OF LIFE, LIFESTYLE AND ADIPOSY: A LONGITUDINAL STUDY IN PRESCHOOLERS
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BACKGROUND Childhood obesity has been increasing at an alarming rate. In obesity prevention, insight into the role of psychosocial aspects early in life is pivotal. Recently, several reviews reported contradictory results regarding the associations between psychosocial and adiposity markers in childhood and adolescence. These reviews also noted the lack of longitudinal studies focusing on young children and on lifestyle factors that might explain or moderate these associations. METHODS We will test with linear regressions whether low psychosocial Quality-Of-Life (QOL) in pre-schoolers is associated with lifestyle and obesity prone changes over time and whether maternal support moderates the latter. Longitudinal data from 291 pre-schoolers (initially 3.9-6.3y) was collected in the Swiss Ballabeina study: psychosocial QOL (emotional, social and school QOL by PEDsQL parental-report), adiposity (BMI, waist, fat% by BodPod technology), diet (food frequency questionnaire), screen time and activity-level (accelerometers). RESULTS Low psychosocial QOL was related
to unfavourable changes in diet (less fruit beta=0.21 and more fat intake beta=-0.28) and lower physical activity (beta=0.21). Longitudinal QOL-adiposity relations appeared only after moderation by lifestyle (beta-range: 0.13-0.67). Low psychosocial QOL was associated with increases in adiposity in children with an unhealthy diet intake (i.e. low fruit, high fat intake or high soft drink intake frequency) or a high sedentary time. By contrast, low psychosocial QOL was associated with longitudinal decreases in adiposity in pre-schoolers with a high fruit intake frequency or with a healthier activity level (higher MVPA and lower sedentary time). CONCLUSIONS The current study results emphasize the need for testing moderation in the QOL-adiposity relation to explain contradictions in the current literature. An unhealthy diet can be a vulnerability factor and high physical activity a protective factor in QOL-induced adiposity. Consequently, QOL and lifestyle should be targeted concurrently in multi-factorial obesity prevention starting early in life. This emphasizes the value of incorporating education on stress management already starting in preschool. By teaching problem-solving skills, we can increase QOL and decrease stress-induced eating as a maladaptive coping. In addition, the environment is crucial in learning good habits early in life: parents and schools should act as a good role model by providing healthy food and an activity-friendly environment to minimize emotional eating and sedentary time.
Abstract 2629
DEPRESSION TREATMENT AND DIABETES RISK: A 9-YEAR FOLLOW-UP STUDY OF THE IMPACT TRIAL
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Although epidemiologic evidence and the existence of plausible mechanisms raise the possibility that depression may be a causal risk factor for diabetes, no intervention studies have evaluated the effect of depression treatment on new-onset diabetes. Accordingly, we examined whether a collaborative care program for depression prevents or delays the onset of diabetes over a 9-year period among clinically depressed, older adults initially free of diabetes. Participants were 160 primary care patients [M (SD) age: 67.3 (6.9) years, 77% female, 44% African American] with major depression and/or dysthymia but without diabetes enrolled at the Indiana sites of the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) trial. In the IMPACT trial, participants were randomized to either 12 months of a collaborative stepped care program involving antidepressants and/or psychotherapy or 12 months of usual care depression in their primary care clinic. We identified incident diabetes cases—defined as (a) an ICD-9 diabetes code of 250 and (b) either a positive laboratory value (HbA1c ≥ 8.5% or fasting glucose ≥ 126mg/dL) or diabetes medication initiated after each participant’s randomization date—in the Collaborative Treatment (IMPACT) trial. In the IMPACT trial, participants were randomized to either 12 months of a collaborative stepped care program involving antidepressants and/or psychotherapy or 12 months of usual care depression in their primary care clinic. We identified incident diabetes cases—defined as (a) an ICD-9 diabetes code of 250 and (b) either a positive laboratory value (HbA1c ≥ 8.5% or fasting glucose ≥ 126mg/dL) or diabetes medication initiated after each participant’s randomization date—in the Collaborative Treatment (IMPACT) trial.

Summary of results
At 3 months, there were no differences in the CAPS total score (p = 0.572). We found that 11.1% of DHA group and 5.5% of placebo group developed PTSD, and 4.4% of DHA group and 7.3% of placebo group developed MDD. Erythrocyte level of DHA and EPA in DHA group was significantly elevated compared to placebo group (p < 0.01). Treatment of patients with DHA did not result in superior PTSD symptom at 3 months after severely accidental injury compared to placebo group. Whether a significant ratio of DHA and EPA and higher doses of omega-3 fatty acids can work in secondary prevention of PTSD remains to be determined.

Trial Registration: ClinicalTrials.gov Identifier NCT00671099

33) Abstract 2985
ASSOCIATIONS AMONG SLEEP QUALITY, PERCEIVED DISCRIMINATION AND WAKING HRV IN AFRICAN AMERICANS
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African Americans experience greater rates of sleep disorders, sleep disturbance and poorer overall sleep quality compared to Whites. A growing literature indicates that discrimination contributes to sleep problems among African Americans, with sleep in turn serving as a pathway linking discrimination to poorer health. Surprisingly, no research has examined associations among sleep, discrimination and heart rate variability (HRV), an important marker of cardiovascular and overall health. In the present study, we investigated associations among sleep quality, perceived racial/ethnic discrimination and daytime resting HRV, in a sample of young, healthy African Americans (N = 65). Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Racial/ethnic discrimination was measured using the Perceived Ethnic Discrimination Questionnaire (PEDQ). Resting HRV data was obtained as part of a larger study. Sleep quality and racial/ethnic discrimination were moderately correlated (r = .35, p < .05). HRV was marginally correlated with racial/ethnic discrimination (r = -.24, p = .06), but not with sleep quality (r = -.16, p > .10). In mediated-regression analysis, controlling for age, gender and BMI, racial/ethnic discrimination emerged as a significant predictor of resting HRV. Counter to our prediction, there was no significant indirect effect of racial/ethnic discrimination on HRV through sleep quality. We further considered an alternative model which tested whether the strength of the discrimination-HRV relationship varied at differing levels of sleep quality. These analyses revealed marginal evidence for sleep quality as a moderator (p = .08). Examination of the simple slopes revealed that increasing racial/ethnic discrimination was significantly associated with greater declines in HRV—particularly at lower levels of sleep impairment. These data are among the first to demonstrate a direct association between racial/ethnic discrimination and basal HRV in African Americans. Results further suggest that this relationship is stronger among those with relatively impaired sleep quality.
AGE-RELATED NEUROCHEMICAL CHANGES IN THE POSTERIOR CINGULATE OF THE FEMALE BRAIN

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Introduction: Age is an important potential confound to consider in studies examining the extent to which pathology related behavioral and social changes are related to neurochemical alterations in the brain. While animal models are more definitive in their measures of age-related neurochemical changes, studies involving humans can yield conflicting information. Additionally, neurochemical changes are typically examined in large group studies, which may limit the clinical applicability of the measurements. In this study, we examined age-related changes in the posterior cingulate, a region important in cognition and memory and thus amenable to age-associated neurochemical alterations. The study is limited to a small cohort with a large age range to test potential clinical viability. Methods: Five females with no known health issues, and either in college or with a college degree (ages: 18, 19, 26, 45, and 55-years) participated in a total of 25 magnetic resonance spectroscopy studies to measure glutamate (Glu), the primary excitatory neurotransmitter in the central nervous system; N-acetyl-aspartate (tNAA), a marker of neuron viability; choline (tCho), a marker cellular membrane integrity; creatine (tCr), a measure of energy metabolism, and glutathione (GSH), an antioxidant. All studies were performed on a 3T MRI system using an ultra-short echo time (4-ms) and multiple repetition times (1.5-s, 3-s, 4-s, 6-s, and 8-s). A water reference was corrected for relaxation losses and cerebral spinal fluid signal contributions. All data were analyzed using a linear combination software LCMoDe and the corrected water signals to yield absolute concentrations. Results: Average concentrations were Glu, 11.3 ± 0.9 umoles/g; tNAA, 14.4 ± 0.5 umoles/g; tCho, 1.5 ± 0.2 umoles/g; tCr, 10.7 ± 0.5 umoles/g; and GSH, 1.8 ± 0.1 umoles/g. Values are in good agreement with current published values. With the exception of choline, coefficients of variation (CVs) were less than 10%, suggesting that age differences are small in the healthy brain. However, linear regression showed significant rates of change for Glu (0.53 umoles/g per decade, R2 = 0.91), tNAA (-0.28 umoles/g per decade, p = 0.010, R2 = 0.92), tCho (0.12 umoles/g per decade, p = 0.032, R2 = 0.83), and GSH (-0.071 umoles/g per decade, p = 0.035, R2 = 0.82). tCr was not found to be stable, but rather its variation was non-linear. Conclusion: NAA, Glu, and GSH are important in proper brain function, with NAA and Glu specifically linked to cognition, intelligence and processing speed. GSH provides brain protection, while tCho is strongly linked to cellular membrane degradation, i.e., neurodegeneration. Overall, this group of chemicals provide a potential basis for age-related declines in neuropsychological performance. This study demonstrates that age-related chemical differences are significant even in a healthy sample of females.

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Background: Attrition of participants in longitudinal cohort studies is a serious issue, because reliability, generalizability, and statistical power are jeopardized. However, there are limited data on these factors in cardiac patients. Objective: To detect factors associated with 1 and 2 year attrition in a study of patients referred for exercise stress testing who were enrolled in a longitudinal study on psychosocial predictors of cardiac outcomes. Methods: As a part of the Mechanisms and Longitudinal Outcomes of Silent Myocardial Ischemia (MOSMI) study, 909 patients (31% women) referred for exercise stress testing at the Montreal Heart Institute, Canada, were followed for 2 years. We examined factors associated with attrition at both 1 and 2 year follow-ups. Results: Of 909 patients, 570 (62.7%) completed 1 year follow-up and 494 (54.4%) completed 1 and 2 year follow-ups. From a series of sociodemographic, clinical, and psychosocial variables at baseline, increasing age (OR = 1.04, 95%CI [1.01, 1.07]), being Caucasian (OR = 3.08, 95%CI [1.23, 7.74]), current smoking, (OR = 2.36, 95%CI [1.40, 3.98]), taking hypertension medication (OR = 2.22, 95%CI [1.11, 4.42]), and higher depressive symptoms (Beck Depression Inventory-II) (OR = 1.03, 95%CI [1.002, 1.06]) were independent associated with attrition at year 1. Higher age (OR = 1.04, 95%CI [1.01, 1.06]), current (OR = 2.42, 95%CI [1.29, 4.57], higher anxiety sensitivity (Anxiety Sensitivity Index) (OR = 1.03, 95%CI [1.002, 1.05]), and having major depression (Prime-MD) (OR = 3.52, 95%CI [1.23, 8.45]) were independently associated with attrition at year 2. Conclusions: Among cardiac patients referred for exercise stress testing, depression, older age, and smoking were independent associated with greater odds of study attrition and follow-up for years 1 and 2, whereas being Caucasian and taking hypertension medication were associated with greater odds of attrition at year 1 only. Retention strategies directed at such individuals may improve completion of cardiovascular cohort studies.

SOCIODEMOGRAPHIC, CLINICAL, AND PSYCHOSOCIAL CHARACTERISTICS ASSOCIATED WITH ATTRITION IN CARDIAC PATIENTS IN A LONGITUDINAL STUDY

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35) Abstract 3099
36) Abstract 2575
37) Abstract 2610

ASSOCIATION OF COPD-SPECIFIC FEARS IN THE CLINICAL SETTING

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Anxiety is high in persons with chronic obstructive pulmonary disease (COPD). Anxious COPD patients are confronted with lower quality of life, higher functional impairment, and increased dyspnea during and after activity. Additionally, they have an increased risk for hospitalization. Clinical practitioners consider patients' anxiety as part of the diagnostic routine of COPD, but it is mostly assessed on a broad trait level or as a general psychopathological condition. Current approaches in research try to assess anxiety of the more specific level. Therefore, our objectives were to develop, revise and validate the COPD Anxiety Questionnaire (German: CAF-R) to assess relevant fears in COPD in a series of three studies. Specific fears were: fear of dyspnea, fear of physical activity, fear of progression, fear of social exclusion, and sleep-related worries. Study 1: The CAF-R was validated with the help of a large online sample of persons with COPD (n = 1025). COPD-related fears contributed significantly to disease-specific disability and quality of life after adjusting for GOLD stage, socio-demographic variables, and psychopathology. In additional studies we tested the CAF-R in the clinical setting, both with quantitative and qualitative methods. Study 2: The CAF-R was administered to a sample of COPD outpatients receiving psychotherapy with either elevated levels of general anxiety and depression symptoms, clinically relevant co-morbid disorders such as major depression (ICD10 F32 or F33), agoraphobia (ICD10 F40) or psychological and behavioral factors associated with disorders or diseases classified elsewhere (ICD10 F54.1). The clinical outpatient sample consisted of n = 21 patients with COPD (GOLD stage 1-4) and was comparable in mean age (online: 59.7, clinical sample: 60.7), mean physical quality of life (online: 31.7, SD 8.8, clinical sample: 30.5, SD 5.6) and mental quality of life (online: 40.7, SD 11.9, clinical sample: 28.8, SD 9.8). The clinical sample showed similar elevated level of specific anxieties. Study 3: The CAF-R has been continuously administered to COPD patients in acute care, after hospitalisation. In conclusion, our findings show that the CAF-R is capable to identify the COPD-related fears as well as high acceptance. The attending physicians reported the instrument to be useful for diagnostics and facilitation of appropriate follow-up treatment. Further longitudinal studies and experimental research are necessary to explore the role of COPD-related fears.

38) Abstract 2617
ILLNESS PERCEPTIONS AND QUALITY OF LIFE AMONG PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND THEIR CAREGIVERS
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The self-regulatory model of illness asserts that in response to a health threat or illness, patients form cognitive and emotional representations of the perceived health threat (i.e., illness perceptions). Previous studies indicate that negative illness perceptions among patients with COPD are associated with psychological distress and poor quality of life (QoL). Specifically, emotional representations (negative emotional response to illness) are associated with decreases in both generic and illness-specific QoL. No prior studies have examined the relationship of caregiver illness perceptions to COPD patient outcomes. It is expected that the relationship of COPD patient emotional representation and QoL will be moderated by caregiver emotional representation of patient illness. Thirty-six patients with COPD (mean age = 63.5 yrs; 47.3% female; mean FEV1% predicted = 71.1) and 36 caregivers (mean age = 58.1 yrs; 72% female) completed the Brief Illness Perception Questionnaire (IPQ), MOS SF-36, and St. George’s Respiratory Questionnaire (SGRQ). For the caregiver version of the Brief IPQ, caregivers reported their perceptions or responses to the patient’s illness. Data were analyzed with hierarchical regression analyses predicting QoL in patients. For each regression, patient emotional representation was entered in the first step, caregiver emotional representation was added in the second step, and the interaction of patient emotional representation and caregiver emotional representation was entered in the final step. Results indicated that caregivers’ emotional representation of patient illness moderated the relationship of patient emotional representation with generic and illness specific QoL. SF-36 PCS (R2 change = .15, p < .05), SGRQ-Total (R2 change = .14, p < .01), SGRQ-Symptoms (R2 = .12, p < .05), and SGRQ-Impacts (R2 change = .15, p < .01). In the context of high emotional representation among caregivers, emotional representation among caregivers is associated with poorer physical QoL. Caregivers with greater emotional distress may be less likely to buffer adverse effects of patient distress on patient QoL.

39) Abstract 2984
PSYCHOLOGICAL CORRELATES OF FEAR OF RECURRENCE AMONG AFRICAN-AMERICAN BREAST CANCER SURVIVORS
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BACKGROUND: Compared to Caucasians, African American (AA) women have higher rates of breast cancer (BC) recurrence, which causes significant worry. Fear of recurrence (FOR) is a survivor’s constant worry that cancer will return. A previous study of FOR among BC survivors showed that FOR was negatively associated with demographic characteristics (i.e age) and positively associated with psychosocial characteristics (i.e. impaired quality of life) (74% Caucasian sample). In a recent study of AA BC survivors, FOR was negatively associated with time since diagnosis and positively associated with psychological distress. Further research is needed exploring FOR among AA BC survivors, especially as it relates to other psychological characteristics. Optimism, coping, depression, and symptom distress are psychological factors that have not been fully explored with regards to FOR among AA BC survivors.

METHODS: Recruitment was conducted via mailings to AA BC survivors from the Howard University Cancer Center’s registry and flyers posted throughout the Howard University Community. 51 African-American BC survivors without recurrence completed the questionnaire assessing demographics, FOR, optimism, coping, depression, symptom distress, and several psychological correlates. Positive correlations revealed that high symptom distress, high depression, and maladaptive coping were associated with high FOR. High optimism was associated with high levels of FOR in the form of womanhood worries (r= .302, p<.05).

IMPLICATIONS: These results add to the current knowledge of psychological factors associated with FOR in AA BC survivors.

40) Abstract 2992
RISK FACTORS OF DEPRESSION IN ELDERS WHO LIVE ALONE
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Eulji Hospital, Eulji University School of Medicine, Eulji University, Insti
tute for Behavioral Medicine Research, The Ohio State University, Columbus, Ohio
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41) Abstract 2647
DEPRESSIVE SYMPTOMS NEGATIVELY IMPACT DIET QUALITY IN BREAST CANCER SURVIVORS: A LONGITUDINAL ANALYSIS
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Breast cancer survivors face an increased risk for comorbid health conditions compared to women who did not undergo cancer treatment. Poor diet quality is one factor underlying many chronic diseases, and thus diet quality carries important implications for health in cancer survivorship. Prior cross-sectional cancer research suggests that those with more depressive symptoms report poorer diet quality than those with fewer depressive symptoms, yet the extent to which depressive symptoms adversely affect diet over time has not been addressed. Accordingly, the current study examined whether depressive symptoms predicted longitudinal changes in diet quality in stage I-IIIC breast cancer survivors (n = 42) and benign (non-cancer) control (n = 17) participants. Participants completed the Center for Epidemiological Studies' Depression Scale (CES-D) at two time points, approximately one year and two years after an initial breast cancer diagnostic procedure. At both time points, we obtained in-depth dietary intake information from participants using standardized, multi-pass 24-hour food recall interviews. Detailed data about food and beverage intake items, portion sizes, and preparation were used to calculate alternate Healthy Eating Index (aHEI) scores. The aHEI, a composite diet quality measure, summarizes several aspects of diet based on the 2010 US Department of Agriculture food guidelines; higher aHEI scores indicate better diet quality. Participants with higher baseline depressive symptoms experienced greater decreases in diet quality over the course of the one-year follow-up period than those with lower depressive symptoms (p < 0.05), controlling for cancer stage, BMI, age, and education. The strength of the depressive symptom-diet quality relationship did not differ significantly.
significantly based on cancer status, suggesting that depression affects the diet quality trajectory in similar ways for both breast cancer survivors and healthy women. These results indicate that women with more depressive symptoms may experience adverse changes in diet quality over time compared to those with fewer depressive symptoms. Accordingly, depression may be a risk factor for worsening diet quality in cancer survivorship.

42) Abstract 2773

HEALTH-RELATED QUALITY OF LIFE POST RADICAL PROSTATECTOMY: AN EXAMINATION OF ETHNICITY AND OTHER PREDICTORS IN A CANADIAN SAMPLE

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Radical prostatectomy (RP) for prostate cancer (PC) can exert a significant impact on health-related quality of life (HRQoL). Compared to White men, Black men are at increased risk of PC yet less is known about their HRQoL experience. AIM: To compare the HRQoL experience of Canadian Black men (CBM) and Canadian White men (CWM) at 1 and 2 years post RP. To help elucidate significant findings by examining which HRQoL domains change differently between CBM and CWM.

METHODS: 374 patients, recruited from one of Canada’s leading PC treatment centres, completed an HRQoL measure (Patient-Oriented Prostate Utility Scale; PORPUS-P) at baseline (prior to RP), 1 and 2-year follow-up. PORPUS-P provides an overall score (higher scores suggest better function, 5-point difference denotes clinical improvement) and 16 pathologic variables. Propensity score matching examined 32 CBM and 151 CWM on baseline PORPUS-P. T-test and Wilcoxon-Mann-Whitney were used to compare PORPUS-P and individual domain scores at 1FU. RESULTS: At baseline HRQoL of CBM was 5.6 points lower compared to CWM CI: 10.2 – to -0.99; p<.04). A FU CBM showed clinically significant decline in HRQoL compared to CWM after adjusting baseline PORPUS-P (B = -5.00, p = .009). Ethnicity explained a significant proportion of variance (1.6%, F(2, 368) = 3.47, p = .032). Demographic and pathologic variables did not account for the difference. No differences were observed at 2FU (p = .12).

At 1FU, CBM showed significant worsening in bowel problems (p = .03) as compared to CWM. CBM showed no change in emotional well-being while CWM experienced improvement (p = .025). Borderline significant difference in urinary frequency was detected (p = .06), with CBM showing greater deterioration.

CONCLUSION: During first year post RP Canadian Black men experience significantly greater declines in HRQoL, compared to CWM, decline in bowel function and persistent deterioration and worry affecting emotional well-being. We should focus on developing programming tailored at improving the distressing experiences facing CBM particularly within the challenging first year post RP.

43) Abstract 2957

ELECTRODERMAL ACTIVITY CHANGES DO NOT PREDICT SPECIFIC PATTERNS OF VASOVAGAL SYCONE DURING HEAD-UP TILT

Saharnaz Baleigh, PhD Candidate, Clinical Psychology, McGill University, Montreal, QC, Canada, Kylie Groper, B.Sc., Julie Benoit, M.Sc., Neuropsychology, Montreal Jewish General Hospital, Montreal, QC, Canada, Blaine Ditto, Ph.D, Psychology, McGill University, Montreal, QC, Canada, Ronald Schondorf, MD, PhD, Neuropsychology, Montreal Jewish General Hospital, Montreal, QC, Canada

Vasovagal syncope (VVS) can be induced by strong emotive factors (fear, disgust, pain) or by orthostatic stress. Recent evidence underscores the importance of rapid cardiac output (CO) decline as the major contributor to the hemodynamic collapse of VVS. The decline in total peripheral resistance (TPR) occurs much less frequently than CO and has piqued the curiosity of researchers. Why unique emotive factors or hemodynamic patterns of VVS exist is unclear. In a complementary study, we did not find any association between clinical history and hemodynamic patterns in VVS patients with presyncope induced by 80 degree head-up tilt (HUT). We hypothesized that electrodermal activity (EDA), an index of arousal, might serve as a better indicator of autonomic states that predispose to unique forms of VVS. Data gathered from 58 medication-free patients (20/30; age 30.9 ± 10.1 years) who presented for syncope evaluation were analyzed. Clinical history of faint, obtained from an experienced clinician, was categorized as mainly orthostatic (43) or mainly emotive (15). Patients were also sorted based on their hemodynamic pattern of presyncope during HUT.

Stroke volume (SV), CO and TPR were derived from finger blood pressure (BP) using Modelflow. Presyncope was most often due to a reduction of CO without change in TPR (37), frequently as a result of HR decline (27/37), and less often, a decline in SV (10/37). In the other 21 patients, presyncope was mainly due to a reduction in TPR (14) or a sudden decline in HR (7) where HUT was terminated before BP decline. 12 patients showed no significant change in EDA from baseline. 25 of the remaining 46 patients had EDA prior to the abrupt drop in BP (130 ± 38 secs), which persisted after HUT was terminated and BP had recovered for an additional 123 secs (± 16 secs). The other 21 patients had EDA after tilt was terminated (33.7 ± 5 secs), which lasted for 109 ± 19 secs (No EDA during presyncope). Although EDA significantly preceded the decline of BP, and lasted well after BP had recovered, neither its presence nor its pattern type was related to clinical history or specific hemodynamic pattern. Contrary to our hypothesis, EDA cannot serve as an indicator of unique autonomic state during VVS.

44) Abstract 2878

THE ASSOCIATION BETWEEN SCHOOL BURNOUT, PHYSICAL ACTIVITY AND HEALTH OUTCOMES

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School burnout (school related stress) has been linked to cardiovascular risk; burnout results in an overstimulation of the sympathetic nervous system which has important implications for cardiovascular functioning (May et al., 2014). Therefore, we investigated the relationship between school burnout, physical activity, and health outcomes. We expected increased school burnout to be associated with decreased physical activity and poorer health outcomes.

Participants were 301 undergraduate students (87% females, Mage=19.89, SD=1.92 years) who completed a survey. (School Burnout Inventory-SBI), physical activity (International Physical Activity Questionnaire-IPAQ), and health outcomes. Health outcomes included Likert ratings of physical pain, breathing problems, overall sleep quality, general cardiovascular health, headaches, and allergies. All procedures were approved by the University’s IRB. The demographics of the participants consisted of White (65.7%), Black (13.4%), Hispanic (16.1%), and other (4.9%). Linear and multiple regression analyses demonstrated that significant correlations between burnout and SBI scores and IPAQ scores of fatigue during exercise and interruption during training but not exercise regularity. Moderate analyses indicated significant synergist interactions (p<.05) between SBI and exercise fatigue in predicting physical pain and SBI and training interruption in predicting hypertensive diagnosis. Simple slope analyses showed that increases in burnout and in fatigue/training interruption corresponded to poorer health (i.e. pain and hypertension). Mediation analyses indicated that IPAQ related indices did not significantly mediate the association between school burnout and health outcomes. These findings represent a novel contribution to research pertaining to school burnout, physical activity, and health outcomes. An important implication from these results suggests that school burnout and decreased exercise quality are associated to poorer health outcomes.

45) Abstract 2716

AGE-RELATED DIFFERENCES IN PTSĐ SYMPTOMATOLOGY AND FUNCTIONAL OUTCOMES IN WOMEN VETERANS

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Background: Women Veterans are the fastest growing group among the Veteran population, and they have poorer mental and physical health as compared to civilian women. Posttraumatic stress disorder (PTSD) is prevalent in women Veterans due to stressors associated with military service. As a sizable proportion of this population is approaching older adulthood, it is important to understand differences in symptoms and functioning in the context of age. This study examined age-related differences in PTSD symptomatology, functional outcomes, and the association between the two in a sample of women Veterans.

Methods: Participants were 369 female Veteran New England Department of Veterans Affairs patients who completed a mail survey. PTSD symptom severity was assessed by the PCL, and mental and physical functioning was assessed by the Short-Form Health Survey (SF-36). Multivariate analysis of variance (MANOVA) analyses were conducted to examine differences between age groups (<35, 35-49, 50-64, 65+) in PTSD symptoms and the eight functional health factors of the SF-36. Hierarchical linear regression analyses were then conducted to examine PTSD symptoms as a predictor of overall physical and mental health functioning (SF-36), and to determine whether age moderated the associations. Regression models adjusted for age, marital status, and education.
Results: MANOVA analyses revealed that many indicators of physical health functioning were higher (better) for the younger age groups, while levels of PTSD symptoms and the mental health index score indicate better mental health and functioning for the older Veterans. PTSD symptomatology was associated with poorer mental health functioning (B = -5.3, \( \beta = -0.71, p < 0.001 \)) and physical health functioning (B = -2.4, \( \beta = -0.31, p < 0.001 \)). These effects were not significantly moderated by age.

Conclusions: Findings indicate that PTSD symptoms undermine physical and functional health among women Veterans. Due to women being at increased risk for PTSD, and a large proportion of Veterans approaching older adulthood, these findings underscore the importance of examining PTSD and health correlates across the lifespan in this important population.

<table>
<thead>
<tr>
<th>Table: Age group differences in PTSD symptoms and functioning</th>
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<tr>
<td><strong>Under Age 35</strong></td>
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<tr>
<td><strong>M (SD)</strong></td>
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<td>PTSD Symptom Severity</td>
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**Physical Health Functioning**

| **Physical Functioning** | 81.48 (23.23) | 70.74 (30.40) | 53.88 (31.07) | 55.00 (32.34) |
| **Role Physical** | 65.69 (43.00) | 57.38 (47.51) | 39.26 (43.64) | 51.10 (43.81) |
| **Pain Index** | 64.45 (27.35) | 55.31 (29.24) | 43.18 (24.70) | 59.55 (25.02) |
| **General Health Perceptions** | 63.24 (23.34) | 60.67 (24.85) | 51.80 (24.74) | 61.51 (21.38) |

**Mental Health Functioning**

| **Vitality** | 45.49 (20.43) | 43.72 (25.95) | 39.70 (23.15) | 52.54 (23.63) |
| **Social Functioning** | 71.08 (27.10) | 62.50 (33.31) | 55.89 (29.85) | 73.68 (27.35) |
| **Role Emotional** | 54.90 (46.10) | 59.02 (48.31) | 59.09 (42.71) | 69.74 (41.52) |
| **Mental Health Index** | 62.31 (23.75) | 63.74 (24.33) | 61.72 (24.03) | 74.67 (17.60) |

Significantly different at \( p < 0.05 \): under 35, 35-49, 50-64, over 65

46) Abstract 2755

**PERSONAL HISTORY OF FAINTING AND REACTIONS TO EMOTIONAL MOVIE SCENES**

Tudor Vranceanu, B.A., Kristin Horsley, B.A., Psychology, McGill University, Montreal, Quebec, Canada, Simon L. Bacon, Ph.D., Psychology, Concordia University, Montreal, Quebec, Canada, Blaine Ditto, Ph.D., Psychology, McGill University, Montreal, Quebec, Canada, Philippe T. Gilchrist, Ph.D., Psychology, University of Cambridge, Cambridge, Cambridgeshire, United Kingdom

To better understand the psychophysiological mechanisms of emotion-related vasovagal syncope, 16 undergraduates (75% female) with and 43 (74% female) without a self-reported history of fainting watched five 3-minute movie clips with different emotional content. One documentary clip (neutral) described a campus environmental project while another (blood and injury) depicted portions of open heart surgery. Three clips from commercial movies were used – the Exorcist (girl undergoes a painful injection with some, but not much, blood), the Shining (boy is threatened with injury, but not caught, by a man wielding an ax), and Trainspotting (disgusting scene with someone rummaging in a toilet). Standard impedance cardiography variables were assessed. Self-reports of emotional and physical symptoms (including vasovagal symptoms) were obtained after each movie. A 2 (sex) x 2 (fainting history) x 5 (movie) ANOVA of vasovagal symptom score produced a significant fainting history x movie interaction, \( F(2,220) = 4.26, \ p = .007 \). The surgery movie produced the highest scores and the only significant difference between previous fainters and non-fainters, strengthening evidence indicating the importance of exposure to blood stimuli. On the other hand, the physiological measures revealed no group differences or significant main effects (lower systolic blood pressure (SBP) and heart rate and higher heart rate variability for fainters) across the pre-movie baseline and all movies, as well as several main effects of movie. Given the absence of differences between fainters and non-fainters in age, sex, and body mass index, it seems unlikely that these cardiovascular differences reflect trait characteristics. Rather, they suggest that participants who had previously experienced strong vasovagal responses displayed an anticipatory response to the surgery film. An additional decrease in SBP produced by watching the surgery film may have been sufficient to trigger symptoms in some, though the results also suggest that systemic variables like SBP do not entirely explain susceptibility to symptoms. More careful evaluation of regional blood flow may be required.

47) Abstract 3051

**DEPRESSIVE SYMPTOMS PREDICT SALIVARY ALPHA AMYLASE RESPONSES TO REPEATED PSYCHOSOCIAL STRESS IN YOUNGER BUT NOT OLDER ADULTS**

Karen T. Kaye, Bachelor of Science, Psychology, Christine McInnis, MS, Neuroscience, Yuliya Kuras, MA in progress, Danielle Gianferante, MA, Luke Hanlin, MA, Xuejie Chen, MA, Myriam V. Thoma, Ph.D, Nicolas Rohleder, Ph.D, Psychology, Brandeis University, Waltham, MA

Rationale: Depressive symptoms are associated with altered hypothalamic pituitary adrenal (HPA) axis and interleukin-6 responses to stress. Salivary alpha amylase (sAA) also responds to stress, and has been suggested as a biomarker for activity of the sympathetic nervous system (SNS) in response to stress. Individuals with higher symptoms of depression have been shown to have elevated levels of circulating catecholamines in response to acute psychological challenges but it is currently unknown whether sAA responses to stress are also altered in depressed individuals. We therefore set out in this study to examine whether self-reported depression symptoms predicted sAA responses to repeated psychosocial stress.

Methods: The Trier Social Stress Test (TSST) was administered twice in young (N=43; M=21.0 yrs. SD=3.89) and older (N=38; M= 56.7 yrs., SD=5.02) healthy adult men and women. Saliva was collected as well, before, as well as 1, 10, 30 and 60 minutes after TSST for measurement of sAA. Participants completed a number of self-report questionnaires including the Center for Epidemiological Studies Depression (CES-D) questionnaire.

Results: Repeated measures ANOVA revealed that stress induced an increase in sAA concentrations in response to both TSSTs (time effect: F(4, 308) =26.21, \( p < 0.001 \)). Amylase responses habituated to repeated stress (t=2.50, p=0.02). Linear regression revealed that age was a significant, or marginally significant, predictor of sAA responses to TSST1 (beta=0.26; p=0.02) and TSST2 (beta=0.21; p=0.074). While CES-D was not a significant predictor of sAA responses to TSST1 in younger (beta=0.14; p=0.06) or older adults (beta=0.09, p=0.60), sAA responses to TSST2 were significantly higher in younger (beta=0.31, p=0.045), but not older (beta=0.16, p=0.35) adults reporting more depressive symptoms.

Conclusion: We find here that like other stress responsive systems, sAA responses are also altered in individuals reporting higher levels of depressive symptoms. However, depressive symptoms only predict sAA responses to a repeated, not an initial stress exposure, and they only predict stress responses in younger adults. These findings highlight the importance of employing repeated testing paradigms when testing for relation of psychological states with health-related biological responses. Future studies will address whether altered sAA habituation is related with habituation of other SNS markers and dependent systems, such as peripheral inflammation.

48) Abstract 2717

**PREDICTORS OF PERSISTENT IMPROVEMENT IN SYMPTOMS AND QUALITY OF LIFE AFTER INPATIENT TREATMENT FOR COMORBID CARDIOVASCULAR AND MENTAL ILLNESS**

Christoph Herrmann-Lingen, MD, Katharina Löser, MD, Christina Kleiber, MD, Psychosomatic Medicine and Psychotherapy, University of Göttingen Medical Center, Göttingen, Nds., Germany

Several options have been tested for treating patients with cardiovascular diseases and mental comorbidity. We established an inpatient unit offering medical treatment and multimodal psychotherapy for patients with psychosomatic co-morbidity not sufficiently improving under outpatient treatment. Consecutive patients (n=55; 28m; 59±10 y/o) treated on the psychocardiology ward completed the Brief Symptom Inventory (BSI), the EuroQol-5 Dimension quality of life scale (EQ-5D) and the Giessen Symptom Checklist cardiac complaint scale (GSC) at admission, at discharge and after a mean follow-up of 1.5 years. Leading mental disorders included affective (46%), somatoform (27%) and anxiety (24%) disorders. Comorbid cardiovascular diseases included hypertension (91%), coronary disease (42%), and other heart diseases, eg, heart failure or arrhythmias (22%).

During inpatient treatment (mean duration 40±6 days), the BSI Global Severity Index (GSI; d=0.65), the GSC (d=0.85) and the EQ-5D (d=0.57) improved...
substantially (all p<0.0005). Despite small deteriorations during follow-up, follow-up values were still considerably better than baseline (all p<0.0005).

In separate linear regression models adjusting for age, sex, and baseline psychometric scores, we tested independent effects of symptom improvement during inpatient treatment, antidepressant prescription at discharge and continued outpatient psychotherapy on follow-up well-being. Better symptom improvement during inpatient treatment predicted better follow-up scores on the GSI (beta=0.38; p=0.007), GSC (beta=0.28; p=0.022) and especially the EQ-5D (beta=0.46; p<0.0005). In contrast, antidepressant medication at discharge only predicted worse follow-up EQ-5D scores. Continued outpatient psychotherapy predicted less GSI cardiac complaints (beta=0.34; p=0.005) and tended to predict less mental symptom severity (beta=-17; p<0.10).

In conclusion, improvement in physical and mental symptoms and quality of life observed during inpatient treatment for comorbid cardiovascular and mental illness is largely maintained over 1.5-year follow-up. Although this uncontrolled study does not prove causality, the independent predictive value of inpatient treatment results for follow-up well-being suggests a sustained treatment effect, while continued outpatient psychotherapy and antidepressant medication seem to have modest, if any, additional benefit.

49) Abstract 2485
DEFAULT BRAIN ACTIVITY OF DEPERSONALIZATION-DEREALIZATION DISORDER: BEING AN OUTSIDE OBSERVER
Matthias Michal, M.D., Department of Psychosomatic Medicine and Psychotherapy, Mathias Schreckenberger, Prof., Department of Nuclear Medicine, University Medical Center Mainz, Mainz, RLP, Germany, Julia Adler, Dr., Iris Reiner, Dr., Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Mainz, Mainz, RLP, Manfred E. Beutel, Dr., Department of Psychosomatic Medicine and Psychotherapy, Hans-Georg Buchholz, Dr., Martin Gartenschläger, Dr., Department of Nuclear Medicine, University Medical Center Mainz, Mainz, RLP, Germany
Depersonalization-derealization disorder (DPD) is characterized by experiences of unreality, detachment, and being an outsider observer to thoughts, sensations, actions or feelings. Previous neuroimaging studies investigated task related brain activity of DPD. They found decreased activation of areas involved in affective processing and increased inhibition of frontal activity in response to emotional stimuli. As the resting state offers important windows into the neural basis of psychological traits, we aimed to explore default brain activity in DPD. Using 2-deoxy-2-18Ffluoro-D-glucose PET (F-18-FDG PET), we investigated default mode brain activity of n=14 DPD patients by analyzing the association of the severity of depersonalization with brain glucose metabolism. Severity of depersonalization was determined by the Cambridge Depersonalization Scale. Severity of depersonalization was associated with glucose metabolism of the left superior parietal lobule (BA 7) and of the left supplementary motor area (BA 32) as well as the right midcingulate cortex (BA 32). Cerebellar activity of the vermis was negatively correlated with depersonalization severity. Depersonalization appears to be specifically associated with functional abnormalities along brain regions, which are involved in internally-directed cognition, the conscious representation of the body, and areas involved in processing of uncertainty and defensive responses to unpleasant emotions.

50) Abstract 2786
CHILDREN'S PSYCHOSOCIAL STRESS AND EMOTIONAL EATING: A ROLE FOR LEPTIN?
Nathalie Michels, PhD, Public Health, Ghent University, Gent, OV, Belgium
Introduction: An important public health threat is that stress has been associated with more emotional eating (beta=0.34; p=0.005) and tended to predict less mental symptom severity (beta=-17; p<0.10).

In conclusion, improvement in physical and mental symptoms and quality of life observed during inpatient treatment for comorbid cardiovascular and mental illness is largely maintained over 1.5-year follow-up. Although this uncontrolled study does not prove causality, the independent predictive value of inpatient treatment results for follow-up well-being suggests a sustained treatment effect, while continued outpatient psychotherapy and antidepressant medication seem to have modest, if any, additional benefit.

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of illness and treatment was assessed through Structured Interview for Renal Transplantation.

The groups (with or without anxiety or depression) were compared using Mann-Whitney U and Fisher’s exact test. The effect sizes were reported as r and Cramer’s V.

Results: 12 (11.43%) patients had syndromal anxiety; 10 (9.52%) had syndromal depression. Patients with anxiety had significantly poorer adherence (p = 0.019), more frequent glomerular pathology (p = 0.007) and poorer general health during pre-transplant dialysis (p = 0.001) than those without. Both the patients with anxiety and depression had significantly lower quality of life than those without them.

Kaplan Meyer survival analysis showed mean time to develop anxiety and depression were 119.95 (95% CI 99.85 to 140.03) months and 125.37 (95% CI 106.82 to 143.92) months respectively.

Conclusion: Anxiety is associated with glomerular pathology and poor general health during pre-transplant dialysis. It significantly worsens adherence. Both depression and anxiety worsens post RT outcome by significantly reducing the quality of life.

53) Abstract 2648

IS THE BORG RATING OF PERCEIVED EXERTION A PREDICTOR OF PSYCHOPHYSIOLOGICAL FUNCTIONING IN PATIENTS WITH HEART FAILURE AND IMPLANTABLE CARDIAC DEFIBRILLATORS?

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Objective: Recently, there has been increased speculation about the link between exercise perception and mortality in cardiac patients. The Borg rating of perceived exertion (RPE) is administered after an acute bout of exercise because exercise provides a sensitive window to look into physiological functioning. It is plausible that the RPE may also provide us with an overview of psychological functioning and negative affectivity (e.g. depressive symptoms). This study aimed at examining whether the RPE after a 6-minute walk test is a measure of psycho-physiological functioning in patients with heart failure (HF) and implantable cardiac defibrillators (ICD; cardioverter- and resynchronization therapy defibrillators).

Methods: A total of 215 ambulatory patients aged 62.4 ± 9.4 (M ± SD) years old with HF and ICDs were evaluated for Ejection Fraction (EF; a surrogate measure of physiological functioning) and depressive symptoms (Beck Depressive Inventory; BDI) to determine the psycho-physiological relationship with RPE. Hierarchical multiple regression (HMR) analyses were conducted to test the association between BDI scores, RPE, EF, and other clinical parameters (e.g. blood pressure, ventricular work) to demonstrate the incremental contribution of sets of predictors in accounting for variance in EF and BDI values. Separated HMR analyses where conducted for EF and for BDI. Each HMR analysis contained three sets of predictors: Model 1 contained the clinical laboratory parameters Model 2 the cardiovascular hemodynamics and Model 3 RPE.

Results: The HMR analysis predicting EF variance, Model 1 and Model 2 predictors accounted for a non-significant (p > 0.05) amount of EF variance (3.9% and 5.3%, respectively). However model 3 predicted a significant amount of EF variance (8.1% of , p = 0.043); a 2.8% increase from Model 1 and 2 predictors (p = 0.025). Full Model parameter estimates indicate that CRP (β = 0.170, p = 0.024) and the RPE (β = -0.172, p = 0.025) were significant predictors of EF variance. For the HMR analysis predicting BDI variance, Model 1, Model 2, and Model 3 were significant predictor sets, accounting for 9.3% (p < 0.01), 10.7% (p = 0.002), and 13.1% (p < 0.001) of the BDI variance. Full model parameter estimates indicates that C-reactive protein (β = -0.178, p = 0.013) and the RPE (β = -0.160, p = 0.028) significantly predicted BDI variance.

Conclusion: These results revealed an independent psycho-physiological relationship between the RPE and EF as well as RPE and BDI. These findings suggest that the Borg Scale could be a useful tool to examine psychophysiological status in patients with HF and ICDs.

54) Abstract 2945

INTERVENTIONS FOR AMELIORATING SCHOOL BURNOUT: COMBING PHYSIOLOGICAL AND PSYCHOLOGICAL THERAPIES

Daniel Naranjo, MD, Psychiatry, Clinical Research, Larkin Community Hospital, Miami, Florida, Ross W. May, PhD, Family Institute, Florida State University, Tallahassee, Florida

In this presentation the main point of discussion is revolving around the incorporation of interventions intended to ameliorate school burnout in students. To this end, it will be discussed interventions specifically designed to improve mental and physical health, by means of psychological resilience training and physical exercise, respectively. As a point of emphasis, this presentation describes results of four week interventions based on the self-regulation of heart rate variability designed to decrease school burnout and increase optimal cardiovascular and autonomic functioning. In addition, implementation of high intensity aerobic exercise can be used as a potential therapy for decreasing the psychophysiological adverse manifestations of School Burnout. The results of this randomized clinical trial may shed light into potential ways to improve psychophysiological health by decreasing several of the main adverse components associated with School Burnout.

55) Abstract 2944

POTENTIAL ROLE OF SCHOOL BURNOUT AS A CARDIOVASCULAR RISK

Marcos Sanchez-Gonzalez, MD, Internal Medicine & Psychiatry, Larkin Community Hospital, Miami, Florida

This presentation discusses a line of studies aimed at examining the effects of School Burnout on cardiovascular health by means of progressive markers of cardiovascular hemodynamics and autonomic functioning. Various studies points towards the conclusion that school burnout adversely influences the cardiovascular system. Specifically, markers of cardiovasual modulation, sympathetic nerve activity, and sympathetic vasomotor tone via (low frequency component of systolic blood pressure variability; LFSBP) are increased in individuals with high School Burnout scores. Strikingly, alterations in LFSBP, which are evident in individuals with high burnout scores, are typically observed in the early stages of the development of hypertension, which is the leading cardiovascular disease. Moreover, we have reported that School Burnout increases central hemodynamics markers (e.g. wave reflection, aortic blood pressure, ventricular work) and baroreflex function. By the end of this presentation, the audience should have a more clear understanding of how school burnout affects the cardiovascular health.

56) Abstract 3166

SCHOOL BURNOUT IMPAIRMENT OF COGNITIVE FUNCTIONING: IMPLICATIONS FOR ACADEMIC ACHIEVEMENT

Ross W. May, PhD, Family Institute, Florida State University, Tallahassee, FL

This presentation describes a series of studies that examined school burnout (school related stress characterized by chronic exhaustion, cynicism, and feelings of inadequacy) and its deleterious relationship with cognitive functioning and academic achievement. Both correlational and experimental findings demonstrate that increased school burnout leads to poorer cognitive functioning and performance including attentional process, problem solving success, and working memory capacity. Additionally, we have demonstrated that higher school burnout is negatively related to academic performance (GPA), and a stronger predictor of GPA that both anxiety and depression combined. Emphasized in the discussion are suggested methodological and statistical improvements for current burnout research to provide more accurate parameter estimation of burnout effects on indices cognitive functioning and academic performance.

57) Abstract 3167

A CLINICAL PERSPECTIVE: DOES SCHOOL BURNOUT INFLUENCES MOOD AND BEHAVIOR?

Gerardo F. Ferrer, MD, Psychiatry, Larkin Community Hospital, South Miami, FL

The incidence of depression and anxiety has increased dramatically over the last decade, especially in the pediatric population. Maladaptive affective functioning (i.e. depression, anxiety, and stress) is a prevalent psychological impediment affecting mental health across the US. Unfortunately, as the rates of affective illnesses increase so do the number of behaviors including substance abuse, criminal activity, and suicide. Accordingly, a growing concern has been placed on understanding and ameliorating psychological and psychiatric risk factors in school children. In particular depression and anxiety (15%-20% prevalence) as these affective factors are well known to decrease academic performance, as well as negatively impact mental and physical health. This presentation explores preliminary data suggesting that children with high levels of depressive and anxiety symptomatology may high levels of depressive and anxiety symptomatology. Finally, how school burnout operates to independently predict psychological risk and poorer psychiatric outcomes will also be covered.
TESTING THE 1% RULE IN AN INTERNET SUPPORT GROUP FOR TREATING MOOD AND ANXIETY DISORDERS IN PRIMARY CARE

Bruce L. Rollman, MD, MPH, Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA, Bea Herbeck Behnap, PhD, Medicine, Jordan F. Karp, MD, Psychiatry, Armand J. Rotondo, PhD, Critical Care Medicine, Koleeb Z. Abbe, PhD, Medicine, University of Pittsburgh, CA, Psychiatry, Internet support groups (ISGs) that enable individuals with similar conditions to exchange information and emotional support have become a widely-available self-help resource for people with chronic medical conditions. Yet just 1% of ISG members typically provide approximately 90% of the content with the balance largely provided by the next 9% of members (1% Rule; van Mierlo T. J Med Internet Res. 2014). We examined whether this relationship existed in a moderated ISG we created as part of an ongoing NIMH-funded trial to determine whether an ISG linked to patients’ usual source of primary care can improve treatment outcomes for mood and anxiety disorders. Methods: Physicians from 26 Pittsburgh-area primary care practices referred patients aged 18-75 to our trial in response to an electronic medical record system prompt. Those who scored PHQ-9 and/or GAD-7 ≥ 10, had Internet access, and provided consent were randomized to one of three groups, including one with password access to our ISG. We encouraged patients to log in via email notification of new content, and the ISG software displayed indicators of status on members’ profiles to recognize them for their contributions. We analyzed server logs and categorized the top 1% of posters as superusers, the next 9% as top contributors, and the rest as either contributors (provided 1+ posts), observers (logged-in, never commented), or never log-ins. Results: Between 8/1/12-9/30/14, we randomized 704 patients including 302 to ISG access (mean age: 43; female: 81%; mean PHQ-9 and GAD-7 scores: 14.4 and 16.2, respectively). Overall, they created 1,223 posts and 1,018 comments (P+C), and 48% did so at least once (mean: 5.4; median: 3). Superusers averaged 80 P+C (20% of total posts); top contributors 23 P+C (49%); and contributors 3.3 P+C (31%; 38% of members), but 28% were observers and 23% never logged-in. Conclusion: While our observations support the 1% Rule for posts per person, we observed broader member participation on our ISG than has been reported by others. We will present additional data characterizing these members and various strategies we employ to promote engagement with our ISG.

NOCEBO EFFECT AS A PLAUSIBLE EXPLANATION FOR SYMPTOM PRESENTATION IN INDIVIDUALS WITH IDIOPATHIC ENVIRONMENTAL ILLNESS WITH ATTRIBUTION TO ELECTROMAGNETIC FIELDS

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Background: Individuals with idiopathic environmental illness with attribution to electromagnetic fields (IEI-EMF) claim they experience adverse symptoms when exposed to electromagnetic fields (EMFs) produced by mobile telecommunication stations and computer equipment, and however, there is poor evidence of a relationship between exposure to EMFs and symptoms in IEI-EMF individuals when tested under double-blind placebo controlled conditions. The current study investigated if the presence of symptoms in individuals with IEI-EMF were associated with the nocebo effect. Methods: Data from a previous double-blind provocation study were re-analyzed based on participants’ judgments as to whether or not they believed the telecommunication base station was “on” or “off.” In the original study, 48 IEI-EMF and 132 control participants were exposed to EMFs from Terrestrial Trunked Radio Telecommunications System (TETRA) and sham base station signals and reported subjective well-being as well as whether they thought they were being exposed to EMFs or not. Data from 34 IEI-EMF and 87 control participants who made just one “on” and one “off” judgment were analyzed. Subjective well-being was measured using visual analog scales (VAS) for anxiety, tension, arousal, relaxation, discomfort, and fatigue along with a measurement of total number and severity of symptoms experienced. Results: When asked about levels of actual exposure, IEI-EMF participants consistently reported significantly higher levels of anxiety, tension, arousal, and discomfort; lower levels of relaxation; more symptoms; and greater symptom severity when they believed the base station was “on” compared to when they believed it was “off” (p’s ≤ .008). Interestingly, control participants also reported experiencing more symptoms and greater symptom severity (p’s ≤ .001) when they too believed the base station was “on” compared to “off.” Conclusion: The nocebo effect of the 1% rule may have a reasonable explanation for the presence of symptoms in IEI-EMF and control participants. Future research should focus on developing interventions that effectively counteract nocebo beliefs to better treat IEI-EMF individuals.

THE EFFECT OF WEIGHT STIGMA ON HPA REACTIVITY: THE IMPORTANCE OF SELF-PERCEIVED WEIGHT

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Weight stigma is a conditioned, pervasive prejudice that is both comparable to other forms of stigma (e.g., racism, sexism) and is steadily increasing in the United States. Though research has established psychological costs of weight stigma (e.g., depression, anxiety, body dissatisfaction and low self-esteem) scant research explores the physiological consequences of weight stigma. This study examined the effect of weight stigma on the stress responsive hypothalamic-pituitary-adrenal axis. We also examined perceived body weight and BMI as moderators of the relationship between weight stigma and cortisol reactivity. We rejected 110 female undergraduates (BMI: M=19.30, SD=1.55) from a simulated shopping activity for their weight (weight stigma condition) or their arrival time (control condition). Results indicated participants’ perceptions of their own body weight (but not objective BMI) moderated the effect of weight stigma on cortisol reactivity, such that participants who perceived themselves as overweight exhibited sustained cortisol secretion compared to individuals who did not experience the weight stigma. Cortisol change did not vary by condition for participants who perceived themselves as normal weight though effect sizes were similar. Thus, in the first study to examine physiological consequences of active exposure to weight stigma, experiencing weight stigma was stressful for participants who perceived themselves as heavy, regardless of their objective BMI. Stress and cortisol are linked to deleterious health outcomes, stimulate eating, and contribute to abdominal adiposity, and therefore HPA reactivity to weight stigma may perpetuate a vicious cycle of stigma, weight gain, and more stigma.

ASSOCIATION BETWEEN AFFECT AND SOMATIC SYMPTOMS IN HEALTHY VOLUNTEERS

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The effect of psychological pressure on the experience of somatic symptoms is poorly understood. Research focuses mostly on the effect of stress in medically ill patients or the effects of somatic symptoms on affect. Also, most studies have a cross-sectional design. As a result, it is unknown how positive affect (PA) (e.g., being energetic or enthusiastic) and negative affect (NA) (e.g., sad or anxious) may influence levels of somatic symptoms in healthy volunteers. Also, it is unknown if PA and NA interact with each other in affecting somatic symptoms. The purpose of this study is to identify the association between affect and somatic symptoms in healthy volunteers. This study overcomes the cross-sectional design of past data and collects longitudinal data. The current study is an ongoing study of the psychology of weight stigma. This study explores the physiological consequences of weight stigma. This study investigates the effect of weight stigma on the stress responsive hypothalamic-pituitary-adrenal axis. We also examined perceived body weight and BMI as moderators of the impact of weight stigma on cortisol reactivity. We rejected 110 female undergraduates (BMI: M=19.30, SD=1.55) from a simulated shopping activity for their weight (weight stigma condition) or their arrival time (control condition). Results indicated participants’ perceptions of their own body weight (but not objective BMI) moderated the effect of weight stigma on cortisol reactivity, such that participants who perceived themselves as overweight exhibited sustained cortisol secretion compared to individuals who did not experience the weight stigma. Cortisol change did not vary by condition for participants who perceived themselves as normal weight though effect sizes were similar. Thus, in the first study to examine physiological consequences of active exposure to weight stigma, experiencing weight stigma was stressful for participants who perceived themselves as heavy, regardless of their objective BMI. Stress and cortisol are linked to deleterious health outcomes, stimulate eating, and contribute to abdominal adiposity, and therefore HPA reactivity to weight stigma may perpetuate a vicious cycle of stigma, weight gain, and more stigma.

IMPlicit AGONISTIC STRIVING IN BOTH CHILD AND PARENT IS ASSOCIATED WITH INCREASED HYPERTENSION RISK IN THE CHILD

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Our studies of nonconscious ("implicit") stress-inducing motives have shown that Agonistic Striving (AS; seeking to influence/control others) is associated
with heightened vigilance and increased risk of hypertension in adolescents and adults. A new study investigating how physical and social environments affect cardiovascular (CV) development in childhood now offers our first opportunity to determine if AS in children is related to AS in their parents, and if parental AS predicts children’s CV responses to stressors.

Participants were 64 children, aged 9-11 (average age = 10.2±0.9 years, 41% female, 60% Black) from urban neighborhoods. AS was measured separately in both the child and the parent with the Social Competence Interview, which yields interviewer ratings of implicit Agonistic Goals (AG). CV responses included indices of heart rate (HR), stroke volume (SV), and blood pressure (SBP/DBP) measured in the laboratory during mirror image tracing, reaction time, and signal detection tasks (counterbalanced). CV responses (task mean minus baseline mean) to the 3 tasks were averaged to yield a single CV stress reactivity score for each child. Hypothesized associations among Parent AG, Child AG, and CV indices were tested by computing Pearson correlations. Results revealed a significant correlation between Parent AG and Child AG (r=.316, p<.05), Child AG and HR reactivity (r=-.338, p<.01), Child AG and CV reactivity (r=.393, p<.01) and Parent AG and Child baseline HR (r=.255, p<.05). These results, although preliminary, are consistent with our hypothesis and encourage a new line of inquiry into the early environmental origins of CV stress and related illness. First, the association between AS and increased hypertension risk that has been found in adolescents and adults may also exist in younger children. Second, the association between parent and child AG scores suggests that AS may be generationally transmitted through family interactions and observational learning. Third, parents’ AS may affect their children’s cardiovascular health. Together, these findings suggest that children who exhibit agonistic stress (higher AG scores in child and parent) tend to exhibit higher CV reactivity when confronted with challenges that demand active coping. This tendency may increase their risk of developing hypertension and cardiovascular disease in later youth and adulthood.

63) Abstract 2664

CHANGE OF CALORIC INTAKE AND AEROBIC ACTIVITY IN INDIVIDUALS WITH PREHYPERTENSION AND HYPERTENSION IN RESPONSE TO CHRONIC INFLAMMATORY BIOMARKERS

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Methods: Sixty-eight sedentary prehypertensive and hypertensive individuals (mean age ± SEM: 45.4 years ± 1.2) were randomized to one of three 12-week intervention groups: aerobic cardio training and caloric reduction, aerobic cardio training, or waitlist control group. Plasma levels of the soluble intercellular adhesion molecule-1 (sICAM-1), sICAM-3, plasminogen activator inhibitor-1 (PAI-1), and inflammatory biomarkers C-reactive protein (CRP), interleukin (IL)-6, tumor necrosis factor (TNF)-alpha were determined before and after the intervention.

Results: In the final regression model, higher caloric reduction predicted greater increases of sICAM-3 (p = 0.026) and decreases of CRP (p = 0.018) levels. More aerobic cardio training predicted increases of sICAM-3 (p = 0.046) and IL-6 (p = 0.004), and decreases of TNF-alpha (p = 0.017) levels. Higher blood pressures predicted higher (p = 0.001) and greater fitness (p = 0.006) lower levels of PAI-1 after the intervention.

Conclusions: Our findings suggest that in prehypertensive and hypertensive patients, levels of the adhesion molecule sICAM-3 and inflammatory biomarkers have different response patterns to aerobic cardio training with or without caloric reduction, which interact depending on blood pressure and fitness. This could have implications for the prevention of prothrombotic events, as for example sICAM-3 plays a regulatory role on the lymphocyte function-associated antigen (LFA-1)/ICAM-1 pathway of intercellular adhesion.

64) Abstract 3117

RACIAL DISPARITIES IN ANGER COGNITIONS WITHIN A HETEROGENEOUS CARDiac SAMPLE

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Anger has been linked to cardiovascular health and cognitive restructuring is a key component of enabling people to cope with anger. Prior data in our lab have indicated that cognitive correlates of anger can be effectively measured (Anger Cognitions Inventory; ACI) and there are ethnic differences in the utilization of cognitive techniques. The current study assessed differences in the endorsement of cognitive correlates of anger between African American (N=127), Caucasian (N=73), and Other (N=26) samples. Anger cognitions, assessing the frequency of angry thoughts were measured with the Anger Cognitions Inventory (ACI) including five scales; rational coping, vengeance, seeking justice, distancing, and self-righteousness. Analysis of variance was computed controlling for age on the five subscales of the ACI to assess differences based on race. After adjusting for age, there was a significant difference in the vengeance (F(1,142.4)=.03, p<.005) subscale. However, a post-hoc Tukey analysis revealed that African American’s reported statistically significant higher scores for the rational coping (p<.01), seeking justice (p<.01), distancing (p<.01), and self-righteousness (p<.00) scales compared to Caucasians. Reasons for the higher endorsement of anger cognitions among African Americans and the interconnections between cognitions, other psychosocial risk factors, and heart disease need to be explored. Further inquiry of the social and biological mechanisms of these differences should be studied in a larger sample in order to increase our understanding of pathways to cardiovascular disease and the differences between ethnic and racial groups.

65) Abstract 2477

A POSITIVE PSYCHOLOGICAL INTERVENTION FOR PATIENTS WITH AN ACUTE CORONARY SYNDROME: TREATMENT DEVELOPMENT AND PROOF-OF-CONCEPT TRIAL

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Background: Positive psychological attributes have been associated with greater participation in cardiac health behaviors, improved well-being, and lower rates of cardiac mortality. However, there has been minimal study of interventions to actively increase positive psychological states following a cardiac event such as an acute coronary syndrome (ACS).

Methods: Using existing literature and qualitative interviews with post-ACS patients, we developed an 8-week phone-based positive psychology (PP) intervention for patients hospitalized for ACS. We then tested this intervention in a single-arm proof-of-concept trial (N=25) to assess feasibility, acceptability, and pre-post change in psychological states. Measures, obtained at baseline and 8 weeks, included: (1) positive affect items from the Positive Affect Negative Affect Schedule (PANAS), (2) the Life Orientation Test-Revised (LOT-R), and (3) the depression and anxiety scales of the Hospital Anxiety and Depression Scale (HADS); we calculated pre/post effect sizes (ES; Cohen’s d) for each outcome variable. We then prospectively enrolled a comparison (treatment as usual; TAU) sample with identical inclusion criteria and compared outcomes between the intervention and TAU group.

Results: Follow-up data was available from 20 (87%) intervention participants. In total, 131 of 160 possible PP exercises (82%) were completed by participants, 14 participants (70%) completed all exercises, and mean scores on ratings of ease of exercise completion (7.4 out of 10) and immediate utility (8.1/10) were high. There were pre-post improvements in positive affect (PANAS: 3.1 points; ES .37), anxiety (HADS-A: 3.4 points; ES .53), and depression (HADS-A: 1.9 points; ES .47), but not dispositional optimism (LOT-R drop 0.5 points).

In the comparison condition (see Figure), changes were minimal, with lesser improvement on all outcomes, including dispositional optimism (1.1 point LOT-R drop in comparison condition). ES differences between the intervention and TAU groups ranged from .27 (optimism) to .51 (depression), all in favor of the intervention.

Conclusions: A phone-based PP intervention was feasible, well-accepted, and associated with improvements in psychological outcomes among ACS patients. Additional study is needed to further evaluate the efficacy of this intervention.
A POTENTIALLY LIFESAVING PSYCHOPHYSIOLOGICAL INTERVENTION FOR SPECIAL FORCES POLICE OFFICERS

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Policing has been termed one of the most ‘psychologically dangerous jobs’ given the routine exposure to trauma (e.g., domestic and child abuse) and violent criminals. Further, officers often experience very elevated sympathetic arousal during high threat situations. High sympathetic arousal is associated judgment and decision-making. In policing, this translates to potential life or death consequences for officers and civilians. We longitudinally monitored the physiological and psychological responses to critical incidents in real life and training scenarios among four Special Forces police SWAT teams (n=54) in North America and Finland. Officer performance during critical incidents (as rated by expert SWAT trainers independent of our research) could be predicted from their physiological profiles (e.g., cortisol, heart rate, heart rate variability). Based on these findings, we conducted a randomized controlled intervention trial addressing both the psychological and physiological arousal associated with high threat situations among an elite Federal Special Forces SWAT team (n=12). Highly significant (p<.001) and clinically relevant improvements in overall performance, situational awareness (as rated by independent expert SWAT trainers blinded to study condition) and physiological arousal were observed in the intervention group (n=6). Implications of this short term (3 day) training to improve officer psychological and sympathetic nervous system arousal in life threat situations include potential lifesaving actions for both officers and the civilians they interact with.

N3 TO N6 DIETARY FATTY ACID RATIO IS ASSOCIATED WITH LONGITUDINAL CHANGE IN DEPRESSIVE SYMPTOMS AMONG US WOMEN

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The present study examined longitudinal changes in self-reported depressive symptoms (and related domains) in relation to baseline n3 fatty acid intakes (absolute and relative to n6 fatty acids). Additionally sex-specific associations were evaluated. This study was a prospective cohort of adults aged 30-64y at baseline (N=2,053, mean follow-up time=4.65±0.93y, Baltimore , MD, 2004-2013). Using n3 and n6 fatty acid means from two 24-hr dietary recalls, ratios of n3 to n6 for highly unsaturated fatty acids (>=20C) (HUFA), and polyunsaturated fatty acids (>=18 C) (PUFA) were estimated. Outcomes included total and domain-specific scores on the 20-item Center for Epidemiologic Studies Depression Scale (CES-D) scale. Based on mixed-effects regression models, among women, both higher n3 HUFA:n6 PUFA and n3 PUFA:n6 PUFA ratios were associated with a slower rate of increase in the total CES-D score over-time. n3 HUFA:n6 PUFA was associated with slower increases in somatic complaints in men, while among women, n3 HUFA:n6 PUFA and n3 PUFA:n6 PUFA ratios were both linked to putative longitudinal over-time improvement in positive affect. Among US adults, n3:n6 dietary fatty acid ratio was associated with longitudinal change in depressive symptoms, suggestive of a protective effect, particularly among women.

66) Abstract 2789

67) Abstract 2009

Reductions in Pre-Incident Anticipatory Cortisol Response Across Training Week

Figure. Pre-post changes in psychological outcome variables in intervention and TAU groups.
Determinants of Smoking Cessation in Young Women and Men After Acute Coronary Syndrome

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Background: Almost half of patients with premature acute coronary syndrome (ACS) are smokers. Targeted smoking cessation interventions are critical for secondary prevention in these young adults. However, the factors associated with cessation are unknown. We aimed to identify the determinants of smoking cessation in men and women after premature ACS. Methods: GENESIS-PRAXY is a prospective cohort follow-up of ACS patients (d55 years) recruited from 26 centres in Canada, the US, and Switzerland. The sample included 95 women and 167 men who were smokers at presentation and who had data over 12 months. Follow-up data was assessed when patients reported having quit for 6 months. Participants completed a sociodemographic and medical questionnaire, and medical chart review was conducted. Sex-specific multivariable logistic regressions were conducted to identify the determinants of smoking cessation in women and men. Results: By 12 months, 41% of women and 47% of men quit smoking. Overall, patients who quit were younger and were less likely to have had a previous ACS and a low income, and more likely to have had ST-elevation myocardial infarction (STEMI) presentation as opposed to non-STEMI, high social support, post-secondary education, and to have been referred for smoking cessation counseling than patients who did not quit. It is noteworthy that 27% of these patients were not referred for smoking cessation counseling at discharge. In sex-specific multivariable analyses including women, referral for smoking cessation counseling increased the likelihood of smoking cessation (OR=5.56, 95% CI: 1.60-19.25), while a family history of CVD was associated with a lower likelihood of cessation (OR=0.24, 95% CI: 0.06-1.00). In men, referral for cessation counseling (OR=2.48, 95% CI: 1.05-5.86), as well as good stress management abilities (OR=2.61) were independent determinants of cessation over 12 months. Among patients who were still smoking at 12 months, the median number of cigarettes smoked per day decreased from baseline to 12 months in both sexes, however, the decrease was more substantial in men who then reached an equivalent level as women (from 15 to 10 in women, and from 19 to 10 in men). Conclusions: Our results suggest that referral for smoking cessation counseling was one of the most important determinants of smoking cessation in women and men after premature ACS. Yet, a substantial proportion of these patients do not receive this referral. Systematic referral for smoking cessation counseling may help to improve quitting rate after a premature ACS.

Coping Style Mediates the Relationship Between Symptom Burden and Cancer Specific Distress in Men with Advanced Prostate Cancer

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Background: Men with advanced prostate cancer (APC) report significant symptom burden due to disease processes and cancer treatments. Few studies have examined how APC patients cope with such physical and functional declines and what impact coping strategies have on cancer-related distress. The purpose of this study was to evaluate symptom burden, coping strategies, and cancer-related distress in men with APC. We hypothesized that both greater symptom burden and use of maladaptive coping strategies would be associated with greater cancer-related distress. We also examined whether coping strategies mediated the relationship between symptom burden and cancer-related distress. Method: A total of 82 men with APC undergoing hormone therapy completed the following self-report measures: Memorial Symptom Assessment Scale-Short Form (MSAS-SF) for symptom burden, Brief COPE for coping strategies, Memorial Anxiety Scale for PC (MAX-PC), and Impact of Events Scale-Revised (IES-R) for cancer-related distress. The sample was a mean age of 68.3 (52-91); and 54% completed 4 or more years of college and 43% had income above $40,000 annually. Linear regressions examined the relationships among symptom burden, coping strategy use and cancer-related distress. Results: Greater MSAS-SF scores and greater deniable coping had statistically significant associations with greater cancer-related distress measured by both the MAX-PC (p<.05) and IES-R (p<.05). Greater MSAS-SF scores also were significantly associated with greater use of denial coping (p<.001). No other coping strategies were associated with either symptom burden or distress measures. Greater use of denial coping mediated the relationship between greater total MSAS-SF and greater cancer related distress (MAX-PC Sobel test = 2.30, p<.05; IES-R Sobel test = 2.67, p<.01). Further analyses revealed that denial coping also significantly mediated the association between the physical subscale of the MSAS-SF and cancer-related distress (MAX-PC Sobel test = 2.38, p<.05; IES-R Sobel test = 2.79, p<.01). Conclusions: Study findings demonstrate that maladaptive coping (denial) is related to how distressing physical symptoms are perceived in men with APC. This is consistent with previous research linking denial to poorer psychological outcomes in cancer. Future research should evaluate these associations longitudinally and explore ways to promote adaptive coping strategies in this population to help reduce the psychological impact of the physical changes associated with APC.

Impact of Sleep, Mood and Menopausal Transition on Adjuvant Chemotherapy-Induced Nausea in Breast Cancer

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Purpose: Younger age and female gender are well known risk factors for chemotherapy-induced nausea (CIN). This study was designed to evaluate the potential effect of sleep, mood and menopausal transition on CIN. Methods: In this prospective observational study, we recruited early-stage breast cancer patients who recovered from surgery and received the first cycle of adjuvant chemotherapy with anthracycline and cyclophosphamide. Candidate factors associated with CIN were assessed before chemotherapy: follicular stimulating hormone (FSH), Menopausal Rating Scale (MRS), Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index (ISI), Epworth Sleepiness Scale (ESS), Fatigue Severity Scale (FSS), Hospital Anxiety and Depression Scale (HADS), and Impact of Events Scale - Revised (IES-R). The CIN was defined as vomiting ≥2 after chemotherapy and ≥0 in the 3 days before treatment (NSR). Results: Between February 2012 and May 2014, data from 198 patients were collected. CIN occurred in 35.4% of patients. Nausea before chemotherapy (odds ratio [OR], 5.52, 95% CI 1.15-25.08), age over 45 (OR, 3.49; 95% CI, 1.56-7.83), FSH less than 40 mIU/mL (OR, 4.35; 95% CI, 1.81-10.43), sleep quality impairment (OR, 2.68; 95% CI, 1.14-6.26) and depression (OR, 2.28; 95% CI, 1.18-4.42) were significantly associated with CIN. Conclusion: Age of menopausal transition, sleep quality impairment and depression appear to be significant risk factors for CIN in early-stage breast cancer patients. Instead of younger age, menopausal transition period, when women are vulnerable to depression and insomnia in the general population, was found to be a risk factor.
A COMPLEMENTARY INTERVENTION FOR IRRITABLE BOWEL SYNDROME: ASSESSING THE COMPONENTS OF MINDFULNESS WITH PLACEBO, BREATHING, AND COGNITION.

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This research looks into a three-week intervention with a sixty-week follow up to investigate the effects of mindfulness training with placebo, breathing, and mindfulness meditation in alleviating the symptoms of Irritable Bowel Syndrome (IBS). Irritable bowel syndrome (IBS), a chronic gastrointestinal disorder with no known organic cause, has made a striking impact on western health systems (Andrews et al., 2005; Bommelaeer et al., 2004). Its pervasiveness is seen throughout the community with prevalence rising in all age groups and across the globe (Choong & Locke III, 2011; Wilson, Roberts, Roalfe, Bridge, & Singh, 2009), and it is within the top ten reasons for seeking primary care (Kaptchuk et al., 2010). The need to augment or replace the traditional biomedical attempts at treatment for IBS is evident in the increased number of patients who seek complementary and alternative medicine for relief of their symptoms (van Tilburg et al., 2008). One such treatment is the practice of mindfulness: a meditation technique (Zernicke et al., 2013). However, the underlying mechanism as to why mindfulness works to alleviate IBS is unknown and has yet to be sought. This study investigates each of these components by testing the effectiveness of three interventions that will target social impacts on symptom reduction through the placebo effect seen in IBS populations (Kaptchuk et al., 2008), physiological changes in the autonomic nervous system (ANS), and psychological improvements through the emotional and cognitive changes from mindfulness training. In addition to analyzing the effects of each intervention, this study is able to account for each influence’s effect size on the success of the impact on symptoms in the IBS population. By uncovering what helps these patients the most, the costly search for relief from IBS will be furthered.

FOOD-ALCOHOL COMPETITION: DO YOUNG GIRLS WHO EAT MORE DRINK LESS?

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Food and alcohol consumption independently stimulate the mesolimbic dopamine reward pathway. The food-alcohol competition hypothesis proposes that because these behaviors share activation of this pathway, individuals will tend to consume one rewarding substance (e.g., food) to the exclusion of the other (e.g., alcohol). These health behaviors are modifiable risk factors for a broad range of physical illness, and adolescence is a critical time for the initiation of alcohol use. Therefore, the present study evaluated the food-alcohol competition hypothesis in a developmental window where one would expect reward-pathway competition between these substances to emerge. Latent Growth Modeling captured the dynamics between total calorie intake, sugar intake, fat intake, interaction of sugar and fat intake, fast food consumption, and alcohol consumption change longitudinally in a sample of 2,379 adolescent girls assessed yearly from age 15 to 19. No significant associations emerged between alcohol and total calorie intake, but alcohol consumption was negatively associated specifically with fast food consumption and the interaction of sugar and fat intake. Food-alcohol competition was not supported generally, albeit food-alcohol competition may occur specifically with palatable, sweet high-fat foods.

HOW ILLNESS-BELIEFS MAY INFLUENCE HELP-SEEKING IN TRAUMATIZED ASYLUM SEEKERS

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Background: Many asylum seekers suffer from post-traumatic stress disorder (PTSD) with comorbid depressive and somatoform symptoms. However, most of them do not receive professional mental health care. Although access to treatment is impeded by language barriers, asylum seekers’ illness-beliefs and attitudes towards treatment might also influence help-seeking behavior. We suppose that asylum seekers perceive their mental health as less controllable by personal means and treatment than persons of the German general population, and that this influences their help-seeking behavior.

Method: We surveyed N = 59 traumatized asylum seekers (study ongoing) and N = 218 persons of the general German population. Mental health was assessed by different questionnaires (asylum seekers’ illness-beliefs ‘a treatment will be effective in curing my symptoms’ (treatment control) of the Illness Perception Questionnaire Revised (IPQ-R) were used to assess illness-beliefs. In the asylum seeker sample, we further applied questions about help-seeking behavior.

How did the researchers find that the food-alcohol competition hypothesis is not supported generally, but could occur specifically with palatable, sweet high-fat foods?
hypothesized, longitudinal HLM demonstrated significant between-person relationships between IL-6 and pain. Higher average levels of IL-6 predicted greater pain intensity [F1, 19.5] = 9.2, p = .007] and unpleasantness [F1, 19.3] = 6.19, p = .002] over the 2 week period. Similarly, greater average distress was a significant between-person predictor of greater pain intensity [F1, 20.0] = 61.1, p < .001] and unpleasantness [F1, 20.1] = 146.3, p < .001]. Regarding within-person relationships, above average levels of distress on any given day were associated with greater pain intensity [F1, 18.5] = 36.5, p < .001] and unpleasantness [F1, 18.9] = 30.9, p < .001] on the same day. Contrary to hypotheses, IL-6 did not moderate the relationship between distress and pain experiences. Conclusions: These findings suggest that women with higher IL-6 or distress may be at greater risk for pain following surgery. Pain showed daily within-person changes associated with distress but IL-6 did not moderate this relationship. Consequently, interventions for distress may have a positive impact on cancer patients' pain experience. Treatment efficacy may be improved by utilizing inflammation and distress screening to identify patients likely to receive the greatest benefit from interventions for pain.

76) Abstract 2034 ASSOCIATIONS BETWEEN EFFORT-REWARD IMBALANCE AND THE METABOLIC SYNDROME - FINDINGS FROM THE MANNHEIM INDUSTRIAL COHORT STUDY (MICS)
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Objectives: Job stress is a predictor of cardiovascular disease incidence and mortality and the metabolic syndrome (MetS) represents one of the key pathways potentially underlying those associations. Effort-reward imbalance (ERI) represents one of the most influential theoretical work stress models, but evidence on its relationship with MetS remains sparse and with only limited generalizability. We therefore aimed to determine this association in a large occupational sample with different occupational groups.
Methods: The present study used cross-sectional data from an industrial sample in Germany (n=4114). ERI was assessed by a validated 10-item questionnaire. MetS was defined according to a joined interim statement of six expert groups. Multivariable associations of ERI, and its subcomponents “effort” and “reward”, with MetS, were estimated by logistic regression analysis. ERI and its subcomponents were dichotomized based on multivariate odds ratios (OR) with 95% confidence intervals (CI).
Results: ERI (continuous z-score) was positively associated with MetS (zERI: OR=1.14 95%CI=1.05-1.26). The association was more prominent in males (zERI: OR=1.20 95%CI=1.10-1.33) and in younger employees (Age 18-49 zERI: OR=1.24 95%CI=1.09-1.40). Analysis of the ERI subcomponents yielded weak associations of both effort (zEffort: OR=1.12 95%CI=1.00-1.25) and reward (zReward: OR=0.92 95%CI=0.84-1.00) with MetS. Conclusions: ERI is associated with increased occurrence of MetS, in particular among younger men. Further longitudinal studies are needed to determine the temporal relation of these associations.

77) Abstract 2964 DEVELOPMENT OF COGNITIVE BEHAVIORAL THERAPY FOR IRRITABLE BOWEL SYNDROME IN JAPAN: INTERIM REPORT OF A PILOT STUDY IN JAPAN
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Introduction: Irritable bowel syndrome (IBS) is one of the most common psychosomatic diseases. Cognitive behavioral therapy (CBT) is reported to be an effective therapeutic option for treatment-resistant IBS. The efficacy of CBT for IBS has not been well studied in Japan. Therefore, we conducted a pilot study of CBT for IBS, using an intervention protocol named CBT-IE, referring to the use of interoceptive exposure (IE) for IBS reported by Craske, et al. (2011). In this presentation, we report the results thus far.
Methods: Participants were 16 years or older who were diagnosed with IBS by specialists. We translated Craske et al.’s IE protocol into Japanese and developed new materials in cooperation with the original authors. The protocol comprised 10 sessions aimed at patients enhancing control of their overall symptoms by reducing their fear of the physical symptoms. All sessions were completed in 16 weeks. Primary outcomes were the IBS severity index (IBSSI), an index assessing the severity of IBS symptoms, and the visceral sensitivity index (VSI), which assesses anxiety over abdominal symptoms. Secondary outcomes included IBS-QOL, BDII, and STAI. These measures were assessed pre, mid, and immediately post-intervention and at 3 and 6 months post-intervention.
Results: Overall, 9 subjects participated in the study and 7 of have completed the entire intervention and questionnaires to date. We compared the pre-intervention and post-intervention scores using the paired t-test, and the results were as follows; IBSSI: t = 2.35, p = 0.057, Cohen’s d = 1.53, VSI: t = 3.71, p = 0.010, d = 1.43, IBS-QOL:Total: t = 7.00, p < 0.001, d = 3.12, BDII: t = 2.88, p = 0.028, d = 1.37, and STAI-Trait: t = 2.04, p = 0.087, d = 0.95.
Discussion: The scores for IBS symptoms, anxiety about abdominal symptoms, IBS-related QOL, depression, and general anxiety were improved after intervention. No adverse events have occurred during intervention thus far. The results from this pilot study suggest that the CBT-IE can be performed safely and with some effectiveness in Japan. It is necessary to complete the study to confirm these results and to examine whether the effects are maintained long term after intervention.

78) Abstract 2803 SEXUALLY DIMORPHIC ADAPTATIONS IN MATERNAL HPA AXIS AND ANS DURING PREGNANCY
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There is clear evidence of reciprocal exchange of information between the mother and fetus during pregnancy but the majority of research in this area has focussed on the fetus as a recipient of signals from the mother. From the perspective of the Developmental Origins hypothesis, physiological signals produced by the maternal stress systems in response to her environment carry valuable information about the state of the external world. Moreover, it is known that some maternal signals, including prenatal stress, produce sex-specific adaptations within fetal physiology that have pervasive and long-lasting effects on development. Little is known, however, about the effects of sex-specific fetal signals on maternal adaptations to pregnancy.
The current study examines sexually dimorphic adaptations within maternal stress physiology during pregnancy, including the hypothalamic-adrenal-pituitary (HPA) axis and the autonomic nervous system (ANS). Using diurnal suites of saliva collected in early and late pregnancy, we demonstrate that basal HPA axis and ANS function differ by fetal sex. Mothers pregnant with a female displayed greater autonomic arousal (see Figure 1) and flatter (but more elevated) diurnal cortisol patterns (see Figure 2) compared to mothers pregnant with males, and these patterns are exaggerated by psychological distress. In our discussion of these findings we argue that these maternal adaptations during pregnancy are consistent with sexually dimorphic fetal developmental/evolutionary adaptation strategies that favor growth for males and conservation of resources for females. Furthermore we speculate on the contributions of sex-specific maternal adaptations to well-known sex differences in the incidence and presentation of stress-related disorders in offspring.
The importance of incorporating mental health services in primary care, alleviating the societal and economic costs of poor health in refugees.

80) Abstract 2950
SOCIO-ECONOMIC STATUS AND CARDIOVASCULAR RISK - FIRST RESULTS FROM THE SPIRR-CAD STUDY
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Introduction: Low socio-economic status (SES) has been associated with an increased coronary risk. In Stockholm, women with only mandatory education had higher levels of both standard and psycho-social risk factors, than academic women. Psycho-social risk factors “explained” a larger part of the social gradients than did standard risk factors (Wamala, Orth-Gomér, 1999) Methods: In the German multicenter SPIRR-CAD study we examined this risk in 450 men and 120 women patients. Results: 24% of the patients were academics (high SES) and 42% belonged to lower SES classes. Of standard risk factors, smoking was twice as common in low as in high SES, and mean body mass index (BMI) was also higher in low SES. A majority of low SES men and women were living alone and more high SES were cohabitating. Twice as many, as high SES were divorced. Too short education was more common in low SES and the proportion of women was higher. The access to social support was significantly lower in low SES (< 0.001). Of psychological factors, exhaustion showed a strong inverse social gradient, anxiety was borderline, but depression was not socio-economic. At follow-up after 2.5 years, more clinical events had occurred in low than in high SES groups (59% vs 46%, p=0.03 Chi 2 =4.7). Likewise, more cardiac events had occurred (41 % vs 29 %, p=0.03 Chi 2 =4.5).
Conclusion: In summary social gradients were strong and dependent on psychosocial inequalities. More preventive activities and skills are needed in low SES groups.

81) Abstract 3165
THE ECALM TRIAL: ETERAPY FOR CANCER APPLYING MINDFULNESS EXPLORATORY ANALYSES OF THE EFFECTS OF AN ONLINE MINDFULNESS-BASED CANCER RECOVERY PROGRAM ON MOOD, STRESS SYMPTOMS, MINDFULNESS, POSTTRAUMATIC GROWTH AND SPIRITUALITY
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Objective: The goals were to assess the effects of participation in a synchronous online mindfulness-based cancer recovery program (MBCR) on patient reported psychological outcomes in underserved cancer patients in Alberta, Canada.
Methods: A convenience sample of participants diagnosed with cancer were enrolled after providing informed consent. All participants completed self-report psychological questionnaires before and immediately after the eight week online program. The intervention consisted of weekly two hour “real time” online classes and an online weekend six hour retreat. Sixty-two participants provided pre- and post-intervention data. The largest represented cancer stage was I (34%) and type was breast cancer (34%). Mixed model analyses for repeated measures were conducted and subgroup analyses investigated moderator effects.
Results: There were statistically significant improvements over time for total scores of mood, stress, spirituality, posttraumatic growth and four of five measured mindfulness facets, with no change in the describe facet. Younger participants had a greater reduction in stress symptoms, greater increases in spirituality, and their non-react mindfulness facet scores increased more over time. Male participants posttraumatic growth inventory (PTGI) scores increased more over time. Standardized subscale change scores indicated increases in vigor and fatigue (Profile of Mood States) and sympathetic arousal (Calgary Symptoms of Stress Inventory) had the greatest improvements.
Conclusions: This online MBCR program was effective in decreasing mood disturbance and stress symptoms for underserved cancer patients with a wide variety of cancer diagnoses, stages of illness, ages and educational backgrounds.

82) Abstract 2933
DEPRESSION EXACERBATES COGNITIVE VULNERABILITY IN HSV-1 CARRIERS
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Introduction:
The goal of this study was to examine the role of chronic psychological stress, depression, and anxiety in exacerbating cognitive vulnerability in herpes simplex virus type 1 (HSV-1) carriers. HSV-1 is a ubiquitous pathogen, commonly known as the ‘cold sores virus.’ While only one community-based study has shown relationships between HSV-1 infection and poor cognitive performance in the general population, several studies have documented steeper cognitive declines in HSV-1 positive patients with chronic physical and psychiatric illnesses as compared to their HSV-1 negative counterparts. Thus, an intriguing possibility is raised, that it is the interaction between HSV-1 and other risk factors that contributes to cognitive impairment rather than HSV-1 infection alone.

Methods:
One hundred and fifteen community-dwelling adults (50 men; 49±6 yrs of age) completed a global cognitive performance test (Wechsler Abbreviated Scale of Intelligence, WASI-II) and a health screen including the Beck Depression Inventory II (BDI-II), the State-Trait Anxiety Inventory (STAI-trait), and a blood draw to determine seropositivity to HSV-1 IgG antibodies.

Results:
While neither HSV-1 infection, nor depressive symptoms alone accounted for any significant differences in cognitive performance, over and above the effects of age, sex, and education, there was a significant interaction between HSV-1 status and BDI-II score on cognitive performance (interaction t=2.45, p=0.016). While WASI-II performance was comparable among HSV-1 positive and negative participants reporting few depressive symptoms (below the sample median: t=-0.31, p=0.755, 95% CI -0.26 to 0.73), WASI-II performance was significantly lower in HSV-1 positive participants reporting higher number of depressive symptoms (above the sample median: t=-3.90, p=0.002, 95%CI -21.91 to -7.14).

Conclusions:
We found that the presence of depressive symptoms exacerbated the negative effect of HSV-1 infection on cognitive performance with only seropositive individuals with higher numbers of depressive symptoms exhibiting cognitive vulnerability. These results support our hypothesis that it is the interaction between HSV-1 and other genetic and environmental risk factors that contributes to cognitive impairment rather than HSV-1 infection alone. They also identify a subset of particularly vulnerable individuals who may benefit from viral suppression therapy.

ASSOCIATIONS BETWEEN HAIR AND SALIVARY CORTISOL: A STUDY OF TEMPORAL RELATIONSHIPS
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Introduction. Conventional cortisol assessments employing salivary or plasma specimens are limited as they provide measures of momentary cortisol output. The recent development of cortisol assays from hair may provide a major methodological improvement in this respect. Hair cortisol is thought to reflect output over recent weeks, but it is unclear exactly what time points it corresponds to. There is divergent evidence on the associations between hair and salivary cortisol. The aim of the present study was to investigate the associations between hair cortisol and salivary measures taken repeatedly over previous weeks.

Method. Medical and law students (n=77, aged 18-25) completed three diurnal salivary cortisol profiles at 6, 4 and 2 weeks before hair cortisol (1 cm) sampling. The area-under-the-curve (AUC) was calculated for each time-point for total daily salivary cortisol output. Linear regression analyses were used to predict hair cortisol levels from each daily AUC and an averaged AUC.

Results. Hair cortisol was significantly associated with the salivary cortisol AUC at all three sampling points (Time 1: B = 0.646; 95% CI = 0.30 to .99; Time 2: B = 0.735; 95% CI = .47 to 1.0; Time 3: B = .715; 95% CI = .44 to .99, all p’s <.001), controlling for age, BMI and hair treatment. When the AUC was averaged the association between hair and saliva cortisol levels became stronger (B = 1.23; 95% CI = .89 to 1.57, p<.001).

Conclusions. Associations between three salivary sampling points and hair cortisol support the notion that a 1cm-hair segment reflects the cortisol output over the month before measurement in hair. The strongest associations were for the combined saliva profiles, suggesting that stronger associations emerge with more robust estimates of salivary cortisol samples collected over several days. These associations suggest a common HPA axis activity in both tissues and further validate the method of hair cortisol analyses as a marker of long-term cortisol exposure.
DEPRESSION AND OROPHARYNX CANCER OUTCOME.

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Background. Studies have shown a modest relationship between depression and mortality in cancer patients. Our study addressed methodological weaknesses in the literature by restricting the sample to patients with 1 cancer type, controlling for factors known to affect outcome, and evaluating outcomes other than overall survival.

Methods. We prospectively followed patients newly diagnosed with squamous cell oropharyngeal cancer from the start of radiation therapy until death or until date of last clinical visit. All patients were optimally treated with radiation and sometimes chemotherapy. After controlling for tumor stage, treatment, comorbidities, smoking, excessive alcohol use, and demographic factors, we assessed the effects of baseline self-reported depression on overall survival and recurrence.

Results. One hundred thirty participants were followed for a median of 5 years. The average age was 56 years, and 83% were male. Eighteen participants died during the study and 15 experienced disease recurrence. Self-reported depression was associated with decreased overall survival duration (hazard ratio [HR] = 3.6; 95% confidence interval [CI] = 1.2-10.8), and disease recurrence (HR = 3.8; 95% CI = 1.2-12.2) in multivariate analysis. In addition, smoking was associated with disease recurrence.

Conclusion. Patients with oropharyngeal cancer may benefit from depression screening and appropriate follow-up. Future studies should address methodological weaknesses in the literature to determine whether depression is truly an independent prognosticator of outcome.

DETERMINANTS OF DYSPNEA IN CHRONIC HEART FAILURE

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Background - Dyspnea is a hallmark symptom of heart failure (HF), associated with impaired functional capacity and quality of life. In systolic HF patients, dyspnea is thought to arise from pulmonary congestion, which is also the primary treatment focus to reduce dyspnea. This approach however surpasses the notion that the experience of dyspnea is multifactorial and may originate from different sources. Evidence suggests that alternative factors such as chronically elevated inflammation and psychological distress may explain individual differences in the report of dyspnea complaints. As the potential contributors to dyspnea have not been examined in HF before, the current study set out to examine the relative importance of disease severity, inflammation and psychological distress to the experience of dyspnea in a large prospective cohort of chronic heart failure patients. Methods - Dyspnea complaints (Health Complaints Scale subscale), demographic and clinical variables and psychological distress (i.e., depression and anxiety) were assessed in 464 HF patients (mean age = 66.6, 70% men) at baseline and 1-year follow-up. Inflammation markers (i.e., TNF-α, IL-6, IL-10, sTNFR1, sTNFR2) were also assessed at both time points in a subsample of N=255. Results – Mixed linear modeling analysis with maximum likelihood estimation showed that when determinants clusters were entered separately, disease severity measures (i.e. NYHA class (p<.0001) and left ventricular ejection fraction (p=.01)) were significantly associated with dyspnea complaints, as were depression (p<.0001) and anxiety (p<.0001), while inflammation did not significantly affect dyspnea complaints over time. When all determinant clusters were entered together, including a priori selected covariates, results showed that only depression and anxiety remained significantly associated with more dyspnea complaints over time (p<.0001). In this final model, sTNFR1 (p=.04) and being overweight (p=.02) were also significantly related to dyspnea complaints. Conclusion – The experience and report of dyspnea in HF is determined foremost by psychological distress and being overweight, with disease severity and inflammation levels playing an ancillary role in the fully adjusted model. These findings suggest that psychological distress should be considered when treating dyspnea complaints in patients with HF.

EMOTIONAL SUPPRESSION MEDIATES THE RELATIONSHIP BETWEEN LOW SOCIAL STATUS AND LOW SOCIAL SUPPORT.

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Objective: Low SES has been associated with lower levels of social support, a risk factor for poor mental and physical health. More recently, studies have shown that low SES and minority status, which often overlap, are associated with a greater tendency to suppress emotional expressions. A small body of evidence from laboratory studies suggests that the use of suppression can disrupt the formation of social bonds, the quality of social relationships and the receipt of social support (Srivastava et al., 2009; English & John, 2013; Butler et al., 2003). To date, researchers have not examined whether individual differences in emotional suppression may help explain the lower levels of social support reported for lower SES persons. Understanding how social position and minority status are associated with emotion regulation strategies in a population-based sample, and how these strategies may shape individuals’ social relationships would contribute to our understanding of how broad social constructs (social rank, social resources, race) may come to impact the social networks – and ultimately the health – of individual persons. Methods: The current study cross-sectionally examines the relationships among different indicators of social status, race, suppression, and social support in a population-based sample of adult Black and White males. Results: Results reveal that, similar to other samples (Gross & John, 2003), Blacks report greater use of suppression than Whites, and individuals who report fewer resources (e.g., income) and/or lower subjective rank also report greater use of suppression. Lower social rank was associated with lower levels of perceived social support, and Blacks also reported significantly lower levels of perceived social support than Whites. Although the association between race and social support was mediated by suppression, this pathway was no longer significant after controlling for social rank. However, suppression also mediated the relationship between social rank and social support, and this effect remained significant after adjusting for race, marital status, and depressive symptoms. Although lower social status was also associated with the size and diversity of individuals’ social networks, suppression mediated status disparities in the quality – but not the quantity – of social relationships. Conclusions: Findings indicate that lower social rank is associated with poorer perceived quality of social support, partially due to greater reported use of emotional suppression in lower status persons.
community volunteers (40-58 years; 55% female; 90% white) performed an acute stress protocol, with blood samples drawn at the end of a 30-min resting baseline, a 5-min evaluative public speaking task, and a 30-min recovery period to assess acute stressor-evoked IL-6 changes. An index of childhood family disadvantage based on family assets was derived from reports of parental home and vehicle ownership, as well as number of bedrooms per child in the home across ages 1-2, 3-4, and 5-6. Hierarchical regression analyses adjusted for age, sex, education, BMI, and inflammation and thus inflammatory disease.

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90) Abstract 3080 ASSOCIATIONS BETWEEN PSYCHOSOCIAL SELF-CONCEPT AND COPING VARIABLES AND SUICIDE IDEATION IN CHRONIC PAIN PATIENTS.

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Introduction: The link between chronic pain and depression has been long established. Accordingly, chronic pain patients are at higher risk of developing suicide ideation, yet due to a high variance in symptoms in this population, the exact risk factors remain unclear. The aim of this study was to examine the prevalence of suicide ideation, as well as clinical and psychosocial predictors of these ideations, in highly chronic sufferers of pain syndromes.

Methods: 70 outpatients from two specialty pain clinics suffering from chronic pain for over three months completed self report measures to assess suicide ideation, pain and depression symptoms, and pain related disability (e.g. participation in outside activities). Psychosocial predictors examined included self-concept aspects (self concept clarity and self criticism), and coping variables (e.g. engagement in life and pain catastrophization). Patients were sufferers of chronic pain spectrum (e.g. Fibromialgia) between the ages of 25 to 70 (Mean age: 49.5); 55% of patients were married.

Results: 10% of the patients exhibited suicidal ideations. Ideators had higher levels of pain (sensory and affective), depression, self-criticism, catastrophizing, sense of burdening others, lack of belongingness, and less sense of control, outside activities, self-concept clarity, and engagement in life. Of these predictors, only two evinced unique effects: catastrophizing (O.R. = 6.77, Wald's Chi-Square = 5.35, p < .001) and participation in outside activities (O.R. = .15, Wald's Chi-Square = 5.07, p < .05). self concept clarity was strongly correlated with pain catastrophization (r=.57, p<.000), which in turn predicted higher levels of suicide ideation (r=.57, p<.000).

Conclusions: A resilient self concept may influence clinical symptoms of pain and suicide ideation. Furthermore, it may be modified through the use of coping variables. Results support the use of cognitive-behavioral treatment for chronic pain sufferers, so as to neutralize catastrophic thinking and increase behavioral activation, in turn reducing suicidal ideations.

91) Abstract 2829 EVERYDAY LIFE INFLUENCES OF NEUROENDOCRINE AND PHYSICAL ACTIVITY ON FATIGUE IN FIBROMYALGIA PATIENTS

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Background: Besides pain, fatigue is a defining and very debilitating feature in fibromyalgia syndrome (FMS). Since FMS research predominantly focuses on pain, mechanisms underlying fatigue in FMS remain unclear. It has been suggested that both neuroendocrine processes and physical activity might modulate fatigue experience. There is need of studies investigating underpinnings of fatigue in FMS, ideally using ecologically valid designs in order to ensure applicability to everyday life.

Methods: A sample of 28 female fibromyalgia patients (50±10yrs) reported fatigue levels on 5 dimensions (general fatigue, reduced motivation, reduced...
REDUCED AUTONOMIC STRESS MODULATION IN PATIENTS WITH SOMATIC SYMPTOM DISORDER (SSD)
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Introduction: In patients with somatic symptom disorder (SSD), sympathetic hyperactivity is reported to be an underlying mechanism. This study aimed to investigate autonomic stress modulation in SS patients compared to healthy controls.
Methods: Patients with SSD participated in a standardized 5-phase computerized stress test (phase 1: attentional distraction, phase 2: mental arithmetic task, phase 3: concentration task, phase 4: mental arithmetic task, phase 5: recovery, 5 min each). HRV was continuously recorded and analyzed by ANOVA (SPSS 21). Results: Compared to healthy controls, SSD patients showed significantly reduced overall levels of HRV and a lack of autonomic stress modulation during a standardized mental stress paradigm. The present data are taken from an ongoing study.
Discussion: Our results indicate reduced overall levels of HRV and impaired autonomic stress modulation in patients with SSD compared to healthy controls. These findings suggest a potential role of autonomic dysfunction in the pathophysiology of SSD.

94) Abstract 2514
HDL CHOLESTEROL AND STROKE RISK: THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS
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The association between HDL cholesterol and stroke risk is complex; it is unclear if measurement of HDL cholesterol concentration or HDL subfractions are better markers of stroke risk. We assessed the associations between HDL cholesterol concentration (per 10 mg/dL), particle number, and particle size (based on NMR spectroscopy) with stroke events (n = 174) in the Multi-Ethnic Study of Atherosclerosis (MESA). At baseline, 6769 participants (ages 45-84 years old) underwent an assessment of traditional risk factors, HDL cholesterol concentration, and HDL subfractions. HDL cholesterol concentration was positively correlated with total HDL particle number (p = .69), number of large (9.4 – 14 nm) (p = .91), and number of medium particles (8.2 – 9.4 nm) (p = .45; ps < .001). HDL cholesterol concentration was negatively correlated with number of small HDL particles (7.3 – 8.2 nm) (p = .28, p < .001). Excluding participants taking anticoagulant drugs (i.e., warfarin) and controlling for education, medication use (lipid lowering, hypertension, and hypoglycemic drugs), race/ethnicity, gender, smoking age, BMI, systolic blood pressure, total cholesterol, and triglycerides, HDL cholesterol concentration was negatively associated with stroke events (Hazard Ratio = 0.86; 95% CI 0.74 – .99, p < .05). There was a trend for HDL particle size and stroke outcome in the negative direction (HR = 0.79; 95% CI 0.61 - 1.02, p = .07). Adjusting for number of medium and number of small HDL particles, the number of large particles was negatively associated with stroke events (HR = 0.52; 95% CI 0.28 – .96, p < .05). Further adjustment for family history of heart attack did not alter estimates. There were no significant interactions between HDL composition and ethnicity for stroke events. Results from this study point to the complexity of HDL cholesterol characteristics with stroke and the need to further determine how these components influence stroke risk. Understanding associations among HDL cholesterol levels and stroke risk can lead to better targeting of disease prevention efforts and improved public health promotion.
AN EXAMINATION OF POSSIBLE PREDICTORS OF RELATIVE ERROR IN MEAL CALORIE CONTENT ESTIMATION
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Background: People are notoriously bad, even experts, at estimating calorie content of meals without a direct measurement tool. An inability to correctly estimate the calorie content of meals may be a contributing factor to excessive caloric intake. However, the factors that contribute to poor calorie estimation are not fully understood. Method: Two hundred sixty-nine participants had their BMI, body fat percentage, and waist-to-hip ratios calculated and were allowed to eat ad libitum in a cafeteria setting. After meal completion, participants estimated their caloric intake, either with (CI given) or without (CI not given) the aid of a menu containing caloric information. Participants’ total caloric intake was then calculated. Results: A linear regression analysis was used to examine the effect of BMI, body fat percentage, waist to hip ratios, menu presence and meal caloric content on relative calorie estimation error. Relative error was significantly predicted by menu presence, \( \beta = .117, t(262) = 2.14, p < .05 \), meal caloric content, \( \beta = -.454, t(262) = -8.14, p < .001 \), and waist to hip ratios, \( \beta = -.194, t(262) = 3.188, p < .005 \). Body fat percentage and BMI did not significantly predict relative estimation error. The overall model explains a significant proportion of variance in estimation error, \( R^2 = .253, F = 17.71, p < .001 \). An analysis of the bivariate correlations showed that kcal and menu presence were negatively correlated with relative estimation error (\( r = -0.56 \) and \( r = -0.27 \), respectively). However, waist-to-hip ratio did not correlate significantly with relative error and the direction is in an unexpected direction (\( r = 0.03 \)). Conclusion: The strongest predictor of relative estimation error in calorie estimation was meal caloric content, i.e., the more calories eaten, the more caloric intake was underestimated. When a menu was present, underestimation was reduced. While waist-to-hip ratio was a significant predictor in the multiple regression, it had a small weight and did not have a significant bivariate correlation with relative estimation error. While a menu will help reduce caloric underestimation, this reduction will be tempered by the amount of calories eaten.

ARE INDIVIDUALS WITH COMORBID DEPRESSION AND GENERALIZED ANXIETY DISORDER AT INCREASED RISK OF CONCURRENT DIABETES AND HEART DISEASE? EVIDENCE FROM A POPULATION-BASED STUDY.
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Depression seems to be bi-directionally associated with diabetes and heart disease. Research on the associations between these chronic conditions and generalized anxiety disorder (GAD), a condition often comorbid with depression, however, is mixed. Depression and GAD may have additive effects – examining the role of comorbidity may further our understanding of the association between GAD, depression, and chronic illness. We examined the associations between major depression and GAD with diabetes and heart disease using data from the 2012 Canadian Community Health Survey – Mental Health (n = 14 976). We hypothesized that depression-GAD comorbidity would be associated with the highest odds of diabetes and heart disease than non-comorbid depression or non-comorbid GAD, and that results would be maintained after accounting for socio-demographic factors and health-related factors. 12-month depression and 12-month GAD were assessed with the World Mental Health — Composite International Diagnostic Interview 3.0. Diagnoses of diabetes or heart diseases made by a health care professional were the outcome variables. Covariates included age, sex, education, race, marital status, smoking, alcohol use frequency, and body mass index. In fully-adjusted models, we found that comorbidity increased the likelihood of concurrent diabetes but not heart disease. Specifically, compared to those without GAD or depression, the odds of diabetes were more than twofold higher for those with comorbidity (OR = 2.21, 95% CI [1.34 – 3.67], \( p < .002 \)), whereas the odds of diabetes were not significantly greater for the non-comorbid conditions. Conversely, compared to those without GAD or depression, the odds of heart disease were almost threefold higher for those with depression only (OR = 2.95, 95% CI [1.55 – 3.55], \( p < .001 \)), whereas the odds of diabetes were not significantly greater for those with GAD only or depression-GAD comorbidity. These findings suggest that individuals with comorbid depression and GAD may be at a particularly increased risk of diabetes. Comorbidity, however, does not seem to affect the likelihood of heart disease, but rather depression alone seems to increase the likelihood of concurrent heart disease.

HIGH FREQUENCY HEART RATE VARIABILITY ASSOCIATED WITH CEREBRAL LATERALIZATION MEASURED AS HANDEDNESS
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Objective: Previous animal and human research suggests that cerebral regulation of cardiac vagal control is preferentially lateralized to one cerebral hemisphere, but findings have been mixed as to whether the right or left hemisphere is predominant. Handedness is an index of cerebral hemispheric dominance. We hypothesized that if cerebral laterality for cardiac vagal control exists, cerebral dominance on that side would result in enhanced cardiac vagal control. To test this hypothesis, we examined the relationship between handedness and high frequency heart rate variability (HF HRV), an index of vagal heart rate control, in a large nationally representative dataset. Method: We utilized data from adults (aged 35–86) enrolled in the Midlife Development in the United States II (MIDUS II) Biobehavioral Project (N=1,153). Handedness was assessed using a modified version of the Edinburgh Inventory and a Laterality Quotient (LQ). Based on the LQ, strong handedness was evaluated. HF HRV was derived from an electrocardiogram recorded during seated rest. Both measures were collected during a 1.5 day visit to one of three MIDUS clinical research centers. Results: There was no effect of handedness, or of strong handedness, on HF HRV in unadjusted analysis, and also after stratification by sex. In the analysis we controlled for age, BMI, and gender. Conclusions: There was no effect of handedness, or of strong handedness, on HF HRV. Possible interpretations of this finding are: (1) cerebral hemispheric dominance is unrelated to lateralization of cerebral control of efferent vagal cardiac innervation (2) integration of descending control in brainstem cardiovegetative centers obscures the effect of cerebral dominance on lateralization of control of vagal efferents.

COPING FLEXIBILITY FOLLOWING BEREAVEMENT OR DIVORCE MAY NOT BE PREDICTIVE OF PHYSIOLOGICAL PARAMETERS
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Individual responses to stressful life events (e.g. bereavement, divorce) impact mental and physical health. Recent research suggests that coping flexibility, or the flexible command of multiple coping strategies, may be more adaptive than use of traditionally “beneficial” strategies (e.g. emotional reappraisal; Bonanno & Burton, 2013). Based on plasticity theory, coping flexibility equips individuals to deal effectively with stressful life events and is associated with long-term adjustment despite including seemingly opposing strategies (e.g. working through a stressor vs. emotional avoidance; Becker et al., 2011). In the current study, we conceptualize coping flexibility as broad repertoire, the implementation of a wide range of coping strategies (Cheng, 2014). Findings on broad repertoire suggest a small positive effect on mental health outcomes (\( r = 0.12 \)) but effects on physical parameters are unknown. We examined three measures of broad repertoire predicting immunological and physiological parameters in bereaved women (N=20) and divorced adults (N=133). The bereaved sample completed a coping measure with 24 items from the COPE scale (6 subscales: Acceptance, Mental Disengagement, Religious coping, Denial, Instrumental social support) and 8 emotional approach coping items (Emotional processing and Emotional expression; Stanton et al., 2000), grief scale (ICG-R), high frequency heart rate variability (HF-HRV), and salivary IL-1beta and TNFp2. Divorced individuals completed the Brief COPE (14 subscales), sympathetic and diastolic blood pressure, and HF-HRV. Three measures of broad repertoire were calculated: COUNT (coping repertoire size, as the number of endorsed strategies), AVERAGE (general use of coping repertoire, as the average of subscale means), and VARIABILITY (within person variability, as the mean of all subscale standard deviations). After controlling relevant variables for each outcome (e.g. age, time since event, BMI), the COPE variables did not predict outcomes in either sample (\( p > 0.05 \)). Contrary to theory, these data suggest that coping flexibility, conceptualized solely as broad repertoire, is not associated with grief, immunological, or physiological parameters and that broad repertoire describes flexible coping without reference to context; how, when, and under what circumstances strategies are deployed remains unknown. Consequently, broad repertoire may fail to differentiate effective and ineffective strategies across situations (Moser & Annis, 1996). Future research should include context.
LIFESTYLE MEDIATION OF THE ASSOCIATION BETWEEN CRP AND DEPRESSIVE SYMPTOMS IN NON-OBSTRUCTIVE CORONARY ARTERY DISEASE, FINDINGS FROM THE TWEESTED MILD STENOSIS TWIST STUDY

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Background: Depressive symptoms are predictive of acute coronary syndromes and poor prognosis in coronary artery disease (CAD). However, biobehavioral processes in non-obstructive CAD are not well understood. The aim of the present study is to establish the association between depressive symptoms and anxiety with inflammation markers involved in CAD progression, and to identify mediating factors.

Methods: Patients with non-obstructive CAD (angiographically or CT-scan detected stenosis ≤60% or wall irregularities, N=414, mean age 62±9.3, 52% women) completed questionnaires and provided blood samples (the TweeSteden Mild Stenosis Study: TWIST). Anxiety and depressive symptoms were measured using the hospital anxiety and depression scale (HADS). Blood samples were analysed for hs-CRP and fibrinogen. Statistical analyses involved multivariate regression analysis, adjusting for covariates. Mediating effects of lifestyle factors (BMI, smoking, physical activity) were assessed using the INDIRECT bootstrap method.

Results: Depressive symptoms were positively associated with hs-CRP level (β=.135, p=.009), but not fibrinogen (β=.075, p=.153), adjusted for age and sex. No associations were observed for anxiety with hs-CRP or fibrinogen (p>0.10). Mediation analysis showed that the association of depressive symptoms with hs-CRP was mediated via body mass index (BMI) and smoking, but not physical activity.

Conclusion: Among patients with non-obstructive CAD, depressive symptoms were associated with increased hs-CRP levels, mediated by BMI and smoking. Because acute coronary syndromes can occur in the setting of minimally obstructive CAD, these findings provide an important biobehavioral pathway for the association between depression and acute coronary syndromes.

MEDIA'S IMPACT ON IDIOPATHIC ENVIRONMENTAL ILLNESS WITH ATTRIBUTION TO ELECTROMAGNETIC FIELDS ILLNESS AND DEPRESSIVE SYMPTOMS IN NON-OBSTRUCTIVE CORONARY ARTERY DISEASE, FINDINGS FROM THE TWEESTED MILD STENOSIS TWIST STUDY.

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Background: Idiopathic environmental illness with attribution to electromagnetic fields (IEI-EMF) is a condition in which individuals believe they experience non-specific health complaints due to exposure from electromagnetic fields (EMFs) produced by things like cell phones, computers, etc. Interestingly, prevalence rates vary greatly with estimates as high as 13.5% in Iran. Despite being virtually unheard of in Iran, EMF is a condition that is increasing in the West. Little research has been done to understand the etiology of this condition. In previous research, we have shown that biased media reports, specifically the news media, can influence the perception of EMF by the public.

Aim: The present study examined whether watching a biased news report would influence participants’ perception of EMFs as causing IEI-EMF symptoms as well as their ability to recall neutral, technology-related, and symptom words.

Methods: Thirty undergraduate students from Biola University first rated 18 neutral, 18 technology-related, and 18 symptom words for valence, arousal, and dominance. Then half of the participants watched a balanced news report that presented evidence for and against EMFs causing symptoms in IEI-EMF sufferers while the other half watched an edited version of the same news report which only presented evidence for EMFs as a causal factor. Participants then completed an IEI-EMF perception questionnaire, a surprise recall test, rated the same words, and finally a packet of psychological questionnaires.

Results: Participants who watched the biased video showed a positive correlation between their recall of technology-related and symptom words (r=.518, p=.048). Those who watched the neutral video did not show a similar correlation.

Conclusions: Biased media may influence illness and symptom perception as well as word association. Future research should explore the role of repeated media exposure on illness perception as well as whether media reports can influence other cognitive factors, such as attention.

DIURNAL CORTISOL RHYTHM AND SYSTEMIC NOREPINEPHRINE PREDICT GYNECOLOGIC CANCER SURVIVAL

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Cortisol and norepinephrine (NE) are two of the primary hormones produced by the body in response to a stressor. Poorly coordinated diurnal cortisol rhythms predict early mortality in metastatic breast, renal, and lung cancer. NE is prognostic for renal disease survival, while drugs that block catecholamines (i.e., beta-blockers) improve survival in breast and epithelial ovarian cancer patients. Allostatic Load (AL), an index of cumulative stress, has been shown to predict mortality in older adults. The prognostic value of these major stress hormones have not been tested in gynecologic cancer. In a cross-sectional study, we investigated the relationship between AL and gynecologic cancer survival.

Methods: In this study, we hypothesized that cortisol, NE, and AL would be elevated in gynecologic cancer patients compared to controls. We also hypothesized that cortisol, NE, and AL would be positively correlated with each other and negatively correlated with survival.
density lipoprotein, blood pressure, and waist circumference. Nine years after
assessment, survival data were obtained for 39 patients. Cox Proportional
Hazards analyses adjusted traditional prognostic indicators (age, cancer type,
and stage) in tests on survival calculated from date of diagnosis (DD) and from
study entry (SE). Women with relatively flattened diurnal cortisol rhythms had
shorter survival (p=0.049; DD; p=0.91; SE; two-tailed). High NE emerged as an
even stronger predictor of early mortality (p=0.031; DD; p=0.054; SE; two-tailed).
AL was not a prognostic indicator. Findings extend and support research in
breast, lung, and renal cancer showing that disrupted diurnal cortisol rhythms
predict early mortality. This work provides the first evidence that high urinary
NE levels predict shorter survival in human gynecologic cancer. Future research
should continue to focus on potential mechanisms by which these two major
stress hormones might influence cancer progression, and/or serve as markers of
other biobehavioral factors with effects on tumor growth.

103) Abstract 2752
EFFECTS OF BEHAVIORAL STRESS AND ANGIOTENSIN II
RECEPTOR INHIBITION ON DAMAGE-ASSOCIATED MOLECULAR
PATTERNS
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Georgia Regents University Augusta, Augusta, GA, Suniti Mathur, PhD,
Biostatistics, Georgia Regents University, Augusta, GA, Jennifer Sullivan, PhD,
Clinton Webb, PhD, Cameron G. McCarthy, MS, Advise Ergul, PhD,
Physiology, Gregory Harshfield, PhD, Georgia Prevention Institute, Georgia
Regents University Augusta, Augusta, GA
Background: Our studies demonstrated that approximately 1-in-3 African-
Americans (AAs) increase renal sodium retention during behavioral stress. This
adds a volume component to the blood pressure which remains elevated until the
volume expansion diminishes. We further demonstrated sodium retention increases
with age, is associated with the premature development of blood
pressure-related target organ damage, and is blocked by an angiotensin receptor
blocker (ARB). The purpose of this preliminary study was to provide evidence
that the innate immune system contributes to this response pattern. Methods: We
measured changes in circulating concentrations of damage-associated molecular
patterns (DAMPs), specifically high mobility group box 1 (HMGB) and
mitochondrial DNA (mtDNA), in response to a behavioral stressor in equal
numbers of males and females from samples obtained previously in our studies
in youths (n=10, aged 16.6±3.1) and our study in adults while on treatment with an
ARB (n=12, age 40.5±7.6 yrs.). Results: Consistent with our hypothesis, DAMP levels of HMGB, cytochrome B (CytB), nicotinamide adenine
dinucleotide (NADH), and NADH dehydrogenase subunit 6 (ND6) significantly
increased during stress (Table). Conversely, the levels of CytB, NADH, and
ND6 in those with ARB treatment significantly decreased during stress, as
shown in the example for ND6 in the figure. The levels of HMGB decreased as
well, but did not reach significant level. Conclusion: These findings provide
proof of concept that the innate immune system contributes to this response
pattern, an effect that can be prevented by suppression of Ang II.

### Table: Mean differences at pre- and post-stress in
untreated vs treatment group.

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Values are expressed as means ± SD. All results are based upon paired sample
t-tests.

104) Abstract 2860
THE STRESS-REDUCING EFFECT OF MUSIC LISTENING IN DAILY LIFE IS DETERMINED BY SOCIAL CONTEXT FACTORS
Alexandra Linnemann, M.Sc., Jana Strahle, PhD, Urs M. Nater, PhD,
Psychology, University of Marburg, Marburg, Hesse, Germany
Background: Music listening in daily life is associated with a stress-reducing
effect. One of the main reasons for music listening is ‘relaxation’, which
predicts the stress-reducing effect of music listening (Linnemann et al., in
preparation). Another important reason for music listening in daily life may be
that music has a social function in that it facilitates social contact. Against
the background that social support has a stress-buffering effect, we examined
whether the stress-reducing effect of music listening would be further enhanced
when other people were present while listening to music.
Method: The relationship between daily music listening, social context, and
stress was examined in 55 healthy university students by means of ecological
momentary assessment. Participants rated their perceived stress levels and music
listening behavior, reasons for music listening, and presence of others six times
day for 7 consecutive days. Each assessment was accompanied by collecting
saliva samples for the later analysis of salivary cortisol (as marker for the
hypothalamus-pituitary-adrenal axis, HPA) and salivary alpha-amylase (as
marker for the autonomous nervous system, ANS).
Results: Hierarchical linear modeling revealed that the stress-reducing effect
of music listening varied depending on the social context. When listening to music
alone, only music that has been listened to with the intention to relax predicted
lower subjective stress (p = .004) and lower cortisol secretion (p < .001). When
listening to music with others present, lower subjective stress ratings, lower
cortisol levels, and higher alpha-amylase activity (all p < .001) could be observed,
independent of the reasons for music listening.
Conclusion: Different mechanisms might underlie the stress-reducing effect
of music listening, depending on the social context of the listening situation.
Whereas solitary music listening is only stress-reducing when music is listened
to with the intention to relax, music listening in the presence of others leads to
attenuated subjective stress ratings, a down-regulation of HPA activity, and an
activation of ANS. These results indicate that the social context of the listening
situations should be kept in mind when developing music interventions for stress
reduction purposes.

105) Abstract 2864
DIFFERENTIAL IMPACT OF TYPE OF EARLY ADVERSITY ON THE CORTISOL AWAKENING RESPONSE (CAR)
Allison B. Asarch, M.A., Kimberly A. Dienes, Ph.D., Psychology, Roosevelt
University, Chicago, IL
Early adversity has been associated with dysregulated cortisol secretion with
varying results, as some researchers have found that adverse experiences in
childhood are associated with a significantly higher cortisol awakening response
(CAR; Engert et al. 2011; Gonzalez et al. 2009; Weissbecker et al. 2006), while
others have shown that early adversity is associated with a significantly lower
CAR (Heim et al. 2009; Meinlschmidt & Heim 2005). Few researchers have
explored how the type of adversities experienced in childhood the impact of type
of adversity on the relationship between early adversity and cortisol (Van der
Vegt et al., 2009). This study attempts to examine the influence of type of
adversity on the relationship between early adversity and the CAR. The two
types of adverse events are victimization (e.g. abuse, bullying) and non-
goal of this study was therefore to measure these associations in normal male and female participants.

Methods: Ninety-two healthy adults (53% women) between ages 18 and 35 (M = 25.11) were recruited and exposed to the Trier Social Stress Test (TSST). Seven salivary cortisol samples were transformed into area under the curve with respect to ground (AUCg) scores representing stress reactivity. MW was measured using the Imaginal Processes Inventory Short Form (IIPS), comprised of three subscales: Positive-Constructive daydreaming (PCD), Guilt-Fear of Failure daydreaming (GFD), and the Poor Attentional Control (PAC) subscales. Gender-roles were also assayed by using the Bem Sex-Role Inventory which provides masculinity and femininity subscales. Pearson correlations and ANOVA were employed.

Results: Our analyses revealed that women displayed higher PAC scores than men. In terms of gender-roles, femininity was positively associated with PC and GFD scores, while masculinity was negatively associated to PAC scores. Our main analyses showed that cortisol reactivity (AUCg) was negatively correlated with the PCD scores, was higher in men, and showed a trend towards a negative correlation with femininity.

Conclusion: Our novel findings suggest that both sex and gender influence the content and propensity to MW. Interestingly, positive MW was related to lower cortisol reactivity. These results highlight the importance of using sex and gender-based perspectives to understand the biological correlates of MW, particularly as it relates to the manifestation and maintenance of depressive tendencies.

108) Abstract 2579
COMPARING CATEGORICAL AND DIMENSIONAL MEASUREMENT OF ANXIETY AND DEPRESSION IN ASSOCIATION WITH C-REACTIVE PROTEIN LEVELS IN CARDIAC PATIENTS
Darren A. Mercer, PhD(c), Blaine Dito, PhD, Psychology, McGill University, Montreal, Quebec, Canada, Kim L. Lavoie, PhD, Psychology, Université du Québec à Montréal, Montreal, Quebec, Canada, André Arsenault, MD, Médecine Nucléaire, Hôpital Jean-Talon, Montreal, Quebec, Canada, Simon L. Bacon, PhD, Exercise Sciences, Concordia University, Montreal, Quebec, Canada

Objectives: A growing body of research examines associations of anxiety and depression with elevated C-reactive protein (CRP) levels, a known marker of inflammation and risk factor for cardiovascular disease (CVD). However, methodologies employed in these studies remain very heterogeneous, as depression or anxiety may be viewed as a categorical diagnosis, a continuous measurement of clinical/subclinical symptom scores, or a proxy such as prescription records. To clarify this literature, this study compared associations of categorical and dimensional measurements of anxiety and depression with CRP in cardiac patients.

Methods: A sample of outpatients referred for myocardial perfusion single photon emission computed tomography stress testing at the Montreal Heart Institute was recruited (n=295). Patients were administered the PRIME-MD, a brief psychiatric screening interview to determine the presence or absence of a mood or anxiety disorder (by DSM-IV-TR criteria). Patients also completed the Brief Depression Inventory-II (BDI-II), the trait anxiety scale of the State-Trait Anxiety Inventory (STAI-I), and a sociodemographic and medical history questionnaire. During an endothelial function test, serum samples were collected to assess CRP levels.

Results: Elevated levels of CRP were found to be associated with a diagnosis of mood disorder by PRIME-MD criteria (β=1.02, t=2.06, p=.04). However, there was no association with the continuous measure of depressive symptom scores by BDI-II (β=.02, t=4.55, p=.66). Levels of CRP were not found to be associated with anxiety symptom scores measured by the STAI-I (β=.51, t=−5.33, p=.74) or diagnosis of anxiety disorder by PRIME-MD criteria (β=.56, t=1.05, p=.29). All analyses were controlled for age, sex, smoking, CVD, physical activity, antipatelet, hyperlipidemic, ACE inhibitor, angiotensin receptor blocker, calcium channel blocker, and anti-depressant medication.

Conclusions: CRP is shown to be associated with diagnosis of mood disorder, but not a continuous measure of depressive symptoms. These is consistent with research published by our lab suggesting that endothelial function, another risk factor for CVD, shows the same association only with mood disorder diagnosis. It is possible these adverse associations only occur when depression reaches clinically significant levels warranting a diagnosis, but are not seen in sub-clinical levels of depressive symptoms measured by the BDI-II. Neither diagnosis of anxiety disorder nor continuous measure of anxiety symptoms were related to CRP levels.
INFLUENCE OF CLUSTER A, B AND C PERSONALITY TRAITS ON INTERPERSONAL DIFFICULTIES, DEPRESSIVE SYMPTOMS, ANXIETY, DISTRESS AND QUALITY OF LIFE AND THEIR IMPROVEMENT AFTER A MULTIDISCIPLINARY, MULTIMODAL PSYCHOTHERAPY

Mareto E. Schindler, MD, Patrick Figlioli, M Sc, Daniel Horvat, MD, Anne-Line Jordi, MD, Marcel Färber, MD, Psychosomatic and Psychotherapeutic Medicine, Lindenhospital, Bern, Bern, Switzerland

The quality of life, depressive symptoms, anxiety, distress and interpersonal difficulties of patients with severe depressive, anxiety, eating, somatoform, personality and trauma related disorders improve during a multidisciplinary, multimodal psychotherapeutic treatment. We explored whether cluster A, B or C personality traits affected the degree of symptoms at the beginning and/or the outcome at the end of treatment.

From 6/2006 until 8/2014 761 patients (mean age 32.2, range 15.1-71.3; 79.5% female) were treated as in-patients and/or in the day clinic of the Department of Psychosomatic and Psychotherapeutic Medicine of a non-profit private hospital. Personality traits, interpersonal difficulties, depressive symptoms, anxiety, distress and quality of life were assessed at the beginning and at the end with the PSSI, IIP (total score), BSCI (GSI), HADS (Anxiety and Depression score) and the SF-36 (mental component summary score). Personality traits assessed with the PSSI were summarized as belonging to cluster A (odd, eccentric personality traits; 8 % of all patients, 46.7% female), B (dramatic, emotional or erratic personality traits associated with interpersonal difficulties, distress, and interpersonal exacerbation of a range of symptoms in a post medical center, New York, NY) and C (anxious or fearful personality traits; 17.5%,78% female), or none N (59.9%, 83% female).

Personality traits were associated at the beginning with interpersonal difficulties (p<.05, N=761, A>B, C>B), depressive symptoms (p<.05, N=761, A>B, C>B), anxiety (p<.05, N=761, A>B, C>B) and the mental component of quality of life (p<.05, N=761, A>B, C>B). There was a significant improvement of interpersonal difficulties (p<.05, depressive symptoms (p<.05, anxiety (p<.05, distress (p<.05) and quality of life (p<.05) during treatment. Personality traits predicted the improvement for distress (p<.05, N=761, A>B) and depressive symptoms (p<.05, N=761, A>B). On the other hand, personality traits affected the degree of symptoms at the beginning and/or the outcome only for distress and depressive symptoms.

110) Abstract 2753

EFFECTS OF GENDER AND GROUP GENDER COMPOSITION IN A SOCIAL EATING LABORATORY EXPERIMENT

Bjoern Horing, Ph.D, Phillip W. Jasper, M.S., Psychology, Adam W. Hoover, Ph.D., Electrical and Computer Engineering, Eric R. Muth, Ph.D., Psychology, Clemson University, Clemson, SC

Background and objective: The gender composition of a group has been shown to differentially affect eating behaviors of females and males. However, research examining the effects of gender interactions on social eating behavior is limited. We explored these effects in a post-hoc analysis of an eating experiment employing mixed- and same-gender groups.

Methods: 56 participants (34 F) ate macaroni and cheese ad libitum in groups of four. Group gender composition was: FFFF, FFFM, FMFM, FMMM and MMMM. Using a wrist-worn device that counts bites, and scales hidden under the plates, we derived: Consumption (g), EatingRate (g/sec), BiteSize (g/bite) and Delay after the first person stopped eating (sec). Participants rated pre-meal Satiety, meal Enjoyment (0-100), and reported social relations with members of their group (Familiarity). Linear mixed-effects models were used with Group as random effect, and Gender and Composition as fixed effects. For predictor analyses, moderated multiple regressions were used. All results are mean±SD.

Results: Composition had a significant effect on Consumption (p=0.04), with the MMMM group consuming 351±100g compared to all other groups 135±71g. Increasing male Composition affected Delay (p=0.017), with the shortest Delay in the FFFF group (16±2sec) and longest Delay in the FMMM group (68±8sec). Composition significantly impacted Enjoyment (p=0.029), with the lowest Enjoyment in the FMMM Composition (48±16) compared to all other groups (71±11). Gender moderated the effect of Satiety on Consumption (p<.001, partial effect of Gender*Satiety=0.022) such that lower Satiety predicted higher Consumption in males only (p=0.005). Familiarity could only be partially considered with seating order, perhaps increasing a facilitating effect on Consumption and BiteSize in males but not females.

Conclusion: Group gender Composition played a significant role regardless of the gender of individual participants (no Gender*Composition interaction). Male presence appears to facilitate Consumption and ameliorate social pressure to stop eating (Delay). Familiarity has been shown to not affect social modeling in females, which corresponds to our current results. It is worthwhile to further investigate these effects in dedicated studies.

111) Abstract 2849

AMBULATORY ASSESSMENT OF STRESS: A TWO-STUDY EXPERIMENT EVALUATING THE ROLE OF QUESTION FORMAT ON SELF-REPORTED DAILY STRESSORS

Kristin Heron, Ph.D., Psychology, Old Dominion University, Norfolk, VA, Stacey Scott, Ph.D., Aging Studies, University of South Florida, Tampa, FL, Robin Everhart, Ph.D., Psychology, Virginia Commonwealth University, Richmond, VA, Kurt Johnson, Ph.D., Survey Research Center, Pennsylvania State University, University Park, PA

Stress is known to play a critical role in the onset and exacerbation of a range of mental and physical health outcome and disease processes. With advances in mobile technology, more studies are using ambulatory assessment methods (e.g., Ecological Momentary Assessment [EMA]) to study daily stress and its impact on health and behavior. Although self-reported exposure to stressors is often included in EMA studies, little attention has been given to its measurement. The present study embedded an experimental design into two ongoing EMA studies to evaluate the effect of question format on responding. Two commonly used EMA stress question formats were used: dichotomous yes/no (“Did anything stressful happen?”) and a multi-select list (“Which of the following stressful events happened?”). Participants in both studies completed EMA using a customized smartphone survey app for 2 weeks with one question format presented each week. A within-person design was used with participants randomized to question order, which was counterbalanced across weeks. Study 1(S1) randomized 39 urban, African American families with a child with asthma. The primary caregiver (Mage=38, 90% women) reported stressors daily as part of a quality of life study. Study 2 (S2) randomized 26 overweight/obese adults (Mage=35, 70% women), who completed 4 daily stressor reports as part of a physical activity study. Compliance was very good (S1: 75% of surveys completed, S2: 84%). Participants in both studies reported more stressors when provided a list vs. yes/no question (S1: 48% vs. 25% of assessments, S2: 22% vs. 17%). Question format did not influence stressor severity ratings (p>0.05). The question order appeared to matter; participants receiving the list format first reported more stressors in response to the dichotomous question than participants who saw the dichotomous question first (S1: 33% vs. 21% of assessments; S2: 20% vs. 14%), likely due to carryover effects (i.e., remembering the list). Findings suggest the rate of self-reported daily stressors may be due, in part, to question format; higher rates were reported when using a list of events than a dichotomous response format. This pattern was observed across two studies using different samples and designs. To our knowledge this is the first experimental investigation of the effect of EMA question format on self-report stress measures. Findings have implications for the design of EMA study protocols, which often assess the impact of stress on a range of health behavior and psychosomatic disease processes.
characteristics (beta = 0.22, p = 0.003). In Step 2, perceived ED threat (beta = 0.41, p < 0.001) attenuated the association of negative social support-related anxiety with acute stress to non-significance (beta = 0.13, p = 0.06).

Conclusion: Anxiety related to negative social support predicts subsequent acute stress disorder symptoms in cardiac patients, and the association is mediated by increased perception of threat during ED treatment for the cardiac event. Patients who are with someone who makes them anxious while in the ED may perceive the event as more threatening, which thereby increases their likelihood of developing acute stress – and potentially PTSD – from their ED experience.

Figure 1

114) Abstract 2700
TRANSCENDENTAL MEDITATION® AND PSYCHOTROPIC MEDICATION USE AMONG ACTIVE DUTY MILITARY SERVICE MEMBERS WITH ANXIETY AND PTSD
Vernon A. Barnes, PhD, Georgia Prevention Institute, Georgia Regents University, Augusta, GA, Andrea Monto, MSW, Jennifer J. Williams, MSW, John L. Riggs, MD, Traumatic Brain Injury Clinic, Eisenhower Army Medical Center, Augusta, GA
The objective of the study was to determine whether the regular practice of Transcendental Meditation (TM) decreased the need for psychotropic medications required for anxiety and post-traumatic stress symptom management and increased psychological well-being. Records of 74 military Service Members with documented post-traumatic stress or Anxiety Disorder Not Otherwise Specified were followed in a chart review. Of those Service Members, 37 practiced TM and 37 did not. At one month, 83.7% of the TM group stabilized, decreased or ceased medications and 10.8% increased medication dosage, compared to 59.4% of controls that showed stabilizations, decreases or cessations and 40.5% that increased medications (p<.03). A similar pattern was observed after two (p<.27), three (p<.002) and six months (p<.34). There was a 20.5% difference between groups in severity of psychological symptoms after six months, that is, the control group experienced an increase in symptom severity when compared the group practicing TM. These findings suggest the benefit of TM as an adjunctive treatment modality in military treatment facilities.

115) Abstract 2816
SUBJECTIVE SOCIAL STATUS PREDICTS STRESS-INDUCED SKIN BARRIER RECOVERY
Melissa R. Fales, M.A., Psychology, University of California, Los Angeles, Los Angeles, California, Ben Shalman, B.A., Christine Dunkel Schetter, Ph.D., Theodore F. Robles, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA
Across human and nonhuman social species, social status is associated with stress-related diseases. In humans, lower subjective social status (SSS)—the psychological perception of one’s position within the social hierarchy—is associated with poorer health. Related research on social interaction and immunity in nonhuman dominance hierarchies suggests that repeated experiences of social threat (e.g., low social status) decrease glucocorticoid sensitivity, which potentially primes an inflammatory response to injury and could lead to faster wound healing. Given the precedent in the animal literature, we tested whether lower SSS individuals recovered more quickly following stress-induced skin barrier disruption, and also explored potential gender differences. Dating couples (N=34) reported their SSS relative to individuals in the U.S. using the MacArthur ladder scale. During two laboratory visits, normal skin barrier function was disrupted using a tape-stripping procedure, followed by a discussion of personal concerns in one visit and relationship problems in the other (counterbalanced). We assessed skin barrier recovery by measuring transepidermal water loss. Among women, multilevel modeling showed that lower SSS predicted faster skin barrier recovery, regardless of discussion type. Among men, lower SSS predicted faster skin barrier recovery during the relationship problems task. However, lower SSS predicted slower skin barrier recovery during the personal concerns task. Existing models of SSS do not address gender differences. One possibility is that men and women of low SSS subjectively experience relationship discussions differently. During the personal
concern discussion, participants were expected to provide support to their partner. This may have been more distressing to low SSS men than women, regardless of SSS, and thus delayed skin barrier recovery. Low SSS men might have fewer opportunities to provide support given their lower position in the social hierarchy. Furthermore, men are socialized to be masculine, and may be relatively uncomfortable providing support. Differential exposure, coupled with socialized gender roles, may inform our understanding of these findings.

116) Abstract 3106
CANCER CAREGIVING STRESS AND BIOMARKERS OF CHRONIC ACTIVATION OF SYMPATHETIC NERVOUS SYSTEM: PRELIMINARY REPORT

Youngmee Kim, PhD, Psychology, Charles S. Carver, PhD, Department of Psychology, University of Minnesota, Minneapolis, MN.

Evidence linking caregiving stress of family members of cancer patients to their long-term poor physical health has been accumulating in recent years. Unknown is the extent to which early cancer caregiving stress is manifested in biological markers representing chronic activation of the sympathetic nervous system (SNS), which is known to be a strong predictor of long-term morbidity and mortality. This study examined cortisol, dehydroepiandrosterone-sulfate (DHEA-S), and alpha-Amylase (AA) obtained from saliva samples as promising candidates for non-invasive assessment of SNS activity. A subsample of family caregivers of cancer patients who are newly and recently diagnosed with colorectal cancer from a larger longitudinal study was included in the preliminary analyses (47 years old; 75% female; 65% Hispanic). Caregivers collected saliva at wake-up and bedtime for two consecutive days. Cortisol, DHEA-S, and AA from the saliva sample were assayed, which served as the primary outcomes. Perceived stress from cancer (Perceived Stress Appraisal) and family obligation (Familyism Scale) were primary predictors. Age and gender were covariates. Data reported here is from the initial assessment that was about 3-month post-diagnosis. Multivariate general linear modeling revealed that awakening AA was positively related to perceived stress (B=58.49, p<.007) and marginally negatively with family obligation (B=-42.37, p<.09). Awakening cortisol and DHEA-S were not significantly related to proposed predictors. Bedtime DHEA-S was marginally negatively related to family obligation (B=-1.08, p<.08). Bedtime cortisol and AA were not significantly related to proposed predictors. Findings suggest that the stress evoked by the cancer diagnosis in the family is substantial, readily manifested in biomarkers that are typically related to chronic activation of SNS. Alpha-Amylase at awakening and DHEA-S at bedtime were sensitive to psychological caregiving-related stress factors during the time of diagnosis and treatment, highlighting the need for further investigating the differential role of caregiving stress in chronic activation of SNS and long-term health outcomes of family caregivers.

117) Abstract 2016
ASSOCIATION BETWEEN ASTHMA CONTROL, DEPRESSION, AND ANXIETY: AN ANALYSIS OF THE MONTEFIORRE ASTHMA CENTER’S SEVERE ASTHMA PATIENTS

Sapna Joshi, M.B., B.A., Polish University of Martial Arts, Internal Medicine, Albert Einstein/Montefiore Medical Center, Bronx, New York, Jaryn Henner, M.D., Jennifer Too, M.D., Denisa Ferestrau, M.D., Sunit Jariwala, M.D., Internal Medicine, Albert Einstein/Montefiore Medical Center, Bronx, NY

Rationale: Asthma morbidity has been associated with anxiety and depression, although there is a lack of data surrounding the link between the Asthma Control Test (ACT) and Patient Health Questionaire-4 (PHQ-4), which is a 4-item questionnaire that measures depression and anxiety. This study aims to further evaluate this association in an area with high asthma prevalence, the New York City borough of the Bronx.

Methods: We reviewed 237 charts of severe asthmatics at Montefiore’s Asthma Center (41 males, 196 females, mean age of 50.7). Patient criteria included at least one asthma-related emergency department (ED) visit or asthma-related hospitalization within the last 12 months. For each patient, we reviewed ACT score, number of asthma ED visits in the past year, and PHQ-4 score at the initial Asthma Center visit.

Results: Our analysis revealed that patients with an ACT score ≥ 19 had a higher (i.e. increased depression, anxiety) mean PHQ-4 score than when ACT ≥ 19 (3.92 versus 2.69, p = 0.016). Frequent asthma ED visits (≥ 3 in the past year) were also associated with higher mean PHQ-4 scores than < 3 asthma ED visits in the past year (4.51 versus 3.28, p = 0.018). ACT and PHQ-4 were found to have a negative Spearman correlation (r = -0.233, p = 0.001).

Conclusion: There is evidence of an association between depression and anxiety in severe uncontrolled asthma patients in the Bronx. This relationship requires further investigation as it may have therapeutic value in the prevention and management of asthma exacerbations.

118) Abstract 2693
AUTONOMIC NERVOUS SYSTEM FUNCTION IN THE ANTICIPATION OF PAIN IN ADOLESCENT NON-SUICIDAL SELF-INJURY

Julian Koenig, Dr., Psychology, The Ohio State University, Columbus, Ohio, Lena Rinnwitz, Master, Child and Adolescent Psychiatry, University of Heidelberg, Heidelberg, BW, Germany, Marco Warth, Master, Thomas K. Hillecke, Dr., Therapeutic Sciences, SRH University Heidelberg, Heidelberg, BW, Germany, Franz Resch, Dr., Michael Kueess, Dr., Child and Adolescent Psychiatry, University of Heidelberg, Heidelberg, BW, Germany

There is evidence that the anticipation of pain leads to different neuronal responses in individuals engaging in non-suicidal-self-injury (NSSI), that in-turn influences pain processing. Previously no study investigated autonomic nervous system (ANS) response during the anticipation of pain in NSSI. The present analysis is based on preliminary data from an ongoing study on pain processing in NSSI. The study protocol comprises the repeated painful stimulation by the cold pressor task with a 15-minute inter-stimulus interval, while the heart rate variability (HRV) of participants is continuously recorded. The root mean square of successive differences (RMSSD) a measure of vagal parasympathetic activity was extracted for 4 segments of 30 seconds each before and after the onset of noxious stimulation. Data from a total of 14 adolescents with NSSI and 15 age and sex matched controls was available for the present analysis. Mean RMSSD between groups did not differ 60 seconds (HC = 55.03 (21.84); NSSI = 54.32 (55.89); p = 0.964), 30 seconds (HC = 46.62 (21.87); NSSI = 60.93 (56.91); p = 0.373) prior to noxious stimulation, and 30 (HC = 49.71 (25.08); NSSI = 61.98 (50.69); p = 0.411) as well as 60 seconds (HC = 51.81 (31.75); NSSI = 58.65 (52.88); p = 0.673) after the onset of the painful stimulus. Only healthy controls showed a significant decrease in vagal activity 60 seconds to 30 seconds prior to the onset of pain (t(14) = 2.142, p = 0.025). NSSI showed an increase in RMSSD that was statistically not significant (t(13) = 1.358, p = 0.198). Repeated-measures ANOVA revealed a significant quadratic group effect over time (F = 5.946, p = 0.022), indicating greater parasympathetic activity or less vagal withdrawal and arousal throughout the procedure. Altered physiological response during pain anticipation may be an important mechanism underlying differences in pain processing in NSSI.

119) Abstract 3149
SIX-MONTH STABILITY OF INDIVIDUAL DIFFERENCES IN BLOOD PRESSURE RESPONSE TO MOMENTARY AFFECT DURING DAILY LIFE

Joseph E. Schwartz, PhD, Psychiatry, Stony Brook University, Stony Brook, NY, Richard P. Sloan, PhD, Psychiatry, Columbia University, New York, NY, Daichi Shimbo, MD, Medicine, Columbia University, New York City, NY, Matthew M. Burg, PhD, Medicine, Yale University, New Haven, CT:

Objective: Using ecological momentary assessments (EMA) obtained concurrently with 24-hr ambulatory blood pressure (ABP) assessments, we and others have shown that there are individual differences in the BP response to changes in negative affect (NA) during daily life. To our knowledge, this is the first investigation of the reproducibility of these individual differences; i.e., the extent to which these individual differences are stable over a period of several months. Data: A random 20% of Masked Hypertension Study participants at the Stony Brook University recruitment site (N=161 employed, with screening BP≥160/105 mmHg, no BP meds and no history of CVD; 59% women, 26%}

A-55
minority, mean age ±sd=45±10(years) completed two 24-hr ABP recordings (Space labs 90207) with assessments every 28 min, an average of 6 months apart. After each BP assessment, participants completed an electronic diary entry (Palm Pilot) that included 0-100 VAS ratings of how “angry/hostile”, “anxious/tense” and “frightened” they felt just prior to the BP reading. Analyses are based on 8588 matched (±6 minutes) BP reading/diary entries; mean±sd=26.7±5.9 per participant per assessment. Analysis: Multilevel linear random coefficients models were estimated in which a separate line predicting BP from an NA measure was implicitly fit for each participant for each 24-hr recording and the mean and SD of the slopes (and intercepts) were estimated, as well as the correlations within and between assessments. The present focus is on the (test-retest) correlation of the slopes -- estimating each individual’s typical BP response to changes in an NA measure -- between the two assessments. Within assessments, the within-person residuals from each participant’s line were assumed to consist of a serially-autocorrelated component and random measurement error. Results: Individual differences in the systolic BP (SBP) response to feeling “excited” or “anxious/tense” are moderately highly reproducible at follow-up, an average of 6 months after the initial assessment. These, and “relaxed” are the moods that exhibit the greatest individual differences at baseline (results not shown). The test-retest correlations of the individual differences in the diastolic BP (DBP) response to changes in mood are not statistically significant for any of the moods. Conclusion: Individual differences in the relationship of SBP to some types of momentary affect exhibit a moderate degree of temporal stability over a 6-month follow up. Supported by NIH grant P01-HL47540

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<tr>
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120) Abstract 2998

PSYCHOSOCIAL PROFILE OF URBAN ADOLESCENTS WITH ELEVATED BLOOD PRESSURE IN INDIA
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Incidence of metabolic-syndrome-related disorders is increasing among adolescents in low-middle income countries like India. However, little is known about the psychosocial correlates of the metabolic syndrome among adolescents in India. The current study is part of an ongoing epidemiologic assessment of blood pressure and BMI among middle school adolescents (N=1100; Females=388; Mean Age=13.96 years (SD=1.57)); Blood pressure was assessed in a subset of the sample (N=723; Females=266; Mean Age=14.60 years (SD=1.28)). Mean Blood pressures were: Systolic (SBP)=112.98mmHg (SD=14.09) and Diastolic(DBP)=68.13mmHg (SD=10.56). Mean BMI=19.04(SD=3.46) was computed on a subsample (N=678; Age=14.35 years(SD=1.31)). Blood pressure and BMI were positively correlated (SBP=r=0.36, p<0.001; DBP=r=0.30, p<0.001). These data are consistent with prior data from our lab indicating that metabolic risk factors are highly correlated even among young people. Twenty-two percent of participants reported experiencing frequent stress/12 months; Positive copers (63.4%): seeking support from parents, friends, teachers) compared to negative copers (36.6%: doing nothing, withdrawal, thoughts of self-injury, not eating) had a lower BMI (p<0.04; 18.72 versus 19.32) and reported greater parental engagement and interest in their activities such as homework, money, etc (p<0.001; 16.15 versus 15.24). Blood pressure did not differ between the two groups. These preliminary data indicate a link between stress, coping, and metabolic health among young adolescents in a developing country which requires further research to identify potential avenues for prevention and intervention.

121) Abstract 2694

PTSD AND AVERSIVE COGNITIVE ASSOCIATIONS ABOUT ASPIRIN IN ACUTE CORONARY SYNDROME PATIENTS
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Background: PTSD is associated with poor prognosis in ACS survivors and with poor adherence to medications. The reasons for the association between PTSD and adherence, however, are not well understood. A hallmark of PTSD is avoidance of reminders of a traumatic event. We hypothesized that patients with ACS-induced PTSD would have aversive cognitions regarding their cardiac medications as the medications may serve as traumatic reminders. Methods: We enrolled a cohort of ACS patients presenting to the ER of a large urban hospital. Patients were eligible for this substudy if they completed their 1-month follow-up and were prescribed aspirin after discharge. PTSD was evaluated at 1-month using the 17-item PTSD-checklist specific to ACS hospitalization (PCL-S). Patients who reported missing their aspirin at least some of the time were asked how often (on a 5-point Likert scale) 1) “you missed your aspirin because you did not want to be reminded about your heart problem”; 2) “thinking about aspirin makes you feel nervous or anxious”; and 3) “thinking about aspirin makes you think about your risk for future heart problems.” Participants who responded “a little” of the time or “a lot” or greater were assumed to have aversive cognitions. Logistic regression was used to determine the association between PTSD and aversive aspirin cognitions after adjusting for age, gender, ethnicity, and depressive symptoms as measured by the 8-item Patient Health Questionnaire. Results: 212 patients were eligible. The mean (SD) age was 62 (12) years, 38% were women, 54% Hispanic, 31% depressed (PHQ ≥20), and 15% possible PTSD (PCL-S ≥34). 15% (N=31) reported not taking their aspirin all of the time. Of those who missed their aspirin at least some of the time, 16% reported missing aspirin because it reminded them of their heart problem; 16% reported thinking about aspirin made them feel nervous or anxious; and 29% reported thinking about aspirin made them think about their future heart problems at least some of the time. In adjusted analyses, a 5 point increase in PTSD symptoms was associated with 1.8 (95% CI 1.2 to 2.6, p=0.003) odds of missing aspirin because it reminded them of their heart problem and 1.6 (95% CI 1.1 to 2.2, p=0.02) odds of feeling anxious/nervous when thinking about their aspirin, but not with aspirin making them think about their future risk for heart problems [AOR 1.1 (95% CI 0.8 to 1.5); p=0.39]. None of the other covariates, including depressive symptoms, were associated with these aversive cognitions.

Conclusions: This study is the first to demonstrate that ACS-induced PTSD is associated with aversive cognitions about the very medications that are necessary to prevent recurrent cardiac events. Interventions that promote positive associations with cardiac medications have the potential to improve adherence in the high-risk group of ACS-survivors who develop PTSD symptoms after ACS.

122) Abstract 3101

SOCIAL AND CULTURAL CAPITAL AS POTENTIAL RESILIENCE FACTORS IN ECONOMICALLY DISADVANTAGED COLLEGE STUDENTS
Christyn L. Dollhier, Ph.D., Laura Luma, BA, Psychology, East Carolina University, Greenville, NC

Introduction: The demands of college coupled with economic hardship can strain students’ academic performance and well-being. Non-financial sociocultural assets may enable students to maintain academic performance and well-being despite college and financial stressors. Two such assets include social capital (access to and use of resources embedded in social networks) and cultural capital (attitudes and knowledge acquired through socialization of culture). This study examines whether social and cultural capital serve as resilience factors in the academic context for economically disadvantaged college students. Method: In this cross-sectional survey study, economically disadvantaged undergraduates (N=238) recruited via campus flyers and psychology classes completed an online survey. Economic disadvantage was determined based on reported receipt of economic need-based loan/scholarship, family use of government assistance, or neither parent being a college graduate. Sample characteristics: 81% female; 57% White, 27% African American, 16% other; mean age=19 years. The survey included the College Student Stress Scale, modified Personal Social Capital Scale, a cultural capital measure developed for the study, College Adjustment Test, and report of current grades from which GPA was calculated. Results: Stress significantly...
related to poorer adjustment (r=-.3, p<.001), and social [F(3,227)=15.9, p<.001, F change p<.001, interaction t=-2.7, p=.007, B=-1.0] and cultural [F(3,227)=12.6, p<.001, F change p=.007, interaction t=-4.0, p<.001, B=-2.0] capital acted as significant stress buffers. Stress also significantly related to poorer GPA (r=-.2, p=.009). While social (r=2, p=.003) and cultural (r=2, p=.001) capital significantly related to better GPA, neither were significant stress buffers. Discussion: These results support program development aimed specifically at aiding economically disadvantaged students’ adjustment to college. Increasing students’ social and cultural capital by facilitating stronger social support systems and easier access to informational resources may decrease stress levels, which could ease the transition and adjustment to college.

123) Abstract 2621

IMPACT OF A PATIENT AND PROVIDER CENTERED HEALTH TECHNOLOGY ENABLED MEDICAL REGIMEN SELF MANAGEMENT PROGRAM AMONG AFRICAN AMERICAN UNCONTROLLED HYPERTENSIVES

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African Americans (AAs) have higher rates of uncontrolled essential hypertension (EH) compared to Whites. Medication (med) non-adherence is the leading modifiable behavior to improve blood pressure (BP) control. Effective, low-cost, easily disseminated med adherence BP control programs are needed. This feasibility trial examined a self determination theory driven iterative patient and provider centered mHealth technology program . The program (Smartphone Med Adherence Stops Hypertension ;SMASH) included electronic med trays which provided patients’ reminder signals and Bluetoothed BP devices.Patients’ self-administered BPAs and med adherence were transmitted to data servers and processed. Electronic trays were replaced with standard plastic trays after 3 months.Participants received personalized motivational and reinforcement SMS messages based upon their adherence and BP levels. Healthcare providers received weekly summary reports of med adherence and BP levels. Twenty uncontrolled EH AA adults ( aged 47+/− 5 yrs) were identified via medical records and a clinic BP screening. Before and at months 1,3 and 6 , clinic BP evaluations were conducted. Following the initial evaluation, participants were randomly assigned to standard of care (SOC) or SMASH . Prior to start of the trial, SMASHers were shown how and demonstrated ability to use the med tray, BP device and smart phone. SMASHERS showed high adherence (e.g., med intake within 1.5 hours of designated times was average of .98 ). Preintervention SBP for SMASH was A 57.5±6.6 and 56.3±7.2 for SOC . As shown in Fig.1, a group x time interaction (p=0.01) revealed that the SMASH group showed greater decreases in SBP compared to the SC group across visits. Change score analyses by visit revealed greater reductions in the SMASH group at each visit (all p<0.01). The SMASH group exhibited higher JNC8 designated BP control across the 4 visits (overall mean of 68.8% vs 20% for SOC ).The feasibility trial results demonstrated SMASH is acceptable and useful in BP control management among AAs. Further patient and provider guided SMASH refinements have been made and a large scale multi-site efficacy trial is planned.

125) Abstract 2879

EFFECTS OF GENETIC VARIANTS IN CANDIDATE GENES FOR ALCOHOL METABOLISM, STRESS RESPONSIVITY, IMPULSIVITY, AND RISK-TAKING ON BINGE DRINKING AMONG MEXICAN ORIGIN ADOLESCENTS IN THE UNITED STATES

Sumi Song, PhD, Social and Behavioral Research Branch, National Human Genome Research Institute, Bethesda, MD, Christopher S. Marcum, PhD, Social and Behavioral Research Branch, National Human Genome Research Institute of National Institutes of Health, Bethesda, Maryland, Anna V. Wilkinson, PhD, School of Public Health, University of Texas at Austin, Austin, Texas, Sanjay Shete, PhD, Department of Epidemiology, The University of Texas MD Anderson Cancer Center, Houston, TX, Laura M. Koehly, PhD, Social and Behavioral Research Branch, National Human Genome Research Institute, Bethesda, MD

Adolescents’ binge drinking is predictive of alcohol dependence later in adulthood, and Hispanic adolescents are at greater risk for developing persistent alcohol problems than non-Hispanic whites. Despite ample evidence for the influence of genetic factors on alcohol dependence in non-Hispanic youth and adults, very few studies have examined genetic factors associated with alcohol dependence or binge drinking in Hispanic youth. The present study aims to examine the effects of genetic variants in 23 candidate genes with 276 tag single nucleotide polymorphisms (SNPs) under four functional categories (e.g. alcohol metabolism, stress responsivity, impulsivity, and risk-taking on binge drinking among Mexican origin adolescents. Participants (N = 933) provided samples for genotyping and survey responses at baseline and reported on their drinking behavior on average 3 years later. Overall, participants were 11-14 years old at baseline, 52% were females, and 10.2% reported binge drinking at the follow-up, which was indicated by having 5 or more drinks in a row during the past month. After adjusting for age, gender, and potential ethnic stratification, four multivariate logistic regression models, one for each functional category, found 7 genes associated with risk for binge drinking. The results showed that having at least one copy of the minor allele on 5 SNPs in 5-hydroxytryptamine receptor 2A (HTR2A, rs4142900), dopamine beta-hydroxylase (rs2519154), thyrotropin-releasing hormone degrading enzyme (rs11613768; rs4550264), and dopamine receptor D3 (rs11721264) was associated with increased risk for binge drinking.

Lisa Wu, PhD, Department of Oncological Sciences, Icahn School of Medicine at Mount Sinai, New York, New York, Mads Agerbek, MD, Oncology, Patrick Londin, BSc, Psychooncology and Health psychology, Aarhus University Hospital, Aarhus, Central Denmark, Denmark, Anders D. Pedersen, MSc, Rehabilitation, Vejlefford Rehabilitation Center, Stoabo, Southern Denmark, Denmark, Lars Larsen, PhD, Psychology, Aarhus University, Aarhus, Central Denmark, Denmark, Mimi Y. Mehlisen, PhD, Psychooncology and Health Psychology, Aarhus University, Aarhus, Central Denmark, Denmark

BACKGROUND AND AIM: Cognitive complaints are commonly reported by cancer patients who have received chemotherapy. Recent research, however, has shown higher prevalence of cognitive impairment in cancer patients already prior to adjuvant treatment, suggesting a multi-factorial causality of cancer-related cognitive impairment, which may include psychological and biological responses to the cancer and surgery. Our aim was to explore possible psychological and biological correlates of cognitive function in testicular cancer (TC) patients after orchiectomy but prior to further treatment. METHODS: Sixty-six newly orchiectomized (TC) patients were assessed prior to further treatment and compared with 25 healthy men. Neuropsychological assessments included 11 outcomes across 8 cognitive domains. Psychological measures included anxiety and depressive symptoms (HADS), perceived stress (PSS-10), cancer-related distress (IES-R), and self-reported cognitive complaints (CQF). Biological outcomes were serum cortisol, hs-CRP, IL-6, and TNF-alpha. RESULTS: While TC patients and controls did not differ on any background variables, e.g. age, education, and estimated premorbid intellectual function, TC patients had lower scores (p<0.01) on 6 of 11 neuropsychological outcomes. Higher cortisol levels were associated with poorer performance across all affected cognitive domains and emerged as an independent predictor (Beta: -0.28, p=0.04) of overall cognitive performance when adjusting for other factors including statistically significant covariates of age, premorbid intellectual functioning, CRP, HADS-depression, and IES-R. In contrast, associations between IL-6 and TNF-alpha and cognitive function did not reach statistical significance. Although cognitive complaints (CQF) and psychological distress measures were correlated (r=0.45-0.50; p<0.001), both were relatively poorly correlated with neuropsychological outcomes. CONCLUSIONS: TC-patients exhibited poorer cognitive function than healthy controls, independent to adjuvant treatment. Among the psychological and biological factors explored, higher cortisol levels emerged as the main predictor of impaired cognitive function in TC patients. This finding is consistent with results in non-cancer populations and suggests dysregulation of the HPA-axis as a risk-factor for cognitive impairment. Further research is needed to determine whether this is due to the cancer, surgery or TC-associated premorbid factors.

124) Abstract 2777

BIOLICAL AND PSYCHOLOGICAL CORRELATES OF COGNITIVE FUNCTION IN NEWLY DIAGNOSED TESTICULAR CANCER PATIENTS

Robert Zachariae, DMSc, Ali Amidi, MSc, Psychooncology and Health Psychology, Aarhus University Hospital, Aarhus, Central Denmark, Denmark

Cancer patients have received chemotherapy. Recent research, however, has shown higher prevalence of cognitive impairment in cancer patients already prior to adjuvant treatment, suggesting a multi-factorial causality of cancer-related cognitive impairment, which may include psychological and biological responses to the cancer and surgery. Our aim was to explore possible psychological and biological correlates of cognitive function in testicular cancer (TC) patients after orchiectomy but prior to further treatment. METHODS: Sixty-six newly orchiectomized (TC) patients were assessed prior to further treatment and compared with 25 healthy men. Neuropsychological assessments included 11 outcomes across 8 cognitive domains. Psychological measures included anxiety and depressive symptoms (HADS), perceived stress (PSS-10), cancer-related distress (IES-R), and self-reported cognitive complaints (CQF). Biological outcomes were serum cortisol, hs-CRP, IL-6, and TNF-alpha. RESULTS: While TC patients and controls did not differ on any background variables, e.g. age, education, and estimated premorbid intellectual function, TC patients had lower scores (p<0.01) on 6 of 11 neuropsychological outcomes. Higher cortisol levels were associated with poorer performance across all affected cognitive domains and emerged as an independent predictor (Beta: -0.28, p=0.04) of overall cognitive performance when adjusting for other factors including statistically significant covariates of age, premorbid intellectual functioning, CRP, HADS-depression, and IES-R. In contrast, associations between IL-6 and TNF-alpha and cognitive function did not reach statistical significance. Although cognitive complaints (CQF) and psychological distress measures were correlated (r=0.45-0.50; p<0.001), both were relatively poorly correlated with neuropsychological outcomes. CONCLUSIONS: TC-patients exhibited poorer cognitive function than healthy controls, independent to adjuvant treatment. Among the psychological and biological factors explored, higher cortisol levels emerged as the main predictor of impaired cognitive function in TC patients. This finding is consistent with results in non-cancer populations and suggests dysregulation of the HPA-axis as a risk-factor for cognitive impairment. Further research is needed to determine whether this is due to the cancer, surgery or TC-associated premorbid factors.

124) Abstract 2777
SIMULTANEOUS SOCIAL STRESS IN A GROUP RAISES BLOOD PRESSURE AND ALTERS NEUROENDOCRINE ACTIVATION IN PATIENTS WITH CORONARY ARTERY DISEASE.

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Introduction: The Trier Social Stress Test (TSST) is a worldwide known tool for studying the individual psychophysiological stress response in an experimental setting. Recently a protocol for group assessment in healthy subjects was established (Childs et al., 2006, Von Dawans et al., 2011). This group TSST (G-TSST) resulted in increased heart rates (HR) in healthy participants compared to those tested individually (S-TSST). However, studies comparing the effects of the G-TSST versus the S-TSST on both the obese non-cardiovascular comorbidity and significant differences are known. Methods: We tested 52 patients suffering from coronary artery disease (CAD) in groups of three participants according to G-TSST protocol (n=24) or individually according to the S-TSST protocol (n=28). Blood pressure (BP) and HR were measured and peripheral blood samples for ACTH, cortisol, epinephrine, norepinephrine and dopamine were collected at three time points (prior to the TSST, 1 and 30 min after the TSST). G-TSST patients suffered more frequently from diabetes (p=0.037), whereas no other characteristics, especially distribution of hypertension and cardiovascular medication, were significantly different between the two groups. Results: Both TSST protocols caused significant stress responses associated with significant elevation of BP and HR as well as HPA (hypothalamic pituitary adrenal) and SAM (sympatho-adrenal medullary) axis activation (p<0.001). Interestingly, the systolic BP was significantly higher in the G-TSST sample at all time points (p<0.003) compared to S-TSST sample, although catecholamines were significantly elevated in S-TSST sample compared to G-TSST (p<0.01). The HR did not differ between the samples.

Discussion: The present study is the first reported trial which applied the protocol of G-TSST to a clinical, here cardiovascular, population. In CAD patients the simultaneous social stress triggered BP elevation, which surprisingly was not mediated by SAM axis activation. Our findings may extend current knowledge of candidate genes that are associated with the onset and maintenance of BED. Our findings may have implications for the disorder, and not obesity, contributing to the onset and maintenance of BED, but was no longer significant following adjustments for depression symptoms. Given the link between depressive symptomatology and blunted cardiovascular stress responses, greater symptoms of depression in the obese BED group may have suppressed overall cardiovascular functioning. Finally, heightened cardiovascular responses to stress (SBP and DBP) were associated with greater increases in hunger ratings post-stress only in obese women with BED, p<.05. These results align with previous studies reporting increased eating rates, hunger, and desire to binge eating following stress in obese women with BED and indicate that for these individuals, stress-induced binge eating may be a function of increased hunger accompanying normal physiological responses to stress. Longitudinal studies are needed to determine if and how stress dysregulation, stress-induced increases in hunger, and depression symptoms contribute to the onset and/or maintenance of BED.

BLOOD PRESSURE RESPONSES TO MOMENTARY NEGATIVE AFFECT DURING BINGE EATING DISORDER AND OBESITY

Kathleen M. McIntyre, LMSW, Psychiatry, Joseph E. Schwartz, PhD, General Medicine, Richard P. Sloan, PhD, Psychiatry, Daichi Shimbo, MD, Matthew M. Burg, PhD, Medicine, Columbia University Medical Center, New York, NY

Objective: Ecological momentary assessment (EMA) has been used to identify both within- and between-person associations between negative affect (NA) and concurrently assessed ambulatory hemodynamic factors known to contribute to cardiac risk over time. We investigated whether individuals with BMI 30 but without BED, and those with BED, and their obese non-BED counterparts reported significant differences. Methods: We tested 35 patients the simultaneous social stress triggered BP elevation, which surprisingly was not mediated by SAM axis activation. Our findings may extend current knowledge of candidate genes that are associated with the onset and maintenance of BED. Our findings may have implications for the disorder, and not obesity, contributing to the onset and maintenance of BED. Finally, heightened cardiovascular responses to stress (SBP and DBP) were associated with greater increases in hunger ratings post-stress only in obese women with BED, p<.05. These results align with previous studies reporting increased eating rates, hunger, and desire to binge eating following stress in obese women with BED and indicate that for these individuals, stress-induced binge eating may be a function of increased hunger accompanying normal physiological responses to stress. Longitudinal studies are needed to determine if and how stress dysregulation, stress-induced increases in hunger, and depression symptoms contribute to the onset and/or maintenance of BED.

Average participant’s increase in BP (mmHg) per 50-point increase in negative affect (on 100-point scale) and standard deviation of individual differences

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<th>Diastolic BP</th>
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* for H0: average=0 are all p<0.0001
Background: “Shitsu-taikan-sho” refers to the condition of having difficulty in experiencing bodily feelings. It has been suggested that shitsu-taikan-sho is an important characteristic of patients with stress-related psychosomatic diseases. As there are no methods to evaluate shitsu-taikan-sho quantitatively, we developed the Shitsu-taikan-sho scale (STSS). The STSS is a 23-item self-administered questionnaire, with a 3-factor structure: (1) difficulty identifying bodily feelings (DIB), (2) over-identification (OA), and (3) lack of health management based on bodily feelings (LHM). This study assessed whether shitsu-taikan-sho affected patients with type 2 diabetes mellitus (DM) by investigating the correlation between STSS score and HbA1c. Methods: Thirty-two outpatients with type 2 DM (22 males, mean age 63.4 ± SD 11.4 yr) completed the STSS questionnaire. A blood sample was collected on the same day to measure HbA1c. The correlation between STSS score and HbA1c was then examined. Their STSS scores were also compared with age- and gender-matched healthy control subjects. Results: The STSS total score was not different between the patients with type 2 DM (56.8 ± 10.5) and the age- and gender-matched control subjects (53.6 ± 7.9). However, the STSS score of patients with poor control (HbA1c > 7.0) (61.8 ± 8.6, n=19) was higher than those with good control (HbA1c < 7.0) (49.5 ± 8.7, n=13, P=0.0004). Furthermore, HbA1c correlated positively with the STSS score (Spearman’s correlation coefficient [r] 0.503, P value 0.003). Conclusions: This study demonstrated that STSS correlates positively with HbA1c, suggesting that shitsu-taikan-sho is related to poor glycemic control in patients with type 2 DM. Although the precise mechanism remains uncertain, this finding suggests that STSS may be a useful tool for investigating the role of shitsu-taikan-sho in physical diseases such as type 2 DM.

130) Abstract 2545
CULTURAL IDENTITY, PSYCHOSOCIAL FACTORS, AND GLOMECTIC CONTROL IN NEW ZEALAND SAMOAN PEOPLE WITH NON-INSULIN DEPENDENT DIABETES MELLITUS
Ann D. Futterman Collier, Ph.D., Psychological Sciences, Northern Arizona University, Flagstaff, AZ; David R. Cole, M.D., Diabetes Centre, University of Otago, Christchurch School of Medicine, Christchurch, Canterbury, New Zealand; Lapesila Tuula, Diabetes Nurse Spec., Diabetes Centre, Christchurch Hospital, Christchurch, Canterbury, New Zealand; J. Douglas Sellman, M.D., Psychiatry and Addiction Medicine, University of Otago, Christchurch School of Medicine & Health Sciences Centre, Christchurch, Canterbury, New Zealand.

Non-insulin dependent diabetes mellitus (NIDDM) is a major international public health concern; it is especially problematic throughout the Pacific region. Samoans are currently the largest Pacific Island (PI) ethnic group living in New Zealand (NZ), comprising almost 50% of NZ PI population. In 2007, Samoan rates of NIDDM were three times that of the total NZ population. In order to develop the most effective diabetes support services possible, consideration needs to be given to the unique cultural identity, social support and health behaviors of Samoan people with NIDDM. We interviewed 53 Samoan NZ immigrants that attended a Diabetes Clinic in Christchurch, NZ (males = 23; females = 31), using the 12-item Short-Form Health Survey, the Diabetes Social Support Scale, a cultural identity questionnaire, and the Self-Management of Diabetes questionnaire. The majority of participants were female (55.8%) and the average age was 54.97 years (SD=10.52). Most patients had lived in NZ for 19.95 years (SD=12.59); the average time diagnosed with NIDDM was 7.86 years (SD = 7.49) and the average HbA1c level was 8.93 (range 5.70 to 15.20; SD 2.12). Bivariate correlations suggested that participants with poorer glycemic control exhibited significantly poorer emotional adjustment to having diabetes (r = .39, p = .004) and greater negative support from their families (r = .25, p = .07). Physical well-being was associated with stronger Samoan cultural identity (r = .31, p = .003) and greater positive familial support from family members (r = .26, p = .06); emotional well-being was associated greater identification with NZ Palagi cultural identity (r = .26, p = .06). Positive familial support was also associated with the increased likelihood of participating in exercise (r = .29, p = .03) and healthful dietary practices (r = .24, p = .08). Multiple regression analysis was used to test if cultural identity, social support, and demographic variables significantly predicted participants’ glycemic control. These variables explained 36.2% of the variance [R2 = .36, F (7, 40) = 3.25, p < .008]. It was found that older age significantly predicted better glycemic control (β = -0.43, p < .007), as did having diabetes for a longer duration (β = .33, p < .003), and, strong identification with both Samoan (β = -.41, p <.02) and Palagi ways (β = -.39, p < .03). While patients gained mastery in managing their diabetes with time and age, our results suggest that dual cultural identity, or adopting both Samoan and Palagi ways, as well as positive familial support, were associated with greater well-being, glycemic control, and healthy lifestyle practices in NZ Samoan diabetic patients.

131) Abstract 2697
BARRIERS TO MINDFULNESS-BASED CANCER RECOVERY PARTICIPATION IN CANCER PATIENTS: A MIXED METHODS EXPLORATION.
Madeline Hermann, BHSc; Jennifer White, PhD, Oncology, University of Calgary, Calgary, Alberta, Canada; Linda E. Carlson, PhD, Oncology, University of Calgary, Calgary, AB, Canada.

Background: Given a consistent drop-out rate of up to 20% from mindfulness-based interventions, this study explored barriers to participation in the MBCR program in a population of cancer patients. Methods: A convergent mixed methods study was conducted. Quantitative surveys were administered pre- and post-MBCR using valid and reliable scales of barriers to practice, personality, spirituality, mood, quality of life, and stress. Qualitative semi-structured interviews explored participants’ perception of barriers through individual interviews at drop out or completion of the program. Qualitative analysis involved an inductive thematic approach with constant comparison.

Results: 46 program participants completed questionnaires, and 20 were interviewed (10 completers and 10 dropouts). Barriers fell into four categories which we called “life-related”, “motivation-related”, “cancer-specific”, and “meditation-specific” barriers. Participants reported experiencing barriers on a daily basis. Program completers reported decreased mood disturbance and increased spirituality. Dropouts experienced relatively high levels of barriers that were less about anxiety than commonly reported in the literature. The most reported barriers were similar across all groups. Qualitative themes described the spectrum of uptake of the mindfulness practice through stages of motivation, maintenance, and commitment and described the impact of a range of facilitators and barriers. Conclusions: The use of mixed methodology contributed to a greater understanding of barriers to MBCR program uptake. Cancer patients, post-treatment, with space and time in their lives were more likely to be successful with mindfulness practice. Increasing consciousness of the awareness of barriers to home practice through regular, personalized check-ins with participants may help tailor the MBCR program to the needs of the participants. Remaining questions include why some cancer patients choose to attend the MBCR program in the first place, and why others are not interested.
magnitudes was significant in all of the subscales except for physical function in PN. Conclusion: The hypothesis was proved. Therapy with attention to the QOL and constipation might be necessary among neurotic patients with PPI-refractory NERD.

133) Abstract 3056 CARDIOVASCULAR RISK FACTORS AS PREDICTORS OF NEW ONSET DEPRESSIVE DISORDERS: RESULTS FROM THE NATIONAL EPIDEMIOLOGIC SURVEY ON ALCOHOL AND RELATED CONDITIONS (NESARC)
Jay S. Patel, Psychology, B.A., Jessica Berntson, Psychology, B.A., Jesse C. Stewart, Clinical Psychology, PhD, Psychology, Indiana University-Purdue University Indianapolis (IUPUI), Indianapolis, Indiana
The vascular depression hypothesis posits that cerebrovascular disease plays a role in the etiology of depression, particularly late-life depression. Although prospective studies have detected associations between traditional cardiovascular disease (CVD) risk factors and future depression, little is known about the independent contribution of these factors. Therefore, our aim was to simultaneously examine hypertension, increased adiposity, and smoking as predictors of new onset depressive disorders. We utilized data from Waves 1 (2001-2002) and 4 (2004) of the NESARC study - a survey of a large probability sample representative of the U.S. adult population. We selected 21,210 adults (Mage = 46.0 years, 52% female, 43% non-white) with no lifetime history of depressive disorders at Wave 1 and no current pregnancy, clinical CVD, or liver disease at Wave 1 or 2. At Wave 1, respondents were interviewed to determine their past-year hypertension diagnosis status, their current height and weight, and their smoking history. The structured Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV was administered to assess lifetime history of DSM-IV major depressive disorder (MDD) and dysthymic disorder at Wave 1 and the onset of MDD or dysthymic disorder during the follow-up period at Wave 2. During the follow-up period, there were 1,134 (5.4%) cases of new onset depressive disorder (MDD and/or dysthymic disorder). In separate logistic regression models (adjusted for age, sex, race/ethnicity, education, alcohol use disorders, anxiety disorders, and diabetes), z-scored BMI (OR=1.065, 95% CI: 1.035-1.096, p=.001) and current smoking (OR=1.110, 95% CI: 1.017-1.200, p=.018) predicted new onset depressive disorders; however, hypertension diagnosis did not (OR=0.997, 95% CI: 0.893-1.112, p=.953). A simultaneous model with all three CVD risk factors revealed the same pattern of results; BMI (OR=1.068, 95% CI: 1.037-1.100, p=.001) and current smoking (OR=1.109, 95% CI: 1.021-1.204, p=.015) were predictors, but hypertension diagnosis (OR=0.967, 95% CI: 0.861-1.081, p=.551) was not. Our findings, which are consistent with the vascular depression hypothesis, suggest that greater adiposity and current smoking are independent risk factors for new onset depressive disorders in the U.S. adult population.

134) Abstract 3160 VOLUNTARY INCREASES IN HEART RATE VARIABILITY INCREASE BAROREFLEX GAIN AND PRODUCE CLINICALLY SIGNIFICANT IMPROVEMENT IN VARIOUS RESPIRATORY, CARDIOVASCULAR, AND EMOTIONAL DISORDERS, AS WELL AS PAIN AND FUNCTIONAL G.I. PROBLEMS
Paul M. Lehrer, PhD, Psychiatry, Rutgers -- Robert Wood Johnson Medical School, Piscataway, NJ
Heart rate variability (HRV) is widely accepted as an index of autonomic and emotional resilience and adaptability. It is higher in health people, young people, and people who are aerobically fit. Low HRV predicts death in vulnerable people. People can be taught to increase heart rate variability by breathing at the resonance frequency of the cardiovascular system, which is determined by characteristics of the baroreflex system. The frequency can easily be determined by testing the respiratory rate at which maximum-amplitude HRV fluctuations occur. Training to increase HRV by biofeedback produces increases in HRV, as well as large increases in baroreflex gain, increased strength of the respiratory muscles, improved gas exchange. Clinically significant improvements have been noted after training in HRV biofeedback for heart failure, hypertension, pain conditions, anxiety, depression, asthma, and chronic obstructive pulmonary disease, as well as improved performance in sports. One study found it to be 100% effective in inoculating asthma patients against clinically significant asthma exacerbations. We present evidence for neuroplasticity of the baroreflex and mechanism for producing large increases in HRV by biofeedback, and review the literature on all clinical applications. New data from a two-center trial will be presented showing clinically significant effects of HRV biofeedback on anxiety sensitivity to methacholine (FEV1), as well as effects on alpha sympathetic control, and asthma symptoms. New data on effects of HRV biofeedback on alcohol craving among rehabilitation patients will also be presented.

135) Abstract 2891 FATIGUE AND SLEEP CHARACTERISTICS IN BRAIN TUMOR PATIENTS: A COMPARISON BETWEEN PATIENTS WITH GLIOMA AND MENINGIOMA
Willeke M. Kitselaar, B.A., Helma M. de Morree, Ph.D., Medical and Clinical Psychology, Tilburg University, Tilburg, NB, Netherlands, Geert-Jan Ruten, M.D.,Ph.D., Neurosurgery, St. Elisabeth Hospital, Tilburg, NB, Netherlands, Margriet M. Sitskoorn, Ph.D., Cognitive Neuropsychology, Willem J. Kop, Ph.D., Medical and Clinical Psychology, Tilburg University, Tilburg, NB, Netherlands
BACKGROUND: Fatigue is highly prevalent in brain tumor patients. The severity and duration of fatigue is assumed to be unfavorable in brain tumor patients with glioma versus patients with a meningioma because of the more persistent disruption of neuronal networks in glioma patients. The present study examines fatigue in brain tumor patients with glioma versus meningioma using self-report and actigraphy based assessments at three months post-surgery.
METHODS: Fatigue and actigraphy data were obtained in 31 brain tumor patients with primary brain tumors (mean age 50.5 ± 58.8 yrs; 48.4% women; 16 glioma and 15 meningioma) three months after surgery. Subjective fatigue was assessed using the Multidimensional Fatigue Inventory (MFI). Objective sleep and activity parameters were measured using 24-hour actigraphy.
RESULTS: Subjective fatigue scores were significantly elevated in the domains of general fatigue, mental and activity-related fatigue (p’s < .05) but not physical fatigue or motivational fatigue (p’s > .05) compared to validated MFI norm scores. Fatigue scores did not differ between glioma versus meningioma patients (Table). Objective sleep measures showed significantly more time in bed (p = .005) and a greater number of awakenings (p = .025) in glioma patients compared to meningioma patients. Glioma patients also tended to have a longer total sleep time (p = .070), delayed sleep onset (p = .093) and a lower sleep efficiency (p = .072).
DISCUSSION: Glioma and meningioma patients have elevated levels of mental and general fatigue at three months post-surgery compared to reference values in healthy individuals. However, the groups did not differ in subjectively experienced fatigue. Sleep was more dysregulated in glioma versus meningioma patients (lower sleep efficiency). Patients may have compensated for lower sleep efficiency by spending more time in bed. Future research is needed to identify the mechanisms involved in high levels of fatigue in post-surgical brain tumor patients and to determine the role of sleep efficiency and cognitive dysfunction.

| Fatigue, Sleep and Activity Levels in Patients with Glioma versus Meningioma |
|-----------------------------|-----------------------------|-----------------------------|
| | Gloma | Meningioma | p |
| Fatigue | | | |
| General fatigue | 13.0 (SD=4.7) | 11.6 (SD=3.1) | .703 |
| Mental fatigue | 9.9 (SD=3.8) | 9.9 (SD=3.0) | .920 |
| Physical fatigue | 11.6 (SD=3.0) | 12.1 (SD=3.4) | .690 |
| Reduced activity* | 12.6 (SD=4.9) | 11.7 (SD=4.7) | .733 |
| Motivation | 9.0 (SD=3.0) | 9.3 (SD=3.5) | .965 |
| Sleep | | | |
| Time in bed (hr) | 9:12:52 (SD=1:17:58) | 9:13:18 (SD=1:16:11) | .001 |
| Total sleep time (hr) | 7:49:43 (SD=1:24:47) | 7:09:41 (SD=1:37:49) | .470 |
| Onset latency (min) | 39.247 (SD=46.83) | 10.143 (SD=5.08) | .093 |
| Sleep efficiency (%) | 84.647 (SD=6.48) | 89.328 (SD=4.32) | .071 |
| Sleep efficiency | 84.647 (SD=6.48) | 89.328 (SD=4.32) | .071 |
| Activity | | | |
| Activity Average day (1-4) | 221 (SD=205) | 291 (SD=89.78) | .685 |
| Physical activity (kcal) | 305 (SD=155) | 161 (SD=104) | .403 |

* significantly higher than norm values
BIOBEHAVIORAL RESPONSES TO MENTAL STRESS IN TAKO-TSUBO CARDIOMYOPATHY

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Objective: Tako-tsubo cardiomyopathy (TTC) is characterized by apical ballooning of the left ventricle and symptoms and signs mimicking myocardial infarction. However, there is no underlying coronary artery disease that can account for the symptoms and the left ventricular abnormalities disappear within days to weeks with no signs of permanent cardiac damage. The prevalence of TTC ranges from 0.7% to 4.9% in patients admitted with symptoms and signs of an acute coronary syndrome. Typical in TTC are high catecholamine levels, the relatively high incidence in women, and the presence of an intense emotional trigger. The emotional triggers and high catecholamine levels suggest a dysregulated stress response system in patients with TTC. This study examines whether TTC patients show exaggerated emotional, neurohormonal and hemodynamic responses to mental stress.

Methods: TTC patients (N=18; mean age 68.3 ± 11.7, 77.8% women) and two comparison groups (healthy controls N=19; mean age 60.0 ± 7.6, 68.4% women; chronic heart failure N=19; mean age 68.8 ± 10.1, 68.4% women) performed a mental challenge task (anger recall and mental arithmetic) while repeated assessments were obtained for negative emotions, blood pressure, heart rate, adrenocorticotropic hormone (ACTH) and cortisol. Differences between groups were examined using independent sample t-tests.

Results: Negative emotions, hemodynamic measures, ACTH and cortisol showed a significant increase in response to mental challenge. TTC patients reported lower levels of emotional arousal compared to healthy controls during anger recall (6.4±3.0 vs 8.4±2.9, p=0.049) and math (8.1±2.0 vs 10.1±2.2, p=0.008). Compared to heart failure patients, TTC patients showed lower baseline ACTH levels (12.5±6.6 vs. 19.4±8.6 pg/mL, p=0.019 and lower blood pressure responses during both the anger recall (SBP: 160.8±26.5 vs. 143.0±19.9 mmHg, p=0.026; DBP: 97.7±10.7 vs. 83.4±11.7 mmHg, p=0.001) and math task (SBP: 163.0±25.9 vs. 145.7±20.0 mmHg, p=0.029).

Conclusion: TTC patients did not show exaggerated negative emotional responses to mental stress but rather a blunted arousal response compared to healthy controls. No evidence was found for a dysregulated HPA-axis or hemodynamic responses. TTC may therefore be characterized by hyperresponsive myocardial tissue to usual elevations in circulating catecholamines or direct sympathetic nervous system activation. Alternatively, these findings may indicate that TTC is triggered by situation-specific emotional responses that are not reproducible in laboratory settings. Additional research is needed to examine emotional and physiological responses during daily life activities.
Symposium 2701
Friday, March 20 from 8:30 to 9:45 am
Risk and Resilience Factors for Multisystem Biological Dysfunction
Joshua F. Wiley, C.Phil., Psychology, University of California, Los Angeles, CA, Tara L. Gruenewald, Ph.D., Davis School of Gerontology, University of Southern California, Los Angeles, CA, Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Semel Institute for Neuroscience and Human Behavior, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine, UCLA, Los Angeles, CA, Robert-Paul Jaster, Ph.D. Candidate, Integrated Program in Neuroscience, McGill University, Montreal, Quebec, Canada
Prospective studies and meta-analyses show that psychosocial factors, including low socioeconomic status and strong social relationships, are robust risk and resilience factors for diverse health outcomes, including chronic disease and mortality. To date, there is less research on mechanisms that explain how psychosocial factors “get under the skin” to impact health. Mechanistic research implicates dysfunction in a number of physiological systems such as the hypothalamic-pituitary-adrenal axis and the immune system. Despite evidence that multiple physiological systems play a role in how psychosocial factors are linked to health outcomes, the majority of research has examined only specific systems or biomarkers.
Multisystem indices of biological risk, such as allostatic load (AL), have been shown to predict cognitive decline, chronic disease, and mortality. The primary goal of the proposed symposium is to demonstrate, through findings from national and international studies and an intervention, that (1) important psychosocial factors are associated with AL. (2) AL mediates the effects of psychosocial factors on health outcomes, (3) behavioral interventions reduce AL.
The first speaker in this symposium will present data from MESA, demonstrating that among Hispanics, chronic stress is associated with an increase in AL across a four-year period. In addition, chronic stress is cross-sectionally associated with higher AL across race/ethnic groups. The second presentation, based on data from MIDUS, will show that psychosocial resources, such as optimism and social support, are associated with lower AL, suggesting their potential importance as resilience factors. The third study, based on data from CARDIA, will test the hypothesis that AL represents a mechanism linking psychosocial factors to health outcomes. This presentation will demonstrate that AL mediates the effects of socioeconomic status on coronary artery calcification. Finally, data from a randomized clinical trial to treat insomnia in older adults will be presented, showing that improvements in sleep quality reduces AL. The discussant will highlight theoretical and practical implications of a multisystem biological index being a potential mechanism underlying the relationships between psychosocial and behavioral factors and health.
In sum, this symposium will examine psychosocial risk and resilience factors for multisystem indices of biological dysregulation across three large epidemiological studies, and show that intervening might reduce biological risk.
Individual Abstract Number: 2900
A Constellation of Psychosocial Resources are Associated with Lower Allostatic Load
Joshua F. Wiley, C.Phil., Psychology, University of California, Los Angeles, CA, Tara L. Gruenewald, Ph.D., Gerontology, University of Southern California, Los Angeles, CA, Arun S. Karlamangla, MD, PhD, Geriatrics, David Geffen School of Medicine at UCLA, Los Angeles, CA, Annette L. Stanton, Ph.D., Psychology, University of California, Los Angeles, CA, Teresa E. Seeman, Ph.D., Geriatrics, David Geffen School of Medicine, UCLA, Los Angeles, CA
Objective: Psychosocial resources (PSRs) are individual differences, such as optimism, and relationships, such as social support, that can buffer the deleterious effects of stress. Allostatic load (AL) theory posits that repeated exposure to stress leads to cumulative, global wear-and-tear across multiple biological systems. Limited extant literature presents to mixed associations between discrete PSRs and multi-system indices of AL, with evidence of sex differences. This study tested the relationship between a constellation of PSRs and a multi-system global AL factor, as well as with system-specific factors.
Method: Data were from the Midlife in the United States (MIDUS) II study, a large multisite study. Included were participants who completed the Biomarker Project (N = 1,255, 57% women, mean age 54.5). AL was operationalized using 23 biomarkers representing seven biological systems: metabolic, lipids, metabolic glucose, blood pressure, parasympathetic nervous system, sympathetic nervous system, hypothalamic-pituitary-adrenal axis, and inflammation. Using structural equation modeling (SEM), biomarkers were modeled using a bi-factor model with a global AL factor and seven system-specific factors. PSRs were modeled as a psychological resources factor.
Results: All models fit the data well (CFIs > .96, RMSEAs < .03). Overall, higher PSRs were associated with lower scores on the AL factor (p = .028) and lipid factor (p = .011). PSRs were not associated with any other system-specific factor. In women, higher PSRs were associated with lower AL factor (p = .014) and the lipid system factor (p = .012), which parallels the overall sample: higher PSRs were also associated with higher scores on the parasympathetic nervous system factor system (p = .023), which indicates greater heart rate variability and slower pulse rate. In men, PSRs were not significantly related to any of the biomarker factors, although results were in similar directions as in women.
Conclusions: Higher PSRs were associated with lower AL, especially in women. A notable finding is that results emerged for the global AL factor, but not most of the specific system factors. This result is consistent with the notion that PSRs buffer stress, which based on AL theory, leads to non-specific, system-wide dysregulation.
Individual Abstract Number: 2003
Does Allostatic Load Underlie Greater Risk of Coronary Artery Calcification in those of Lower Socioeconomic Status?
Tara L. Gruenewald, Ph.D., Davis School of Gerontology, University of Southern California, Los Angeles, CA, Stephen Sidney, MD, Division of Research, Kaiser Permanente, Oakland, CA, Arun S. Karlamangla, MD, PhD, Geriatrics, Geffen School of Medicine at UCLA, Los Angeles, CA, Diana Wang, BS, Davis School of Gerontology, University of Southern California, Los Angeles, CA, Robert-Paul Jaster, Ph.D. Candidate, Integrated Program in Neuroscience, McGill University, Montreal, Quebec, Canada
Background: Allostatic load (AL) is conceptualized as a multi-system indicator of physiological dysregulation hypothesized to accrue as a result of exposure to environmental and psychosocial challenges. Although a sizable body of research indicates that AL varies as a function of challenge experience, and that AL levels predict risk of incident health outcomes, evidence that AL mediates the greater risk of poorer health in those with greater challenge experience remains limited.
Objective: Our objective was to examine AL as a potential mediator of associations between the psychosocial challenge of low socioeconomic status (SES) and atherosclerosis development, as measured by level of coronary artery calcification (CAC).
Method: Data come from the year 15 and 20 exams of the Coronary Artery Risk Development in Young Adults (CARDIA) Study. Year 15 SES was measured as a composite index of educational attainment and household income. Year 15 AL was measured as a summary count of 18 cardiovascular, metabolic, inflammatory, and endocrine biomarkers for which participants values fell into the highest-risk quartile of the biomarker distribution. CAC was assessed with computed tomography (CT) scans at both exams. Multinomial logistic regression analyses were used to examine whether levels of AL mediated hypothesized greater odds of incident year 20 CAC or the presence of CAC at both years 15 and 20 (no CAC - referent) for those of lower SES; analyses included age, sex, and race as covariates (n = 586).
Results: Individuals of low and moderate SES (high SES group as referent) had a greater odds of incident CAC at year 20 (low SES OR = 3.3, 95% CI[1.5,7.0], moderate SES OR = 2.1, 95% CI[1.9,9.4]) and of the presence of CAC at both exams (low SES OR = 7.6, 95% CI[2.9,19.8], moderate SES OR = 4.1, 95% CI[1.6,10.6]). Year 15 AL accounted for 18-21% and 3-5% of the greater odds of CAC, for those of low and moderate SES, respectively.
Conclusion: Multi-system physiological wear and tear, as captured in an AL index, may be a pathway through which the challenges associated with low SES affect the development of atherosclerosis, a condition known to be shaped by multiple physiological processes in the body.
Individual Abstract Number: 2004
Improvements in Sleep Quality Lower Multisystem Biological Risk in Older Adults
Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Semel Institute for Neuroscience and Human Behavior, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA, Los Angeles, CA, R. Olmstead, PhD, Michael R. Irwin, MD, Cousins Center for Psychoneuroimmunology, Semel Institute for Neuroscience and Human Behavior, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA, Richard Bootzin, PhD, Departments of Psychology and Psychiatry, University of Arizona, Tucson, AZ, Perry Nicassio, PhD, Michael R. Irwin, MD, Cousins Center for Psychoneuroimmunology, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA
Sleep disturbances have been linked to increased morbidity and mortality, and our prior work has demonstrated a link between short sleep duration and poor sleep quality with elevated biomarkers representing dysregulation and risk across multiple systems (i.e. allostatic load). In a randomized controlled comparative efficacy trial of cognitive behavioral therapy (CBT), tai chi chih (TCC), and a sleep seminar control (SS) we tested the hypothesis that improving sleep quality would reduce biomarkers of disease risk in a population based sample of older adults with self-reported sleep disturbance. Participants were randomly assigned to CBT, TCC, or SS for 2-hour group sessions weekly over 4 months with a 16-month evaluation. Multisystem biological risk included 8 biomarkers: HDL, LDL, HA1c, glucose, insulin, CRP, and fibrinogen. Using clinical laboratory cutoffs defined as abnormal, a score was computed representing the number of biomarkers falling in the abnormal laboratory range. High risk classification was given if subjects exhibited a score of 4 or more, which indicated elevated allostatic load. For those beginning the trial with high risk, CBT was associated with a significant reduction of being in the high risk group at 4-months (odds ratio [OR]=.21 [95%CI,.03-.147,]). p<.1) and at 16-months (OR=.06 [95%CI,.005-.669]; p<.01). TCC did not show a reduction in risk at 4 months, but did reduce the risk by 16-months (OR=.10 [95%CI,.008-.129]; p=.05). Of participants classified as high risk at the start of trial, evidence of improvements in sleep quality using a clinical severity threshold, was associated with a reduced likelihood of being in the high risk group at 16-months, OR=.08 (95% CI,.008-.78); p = .01. Participants classified as having high multisystem biological risk at entry and assigned to CBT or TCC show improvements in risk scores after one year follow-up. Given that these clinical biomarkers, indicative of allostatic load, are also associated with metabolic and inflammatory disease risk, our findings suggest that improving sleep quality using CBT or TCC may also provide a reduction in risk for chronic disease among older adults with sleep disturbances. Current strategies for patients exhibiting elevated biological risk should include sleep assessment as a component of their overall treatment strategy. ClinicalTrials.gov: NCT00280020, Behavioral Treatment of Insomnia in Aging

Symposium 2768
Friday, March 20 from 11:15 am to 12:30 pm

Brain-body Interactions in Anxiety and Depression
Hugo D. Critchley, DPhil, Psychiatry: Division of Medicine, University of Sussex: Brighton and Sussex Medical School, Brighton, East Sussex, UK, Cristina Ottaviani, PhD, , Santa Lucia Foundation, Rome, Italy, David R. Watson, Ph.D., Clinical Imaging Sciences Centre, University of Brighton, East Sussex, UK, Frances Meeten, D.Phil, Psychiatry, Kings College London, London, UK, Hugo D. Critchley, DPhil, Psychiatry: Division of Medicine, University of Sussex: Brighton and Sussex Medical School, Brighton, East Sussex, UK

Excessive worry and difficulty concentrating are hallmarks of anxiety disorder (AD) to the point that they are perceived as uncontrollable and disruptive to patients’ everyday life. Based on previous findings suggesting vagafunctioning as a marker of cognitive flexibility, we hypothesized that heart rate variability (HRV) would predict the ability of the brain to shift from the spontaneous generation of worry to the sustained focus of attentional control. Moreover, we expected this shift to be more problematic in AD compared to healthy participants (HC). Functional magnetic resonance imaging and HRV data were acquired from 19 AD and 21 HC, matched for age (29.3 (8.3) years) and gender, during performance of three low demand tracking tasks. The tasks required participants to visually track a slowly moving circle and press a button as fast as possible to infrequent color changes of the circle (target events). Randomly, between the second or the third tracking task, all participants underwent a worry induction. Compared to HC, AD participants were characterized by attenuated decreases in brain activity after target events within regions including frontal pole, inferior frontal gyrus, and basal ganglia bilaterally, and left fusiform and lateral temporal cortex. In line with our hypothesis, HRV correlated negatively with this deactivation in key brain regions. Moreover, worry induction differentially impacted brain activity in two groups, particularly affecting the cuneal/precuneus, lateral, and right occipital cortex. Together, these findings suggest that HRV may be a diminished impact on responses to target presentation. This was consistent with the predicted effects of a higher baseline of worrisome cognitions in AD. Overall, our results increase our understanding of the relationship between anxiety, worry, and impoverished attentional control at both the neural and autonomic level, and help clarify why worry is perceived as more functionally disruptive in patients with AD.

Individual Abstract Number: 2907

Interactions Between Heart, Brain and Fear: Implications for Anxiety

The brain and body are dynamically coupled to influence emotion and cognition. The physiological dimension to emotional processing is widely recognised, yet relatively poorly understood mechanistically. One experimental strategy to assess how bodily arousal influences cognitive and emotional processes is to manipulate cardiac autonomic function. Cardiac autonomic function is greater to fear faces at systole relative to diastole. We demonstrate that these interactions between heart, fear and brain are modulated by anxiety levels, suggesting a potential aberrant mechanism through which anxiety may lead to increased and sustained fear responding. Finally, by exploiting this exaggeration of fear responding at systole, we provide preliminary evidence to suggest that the efficacy of exposure therapy can be increased by including a cardiac manipulation during spider-exposure in arachnaphobia. Together, these findings highlight the role of cardiovascular responses on the processing of threat, with implications for the physiological mechanisms to exploit to aid treatment efficacy for anxiety.

Individual Abstract Number: 3002

The Relation of Resting State Functional Connectivity Between Brainstem Regions and the Neocortex in Patients with Major Depression
Karin Krüger, Jürgen Bür, MD, Diplom, David Arnold, Student of Medicine, Stefanie Koehler, M.Sc, Psychology, Gerd Wagner, Ph.D., Psychiatry and Psychotherapy, University of Jena, Jena, Germany

There is limited understanding of how monoamine-producing nuclei within midbrain and brainstem contribute to the formation and functional dynamics of brain networks within the human neocortex. There is now growing recognition,
in humans, of the pervasive and profound contributions of midbrain and brainstem nuclei to adaptive higher cognitive processes and behaviors and to aberrant perceptual and cognitive processes in disorders such as depression. Fifty patients meeting DSM-IV criteria for MDD and 50 matched controls were included in the study. Resting state fMRI was used to elucidate differences between patients and controls with respect to functional connectivity, network organization and hierarchical structure that reflect the interaction between neocortex and brainstem nuclei that are the source of the neuromodulators serotonin (5-HT), dopamine (DA) and noradrenaline (NA). In addition, we obtained heart rate, breathing rate and electrodermal activity to get some insight in the basis of autonomic dysfunction in the disease. As expected, we observed profound differences in resting state connectivity between brainstem and midbrain nuclei in relation to cortical regions of interest. In particular, we observed that the connectivity of upper brainstem nuclei with the DMN module shifted toward regions of the executive-control network (e.g., dorsal anterior cingulate cortex). Moreover, we found significant differences in the correlation between VMPC — brainstem connectivity and mean heart rate in patients with MDD and healthy controls. Observed differences between patients and controls reveal changes in the functional interactions between ACC / VMPC with both serotonergic and dopaminergic nuclei in patients. Previous studies suggested altered activity of the VMPC and pACC in patients with major depression, we demonstrate here the profound influence of the neurotransmitter sites in brainstem and midbrain on previous observations. We hope that some of our results bridge the gap between neurotransmitter changes observed in midbrain and brainstem regions and its relation to psychological states, autonomic function and behaviors closely associated with the integrity of fronto-cingulate regions.

Individual Abstract Number: 2916

Mind-body Interactions in JH: Relevance to Psychiatric Symptoms
Jessica Eccles, MB Bch, MRCPsych, Neil A. Harrison, PhD, MRCPsych, Psychiatry, Brighton and Sussex Medical School, Brighton, East Sussex, UK, Hugo D. Critchley, DPhil, Psychiatry: Division of Medicine, University of Sussex: Brighton and Sussex Medical School, Brighton, East Sussex, UK
Joint hypermobility (JH) affects up to 20% of the population yet is often poorly recognised. In a recent study of 64 hypermobile women we associated JH with changes in cerebral connectivity and heart rate variability. In this study we set out to elucidate mechanisms linking JH to psychiatric disorders. We explore the relationship between JH and psychiatric phenomena such as anxiety and depression. The first presenter demonstrates a bidirectional relationship between JH and autonomic dysfunction in patients with JH. We find that patients with JH have altered heart rate variability, increased sympathetic nervous system activity and increased anxiety. The second presenter demonstrates that symptoms of anxiety are associated with changes in the expression of anxiety. Significant dysautonomia is observed in patients with JH and demonstrates how the benefits of EW on facilitating posttraumatic growth vary as a function of writing instructions and individual differences (i.e. avoidance) among Chinese American breast cancer survivors. The third presenter investigates mediators of an expressive writing intervention in predicting psychological adjustment to hematopoietic stem-cell transplant. The fourth presenter focuses on the effects of expressive writing for infertile couples in Denmark. Our discussant will lead a discussion on the future direction of EW research, such as the challenges and opportunities in diverse populations, the consideration of contextual, cultural, and personal factors, and the examination of the underlying biological mechanisms. This symposium will improve understanding of how to provide cost-effective clinical and community preventive services through expressive writing.

Individual Abstract Number: 3170

Expressive Writing and Avoidance among Chinese American Breast Cancer Survivors
Qian Lu, MD, PhD, Celia Wong, PhD, Psychology, University of Houston, Houston, TX
Background: Expressive writing is a brief intervention designed to improve health by prompting emotional and cognitive processes through writing. However, the effect of expressive writing on health outcomes has varied as a function of writing instructions and individual differences (i.e. avoidance versus control). We hypothesize that writing instructions and individual differences will moderate the effect of expressive writing on health outcomes.

Methods: A total of 96 Chinese American breast cancer survivors who completed treatment were randomly assigned to one of three groups: an emotional disclosure condition, a regulation intervention condition to write about their deepest feelings, and a control condition. We examined the effects of expressive writing on health outcomes by helping the individual to express their difficult thoughts and feelings. More than 300 expressive writing intervention studies have been conducted and EW has been demonstrated to enhance health and well-being. However, relatively unknown is the effects of EW for promoting adjustment and health behavior for diverse communities. In this symposium, we will illustrate four important factors for optimization: cultural and contextual factors, writing instructions, the role of moderators, and the role of mediators. Four presenters report findings from diverse populations ranging from people with risky health behaviors, minority cancer patients, hematopoietic stem cell transplant recipients, and infertile couples. The first presenter reports the utilization of the expressive writing paradigm in a brief alcohol intervention to reduce drinking intentions among college students, and evaluated the role of sample characteristics and writing instructions. The second presenter examines how the benefits of EW on facilitating posttraumatic growth vary as a function of writing instructions and individual differences (i.e. avoidance) among Chinese American breast cancer survivors. The third presenter investigates mediators of an expressive writing intervention in predicting psychological adjustment to hematopoietic stem-cell transplant. The fourth presenter focuses on the effects of expressive writing for infertile couples in Denmark. Our discussant will lead a discussion on the future direction of EW research, such as the challenges and opportunities in diverse populations, the consideration of contextual, cultural, and personal factors, and the examination of the underlying biological mechanisms. This symposium will improve understanding of how to provide cost-effective clinical and community preventive services through expressive writing.

Individual Abstract Number: 3169

Symposium 3169
Friday, March 20 from 11:15 am to 12:30 pm
Optimizing the expressive writing intervention to promote adjustment and health behavior
Qian Lu, MD, PhD, Psychology, University of Houston, Houston, TX, Lindsey Rodriguez, PhD, Psychology, University of Houston, Houston, TX, Timothy J. Williamson, MPH, Psychology, University of California, Los Angeles, CA, Yoon Frederiksen, MSc, Psychology, Psychology, University of Aarhus, Aarhus, Jylland, Denmark, Joshua Smyth, PhD, Biobehavioral Health and Medicine, Pennsylvania State University, University Park, PA

Expressive writing (EW) is a brief intervention designed to improve psychological and physical health outcomes by helping the individual to express their difficult thoughts and feelings. More than 300 expressive writing intervention studies have been conducted and EW has been demonstrated to enhance health and well-being. However, relatively unknown is the effects of EW for promoting adjustment and health behavior for diverse communities. In this symposium, we will illustrate four important factors for optimization: cultural and contextual factors, writing instructions, the role of moderators, and the role of mediators. Four presenters report findings from diverse populations ranging from people with risky health behaviors, minority cancer patients, hematopoietic stem cell transplant recipients, and infertile couples. The first presenter reports the utilization of the expressive writing paradigm in a brief alcohol intervention to reduce drinking intentions among college students, and evaluated the role of sample characteristics and writing instructions. The second presenter examines how the benefits of EW on facilitating posttraumatic growth vary as a function of writing instructions and individual differences (i.e. avoidance) among Chinese American breast cancer survivors. The third presenter investigates mediators of an expressive writing intervention in predicting psychological adjustment to hematopoietic stem-cell transplant. The fourth presenter focuses on the effects of expressive writing for infertile couples in Denmark. Our discussant will lead a discussion on the future direction of EW research, such as the challenges and opportunities in diverse populations, the consideration of contextual, cultural, and personal factors, and the examination of the underlying biological mechanisms. This symposium will improve understanding of how to provide cost-effective clinical and community preventive services through expressive writing.

Individual Abstract Number: 3171

Evaluating Guilt and Shame in an Expressive Writing Alcohol Intervention
Lindsey Rodriguez, PhD, Chelsie M. Young, MA, Clayton Neighbors, PhD, Reese Tou, BA, Qian Lu, MD, PhD, Psychology, University of Houston, Houston, TX
Background: Expressive writing interventions have shown positive physical and psychological health benefits over time, with the presumed mechanism being emotional disclosure. However, work utilizing expressive writing in behavior change has been minimal.

Methods: The current research applied the expressive writing paradigm to reduce drinking intentions among college students, and evaluated the role of event-related guilt and shame in intervention effects. College students (N=429) completed a baseline survey and were randomly assigned to one of three conditions: Negative (write about a heavy drinking event that was negative); Positive (write about a heavy drinking event that was positive); or Neutral (write
about their first day of college). After writing, readiness to change and future drinking intentions were assessed.

Results: Results revealed intervention effects on intended drinks per week and intended number of drinks during peak and typical drinking occasions. Participants in the negative condition also displayed higher levels of event-related guilt and shame. Guilt mediated intervention effects on readiness to change, which also mediated the association between guilt–reparative behavior and drinking intention. Conclusion: Results provide initial support for an expressive writing intervention on alcohol use and underscore the importance of eliciting emotions associated with reparative behavior when considering negative past experiences and future behavior change.

Individual Abstract Number: 3172

Helping yourself by helping others: Mediators of an expressive helping intervention in predicting psychological adjustment to hematopoietic stem-cell transplant

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Research demonstrates the largely positive, although heterogeneous, effects of expressive disclosure through writing (EW) about stressful or traumatic experiences on psychological and physical health. In addition, actively expressing emotions surrounding the cancer experience can act as an effective coping strategy for cancer survivors, as shown in longitudinal research. Evaluating the potential mediators of EW on survivor benefits and above EW alone, as well as mechanisms for their effects, will advance the theory and application of expressive disclosure as an intervention. One modified version of EW is expressive helping (EH), a novel intervention that harnesses the benefits of providing peer support and engaging in expressive disclosure. We developed this intervention to address the specific issues, such as social isolation, faced by hematological cancer survivors after hematopoietic stem-cell transplantation (SCT). Specifically, EH involves three sessions of writing about deepest feelings and thoughts regarding the SCT experience, followed by one session of writing directed toward peer support (i.e., providing help to individuals preparing for SCT). In a sample of (n = 98; 67.3% female) SCT survivors who entered the study with moderate to severe symptoms, EH produced significant benefits on psychological functioning relative to an EW only, a peer helping (PH) only, and a fact-writing control (FW) condition. The current study sought to evaluate the mediators of the beneficial effects of EH on psychological distress. Based on empirical and theoretical evidence, we hypothesized that use of high rates of positive emotion words in combination with moderate rates of negative emotion words would predict a reduction in psychological distress for members in the EH condition. In accordance with conceptual theory, we also evaluated the relationship between emotional expression and psychological distress for those in the EW condition. Results indicated that higher positive emotion words significantly mediated the positive effects of both EH and EW on psychological distress (p's < .05). However, positive emotion words were more strongly related to decreased psychological distress among EH participants with average rates of negative emotion words, 95%CI [-0.52, -0.01]. For EW participants, positive emotion words were more strongly related to a reduction in psychological distress for those with average rates of negative emotion words, 95%CI [-0.45, -0.01] or below, 95%CI [-0.80, -0.09]. These findings suggest that EH and EW carry their positive effects on distress in part through participants’ higher expression of positive emotions. However, higher expression of positive emotions appears beneficial only when negative emotional expression is low or moderate.

Individual Abstract Number: 3173

The effect of expressive writing intervention for infertile couples: a randomized controlled trial study

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BACKGROUND: Assisted reproductive technology (ART) treatment for infertility is often experienced as stressful and infertility-related distress has been associated with poorer outcomes in terms of clinical pregnancies. The present study aimed to test the efficacy of expressive writing intervention (EWI) to improve well-being and reduce infertility-related distress, and possibly - to improve pregnancy rates - in couples undergoing ART. METHOD: A randomized controlled trial study was conducted with couples consisting of 163 women and 132 men enrolled in treatment with in vitro fertility or intracytoplasmic sperm injection. Participants were randomly allocated to EWI (n=153) or a control group (n=142). The psychological outcomes (depression, anxiety and infertility-related distress) were assessed at the beginning of treatment (t1), prior to the pregnancy test (t2), and 3 months later (t3). Mixed linear modeling (MLMs) were used to compared effects on psychological outcomes and a Ch2 test was used to examine differences in pregnancy rates. RESULTS: Compared with controls, women and partners in the EWI group reported reduced depressive symptoms after the intervention (p=0.049; Cohen’s d=0.27), and a similar trend was observed for anxiety (p=0.091; Cohen's d=0.24). In contrast, infertility-related distress increased significantly in the EWI group (p=0.00; Cohen’s d=0.42), with the effect mediated by changes in distress. No effect of EWI was found on pregnancy rates. CONCLUSION: Although the effect was small, the easy to implement home-based EWI may be a potentially cost-effective tool to alleviate depressive symptoms by allowing the expression of feelings about infertility that may be perceived as socially unacceptable. No effects were found for anxiety, infertility-related distress, and pregnancy rates, and future studies are recommended to focus on tailored EWI programs targeted specifically to women and their partners.

Symposium 2652
Friday, March 20 from 2:00 to 3:30 pm

Diabetes, Obesity and the Brain.

Peter Hall, Ph.D., Public Health & Health Systems, University of Waterloo, Waterloo, Ontario, Canada, Corita Vincent, M.S., Medicine, University of Toronto, Toronto, Ontario, Canada, John P. Ryan, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, Andrea P. Haley, Ph.D., Psychology, The University of Texas at Austin, Austin, Texas, Dianne F. Lattmann, Ph.D., Psychiatry & Behavioral Sciences, VA Puget Sound Health Care System and University of Washington, Seattle, WA, U.S.A., Susan Eyrsson-Rose, PhD, Medicine, University of Minnesota Medical School, Minneapolis , MN

It is increasingly recognized that diabetes and obesity have consequences for brain health, and that certain parameters of cognitive function in turn have behaviorally mediated consequences for risk of these same disorders. In this symposium, we explore several important aspects of this bidirectional relationship using methods that analyze processes at the cellular level, through to the cognitive, and social levels of analysis.

The first two speakers will explore the link between diabetes and brain health. Our first presentation describes a meta-analytic investigation of the relationship between Type 2 diabetes status and decrements in executive function. The findings support the existence of modest but reliable decrements across studies, with relatively few moderators of the effect size. The second presentation documents an association between delayed childhood diagnosis of Type 1 diabetes and decreased cerebral perfusion, with effects most evident in the brain regions that support executive functions and other higher cognitive processes. Our third presentation presents data supporting a cross sectional association between visceral fat assessed with dual X-ray absorptiometry (DXA) and cerebral N-acetylace aspartate levels (an indicator of neuronal integrity) in healthy middle-aged adults.

The fourth and fifth presentations employ experimental methods using animal and human models, respectively, to examine: 1) the effects of diet on the neuronally encoded reward value of sucrose, and 2) the effects of facilitating and restraining cues on snack food consumption, among those with relatively strong and weak executive function. Our discussant will explore inter-linkages between the studies presented, as well as the nature of possible relationships among brain health and the development of chronic illnesses such as obesity and diabetes.

Individual Abstract Number: 2655

Executive function and T2DM status: A meta-analysis

Corita Vincent, M.S., Medicine, University of Toronto, Toronto, Ontario, Canada, Peter Hall, Ph.D., Applied Health Sciences, University of Waterloo, Waterloo, Ontario, Canada

Background: Executive functions (EF) are a set of "top-down"cognitive processes that enable consistent enactment of goal-relevant behaviors, including adherence to behavior change recommendations and medication regimens. Several large scale studies have documented decreased EF among those living with diabetes. However, most diabetes research has focused on T2DM relative to controls, but others have failed to find an association. As such, there is uncertainty as to the nature of the association between T2DM status and EF decrements. The objective of this meta-analysis was to examine the extent to which T2DM is associated with impairments in EF across studies, and potential modifiers of the association.
Methods: Medline, PsycholInfo, and Scopus databases and published references were used to identify articles examining the association between T2DM status (case versus control) and EF decrements. Grey area literature was also searched. Results from studies were converted to standardized mean differences and compared using random-effects models. Moderator analysis was conducted for age, sex, and diabetes duration using maximum likelihood estimation.

Results: Sixty studies (59 articles) including 9815 individuals with T2DM and 69,254 controls were included. Findings indicated a small but reliable association between T2DM status and EF decrements (d=0.248, p<.001), observed across all aspects of EF examined: verbal fluency, mental flexibility, inhibition, working memory, and attention. Disease duration significantly moderated the effect of T2DM status on EF.

Conclusions: T2DM is associated with a mild-to-moderate EF decrements. Neither age nor sex were significant modifiers of the effect, and the effect size was similar across all domains of EF. Although the overall effect was not large in magnitude, there are possible implications for diabetes self-management, given the significance of EF for implementation of dietary and exercise recommendations.

Individual Abstract Number: 2820

Age of Onset of Type 1 Diabetes in Childhood is Associated With Regional Cerebral Perfusion in Midlife

John P. Ryan, PhD, Howard J. Aizenstein, MD, Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, Trevor J. Orchard, MD, Epidemiology, Medicine, Pediatrics, Christopher M. Ryan, PhD, David F. Fine, BS, Psychiatry, Karen A. Nunley, PhD, Caterina Rosano, MD, Epidemiology, University of Pittsburgh, Pittsburgh, PA

Background: Type 1 diabetes (T1DM) is a disease with an age of onset typically in childhood and adolescence, and increases long-term risk for microvascular and macrovascular damage. Microvascular complications of T1DM extend to the brain, resulting in overall lower cerebral blood flow. Later age of onset has been associated with increased risk of vascular complications. To date, no studies have examined if the negative effects of later age of onset associate with regional cerebral blood flow (rCBF) in middle age adults with T1DM. Thus, we hypothesized that age of onset may be related to rCBF in midlife in participants with T1DM.

Methods: Participants included 97 individuals from the Epidemiology of Diabetes Complications study at the University of Pittsburgh. The cohort includes patients with childhood onset (< 17 years of age) of T1DM. Patients were invited to participate in an auxiliary study utilizing magnetic resonance imaging. Pulsed arterial spin labeling was used to quantify rCBF. Data were analyzed using FSL and SPM8. Age of onset was entered as the predictor of interest at age of time of scanning, sex, and degree of brain atrophy as nuisance covariates.

Results: Age of onset was predictive of reduced rCBF in two regions: left dorsolateral prefrontal cortex (x, y, z = -46, -4, 42; k = 201, peak t = 3.87) and right ventromedial prefrontal cortex (x, y, z = 34, 52, -14; k = 83, peak t = 4.11). There were no regions in which later age of onset was predictive of increased rCBF.

Conclusions: Later age of onset of T1DM in childhood is associated with lower rCBF in dorsolateral prefrontal and ventromedial prefrontal cortex in midlife. Notably, these reductions in perfusion were localized to regions that are involved cognition and executive functioning. Additional studies will be needed to elucidate the mechanisms underlying the reduced perfusion and the links between CBFRf, neuronal activity and cognitive performance.

Individual Abstract Number: 2810

Abdominal Obesity is Related to Poorer Neurological Integrity in Midlife

Andreanna P. Haley, Ph.D., Psychology, The University of Texas at Austin, Austin, Texas, Sonya Kaur, M.A., Psychology, The University of Texas at Austin, Austin, TX, Kayla Steward, B.S., Psychology, University of Alabama Birmingham, Birmingham, AL, Evan Pasha, M.S., Kinesiology and Health Education, The University of Texas at Austin, Austin, TX, Barbara Strasser, Sc.D.D., Institute for Nutritional Sciences & Physiology, University for Health Sciences, Medical Informatics and Technology, Hall in Tyrol, Hall in Tyrol, Austria, Hirofumi Tanaka, Ph.D., Kinesiology and Health Education, The University of Texas at Austin, Austin, TX

Introduction: Midlife obesity is linked to increased risk for diabetes, cardiovascular disease, and cognitive impairment later in life. However, there appears to be a difference in risk conferred by adipose tissue stored in subcutaneous versus visceral compartments. As visceral adipose tissue (VAT) is associated with greater inflammation, fluctuations and high risk for developing dementia, we set out to examine if VAT volume and mass are related to markers of early brain vulnerability, such as reduced cerebral N-acetyl aspartate (NAA) levels, in otherwise healthy middle-aged adults.

Methods: Sixty-eight community-dwelling adults (34 men; 50±6 yrs of age) were studied using neuropsychological tests, health screen including dual energy X ray absorptiometry (DXA) scan to assess body composition, and a proton magnetic resonance (1H MRS) scan of occipitoparietal grey matter to measure NAA concentrations. LCModel was used to identify and quantify NAA (Provencher 1993). Metabolite concentrations were expressed as ratios to creatine. Participants were excluded if they had pre-existing diabetes, uncontrolled hypertension, full-scale intelligence quotient (FSIQ) below the normal range, or showed signs of acute infection or severe depression. The unique contributions of VAT volume and NAA were identified in a multiple regression model, adjusting for relevant covariates. VAT mass and volume were square root transformed to ensure normally distributed regression residuals.

Results: Greater VAT mass was significantly associated with lower NAA levels (VAT mass beta=-0.33, p=0.032), adjusting for age, sex, systolic blood pressure, fasting glucose, total cholesterol, and CRP (F(7,59)=3.18, p=0.006). The relationship between VAT volume and NAA trended in the same direction (F(7,59)=2.99, p=0.009; VAT volume beta=-0.29, p=0.056).

Conclusions: We found that increased visceral adipose tissue was associated with early signs of brain vulnerability in the form of lower neuronal integrity in otherwise healthy middle-aged adults. This relationship was independent from the effects of age, sex, blood pressure, fasting glucose and cholesterol levels and chronic inflammation. Thus, it appears that visceral fat exerts deleterious effects on the brain early in life and these effects are not solely due inflammation. Further research into the mechanisms by which abdominal obesity negatively impacts the brain is warranted.

Individual Abstract Number: 2770

Dietary Fatty Acids Differentially Modulate the Rewarding Value of Sucrose

Dianne M. Lattemann, Ph.D., Psychiatry & Behavioral Sciences, VA Puget Sound Health Care System and University of Washington, Seattle, WA

Objective: Changes in the rewarding value of palatable foods have been reported in clinical and animal studies, which suggest enhanced reward value in association with overweight BMI but decreased reward value with obese BMI. Further, we have reported that a moderate (30%) mixed fat (stearic/palmitic/oleic acids) diet increases the reward value of sucrose, prior to the development of obesity. In this study we wished to determine if specific dietary fatty acids contribute to this increase of food reward, as these fatty acids are ubiquitous in Westernized diets. Methods: Rats were fed diets that were low fat (LF, 10%) or contained 30% fat specifically augmented with stearic (ST), palmitic (PA), or oleic (OL) acid. After two weeks of diet intake, rats were trained and tested for self-administration of 5% sucrose solutions, a behavioral task reflecting motivation for sucrose. Rats were assessed for body weight and body composition, intravenous glucose tolerance test and HOMA, and terminal fasting leptin and lipids, in addition to the behavioral assessment. Finally, cytoplasmic extracts were prepared from hypothalami (HYP) and striatum (STRI), brain regions that regulate motivated feeding, and phosphorylation of the gene-regulatory cell signals Akt and GSK3B-B was measured. Results: This sub-chronic moderate fat regimen did not alter any of the metabolic parameters assessed. However, rats fed ST or PA diets demonstrated increased motivation for sucrose relative to LF-fed rats. OL-diet had an intermediate effect, with sucrose motivation slightly but not significantly increased relative to LF-fed rats (p=0.05, LF vs. ST or PA groups). Increased phosphorylation of Akt and GSK3B in the HYP, and of GSK3B in the STR, of rats fed ST or PA diets suggests that changes of gene expression may account for the increased sucrose motivation. Conclusions: The commonly ingested fatty acids ST and PA can increase motivation for sweet foods, independent of, and in addition to, an effect on BMI. Thus, both dietary fat composition and development of obesity can alter motivation for palatable foods. Dietary-induced increases in food motivation in humans may drive the seeking of palatable foods and generation of a positive feed-forward of behavior resulting in the onset of blatant obesity.

Individual Abstract Number: 2653

The effects of facilitating and restraining cues on the expression of dietary restraint: Do EFs matter in all circumstances, under conditions of temptation by palatable foods

Peter Hall, Ph.D., Cassandra Lowe, M.Sc., School of Public Health & Health Systems, University of Waterloo, Waterloo, Ontario, Canada, Corita Vincent, M.Sc., Medicine, University of Toronto, Toronto, Ontario, Canada, Betty Tran, B.Sc., Public Health & Health Systems, University of Waterloo, Waterloo, Ontario, Canada

Background. Prior experimental studies using cortical stimulation techniques have shown that obesogenic dietary practices are causally influenced by integrity of the brain regions that support executive functions (i.e., the left dorsolateral prefrontal cortex; L-dLPFC). However, it is not clear under what circumstances EFs are most consequential for consumption of high caloric foods: Do EFs matter in all circumstances, under conditions of temptation by appetitive cues, or only when restraint is called for? Given the ubiquity food cue
exposure of various types (neutral, facilitating and restraining), it is important to know which are high risk situations for those with relatively weaker EFs. In the current study we examined this question in two age groups (older and younger adults), using two different types of cues: semantic cues, and visual cues. Methods: In two studies, the effects of EFs on eating behavior were examined by manipulating the valence of cue exposures during a laboratory taste test involving appetitive snack foods. In study 1, 43 older adults (Mage=74.81 years) were randomly assigned to exposure to one of three different semantic cue types (facilitating, restraining, or neutral) prior to and during the taste test. In Study 2, 79 younger adults (Mage=18.71 years) were exposed to visual cues of the same nature. The amount of snack foods consumed during the taste test (in grams) and total calories ingested were the outcomes of interest.

Results: Findings in both studies indicated that the effects of EFs were most pronounced in the facilitating cue conditions; specifically, those with weaker EF ate 57.66% (older adults; Study 1 (p =0.02) and 28.57% (younger adults; Study 2: p=0.013) more snack foods than their relatively stronger EF counterparts. When the cues were restraining, those with weak and strong EFs consumed comparably modest amounts, and when the cues were neutral, both groups consumed comparably moderate amounts.

Conclusions: Cues have a strong effect on the expression of EFs in eating behavior, such that EFs are most consequential when cues are facilitating in nature. When cues are explicitly restraining or neutral, those with weak EFs restrain as well as those with stronger EFs.

Symposium 2958
Friday, March 20 from 3:45 to 5:00 pm

Psychological and Biological Factors in Heart Failure: It’s Not Only Depression
David S. Krantz, Ph.D., Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD, Paul J. Mills, Ph.D., Department of Psychiatry, University of California, San Diego, San Diego, CA, Romano Endrighi, Ph.D., Dept. of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD, Paul S. Monneret, Ph.D., Center for Research on Psychology and Somatic Diseases, Tilburg University, Tilburg, the Netherlands, Kenneth E. Freedland, Ph.D., Psychiatry, Washington University in St. Louis, St. Louis, MO, David S. Sheps, M.D., Depts. of Epidemiology and Medicine, University of Florida, Gainesville, Gainesville, FL

Heart failure (HF) is an important and prevalent chronic disorder, with a high morbidity and mortality and significant effects on lifestyle. Research suggests that psychosocial and behavioral factors play an important role in heart failure prognosis, clinical outcomes, and quality of life. Much of this research has examined depression associations with HF prognosis, with several biological and/or behavioral pathways suggested to explain how depression may operate. However, less is known about other psychosocial and behavioral variables that are important in HF outcomes, and this symposium presents new insights into these relationships.

Findings from 4 studies are presented, with each paper describing a different facet of psychological influences on HF. Among asymptomatic HF patients, the first paper reports relationships between the psychological trait of gratitude, the orientation toward noticing positive things in life, and mood, sleep, self-efficacy, and an index of cellular inflammatory processes. The next paper examines short-term (acute) and long-term (chronic) predictors of exacerbations in patients with HF. These investigators observed that chronically high, but not acute changes in HF symptom burden, BNP, psychological stress, and poorer function status, predict adverse cardiovascular events. Short-term changes in these variables are related to one another, and except for BNP, also to psychological stress.

The next paper explores the relationships of markers of nitric oxide (NO) regulation to depression in HF patients. They observed that depressive symptoms were associated with a lower i-arginine/ADMA ratio and higher SDMA levels, suggesting that the NO pathway may be dysregulated in depressed HF patients.

The papers conclude with a report of a trial evaluating the efficacy of novel interventions designed to address inadequate self-care, as well depression, in HF patients. These two problems are related to one another in HF patients, are both difficult to treat, and can be addressed in an integrated fashion.

In sum, the topics and findings explored in this symposium provide new insights into the important interplay between psychological, biological, behavioral, and clinical variables in heart failure.

Individual Abstract Number: 2971
Gratitude and its Relationship with Well-being in Asymptomatic Heart Failure (HF) Patients
Paul J. Mills, Ph.D., Department of Psychiatry, Kathleen Wilson, M.S, Meredith A. Pung, Ph.D., Kelly Chin, B.S, Departments of Psychiatry, Barry H. Greenberg, M.D., Omar Lunde, M.D., Departments of Medicine, Deepak Chopra, M.D., Department of Preventive Medicine, University of California, San Diego, San Diego, CA, Alex Wood, Ph.D., Department of Behavioral Science, University of Stirling, Stirling, Scotland, UK, Laura Redwine, Ph.D., Departments of Psychiatry, University of California, San Diego, San Diego, CA

In symptomatic HF, spirituality is associated with better mental health as well as better HF-related physical functioning. Gratitude is part of a broader life orientation towards noticing and appreciating the positive aspects of life, and its practice offers a possible modifiable mechanism by which spirituality may exert its beneficial effects on physical and mental health. Few if any studies have examined whether gratitude is associated with better wellbeing in HF, or whether it is a mechanism through which spirituality may exert its benefit on health.

Participants included 186 men and women with ACC/AHA Stage B asymptomatic HF (age 66.3 years ±10). Gratitude (GQ-6) was associated with better sleep (PSQI) (r=-0.254, p<0.01), less depressed mood (BDI) (r=-0.405, p<0.01), less fatigue (MFSI-f) (r=-0.455, p<0.01), and better self-efficacy to maintain cardiac function (CSEQ-mf) (r=0.406, p<0.01). Patients expressing more gratitude had lower levels of an inflammatory index comprised of a panel of circulating inflammatory biomarkers relevant to HF, including CRP, TNF-alpha, IL-6, IFN-gamma & ST2 (r=-.166, p<0.05). In mediation analysis, when controlling for gratitude, spiritual wellbeing (FACIT-sp) no longer remained a significant predictor of sleep quality indicating that the beneficial effect of spirituality on sleep exerts its effect through gratitude (p<0.001). Finally, when controlling for gratitude, the relationship between spiritual wellbeing and depressed mood was no longer significant indicating that gratitude fully mediates the relationship between spiritual wellbeing and depressed mood (p=0.001).

Gratitude and spiritual wellbeing are key positive factors to consider in this population. We showed that a mental attitude such as gratitude is related to better HF wellbeing, less depressed mood and sleep, and lower cellular-inflammatory and inflammatory index. Further, we attempted to untangle these relationships and found that spiritual wellbeing’s relationship with better sleep and less depressed mood is through higher trait gratitude. Efforts to increase gratitude in HF patients’ lives may be a treatment target for improving wellbeing and be of potential clinical value.

Individual Abstract Number: 2961
Acute and Chronic Predictors of Heart Failure Adverse Events, Functional Status, Symptoms and Biomarkers: Comparison with Psychological Stress
Romano Endrighi, Ph.D., Andrew J. Waters, Ph.D., Dept. of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD, Stephen S. Gottlieb, M.D., Department of Medicine, University of Maryland Medical Center, Baltimore, MD, Kristie M. Harris, M.A., Psychology, The Ohio State University, Columbus, OH, Andrew J. Woolverton, Ph.D., Division of Infectious Diseases, University of Miami, Miller School of Medicine, Miami, FL, David S. Krantz, Ph.D., Dept. of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD

BACKGROUND: Acute predictors of heart failure (HF) exacerbations and their comparison with chronic predictors are poorly understood mainly due to the challenging nature of examining patients in repeated assessments designs. We previously observed that HF patients with repeated high stress levels had significantly greater risk of adverse events (AEs), but short-term increases in stress did not predict AEs. Here we compare prospective acute vs. chronic associations of HF symptom profile, functional status and HF biomarkers with effects of psychological stress.

METHODS: HF symptoms (KCCQ), functional status (6 min walk test; 6MWT), B-type natriuretic peptide (BNP), psychological stress (Perceived Stress Scale; PSS), and hospitalization for cardiovascular (C) causes or death (adverse events; AEs) were assessed every 2 weeks for 3 months and at 9 months in 144 systolic HF patients (77% male; 58±12 yrs). Mixed model analyses were conducted using covariates of age, gender, income, BMI, hypertension, creatinine, EF and NYHA class.

RESULTS: In adjusted between-subject analyses, patients with higher vs. lower HF symptoms burden (OR=1.05, p=0.0004), BNP (OR=1.79, p=0.02), or PSS (OR=1.60, p=0.002) each had higher risk of hospitalization for cardiovascular (C) causes or death (adverse events; AEs) were assessed. 6MWT performance was also marginally associated with risk of AE (OR=1.002, p=0.06) but not after adjustment for covariates. Poor HF symptom status was also associated with impaired 6MWT performance (B=3.53, p=0.002) but not with BNP levels. Higher BNP level was associated with poor 6MWT performance but only in unadjusted analyses (B=-.59, p=0.007).
In within-subjects analyses, neither short-term changes in HF symptoms status, PSS, nor 6MWT performance were significantly associated with an imminent AE. However, increases in HF symptom burden were associated with subsequent impaired 6MWT performance (B=1.96, p<.0001) and higher BNP levels (B=-.005, p=.01). Short-term increases in PSS scores were associated with subsequent impaired 6MWT performance (B=0.26, p=.001) and poor HF symptoms status (B=3.30, p=.001). BNP was not associated with subsequent 6MWT performance or with the PSS.

CONCLUSION: Chronically high stress and BNP and poor HF symptoms status and, to a lesser extent, impaired functional status, each predict adverse CV events. However, short-term changes in these variables do not seem to predict an imminent AE. With the exception of BNP, short-term changes in these markers of HF severity are also related to psychosocial stress. A better understanding of acute changes in predictors of HF clinical status is needed to improve HF outcomes.

Individual Abstract Number: 2969

Altered Nitric Oxide Regulation in Patients with Heart Failure: The Association Between Depressive Symptoms with l-arginine, ADMA, SDMA and isoprostane

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Background: Nitric oxide (NO) regulation plays a critical role in cardiovascular disease including heart failure (HF). Biological markers of NO dysregulation have been found in individuals with depression without cardiovascular disease. Because depression is associated with poor HF outcomes, the present study tested the hypothesis that the NO pathway is dysregulated in HF patients with depression.

Methods: Serum levels of nitric oxide regulation (l-arginine, ADMA and SDMA), and oxidative stress (isoprostane 8-Epi Prostaglandin F2 Alpha) were measured in 104 patients with HF (mean age 65.7±8.4, 28% women) at baseline and 12 months. Depressive symptoms were measured using the Beck Depression Inventory (BDI). The associations between depressive symptoms with markers of NO regulation were examined with mixed model analysis, adjusted for age, sex, time of assessment, LVEF, creatinine, and hypertension status.

Results: Depressive symptoms were correlated with a lower l-arginine/ADMA ratio (r=-0.22, p = .003), and higher SDMA levels (r=0.28, p=.001). Associations were similar for somatic depressive symptoms, compared to cognitive depressive symptoms (l-arginine/ADMA ratio r=0.20, p=.009 vs. r= 0.19, p=0.13; ADMA r=0.16, p=.043 vs. r=0.10, p=.202; SDMA r=0.27, p<.001 vs. r=.22, p=.005, respectively). No associations were found between depressive symptoms and isoprostane. The association between depression and the l-arginine/ADMA ratio remained significant in multivariate adjusted models.

Conclusions: Markers of nitric oxide regulation, particularly the l-arginine/ADMA-ratio and SDMA were associated with depressive symptoms in patients with heart failure. The lower l-arginine/ADMA-ratio represents less available NO, indicating that NO-related endothelial dysfunction may play a role in the adverse risk of HF progression associated with depression.

Individual Abstract Number: 2974

Cognitive Behavior Therapy for Depression and Self-care in Heart Failure: A Randomized Controlled Trial

Kenneth E. Freedland, Ph.D., Psychiatry, Washington University in St. Louis, St. Louis, MO

Objectives: To evaluate the efficacy of an integrated cognitive-behavioral intervention for major depression and inadequate self-care in patients with heart failure (HF). Methods: Participants HF and major depression with were randomly assigned to individual cognitive behavior therapy (CBT) or to enhanced usual care (EUC); all received HF education. Treatment included up to 6 months of CBT plus maintenance contacts; termination of therapy occurred before 6 months if clinical improvement criteria were met. Outcome assessments were conducted at baseline, 3, 6, 9, and 12 months. The primary outcome was the Beck Depression Inventory (BDI-2) score at 6 months. Secondary outcomes included the Hamilton Depression scale (HAM-D), HF self-care, anxiety, physical functioning, and quality of life. Mixed models and ANCOVAs were used to analyze the outcomes. Results: The sample included 158 outpatients with HF and major depression (46% female, 37% minority, age 56±12 years, 58% NYHA Class I-II, 42% Class III, LVEF 39±16%, 34% on an antidepressant at baseline). Most participants were moderately depressed at baseline (BDI-2, 30.2±8.5; HAM-D-17, 24.2±5.5). The primary and secondary outcomes of the trial will be presented. Conclusions: Depression and inadequate self-care are related problems in patients with heart failure, and both are difficult to treat. This trial evaluated the efficacy of a novel cognitive-behavioral intervention that targets both problems in an integrated fashion.
Paper Session: Understanding and Improving Cancer Outcomes

Abstract 2893

BETA-ADRENERGIC ACTIVATION OF EPITHELIAL-MESENCHYMAL TRANSITION IN OVARIAN CANCER

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Objective: The Epithelial-Mesenchymal Transition (EMT) is a process by which epithelial cells lose their cell polarity and cell-to-cell adhesion, and undergo morphologic changes that give them a mesenchymal (more embryonic) phenotype and allow them to migrate and invade other tissues. This is a key process in cancer metastasis. Our previous research has shown that beta-adrenergic signaling stimulates pathways involved in ovarian tumor progression, but the mechanisms underpinning these effects are not fully understood.

Methods: To address this issue, we performed genome-wide transcriptome profiling of advanced stage ovarian carcinomas from 98 patients and compared those that were above versus below a median split on tumor NE level (median: 1.05 pg/mg tumor). Patients were matched on age, BMI, cancer grade, cancer stage, and histology. A Cox proportional hazards regression analysis was used to test length of survival in patients with high vs. low tumor NE. To experimentally assess effects of exposure to NE and effects of stress on EMT mediators, stimulation of ovarian cancer cells with NE, and restraint stress in an orthotopic model of ovarian cancer were used. Results: High-NE tumors showed increased expression of 694 genes by at least 25% and 124 by at least 50%. These included multiple genes related to EMT, as well as decreased expression of a variety of anti-metastatic genes. Patients with high-NE tumors had significantly poorer survival. In ovarian cancer cell lines (SKOV3ip1 and HeyA8), exposure to stress-concentrations of NE increased transcription of SNAI2 and IL6, both of which regulate EMT. In an in vivo orthotopic mouse model of ovarian cancer, 3 weeks of restraint stress decreased the epithelial marker E Cadherin, increased mesenchymal markers N Cadherin and Vimentin, and up-regulated EMT mediators Sna1, Sna2, and Twist1.

Conclusions: These results identify an additional pathway by which beta-adrenergic signaling can promote ovarian cancer progression by stimulating EMT gene expression programs that mediate metastasis.

Abstract 2840

DIURNAL CORTISOL AND SURVIVAL IN EPITHELIAL OVARIAN CANCER

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Objective: Hypothalamic-pituitary-adrenal (HPA) deregulation is commonly observed in cancer patients, but its clinical significance is not well understood. To address this issue, we prospectively examined associations between HPA-axis activity, tumor-associated inflammatory activity, and survival in ovarian cancer patients prior to treatment.

Methods: Participants were 113 women with ovarian cancer who provided saliva cortisol samples for three days prior to treatment for calculation of cortisol slope, variability, and night cortisol. The earliest date of surgery was January 2004, and all survival information was censored June 2013. Cox proportional hazard regression analyses were used to examine associations between cortisol and survival in models adjusting for disease stage, tumor grade, cytoreduction and age. Ascites fluid was assayed for levels of interleukin-6 (IL-6) and correlated with cortisol variables for a subsample of 41 patients with advanced stage disease and high grade tumor.

Results: Elevated night cortisol, flattened diurnal cortisol slope and reduced cortisol variability were each associated with decreased survival time, adjusting for covariates (all ps < .041). A one standard deviation increase in night cortisol was associated with a 46% greater likelihood of death across the length of the study. Patients in the high night cortisol group survived an estimated average of 3.3 years compared to 7.3 years for those in the low night cortisol group. Elevated ascthes IL-6 was associated with each cortisol measure (all r > .36, all p < .017).

Discussion: Abnormal cortisol rhythms assessed prior to treatment are associated with decreased survival in ovarian cancer and with elevated inflammatory activity in the vicinity of the tumor. HPA abnormalities may reflect poor endogenous control of inflammation, dysregulation caused by tumor-associated inflammation, or some combination of both. Nocturnal cortisol may be a clinically useful, non-invasive measure of HPA function and/or disease severity.

Abstract 2886

PREDICTING WHO BENEFITS MOST FROM A BRIEF MINDFULNESS MEDITATION FOR WOMEN UNDERGOING STEREOTACTIC BREAST BIOPSY

Chelsea G. Ratcliffe, MA, Integrative Medicine Program, General Oncology, Sarah Prinsloo, PhD, Alejandro Chaud, PhD, Stephanie G. Zepeda, PhD, Zinaat Taiwo, BS, General Oncology, University of Texas MD Anderson Cancer Center, Houston, TX, Rex Cannon, PhD, Brain Treatment Centers of South Florida, New Directions, LLC, Boynton Beach, FL, Amy Spelman, PhD, General Oncology, Wei Yang, MBBS, Diagnostic Radiology, Lorenzo Cohen, PhD, General Oncology, University of Texas MD Anderson Cancer Center, Houston, TX.

BACKGROUND: Stereotactic breast biopsies (SBB) are associated with significant anxiety, and nonpharmacologic methods to manage acute anxiety are needed. Additionally, it is important to determine factors that predict who benefits most from such interventions.

METHODS: In this single-blind trial, women were recruited prior to SBB and randomized in a 2:2:1 ratio to guided meditation (GM; n=30), focused breathing (FB; n=30), or standard care (SC; n=16). Anxiety and pain were assessed at baseline, after a 10-min pre-SBB group-specific activity (GM, FB, or SC (listening to neutral audio clips)), every 4 min during SBB, and post-SBB. EEG activity was collected throughout the study, and self-reported mindfulness (Five Facet Mindfulness Questionnaire) was collected at baseline.

RESULTS: Linear multilevel modeling covarying for baseline anxiety revealed that women in GM reported a steeper reduction in anxiety during the biopsy compared to FB and SC (p's < .001). There were no group differences in pain ratings during the biopsy. LORIET analyses of EEG data revealed that women in GM and FB exhibited greater left hemisphere delta activity compared to SC, and delta activity was associated with less anxiety and pain during biopsy (p's < .05).

Mindful observing (MO) and mindful nonreaction (MN) both interacted with group-by-time on change in anxiety ratings during the procedure. Specifically, women high in MO or MN who were assigned to GM reported a steeper...
reduction in anxiety during biopsy compared to their high MO or MN counterparts in FB, but not SC. Further, women low in MO or MN experienced the greatest decrease in anxiety during biopsy if they were in GM compared to FB or SC.

There was also a group-by-MN effect on pre-biopsy anxiety, such that being in GM or FB, compared to SC, buffered the negative effect of low MN on pre-biopsy anxiety. Similarly, there were group-by-MN and group-by-mindfulness (MA) effects on post-biopsy pain, such that being in GM or FB, compared to SC, buffered the negative effect of low MN or MA on post-biopsy pain (p’s < 0.05).

CONCLUSIONS: GM relieves anxiety during biopsy more effectively than FB and SC. GM and FB were associated with neuronal quieting compared to SC. For those low in trait mindfulness, GM appears to be the best method for reducing anxiety during biopsy while GM and FB both reduce anxiety before and pain after biopsy. Thus, GM may be an ideal intervention for individuals low in trait mindfulness who desire to manage their distress before, during, and after biopsy.

Abstract 2670
LESS ANGRY WIFE, MORE HAPPY LIFE: RESULTS OF A RANDOMIZED CONTROLLED TRIAL OF BRIEF SUPPORTIVE EXPRESSIVE THERAPY FOR PARTNERS OF EARLY STAGE PROSTATE CANCER PATIENTS
Codie R. Rouleau, M.Sc., Department of Psychology, Linda E. Carlson, Ph.D., Michael Specia, Psy.D., John W. Robinson, Ph.D., Barry D. Bultz, Ph.D., Department of Oncology, University of Calgary, AB, Canada

Background: The diagnosis of cancer is a time of great stress for both patients and their partners. Preliminary evidence suggests interventions to reduce distress in partners may diffuse psychosocial benefits to the patient; however, this topic has not been investigated in prostate cancer. The aims of this study were to (a) pilot a six-week group intervention targeting reduction of psychological distress in wives of men with prostate cancer and (b) examine whether improvements in partner mood disturbance correspond to improvements in patient mood disturbance from baseline to 6-month follow-up.

Methods: Partners of men with newly diagnosed localized (T1-T4, NX, M0) prostate cancer were randomized to receive supportive expressive therapy for partners only (n = 45) or were offered a support group at the conclusion of the study (n = 32). The intervention consisted of six weekly group sessions that emphasized emotional expression, social support, communication skills, and finding meaning in the cancer experience. The Profile of Mood States (POMS) was administered to partners and patients at baseline, post, and at 3- and 6-month follow-up.

Results: A series of 2 (Group) x 4 (Time) repeated measures linear mixed models with statistical adjustment for baseline scores indicated no group x time interaction effects of the intervention on POMS subscales. Regardless of group membership, however, there was a significant improvement over time in partner-reported Tension (F(2,40) = 8.75, p < .001), Anger (F(2,40) = 3.79, p = .011), Confusion (F(2,40) = 9.34, p < .001), and Total Mood Disturbance (F(2,39) = 4.98, p = .002) and in patient-reported Tension (F(2,36) = 2.96, p = .033), Confusion (F(2,36) = 2.96, p = .033), and Total Mood Disturbance (F(2,36) = 2.96, p = .033) indicating partner improvements in Tension were associated with improvements in patient mood disturbances. A low score on Trait Anger was associated with decreases in anger in the partner (r = .434, p = .001), Depression (r = .423, p = .001), Anger (r = .527, p < .001), Vigor (r = -.513, p < .001), Confusion (r = .599, p < .001), and Total Mood Disturbance (r = .592, p < .001), following Bonferroni correction for multiple tests.

Conclusions: Despite lack of evidence for the brief supportive expressive intervention to alleviate distress, these results suggest that partners’ psychosocial adjustment in the context of prostate cancer diagnosis may diffuse benefits to the patient. Specifically, reductions in wives’ anger accounted for 18% of variance in husbands’ improvements in mood disturbance over 6 months. Future research is needed to better understand and help manage partners’ anger and its impact on couples affected by prostate cancer.

Abstract 3082
THREE-ARM RANDOMIZED TRIAL OF TIBETAN YOGA IN BREAST CANCER PATIENTS
Lorenzo Cohen, PhD, Amy Spelman, PhD, Rosalinda Engle, MA, Integrative Medicine Program, Banu Arun, MD, Breast Medical Oncology, Carol Harrison, MED, Behavioral Science, George Perkins, MD, Radiation Oncology, Vicente Valero, MD, Breast Medical Oncology, Gilda Babiura, MD, Surgical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX, Tercin Wang, PhD, Philosophy, Lijinghua Institute, Charlotteville, VA, Guanduo Chaoul, PhD, Integrative Medicine Program, The University of Texas MD Anderson Cancer Center, Houston, TX

Background: The diagnosis and treatment of breast cancer is associated with significant changes in quality of life (QOL). This study assessed the effects of Tibetan Yoga (TY) on sleep, fatigue, and QOL for women with breast cancer undergoing chemotherapy. Methods: Breast cancer patients scheduled to undergo chemotherapy were randomly assigned to a TY, Stretching (SG) or a Usual Care (UC) group. Participants in TY and SG participated in four, 90-minute classes held weekly or every three weeks, depending on chemotherapy treatment schedule. The TY program consisted of controlled breathing, visualizations, meditation, and Tsaa lung movements. The SG program focused on educational basics for recovery and mirrored the TY movements. Measures of sleep (PSQI), fatigue (BFI), and QOL (FACT-B) were obtained prior to randomization and 1 week, 3 and 6 months after the last intervention session. Results: Participants completed baseline and at least one follow-up (n=249). Average age of participants was 49.5 years. Stage of disease ranged from Stage I-III (21.3%, 56.6%, and 22.1%, respectively). Participants were mostly non-Hispanic Caucasian (58.2%), employed (60.2%) and highly educated (55.0% with at least a college degree). The majority of participants had undergone surgery (61.4%) and was receiving weekly taxane therapy (76.7%). There was a 71.5% retention rate at 6 months post-intervention. GLM analyses revealed a significant group main effect at the 6-month time point for sleep duration (least square (LS) means: TY = 8.30; SG = 7.86; UC = 8.52, p = 0.04), with the TY group reporting longer sleep duration than SG (p=0.009) and UC (p=0.05). At 3 months post intervention, significant group effects were found for sleep disturbance (means: TY = 2.79; SG = 3.74; UC = 3.94; p=0.04) as well as for QOL (LS means: TY = 11.75; SG = 14.1; UC = 12.9; p=0.05). There were no significant differences in fatigue scores across groups. Conclusions: TY resulted in better long-term sleep quality and breast cancer-specific aspects of QOL than usual care and stretching. This suggests that TY should be considered to help improve sleep and QOL while breast cancer patients are undergoing chemotherapy.

Paper Session: Distress, Affect and Cardiac Disease
Friday, March 20 from 8:30 to 9:45 am

Abstract 2591
COST-EFFECTIVENESS OF A COLLABORATIVE CARE DEPRESSION AND ANXIETY TREATMENT PROGRAM IN PATIENTS WITH ENDOCRINE CANCER: THE MORE HAPPY LIFE TRIAL
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Depression and anxiety disorders are common and treatable in patients with cardiovascular disease, but treatment programs for this population must be financially viable. Collaborative care (CC) programs that focus on the management of both anxiety and mood disorders have the potential to be more cost-effective than programs that focus on either type alone. In this analysis, we examined the cost-effectiveness of a CC depression and anxiety treatment program that was initiated in 183 cardiac inpatients and continued via telephone over the six months post-discharge. We systematically calculated the time spent by the care manager and study psychiatrist for initial evaluations (diagnostic evaluation, care coordination with the inpatient team), follow-up evaluations (study phone calls, care coordination), and meetings for symptom monitoring. Intervention costs were then calculated based on the salaries (plus fringe benefits) of these staff members. To a significant degree, GM may be an ideal intervention for individuals low in trait mindfulness who desire to manage their distress before, during, and after biopsy.
Abstract 3024
CORONARY MICROVASCULAR DISEASE: A POTENTIAL CORRELATE OF ISCHEMIA WITH MENTAL STRESS
Pratik M. Pimple, MBBS, MPH, Epidemiology, Laney Graduate School and Rollins School of Public Health, Emory University, Atlanta, Georgia, Ernest V. Garcia, PhD, Jonathan Nye, PhD, Radiology, Ibhar Al Mheid, MD, Kobina Wilmot, MD, Ronnie Ramirez, MD, Cardiology, Emory University, School of Medicine, Atlanta, Georgia, Amit J. Shah, MD, MSCR, Epidemiology, Rollins School of Public Health, Emory University, Atlanta, Georgia, Paolo Raggi, MD, FACC, Cardiology, University of Alberta, Edmonton, Alberta, Canada, Michael Kutner, PhD, Qi Long, PhD, Biostatistics, Rollins School of Public Health, Emory University, Atlanta, Georgia, J. Douglas Bremner, MD, Psychiatry and Behavioral Sciences, Arshed A. Quyyumi, MD, Cardiology, Emory University, School of Medicine, Atlanta, Georgia, Viola Vaccarino, MD, PhD, Epidemiology, Rollins School of Public Health, Emory University, Atlanta, Georgia

Objective: Transient ischemic dilation (TID) detected with myocardial perfusion imaging is a measure of dilation in left ventricular cavity size with stress. This apparent dilation may reflect subendocardial hyperperfusion and impaired coronary flow reserve due to coronary microvascular disease. Mental stress (MS) has been postulated to worsen coronary microvascular function. Mental stress-induced ischemia (MSI) predicts adverse events, but does not correlate with coronary artery disease (CAD) severity. We addressed the hypotheses that MS is associated with larger TID as compared to physical stress (PS), and this TID difference is accentuated in subjects with MSI.

Methods: 604 patients with CAD underwent 99mTcTcsestamibi myocardial perfusion imaging at rest and during both mental and physical (exercise/pharmacological) stress testing. TID with each stress was calculated using Emory Cardiac Toolbox software. A 17-segment model was used to calculate summed stress scores to quantify perfusion defects with MS, PS, and at rest. TID with each stress condition and the difference between the two stress conditions were compared according to ischemia status.

Results: One hundred and twenty (20%) developed mental stress ischemia (MSI+), 162 (27%) developed physical stress ischemia (PS+); 60 (10%) developed both MSI and PS. Both MS and PS were associated with a larger increase in TID than PS (within-subject difference (6) MS – PS) = 0.02, p = 0.004). This difference was significantly larger in MSI+ patients (6MSI+ = 0.04, p = 0.003) than in MSI negative subjects (6MSI- = 0.01, p = 0.13). In contrast, PS+ had a similar TID with PS and MS (ΔPSI+ = -0.01, p = 0.20). These results remained unaltered after adjustment by sociodemographic factors (age, sex, race, smoking status) and medical history (hypertension, hyperlipidemia and diabetes). No age, sex or race interaction was found.

Conclusion: Mental stress is associated with higher TID, particularly in subjects who are MSI positive. Higher TID in response to mental stress may be a marker of subendocardial ischemia and coronary microvascular dysfunction and potential mechanism for adverse cardiac events in subjects with MSI.

Abstract 3025
MYOCARDIAL ISCHEMIA INDUCED BY MENTAL STRESS IN PATIENTS WITH STABLE CORONARY ARTERY DISEASE: EVIDENCE FOR A HIGHER RISK AMONG YOUNG WOMEN
Viola Vaccarino, MD, PhD, Epidemiology, Kobina Wilmot, MD, Ibhar Al Mheid, MD, Medicine, Pratik Pimple, MBBS, MPH, Epidemiology, Ernest V. Garcia, PhD, Jonathan Nye, PhD, Radiology, Ronnie Ramirez, MD, Medicine, Amit J. Shah, MD, Epidemiology, Laura Ward, MSHP, Biostatistics, Emory University, Atlanta, Georgia, Paolo Raggi, MD, Mazouzkonki Alberta Heart Institute, University of Alberta, Alberta, BC, Canada, Michael Kutner, PhD, Qi Long, PhD, Biostatistics, J. D. Bremner, MD, Psychiatry, Arshed A. Quyyumi, MD, Medicine, Emory University, Atlanta, Georgia

Objectives. Recent data suggest that young women with coronary artery disease (CAD) are disproportionally vulnerable to the adverse cardiovascular effects of emotional stress, but direct evidence is limited. We hypothesized that young women (<60 years) with stable CAD are at increased risk of ischemia were tested and MSI+ patients (ΔMSI+ = 0.04, p = 0.003) than in MSI negative subjects (ΔMSI = 0.01, p = 0.13). In contrast, PS+ had a similar TID with PS and MS (ΔPSI+ = -0.01, p = 0.20). These results remained unaltered after adjustment by sociodemographic factors (age, sex, race, smoking status) and medical history (hypertension, hyperlipidemia and diabetes). No age, sex or race interaction was found.

Conclusion: Mental stress is associated with higher TID, particularly in subjects who are MSI positive. Higher TID in response to mental stress may be a marker of subendocardial ischemia and coronary microvascular dysfunction and potential mechanism for adverse cardiac events in subjects with MSI.

Abstract 3025
MYOCARDIAL ISCHEMIA INDUCED BY MENTAL STRESS IN PATIENTS WITH STABLE CORONARY ARTERY DISEASE: EVIDENCE FOR A HIGHER RISK AMONG YOUNG WOMEN
Viola Vaccarino, MD, PhD, Epidemiology, Kobina Wilmot, MD, Ibhar Al Mheid, MD, Medicine, Pratik Pimple, MBBS, MPH, Epidemiology, Ernest V. Garcia, PhD, Jonathan Nye, PhD, Radiology, Ronnie Ramirez, MD, Medicine, Amit J. Shah, MD, Epidemiology, Laura Ward, MSHP, Biostatistics, Emory University, Atlanta, Georgia, Paolo Raggi, MD, Mazouzkonki Alberta Heart Institute, University of Alberta, Alberta, BC, Canada, Michael Kutner, PhD, Qi Long, PhD, Biostatistics, J. D. Bremner, MD, Psychiatry, Arshed A. Quyyumi, MD, Medicine, Emory University, Atlanta, Georgia

Objectives. Recent data suggest that young women with coronary artery disease (CAD) are disproportionally vulnerable to the adverse cardiovascular effects of emotional stress, but direct evidence is limited. We hypothesized that young women (<60 years) with stable CAD are more likely than men of similar age to develop abnormal myocardial perfusion (ischemia) with a mental stress test, but not with a standard exercise or pharmacological stress test.

Methods. A total of 613 patients with stable CAD were examined with 99mTcTcsestamibi myocardial perfusion imaging at rest and with both mental (speech task) and physical (exercise/pharmacological) stress. Myocardial ischemia was defined as a new or worsening myocardial perfusion defect with either stress condition in each of 17 myocardial segments using observer-independent software. Sex differences in ischemia were tested according to 3 age groups: <60, 60-69, and ≥70 years.

Results. Women had a similar clinical risk profile but a more adverse psychosocial risk profile compared with men. There were no significant differences in rest perfusion between women and men in any age group. Overall, women experienced more often ischemia with mental stress than men (93% vs. 26%, p=0.002), but not with physical stress (43% vs. 38%, p=0.34). For mental stress there was a significant sex by age interaction. Women <60 had more than double the rate of ischemia with mental stress than men of similar age, while no significant differences were found among older patients (Table). There were no sex differences in ischemia with physical stress. In multivariable analysis, psychosocial and behavioral factors explained 1/3 of the excess risk of mental stress-induced ischemia in young women vs. young men but the difference remained significant (RR=1.18, p=0.004). Clinical risk factors had no impact.

Conclusions. Young women with stable CAD are at increased risk of ischemia with mental stress, which could play a role in the prognosis of CAD in this group.

Abstract 2999
ASSOCIATION OF ANHEDONIA WITH RECURRENCE OF CORONARY HEART DISEASE EVENTS AND ALL-CAUSE MORTALITY: META-ANALYSIS OF INDIVIDUAL PARTICIPANT DATA FROM 8 STUDIES WITH 6,997 PARTICIPANTS
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Background: Numerous systematic reviews and meta-analyses have found that depression, when examined in the aggregate, is associated with an increased risk of morbidity and mortality in patients with coronary heart disease (CHD); however, not all depressive symptoms are uniformly cardiotoxic. Studies that have investigated the cardiotoxicity of anhedonia (i.e., loss of pleasure in people or activities) in patients with CHD report conflicting results regarding its association with recurrence of CHD events and all-cause mortality.

Methods: Electronic databases were searched through October 2014 for prospective cohort studies reporting associations of anhedonia with CHD recurrence and all-cause mortality. Individual participant data regarding anhedonia and other depressive symptoms, CHD outcomes, all-cause mortality, demographic, cardiac severity, and health status indicators were obtained. Anhedonia status was defined using published thresholds on self-report inventories or responses to standardized diagnostic interviews. A two-stage meta-analysis of individual participant data was conducted in which the association of anhedonia with CHD prognosis was first modeled within study using Cox proportional hazards regression analyses, and then results from all studies were meta-analyzed. Cochrane’s Q statistic was used to evaluate heterogeneity of effect sizes.

Results: Of 1,419 references initially retrieved, individual participant data were obtained from 8 prospective studies comprising 6,997 participants. Meta-analyses of these studies showed a 19% increased risk of CHD event recurrence (95% confidence interval [CI] for hazard ratio = 1.06 – 1.35, p = 0.003) and a 49% increased risk of all-cause mortality (95% CI = 1.10 – 1.66, p < 0.001). Depression increased the risk of CHD event recurrence and all-cause mortality independent of depressed mood. Future studies are needed to consider the role of anhedonia in risk stratification and the efficacy of treatments specific to anhedonia for cardiac patients.
GENERALIZED ANXIETY DISORDER AND PANIC DISORDER AS INDEPENDENT RISK FACTORS FOR CARDIOVASCULAR DISEASE: DATA FROM THE NATIONAL EPIDEMIOLOGIC SURVEY ON ALCOHOL AND RELATED CONDITIONS (NESARC)

Elizabeth A. Vanry, Ba, Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, Indiana, Jesse C. Stewart, PhD, Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN

Although evidence suggests that various anxiety measures predict the onset of clinical cardiovascular disease (CVD), few studies have evaluated the relative importance of individual anxiety disorders. Consequently, we examined four anxiety disorders as predictors of incident CVD. Participants were 28,726 adults (mean age 42.2 years, 58% female, 42% white) from the 2005-2006 waves of the NESARC study of a nationally representative sample of the U.S. population. The Wave 1 depression and anxiety disorders were assessed using previously validated methods. A healthy gut microbiome enterotype was defined by high Bacteroidetes, low Proteobacteria, and a very low Firmicutes ratio emerged among individuals with very low food craving (valence, calmness, and energetic arousal was reported after having consumed high fat/high sugar foods. Recent research from our lab has identified two neurobiological pathways that contribute to this phenomenon have yet to be explored. Emerging research related behaviors and appetite-regulation in murine models, was 3-fold higher than the sample mean among two lean participants who rarely consumed carbohydrate food, whereas social phobia did not (OR=1.20, 95% CI: 0.96-1.48, p=10). Results from this large sample representative of the U.S. population indicate that generalized anxiety disorder and panic disorder may be independent risk factors for CVD.

GUT MICROBIOME-BRAIN INTERACTIONS IN HEDONIC EATING BEHAVIORS

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Existing weight control paradigms are not optimally effective partly because they lack strategies to counteract the drive to overeat hedonically-pleasing, high fat/high sugar foods. Recent research from our lab has identified two neurobehaviorally important endophenotypes of obesity based on heterogeneity in attributing incentive salience to palatable foods. The underlying mechanism(s) that contribute to this phenomenon have yet to be explored. Emerging research suggests that the gut microbiome might influence reward-related behaviors leading us to hypothesize that certain gut microbes may influence the attribution of incentive salience to palatable foods. To begin testing this hypothesis, we explored the gut microbiome profiles of those who appeared resistant to hedonic eating behavior. In an exploratory human study of 10 lean and obese adults, we characterized 16S rRNA gut microbiome profiles and indicators of hedonic eating using previously validated methods. A healthy gut microbiome enterotype defined by high Bacteroidetes, low Proteobacteria, and a very low Firmicutes-to-Bacteroidetes ratio emerged among individuals with very low food craving scores, whose habitual diets were characterized by low total energy intake, an overall healthy eating pattern, and low-to-moderate intake of hedonic foods. Bifidobacterium, a beneficial microbe emerging in probiotic obesity interventions, had a positive correlation in murine models, was 3-fold higher than the sample mean among two lean participants who rarely consumed hedonic foods and had very healthy overall diets and low food craving scores. Akkermansia muciniphila, an inhibitor of diet-induced obesity in animal models, was highest among a lean young woman with a healthy enterotype, who reported high levels of cognitive dietary restraint. Findings provide support for the hypothesis that the gut microbiome is associated with the neurocognitive processes that promote hedonic eating. This pilot study represents the first step towards isolating gut bacteria that may function as biological targets for obesity prevention; informing the development of innovative probiotic therapies to modulate the neurocognitive drive to (over)eat high fat/high sugar foods.

LOLONINESS PREDICTS POSTPRANDIAL GHIHELIN AND HUNGER IN WOMEN

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Objective: Loneliness is strongly linked to poor health. Recent research suggests that appetite dysregulation provides one potential pathway through which loneliness and other forms of social disconnection influence health. Obesity may alter the link between loneliness and appetite-relevant hormones, one unexplored possibility. We examined the relationships between loneliness and both post-meal ghrelin and hunger, and tested whether these links differed for people with a higher versus lower body mass index (BMI; kg/m²). Method: During this double-blind randomized crossover study, women (N = 42) ate a high saturated fat meal at the beginning of one full-day visit and a high oleic sunflower oil meal at the beginning of the other. Loneliness was assessed once with the Daily Distress Inventory (9). Ghrelin was sampled before the meal and post-meal at 2 and 7 hours. Self-reported hunger was measured before the meal, immediately post-meal, and then 2, 4, and 7 hours later. Results: Lonelier women had larger postprandial ghrelin and hunger increases compared with less lonely women, but only among participants with a lower BMI. Loneliness and postprandial ghrelin and hunger were unrelated among participants with a higher BMI. These effects were consistent across both meals. Conclusions: These data suggest that ghrelin, an important appetite-regulation hormone, and hunger may link loneliness to weight gain and its corresponding negative health effects among non-obese people.

DOES COMFORT FOOD COMFORT? DYNAMICS OF THE ASSOCIATIONS BETWEEN STRESS, MOOD, AND EATING BEHAVIORS IN A HEALTHY POPULATION

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Objectives: Previous research indicates a strong relation between negative emotions, stressful life events and eating behaviors, i.e. a preference for high-fat and high-carbohydrate food (‘comfort food’). However, these relations have primarily been investigated retrospectively. There is a need for in more in-depth research of the hedonic aspect of eating behavior. Method: In this study, we assessed lifetime history of four DSM-IV anxiety disorders (OR=1.87, p=.002), and social phobia (OR=1.15, 95% CI: 0.82-1.49, p=.51), remained predictors of incident CVD. After further adjusting for Wave 1 lifetime depressive disorders, generalized anxiety disorder (OR=1.45, 95% CI: 1.21-1.47, p=.001) and panic disorder (OR=1.49, 95% CI: 1.39-2.06, p<.001), social phobia (OR=1.49, 95% CI: 1.22-1.83, p<.001), and agoraphobia (OR=2.01, 95% CI: 1.53-2.61, p<.001) predicted incident CVD. In a subsequent analysis (OR=1.92, 95% CI: 1.38-2.71, p<.001), panic disorder (OR=1.46, 95% CI: 1.45-1.87, p=.002), and social phobia (OR=1.25, 95% CI: 1.02-1.54, p=.034), but not agoraphobia (OR=1.11, 95% CI: 0.82-1.49, p=.51), remained predictors of incident CVD.

Abstract 2751
CHANGE IN PSYCHOLOGICAL STATES AFTER MEALS AND FOOD INTAKE: INVESTIGATION BY USING AN ELECTRONIC FOOD DIARY AND ECOLOGICAL MOMENTARY ASSESSMENT

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Psychological effect of food intake has been discussed in the context of emotional eating and overeating, and most previous studies were conducted experimentally. Recently, electronic food diary has become available to evaluate food intake nutritionally in daily settings. Therefore, the aim of this study was to investigate the association between change of psychological states after meals and intake of energy, carbohydrate and fat in subjects including normal weights as well as overweight as in an ecologically valid way.

The subjects were 15 normal weights (13 women and 2 men; age 38.7 ± 10.9 y.o.) and 6 overweight (4 women and 2 men; age 34.7 ± 7.9 y.o.). They carried a smartphone for two weeks and recorded their momentary psychological states several times per day including just before and after meals. They also recorded food intake into an electronic food diary, whose accuracy in calculating intake of energy, carbohydrate and fat was already confirmed. Multitlevel models with change in either stress, anxiety, depressive mood, positive mood or negative mood as the dependent variable and with intake of either energy, carbohydrate or fat as an independent variable were tested.

Results: Change in stress was inversely associated with energy intake (p = 0.03), and change in positive mood was positively associated with intake of energy (p = 0.002), carbohydrate (p = 0.045) and fat (p = 0.02). Change in stress, depressive mood or negative mood was not associated with any intake of energy, carbohydrate or fat. These results suggested that food intake may alleviate anxiety and increase positive mood immediately.

Further analyses are necessary to investigate whether these effects is related to situations (e.g. regular meals vs. snacks) and individual factors (e.g. normal weights vs. overweight).

IS THE OBESOCGENIC QUALITY OF THE HOME ENVIRONMENT ASSOCIATED WITH ENERGY-BALANCE BEHAVIORS AND WEIGHT IN EARLY CHILDHOOD?

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Background: The home environment is thought to play a key role in early weight trajectories, although direct evidence is limited. There is general agreement that multiple factors exert small effects individually, so use of composite measures could demonstrate stronger effects. This study therefore examined whether composite measures reflecting the ‘obesogenic’ quality of the home food, physical activity, and media environments are associated with energy-balance behaviors and weight in early childhood.

Methods: Participants were 1096 families from the Gemini twin birth cohort (one child per family). A telephone interview (Home Environment Interview; HEI) was used to assess multiple aspects of the home environment when the children were 4 years old. Responses were standardized to create four composite scores representing the food, physical activity, media, and overall home environments. Each composite was categorized into ‘obesogenic risk’ tertiles. Energy-balance behaviors (diet, activity, TV viewing) were recorded during the interview. Height and weight measurements were recorded at 4 years and converted to BMI standard deviation scores (SDS).

Results: Children living in higher-risk food environments consumed less fruit (OR: 95% CI = 0.39; 0.27 – 0.57) and vegetables (0.47; 0.34 – 0.64), and more energy-dense snacks (3.48; 2.16 – 5.62), convenience food (2.22; 1.59 – 3.12), fast-food (3.34; 1.85 – 6.05), and sweetened drinks (3.49; 2.10 – 5.81). Children living in higher-risk activity environments were less physically active (0.42; 0.35 – 0.52). Children living in higher-risk media environments watched more TV (3.45; 2.48 – 4.96). (All p’s < 0.001). Neither the individual nor the overall composite scores were associated with BMI SDS at 4 years.

Conclusions: Composite measures of the obesogenic home environment were associated predictably with energy-balance behaviors in early childhood. Associations with weight were not apparent at this age, although the findings highlight the home environment as an avenue for behavior change in preschool children.
Circadian dysregulation is associated with accelerated tumor progression, and systemic inflammation or other immune imbalances (e.g., TH1/TH2 associated responses) may underlie these associations. Few human cancer studies incorporate both circadian and immune data, and even fewer do so among patients with active tumor. We explored associations of behavioral (actigraphic) and endocrine (salivary cortisol) circadian rhythms with cytokine responses to stimulation among presurgical breast cancer patients. We hypothesized that distress, circadian, and endocrine disruption would be associated with systemic inflammation and disproportionate TH1/TH2 associated responses.

Patients awaiting surgery (n=57) reported on distress (IES) and provided 3 days of actigraphic and salivary cortisol data. Cytokines were measured via Multiplex technology after whole blood stimulation with an innate immune activator (bacterial endotoxin, or LPS) or a T-cell activator (PHA). Cytokines were grouped by exploratory factor analysis within stimulation conditions, yielding factor scores. Hierarchical regressions adjusted for age, cancer stage and income in tests of associations of distress, circadian, and endocrine function with cytokine factor scores.

Rest/activity rhythm disruption was linked with higher TH1 and TH2 associated responses to innate activation (Factor 2: IL-4, IL-5, IL-13, IL-12), as was sedentary behavior. Sedentary patients also showed heightened TH1 and proinflammatory responses after T-cell activation (Factor 3: IL-2, IFN-gamma, IL-17). Unexpectedly, patients with flatter diurnal cortisol rhythms had attenuated proinflammatory and chemotactic responses after T-cell activation (Factor 1: IL-1 beta, IL-6, TNF-alpha, MCP-1). Distress was not related to cytokine responses.

Behavioral versus endocrine circadian disruption were independently associated with distinct aspects of aberrant T-cell mediated immune and inflammatory responses. These data highlight the need to examine separately the associations of behavioral versus endocrine rhythms with immunity. Neuroendocrine mechanisms may spark a cascade of tumor-promoting immune changes in patients with circadian disruption.

Abstract 3058

FASTMING MODULATES CORTISOL AND INTERLEUKIN-6 RESPONSES TO ACUTE PSYCHOSSOCIAL STRESS

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Rationale: Caloric restriction (CR) has been shown to prolong rodent lifespans by up to 50%. CR has also been shown to improve surgical survival outcomes in mice. It is less clear whether CR would have these effects in humans. While it is not feasible to reproduce lifelong studies in people, it is possible to investigate CR in humans going beyond basal levels of hormones by testing acute stress responses. In this pilot study we therefore examined the effects of CR on cortisol and inflammatory reactivity to acute psychosocial stress.

Methods: Twenty-nine adults (58% male; 42% Caucasian) with a mean age of 19.45 years (SD=1.30) and BMI of 25.41 kg/m2 (SD=3.79) were randomly assigned to an overnight fast, a three-day juice fast, or a non-fasting control condition. The overnight group fasted for 18 hours, the juice group ingested only water or juice provided to them, and the control group was asked to eat normally. After the intervention participants were conducted to the Trier Social Stress Test (TSST) and cortisol was measured in saliva at -1, +1, 10, 30, 45, 60, and 120 minutes post-TSST. IL-6 was measured in plasma at -1, 30, and 120 minutes post-TSST.

Results: Baseline analyses showed the juice group to have higher pre-stress cortisol levels (M=22.30 nmol/L) and higher variability (SD=19.67) than the overnight fast (M=12.59 nmol/L; SD=7.32) or the control group (M=13.34 nmol/L; SD=8.33). A repeated measures ANOVA revealed a significant group difference in cortisol responses (group by time interaction: F=2.80; p=.04), indicating normal reactivity in the overnight and control groups, but blunted reactivity in the juice group. IL-6 showed significant increases in response to stress in all groups (F=20.26; p<0.001), but IL-6 responses in both CR groups were lower compared to controls (marginal group by time interaction F=3.98; p=.051).

Conclusions: The findings of this pilot study indicate that CR (mitrates reactivity to cortisolation IL-6) and the group differences in cortisol responses (group by time interaction: F=2.80; p=.04) are maintained over the course of the study.

Abstract 2940

DEPRESSION PREDICTS SURVIVAL IN A 17 YEAR LONGITUDINAL STUDY OF PEOPLE WITH HIV

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Introduction: HIV is one of the leading causes of death for people ages 25-54. Since depression is present in a substantial proportion of people with HIV, studies that orientate the treatment of depression as a potential treatment for HIV are needed. However, very little is known about treatment response in these complex individuals.

Abstract 2937

GENDER DIFFERENCES IN MENTAL-STRESS INDUCED PRO-INFLAMMATORY RESPONSES IN HEALTHY, OLDER PARTICIPANTS FROM THE Framingham Heart Study COHORT.

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Background: Psychological stress triggers innate immune responses and elevation in serum levels of circulating pro-inflammatory cytokines. Interleukin-6 (IL-6) is one of such biomarkers that is reliably induced by mental stress and is implicated in several diseases prevalent in older populations. The effect of gender on inflammatory responses remains unclear due to limitations of previous studies such as small samples, failure to account for confounders and inadequate blood sampling design.

Aim: To examine sex differences in the pro-inflammatory IL-6 response to acute stress in a large, older sample of healthy participants after accounting for several confounders.

Methods: 506 participants (63.3 ± 5.60 yrs, 55% male) without history or objective sign of heart disease underwent 10 minute of mental stress consisting of mirror tracing and Stroop task. Peripheral blood was collected at baseline, after stress, at 45 and 75 minutes post-stress, and assayed for IL-6 using a high sensitivity kit. Stress-induced IL-6 reactivity was computed as the mean difference between baseline and 45 minutes post-stress, and between baseline and 75 minutes post-stress. Main effects and interactions were examined using ANOVA models estimated that roughly a quarter to one-third of people with HIV have clinically significant depressive symptoms, representing about a threefold greater prevalence of depression than the general population. Several studies have shown that depression predicts worse course with HIV, but few have investigated its relationship with mortality, and none have had a 17 year period of observation or have been conducted entirely during the period since the advent of protease inhibitors.

Methods: We followed a diverse sample of people who were HIV positive (n=177) and in the middle range of illness at baseline (CD4 between 150 and 500; never had an AIDS defining symptom) for a study on stress and coping. Participants were seen every six months (for 12 years) for blood draws, psychosocial questionnaires, and an interview. Depression was assessed by the Beck Depression Inventory.

Results: Controlling for medical variables (baseline CD4 and VL, age, and antiretroviral medication over the course of the study), the single baseline measure of depression did not significantly predict mortality (p=.11). However, the more representative measure of depression averaged over the first four time points (following our previous work on predicting disease progression). The study began in March of 1997 and mortality was assessed in April of 2014.

Conclusions: Depression measured during the first year and a half predicted worse survival in a diverse sample of people with HIV followed up to 17 years. Since depression is present in a substantial proportion of people with HIV, treating depression should be a priority for clinicians both for well-being and potential effects on survival.
PARENTAL MARITAL CONFLICT AND CELLULAR AGING IN CHILDHOOD: ADVERSE EXPOSURE ACCUMULATION VS. NEGATIVE AFFECT REACTIVITY

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Accelerated cellular aging is implicated in the biology of aging, disease risk, and mortality. One marker of cellular age is telomere length, which shortens over the lifespan. Early conceptualizations of links between stress and cellular aging suggested that accumulating stress predicts shorter leukocyte telomere length (LTL), while recent conceptualizations (e.g., Puterman & Epel, 2012) suggest negative affective reactivity to stress as a potential predictor. Unfortunately, most approaches to stress in the LTL literature have used single-occasion, retrospective measures of stress that cannot be used to compare accumulation vs. reactivity models against each other. Using intensive repeated measures to assess daily marital and parent-child conflict, and negative mood in children’s daily lives, we tested whether stress accumulation or negative affective reactivity are related to shorter LTL in children.

Families (N=47) with a target child between 8 and 13 years of age completed daily diary questionnaires for 56 consecutive days. Children completed items assessing daily parental marital conflict, parent-child conflict, and negative affect. After diary collection, 31 target children and 9 siblings in the same age range provided a blood sample to determine relative LTL using real-time qPCR (T/S ratio).

For accumulation, we averaged conflict scores (marital and parent-child, separately) over the 56 day diary period. Negative affective reactivity to conflict was determined by using multilevel modeling to generate estimates of the slope of conflict scores (marital and parent-child, separately) predicting same-day negative affect across all days of sampling for each individual child. OLS regressions (age as a covariate) showed that a reactivity model (R² = .45) was significantly associated with LTL, while an accumulation model (R² = .11) was not. Specifically, greater negative affective reactivity to parents’ marital conflict was related to shorter LTL (B = -.51, p < .002). Reactivity to parent-child conflict was not related to LTL.

These data add to existing work showing that adverse family experiences are related to cellular aging, and extend those findings to modest levels of family conflict. Our findings are consistent with recent conceptualizations of individual differences in reactivity to stress influencing vulnerability to cellular aging. Specifically, negative emotional responses to interpersonal conflict in the home may be a risk factor predicting cellular aging in children.

HARSH EARLY FAMILY CLIMATE, LOW CHILDHOOD SOCIOECONOMIC STATUS, AND PRO-INFLAMMATORY PHENOTYPE IN ADULTS

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Low early life (EL) socioeconomic status (SES) confers increased cardiovascular risk, which is thought to be partly mediated through inflammation. However, not all youth from low SES families display adult health risks. The goal here was to determine whether harshness of early family environment might explain some of the variability in these outcomes. Methods: 360 healthy adults were recruited into a four-group design, defined by early (low vs. high) and adult (low vs. high) SES. We measured features of early family environment (Risk Family Questionnaire), demographics (age, gender, ethnicity) and health behaviors (alcohol use, smoking status, physical activity). Waist circumference and blood samples were taken. Regulation of inflammation was indexed by GC sensitivity assay, wherein whole blood was stimulated with LPS in the presence of various doses of hydrocortisone for 6 hours, and higher values denote less sensitivity to GCs. Flow cytometry was used to measure IL-6 production and GC receptor (GR) expression. Results: GR expression, gauging on CD14+ monocytes. To index low-grade basal inflammation, serum IL-6 was assessed via high-sensitivity ELISA. Results: Linear regression predicting GC sensitivity revealed an interaction between EL SES and harsh early family environment, β = 8.3, p < .01, independent of demographics, health behaviors and current SES. Simple slopes analyses showed that, for low EL SES individuals only, harsh early family context was associated with lower GC sensitivity, b = 4.8, p = .01. These patterns were extended to EL participants only, greater harshness was associated with higher IL-6, b = -.16, p = .04, controlling for covariates. In low EL SES participants only, greater harshness was associated with higher IL-6, b = .10, p = .06. To test mechanisms, similar linear regression models were used to predict changes in GR protein expression following LPS exposure. Only IL-6 SES associated with GR change, b = 6.9, p = .05, such that low EL SES individuals demonstrated smaller increases in GR expression to LPS exposure.

Conclusion: Low EL SES combined with a harsh family environment is associated with increased peripheral inflammation in adults and decreased GC sensitivity, and low EL participants also demonstrated lower increases in GR following immune challenge, all independent of current SES. These results suggest that low EL SES alone may not confer excess inflammation risk in adults.
status (SES) and risk behaviors that are associated with ACEs. Methods: Systolic and diastolic BP (SBP and DBP) were measured up to 16 times (13 times on average) over a 23-year period in 213 African Americans (AAs) and 181 European Americans (EAs) aged 5 to 38 years. Retrospective data on traumatic experiences prior to age 18 were collected, including abuse, neglect and household dysfunction. Health behaviors including physical activity, smoking and using illicit drugs as well as parental SES measured by Hollingshead Four Factor Social Status Index were also collected at multiple times. Individual growth curve modeling within a multilevel framework was used to examine the relation between exposure to ACEs and BP development. Results: No main effect of ACEs on average BP levels was found. However, a significant interaction of ACE score with age3 was observed (SBP: p=0.033; DBP: p=0.017). Subjects who experienced multiple traumatic events during childhood showed a faster rise of BP levels after age 30 than those without ACEs. As expected, a graded association of ACEs with childhood SES and negative health behaviors was observed (p<0.001). The ACE-SBP relation was not explained by these factors, while the ACE-DBP relation was partially mediated by illicit drug use. Conclusions: In this longitudinal study, we observed that participants who were exposed to multiple ACEs displayed a greater increase of BP levels in young adulthood compared to their counterparts without ACEs.

Abstract 2496
REDUCED MATERNAL SENSITIVITY AS A MECHANISM BY WHICH PRENATAL MATERNAL DEPRESSION INCREASES INFANT CORTISOL REACTIVITY TO STRESS
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Background. There is clear evidence that postpartum depression is a significant risk factor for poor child development outcomes, primarily through reduced sensitivity in maternal caregiving. However, biological changes that support the development of maternal sensitivity begin during the prenatal period in order to prepare a mother to be sensitive to the needs of her infant immediately after birth. As such, factors that impact the development of maternal sensitivity during pregnancy may have a long-term impact on the mother-infant relationship and infant development. In this study, we set out to determine whether reduced maternal sensitivity was a mechanism by which maternal depression leads to increased risk of poor developmental outcomes, which was defined as increased cortisol reactivity to a laboratory stressor. Method. Maternal depression was assessed twice in pregnancy using a self-report measure. At 6 months, mother-infant dyads completed an observational measure of maternal sensitivity and infants underwent a battery of frustration tasks. Infant cortisol reactivity was assessed via salivary cortisol collection at baseline and 20 minutes post stressor. Maternal age, infant sex, infant age at assessment, and baseline infant cortisol were included as covariates in the mediation model. Results. Increasing prenatal maternal depression significantly decreased maternal sensitivity (p<0.05). Decreases in maternal sensitivity resulted in significant increases in infant cortisol reactivity to frustration (p<0.001). The bootstrapped mediation effect was significant, B = -11 [95%CI = -0.15- -0.29]. There was no direct relationship between prenatal depression and infant cortisol reactivity. Conclusion. The results indicate that prenatal depression indirectly increases infant cortisol reactivity via reductions in maternal sensitivity. Previous research suggests that neurobiological changes during mid-pregnancy increase maternal sensitivity to emotional facial expressions and enhance attentional engagement towards infant distress signals. Prenatal depression may disrupt these neurocognitive processes, resulting in lower quality postnatal caregiving and subsequently poorer external regulation of infant cortisol reactivity to stress. Clinical Relevance. These results highlight the impact of maternal depression during pregnancy on subsequent child development. Our findings support the need to address maternal mental health during pregnancy and to develop interventions to assist mothers in developing sensitive caregiving skills in the early postnatal period.

Abstract 2528
CHILDHOOD ABUSE IS ASSOCIATED WITH INCREASED HAIR CORTISOL AMONG URBAN PREGNANT WOMEN
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Introduction: Childhood abuse can lead to long-term alterations of the hypothalamic-pituitary-adrenal (HPA) axis. Little is known about the effects of child abuse history during pregnancy, especially among women from different racial/ethnic backgrounds, despite maternal HPA axis dysregulation having important implications for fetal development. Methods: During pregnancy, 180 women from diverse racial/ethnic backgrounds reported on their exposure to emotional, physical, and/or sexual abuse before the age of 11 and general posttraumatic stress symptoms (i.e., not limited to childhood years or abuse experiences). Around delivery, they provided hair samples for the assessment of cortisol levels during pregnancy. Results: Controlling for posttraumatic stress symptoms and sociodemographics, hair cortisol levels varied by child abuse history, F(2, 167)=3.53, p = .032. Childhood physical and/or sexual abuse was associated with greater hair cortisol levels, t(167)=2.59, p = .011, compared to no history of abuse. Because childhood abuse rates and hair cortisol levels varied by race/ethnicity, analyses were stratified by race/ethnicity. The associations between abuse history and cortisol levels were strongest among Black women, F(2, 25)=5.65, p = .009. Conclusion: Childhood abuse, especially physical and/or sexual abuse, is associated with differences in cortisol production during pregnancy, particularly among Black women. Future research should investigate how these differences impact physical and mental health outcomes among offspring of affected women.
Abstract 2850

ANXIETY SYMPTOM SEVERITY MODERATES THE RELATIONSHIP BETWEEN STRESSFUL LIFE EVENTS AND CAROTID INTIMA MEDIA THICKNESS: DATA FROM THE ST. LOUIS AFRICAN AMERICAN HEALTH-HEART STUDY

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Even though stressful life events (SLEs), anxiety, and depression co-occur and may act together to influence cardiovascular disease (CVD) risk, these psychosocial factors have been mainly examined in isolation. We hypothesized that anxiety and depressive symptoms would potentiate the deleterious effect of SLEs on subclinical atherosclerosis. This is plausible, given the evidence suggesting that adults with anxiety and/or depression (a) exhibit exaggerated physiologic responses to stress and (b) are more likely to use methods to cope with stress that can promote atherosclerosis (e.g., smoking and overeating).

We examined cross-sectional data from 175 African American adults (mean age=65 years, 70% female) with no evidence of clinical CVD or dementia who participated in the St. Louis African American Health-Heart study (2009-2011). Severity of anxiety and depression symptoms were measured using the 14-item Hamilton Rating Scale for Anxiety (HAM-A) and the 17-item Hamilton Rating Scale for Depression (HAM-D). Number of SLEs was assessed at each time point with the Life Events Calendar, a structured interview. From this interview, a continuous SLEs variable was computed (number of adult SLEs: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or 11+). Two measures of subclinical atherosclerosis were obtained: carotid intima-media thickness (CIMT; assessed by ultrasonography) and coronary artery calcification (CAC; assessed by multi-detector computed tomography).

We conducted linear (CIMT) and logistic (CAC) regression models, first adjusted for demographics (age, sex, education) and then fully-adjusted (demographics; blood pressure; cholesterol; hemoglobin A1c; BMI; tobacco use; diabetes diagnosis; and use of antihypertensive, lipid lowering, or antidiabetic medications). We did not detect any main effects for SLEs, HAM-A score, or HAM-D score on CIMT. However, a significant HAM-A x SLEs interaction was detected in both CIMT (B=0.0002, p=.045) and fully-adjusted (B=0.0002, p=.018) models. To illustrate the fully-adjusted interaction, we examined the conditional effect of SLEs on CIMT at various levels of HAM-A score: 1 standard deviation below the mean (B=-0.0011, p=0.903, the mean (B=0.0008, p=0.95), and 1 standard deviation above the mean (B=0.0018, p=0.005).

We did not detect a HAM-D x SLEs interaction. Models predicting CAC revealed no main or interaction effects. Our findings raise the possibility that anxiety may potentiate the deleterious effect of SLEs on subclinical atherosclerosis in African Americans adults.

Abstract 3145

RESTING HEART RATE VARIABILITY AND PERCEIVED ETHNIC DISCRIMINATION IN AFRICAN AMERICANS: A FOCUS ON RUMINATIVE TENDENCIES

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Health disparities exist such that African Americans (AAs) are at an elevated risk for mortality and morbidity in comparison to European Americans (EAs). Ethnic discrimination (ED), defined as the negative differential treatment based on one’s ethnicity, is thought to negatively impact mental and physical health outcomes in AAs. Recently, we showed an association between resting HRV and the subjective experience of ethnic discrimination, or perceived ethnic discrimination (PED). In addition to emotional control, rumination is also thought to play an important role in PED. However, to our knowledge, research has yet to examine how rumination influences the link between emotion regulation capabilities, as indexed by resting HRV, and PED. The following study investigates this relationship in 101 (45 AAs, 65 female, mean age = 19.48) undergraduate students who completed a 5-minute baseline period to assess resting-HRV. Following the baseline period, participants completed set of self-report questionnaires. PED was assessed using the brief Perceived Ethnic Discrimination Questionnaire (PEDQ). Trait rumination was assessed using the Ruminative Responses Scale (RRS). A moderation-regression model, with ethnicity (EA, AA), baseline-resting HRV, and RRS scores as predictors and PEDQ as the outcome, showed a 3-way interaction between predictors (R2 change = .021, β = -.245) (Standard error (SE): .05). Specifically, in AAs only, resting HRV was negatively associated with PEDQ scores -- a finding consistent with current theory. However, this relationship was moderated by RRS scores (R2 change = .076; β = -.262). Such individuals with higher HRV did not differ on PEDQ scores as a function of RRS scores (β = -.292,.139, p=.835). However, PEDQ scores of those with lower HRV did vary as a function of RRS scores (β = .417; p < .01), such that higher RRS and low HRV was associated with the highest reports of PED, and lower HRV and lower RRS scores showed PEDQ scores comparable to high HRV individuals, that is, lower PEDQ scores. EAs did not show any similar or related patterns. These data suggest that resting HRV in AAs is related to everyday PED. However, this relationship is moderated by trait rumination; those with low HRV and often ruminate perceive more day-to-day ethnic discrimination. Overall, these data suggest that difficulties in emotion regulation, as indexed by HRV, can lead to more PED in AAs, especially if they are also high ruminators – a mechanism potentially underlying mental and physical health disparities found in AAs.

Abstract 2856

SOCIAL CLIMATE STRESSES EXPLAIN RACE DIFFERENCES IN SLEEP PROBLEM TRAJECTORIES DURING TERTIARY EDUCATIONAL ATTAINMENT

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Whether and why disadvantaged groups do not experience the same health benefits with educational attainment is an essential and understudied topic for disparities research, an understanding of which is critical for attenuating persistent group differences (Fuller-Rowell, Curtis, & Doan, 2010). Current study investigated changes in sleep problems over a 1.5 year period among AA and EA undergraduate college students attending a large, predominantly white university (N=133, 41% AA, 59% EA, Mean age at baseline = 18.8 years, SD = 8.9). Social climate stresses were then examined as a mediator of expected group differences in sleep problem trajectories. Sleep is an important construct for disparities research because of established links to both social stress and subsequent health (Caccioppo et al., 2002, 2010, 2011). Sleep problems were assessed at each time point with the Pittsburg Sleep Quality Index (Buysse et al., 1989). Social Climate Stresses were assessed using an established six-item scale (aα = .88; âα = .86; Smedley, Myers, & Harrell, 1993). Findings indicated that AA students had greater increases in sleep problems between baseline and follow-up than EAs (B=0.73, SE=.36, p=.043). Additionally, social climate stresses predicted changes in sleep problems (B=.86, SE=.22, p<.001), and accounted for all of the race difference in sleep problem trajectories (Figure 1). These findings suggest that policies and programs seeking to mitigate stress, and support the adjustment of AA students in predominantly white college contexts, are warranted.
Abstract 3108
SUBJECTIVE SOCIAL STATUS PREDICTS INTERLEUKIN-6 RESPONSES TO ACUTE PSYCHOSOCIAL STRESS IN NON-WHITE BUT NOT WHITE INDIVIDUALS
Alexander S. Fiksald, MA, Myriam V. Thoma, PhD, Luke Hanlin, MA, Danielle Gianferante, MA, Xiaojie Chen, MA, Nicolas Rohleder, PhD, Psychology, Brandeis University, Waltham, MA
Rationale: Previous research has indicated that racial differences may exist with regard to subjective social status (SSS), inflammatory markers, and physiological stress reactivity. In terms of community SSS, black individuals have been shown to rate themselves higher than whites. In some studies black individuals have also shown higher basal serum levels of interleukin-6 (IL-6), while whites have displayed more robust HPA-axis responses to psychological stress. However, no studies have examined the relationship between SSS and Race in the context of IL-6 responses to repeated acute social stress.
Methods: Eighty-five healthy adults (51% female, mean age=37.9 years) completed the Trier Social Stress Test (TSST) on two consecutive days. Blood samples were collected at 1 minute prior to the TSST, and 30 minutes and 2 hours post-TSST for measurement of plasma IL-6. Community and United States SSS ratings were assessed using MacArthur ladders. Participants self-reported racial identity.
Results: Race groups were collapsed in to a binary white/non-white category (NW) for analyses. Those who chose not to answer were removed from the analysis, leaving n=80 total participants (n=51 white, n=29 non-white). Both TSSTs induced increases in plasma IL-6 (F=65.1, p<0.001), with higher responses to the second exposure (F=7.85, p=0.006). Community SSS was positively associated with IL-6 responses to the first TSST (r=0.24, p=0.03) but not the second (r=0.01, p=0.9). Whites rated themselves higher than nonwhites in SSS, but the community SSS was confounded in black participants. Additional regression analyses revealed a significant SSS by NW interaction predicting IL-6 responses to the first TSST (beta=0.82, p=0.046), with higher SSS predicting elevated IL-6 responses in non-whites but not whites.
Conclusions: Subjective Social Status ratings were sensitive to race and predicted IL-6 responses to an acute social stressor in non-white, but not white, individuals. Although causation remains unclear, high SSS nonwhite individuals may be more sensitive to social evaluation as a key component of social stress. More research is needed to determine the nature and health implications of these associations among more diverse racial groups.

Abstract 2673
THE ASSOCIATION OF PATERNAL WARMTH AND CIRCULATING ANGIOGENIC CELL FUNCTION: A PROTECTIVE EFFECT ON CARDIOVASCULAR HEALTH
Tomas Cabeza de Baca, Ph.D., Health Psychology, Wendy Mendes, Ph.D., Psychiatry, Ronak Darakshande, M.S., Matthew Springer, Ph.D, Cardiology, University of California, San Francisco, San Francisco, California, Kirstin Aschbacher, Ph.D., Psychiatry, University of California, San Francisco, San Francisco, California
Background: Evolutionary theory suggests that greater parental investment will be associated with better long-term health and survival. While much attention has focused on maternal investment (exemplified by maternal warmth), we focus on the influence of paternal warmth among an African American sample on cardiovascular disease risk and vascular regenerative capacity. Objectives: The present study sought to investigate whether higher self-reported paternal and paternal warmth would be associated with better circulating angiogenic cell (CAC) function in culture. Methods: 32 young healthy African American men and women (aged 18-35) completed the warmth subscale in the Parental Bonding Inventory (PBI) and blood was drawn. PBMCs were depleted of initially adherent cells and plated on fibronectin-coated dishes per standard 7-day culturing procedures. 20,000 cells were loaded into a Boyden chamber to test the capacity of CACs to migrate toward a chemotactic gradient of 50 ng/mL vascular endothelial growth factor (VEGF), placed at the bottom of the chamber. Cells migrated during a 6-hour incubation period at 37°C. After fixing and staining, the number of migrated cells was determined using fluorescence microscopy. Results: Greater paternal warmth was significantly associated with migration of CACs (r=0.35, p=0.03) after 6 hours of incubation. Moreover, no significant correlations were observed between maternal warmth and CAC function in culture. Conclusions: The model presents preliminary evidence that sociocultural factors such as paternal warmth are associated with markers of better vascular repair and cardiovascular health.

Abstract 2739
RACISM AND BREASTFEEDING: BARRIERS IN A COMMUNITY SAMPLE OF WOMEN
Elizabeth Brondolo, PhD, Emily Wlodolger, BA, Wan Ng, MA, Victoria Wales, BA, Psychology, St. John’s University, Queens, New York, Gina Basello, DO, Family and Social Medicine, Albert Einstein College of Medicine, Bronx, New York, Alan Roth, DO, Family Medicine, Jamaica Hospital Medical Center, Queens, New York
There are significant racial disparities in breastfeeding. The drivers of these disparities are not clear. Research on immigration-related changes in the rates of breastfeeding suggests that psychosocial factors may play a role in influencing the decision to initiate or maintain breastfeeding. In this study we investigate the role of racism/ethnic discrimination as a predictor of breastfeeding status and as a mediator of the relationship between racism and breastfeeding. Although racism has been identified as a risk factor for other variables related to infant health, to our knowledge, no empirical research has examined the relationship of racism to breastfeeding.
Our sample included 75 mothers drawn from a local hospital-based primary care practice, serving a low income community, of whom 35 were Black, 26 were Latina, and 12 were White (mean age = 29.75 years, range = 18 to 74; 19 participants with a college degree). Perceived racial ethnic discrimination was assessed with the Brief Perceived Ethnic Discrimination Questionnaire – Community Version (PEDQ-CV; Brondolo et al, 2005). The PEDQ-CV provides a lifetime discrimination score, as well as four subscale scores measuring race related social exclusion, stigmatization, work-place discrimination, and threat. Participants were asked if they breastfed their children and were asked to identify the degree to which any of nine circumstances presented a barrier to breastfeeding (scored on a three-point scale: no barrier, moderate barrier, prevented breastfeeding).
Results: Higher levels of racism were associated with decreased odds of breastfeeding (OR = 0.29, Wald’s 95% CI = 0.09 – 0.91, p = 0.01). In comparison to those who breastfed, women who did not breastfeed had higher scores on lifetime exposure and race-related social exclusion. Among Black women, racism was positively associated with the overall level of barriers to breastfeeding (r(34) = 0.40, p < 0.02). The data suggests experiences of race-related social exclusion may be associated with the decision to initiate or maintain breastfeeding. Furthermore, breastfed participants reported fewer barriers to breastfeeding than those who did not breastfeed.
Conclusions: Perceived racial ethnic discrimination is negatively associated with breastfeeding. Future research can investigate the mechanisms explaining this effect.

Paper Session: Predicting Metabolic Risk
Friday, March 20 from 2:00 to 3:30 pm
Abstract 3057
OBJECTIVELY-ASSESSED HEAVY SNORING IS ASSOCIATED WITH INCREASED RISK FOR THE METABOLIC SYNDROME AND ADIPOSI-MTED RELATED COMPONENTS IN A COMMUNITY SAMPLE OF MIDLIFE WOMEN
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Snoring prevalence in women increases with age and is associated with increased risk for the metabolic syndrome (MS) and its components in a community sample of midlife women.
Methods: A subsample of 689 women enrolled in the Sleep and Health Research Office (SHaRO) study were included in this analysis. Snoring was measured overnight by microphone in 248 participants in the SWAN Sleep Study (age=50.2±2.2 years, 45% African American). Snoring index (SI) was calculated as the ratio of objectively-scored snoring epochs (>2 snores per 20-sec. sleep epoch) to sleep epochs. Metabolic syndrome criteria included hypertension (SBP≥130, DBP≥85, anti-hypertensive medication), fasting glucose ≥100 mg/dL, waist circumference ≥88 cm, triglycerides ≥150 mg/dL, and HDL <50 mg/dL. The metabolic syndrome was determined as meeting criteria for ≥3 components. Odds ratios for metabolic syndrome and its components were calculated using logistic regression models and adjusted for apo-α, apo-β, age, race, depression, sleep duration, menopausal status, alcohol use, exercise, and smoking.
Results: Snoring was significantly associated with increased ORs for the metabolic syndrome in fully adjusted models (OR= 6.7, 95% CI=1.4-31.2). Snoring was not associated with increased risk for hypertension or HDL. Moderate snoring was associated with elevated triglycerides (OR=1.8, 95% CI=1.1-1.4). Snoring was associated with waist circumference (SI: OR=65.8, 95% CI=6.5-671.5) and elevated triglycerides (SI: OR=6.1, 95% CI=1.2-31.9). All effects persisted after adjusting for sleep apnea. Sensitivity analyses revealed that associations between objective snoring and the metabolic syndrome were found only in obese participants.
Objective sleep quality is associated with increased cross-sectional risk of metabolic syndrome and adiposity-related components. These associations are present in obese midlife women and may be mediated by adiposity. However, the direction of associations remains unclear; prospective analyses are needed to determine whether objective snoring frequency confers risk for incident metabolic syndrome above and beyond the effect of obesity.

The Study of Women’s Health Across the Nation is supported by grants U01NR040461, U01AG012505, U01AG012555, U01AG012531, U01AG012539, U01AG012546, U01AG012553, U01AG012554, U01AG012495.

Abstract 2896

SOCIAL ISOLATION, MAMMARY GLAND DEVELOPMENT, AND METABOLIC GENE REGULATION IN PUBERTAL FEMALE SPRAGUE-DAWLEY RATS

Mariana B. Johnson, B.A., Medicine, Jocelyn Hoffman, B.A., Hannah You, B.A., Psychology, Paul Volden, Ph.D., Medicine, Martha McClintock, Ph.D., Psychology, Matthew Brady, Ph.D., Suzanne Conzen, M.D., Medicine, University of Chicago, Chicago, IL

Chronic stressors cause reproducible changes in neuroendocrine physiology that in turn have substantial influences on mammary epithelial cell proliferation and development of mammary gland tumors in rats. When exposed to social isolation, Sprague-Dawley rats, a spontaneous model of benign and malignant mammary tumors, exhibit a greater overall tumor burden and more invasive tumors than group-housed rats. Rodent mammary glands have been shown to be particularly susceptible to environmental carcinogens during puberty, when ductal terminal end buds are numerous and largely undifferentiated. We hypothesized that puberty is a critical developmental window during which social isolation will increase the risk of mammary gland tumor burden later in life. To this end, we isolated or group-housed pubertal rats and analyzed gene expression in the mammary gland as well as gland development using whole mount histology. In group-housed animals, mRNA expression of the gene encoding acetyl-CoA carboxylase (ACC), a protein involved in lipogenesis, exhibited a dynamic change in expression throughout puberty. This result suggests that lipid accumulation is regulated in a temporally dynamic fashion. Isolated animals exhibited a significantly different pattern suggesting altered lipid metabolism during development. Isolated rats also displayed fewer changes in ACC gene expression between each age group. To determine the impact of the differences in gene expression, we made conditioned media using mammary adipose tissue from group or isolated rats and tested its ability to affect mammary epithelial cell proliferation. The differences in metabolic gene expression seen during pubertal development and across housing conditions were correlated with the differential ability of the conditioned media to increase proliferation of the human mammary epithelial cell line MCF10A. These results indicate a potential relationship between changes in metabolic gene expression and pubertal mammary gland development following chronic stressor exposure.
Abstract 3072

EARLY-LIFE ADVERSITY AND METABOLIC OUTCOMES IN ADOLESCENTS: THE ROLE OF IMPLICIT AFFECT ABOUT ONES FAMILY

Meane Chan, MA, Gregory E. Miller, PhD, Edith Chen, PhD, Psychology, Northwestern University, Evanston, IL

Objectives: Previous research suggests that the quality of early family relationships may moderate the association between lower socioeconomic status (SES) and cardiovascular and other health outcomes. In this study, we investigated how implicit measures of early childhood environments (implicit anger, fear, or warmth about one’s family) interacted with early-life SES to predict metabolic outcomes in a sample of healthy adolescents. Method: Two hundred and fifty-nine adolescents age 13 to 16 (M = 14.53) participated with one parent. Implicit family affect was assessed with a computer-based implicit affect assessment tool. Early-life SES was indexed by residential crowding (e.g. number of people per bedroom) during the first five years of life. Metabolic indicators included resting blood pressure, total cholesterol, glycosylated hemoglobin, and waist circumference. Results: Significant interactions emerged between early-life SES and implicit negative family affect for resting SBP and DBP levels. Early-life SES also interacted with implicit family warmth to predict total cholesterol levels. These patterns were not observed with current SES or with explicit measures of family relationships. Conclusions: Overall, these findings provide evidence that implicit family affect moderates the association between early-life SES and adolescent metabolic outcomes, revealing the utility of implicit psychosocial measures in cardiovascular health studies, particularly for higher SES samples.

Paper Session: Distress, Affect and Pain
Friday, March 20 from 3:45 to 5:00 pm

Abstract 2748

MOMENTARY ANGER, GENERAL MOOD, AND PHYSICAL WELL-BEING IN PATIENTS WITH CHRONIC DISEASE: THE MODERATING ROLES OF ANGER EXPRESSION STYLES AND GENDER


People who frequently suppress anger (high anger-in) as well as people who frequently express anger (high anger-out) are at risk for health problems. This risk may not result solely from greater or more frequent anger; rather, risk may also arise because anger expression style may influence how a person reacts to anger experiences. Little research, however, has explored these processes in daily life, particularly among people managing chronic disease. The current study used ecological momentary assessment in a sample of community adults (N=128) with asthma or rheumatoid arthritis to test if trait anger expression styles (anger-in and anger-out) moderated momentary relationships between anger experiences and indices of mood (positive and negative affect), health behavior (alcohol and tobacco use), and physical health (disease-specific symptoms and physical limitations). As anger expression style moderation effects may differ by gender, we tested for gender differences via 3-way interactions. Momentary indices were measured 5 times daily for 7 days. Multilevel models indicate that trait anger-in predicted greater anger, worse mood, worse momentary physical health, but less alcohol use, whereas trait anger-out only predicted lower self-reported arthritis symptoms. Significant trait anger-out X anger experience interactions (see Table) suggest that people with high trait anger-out reported greater negative affect and greater alcohol use during angry versus non-angry moments. Additionally, a significant anger-in X anger experience interaction showed that, similar to people with high trait anger-out, people with high trait anger-in are more also likely to use alcohol during angry versus non-angry moments. Significant 3-way interactions (Table) revealed that gender and trait anger-in moderated the effects of anger experiences on momentary health. During angry moments, men with high trait anger-in reported more physical limitations and more coughing/wheezing, whereas men with low trait anger-in were less likely to use tobacco. Women with low trait anger-in showed lower positive affect and more physical limitations during angry versus non-angry moments. These findings (a) suggest that outward versus inward anger expression styles may have differential effects on momentary health among patients with chronic illness, and (b) emphasize anger expression style and gender as moderators of how anger experiences affect momentary health markers.
OBJECTIVES Neurobiological dysregulation and recent adverse life events, both independently and in interaction, have been hypothesized to initiate chronic pain. We examine whether (i) neurobiological function, (ii) recent adverse life events, and (iii) their combination predict the onset of chronic multi-site musculoskeletal pain.

Methods 2019 subjects of the Netherlands Study of Depression and Anxiety, free from chronic multi-site musculoskeletal pain at baseline, were identified using the Chronic Pain Grade Questionnaire and followed-up for the onset of chronic multi-site musculoskeletal pain over 6 years. Baseline neurobiological assessment comprised the hypothalamic-pituitary-adrenal (HPA)-axis (1-h cortisol awakening response, evening levels, post-dexamethasone levels), the immune system (IMS; basal and lipopolysaccharide-stimulated inflammation) and the autonomic nervous system (ANS; heart rate, pre-ejection period, standard deviation of the normal-to-normal interval, respiratory sinus arrhythmia). The number of recent adverse life events were assessed at baseline using the List of Threatening Events Questionnaire.

Results HPA-axe, IMS and ANS functioning was not associated with onset of chronic multi-site musculoskeletal pain, either by itself or in interaction with recent adverse life events. Recent adverse life events did predict onset of chronic multi-site musculoskeletal pain (Hazard ratio per event=1.14, p=0.005).

Conclusions This longitudinal study could not confirm that neurobiological dysregulations increase the risk of developing chronic multi-site musculoskeletal pain. Recent adverse life events were a risk factor for the onset of chronic multi-site musculoskeletal pain, suggesting that psychosocial factors play a role in triggering the development of this condition.

Abstract 2671

THE ROLE OF THE FEELING OF BEING LOVED IN THE RELATION BETWEEN COGNITIONS AND DAILY PAIN IN FIBROMYALGIA PATIENTS

Shannon S. Taylor, M.A., Psychiatry, University of North Carolina School of Medicine, Chapel Hill, NC, Mary C. Davis, Ph.D., Ellen W. Yeung, Ph.D., Psychology, Arizona State University, Tempe, AZ, Howard Tenen, Ph.D., Community Medicine, University of Connecticut Health Center, Farmington, CT, Alex J. Zautra, Ph.D., Psychology, Arizona State University, Tempe, AZ

An abundance of data has established the links between both pain-related cognitions and relationship qualities in the experience of pain, including long-term functional health in chronic pain patients. However, relatively few studies have explored the dynamic relation between pain and pain-related cognitions within a day, and no studies have tested the moderating role of feeling loved on the within-day cognition—pain association in chronic pain patients. The objectives of this study were to: 1) assess whether late morning pain flares predicted changes in afternoon positive and negative pain-related cognitions, and whether these changes in turn predicted end-of-day pain, and 2) explore whether feeling loved moderated the pain-cognition relation in individuals with chronic pain due to fibromyalgia. Two hundred twenty individuals with fibromyalgia completed electronic assessments of feeling loved, pain intensity, and positive and negative pain-related cognitions three times a day for three weeks. Multilevel structural equation modeling established that negative cognitions (a composite of catastrophizing, pain irradiation, and self-criticism related to pain) mediated the link between late morning and end-of-day pain intensity, in line with the hypothesis. Analyses also provided support for a mediating role for positive cognitions in the experience of pain.

Abstract 2787

STRESS EXACERBATES PAIN IN THE EVERYDAY LIVES OF WOMEN WITH FIBROMYALGIA - THE ROLE OF CORTISOL AND ALPHA-AMYLASE

Susanne Fischer, MSc, Johanna M. Doerr, MSc, Jana Strahler, PhD, Ricardo Mewes, PhD, Urs M. Nater, PhD, Psychology, University of Marburg, Marburg, Hesse, Germany

Background: Fibromyalgia syndrome is characterized by chronic widespread pain that cannot be readily explained by any medical condition. The perpetuation of its symptoms, in particular pain, has been associated with stress,
and the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system (SNS) have been proposed as mediators due to their involvement in central and peripheral pain regulation. However, it is not known whether pain is exacerbated by stress on a day-to-day basis (or vice versa), and whether the HPA axis and SNS operate as intermediates. We set out to examine whether and how stress and pain are intertwined in the everyday lives of patients with fibromyalgia syndrome.

Methods: We conducted an ambulatory assessment study over the course of 14 days. Twenty-eight female patients (50 ± 10 years) with fibromyalgia syndrome provided six diary entries on an iPod (awakening, +30 min, 11 am, 2 pm, 6 pm, 9 pm) per day. Momentary stress (“At the moment, I feel stressed”) was scored on a five point Likert scale ranging from 0 (“not at all”) to 4 (“very much”). Momentary pain was rated on a visual analogue scale (VAS) from 0 to 100 (“In this moment, I am in no pain”) vs. “In this moment, I am in the most intense pain possible”). Saliva samples were collected at the same time points to determine cortisol and alpha-amylase. Because of the nested structure, data were analyzed using hierarchical multilevel modeling.

Results: Stress at the previous measurement time point (p = .015) predicted momentary pain, but not vice versa (p = .186). Neither momentary salivary cortisol (p = .102) nor alpha-amylase (p = .074) were related to momentary pain. Discussion: Stress seems to be a powerful exacerbating factor for pain as experienced in everyday life. Based on this finding, a strong case can be made for a stress management component in current state-of-the-art treatments for fibromyalgia syndrome. Our results are, however, not supportive of the notion that the HPA axis or SNS mediate the stress–pain relationship, at least not on a momentary basis. Other mechanisms (e.g., beliefs about stress) translating momentary stress into pain need to be considered.
HPA-affected health outcomes might be mediated, in part, by an association of high E/PE with normalized adrenocortical functioning. Supported by NIH PO1 HL040962.

Abstract 2578
THE IMPACT OF CHRONIC STRESS ON CORTISOL REACTIVITY
Sarah R. Fredrickson, M.A., Orly Weltfreid, M.A., Kimberly Dienes, Ph.D., Psychology, Roosevelt University, Chicago, IL
Chronic stress has consistently been found to have detrimental physical and psychological effects (McEwen, 1998). However, the impact of chronic stress on HPA functioning remains unclear. Some researchers have reported increased cortisol output (Schaeffer & Baum, 1984), while others have found decreased cortisol output is associated with increased chronic stress (Heim, Ehlert, & Hellhammer, 2000). This may be due to the unique effect of different types of chronic stress (Miller, Chen, & Zhou, 2007). Given the dearth of research in this area, this study examined how different types of chronic stress (e.g., health, social) differentially impact cortisol reactivity to an acute psychosocial laboratory stressor.

Participants included 53 undergraduates aged 17 to 56 years (63.6% female; Age: M = 22.18, SD = 6.821). The UCLA Life Stress Interview (LSI; Hammen, 1997) was administered prior to the Trier Social Stress Task (TSST; Kirschbaum et al., 1993). The ratings on the LSI range on a scale from 1 (exceptionally good) to 5 (extremely stressful) for chronic stress over the past 12 months in the domains of Close Friend, Social, Family, Neighborhood, Health, School, Work, and Finance. Five saliva samples were collected across the task using Salivettes (Sarstedt Inc) at baseline, immediately post task, and 10, 25, and 40 minutes past task. Total cortisol was assessed using Area Under the Curve analyses (AUC) relative to the ground (AUCG) and intercept (AUCI). Bivariate regression analyses were conducted. LSI domains of Close Friend, Social, and Health significantly predicted AUCG (Close Friend, p = .013; Social, p = .0028; Health, p = .042), and Social, Neighborhood, and Health significantly predicted AUCI (Social, p = .040; Neighborhood, p = .023; Health, p = .037). Of note, increased neighborhood and health-related chronic stress predicted a significant increase in cortisol secretion across the task. Importantly, the domains of School, Family, Work, Finance, and Total Stress (sum of domains) were not significant predictors of cortisol output.

Different types of chronic stress during the past 12 months were uniquely related to cortisol reactivity to an acute psychosocial stressor in this study. Specifically, social and non-social chronic stress led to distinct patterns of cortisol reactivity, which may account for disparities in research findings involving chronic stress and HPA axis functioning. These findings add to the current literature suggesting the importance of breaking down chronic stress into domains, as total chronic stress does not equal the sum of its parts.

Abstract 2010
CORTISOL STRESS REACTIVITY DIFFERENCES IN MEN AND WOMEN REGULATED BY THE Mu-OPIOID RECEPTOR GENE POLYMORPHISM (OPRM1 A118G)
William R. Lovallo, PhD, Psychiatry and Behavioral Sciences, University of Oklahoma Health Sciences Center, Oklahoma City, OK, Mary-Anne Enoch, MD, Laboratory of Neurogenetics, NIH, NIAAA, Bethesda, MD, Kristen H. Sorocco, PhD, Donald W. Reynolds Department of Geriatric Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK, David Goldman, MD, Laboratory of Neurogenetics, NIH, NIAAA, Bethesda, MD
Objective: Individual differences in reactivity to stress are thought to be significant in long-term health outcomes but there is little information on how these differences arise. The stress axis is regulated in part by the endogenous opioid, beta-endorphin acting on the mu opioid receptors nceded by the OPRM1 gene. G allele carriers (GA or GG) of the OPRM1 A118G polymorphism have mu opioid receptors with higher affinity for beta endorphin compared with AA carriers. In consequence, AA carriers may have blunted cortisol reactivity to stress relative to GA/GG carriers. Methods: We exposed 251 young adults (182 AA and 69 GA/GG carriers, 194 females) to mental arithmetic and public speaking stress in the lab and measured saliva cortisol responses relative to the same time periods on a resting control day. Results: GA/GG carriers had significantly smaller cortisol responses to stress than AA carriers (F = 8.94, p = .003). This effect was due to the absence of a cortisol stress response in female GA/GG carriers (N = 39) relative to female AA carriers (N = 110) (F = 18.4, p < .0001). In contrast, cortisol responses were equally robust in male GA/GG and AA carriers (Ns = 30 and 72; F = 0.29). Blunted cortisol responses in GA/GG women were not attributable to differences in hormonal contraceptive use, which was equally represented in the two genotype groups. Conclusion: Compared to men, women may have cortisol stress responses that are more heavily regulated by endogenous opioid mechanisms. The near absence of cortisol responses to mental stress in female carriers of the GA/GG mu opioid receptor gene polymorphism may impair cortisol's feedback regulation of brain mechanisms during stressful episodes, with potentially long-term impact on mood and behavioral dispositions.

Abstract 2776
NEUROENDOCRINE, METABOLIC, INFLAMMATORY AND TRANSCRIPTIONAL RESPONSES TO ACUTE PSYCHOLOGICAL STRESS ARE MODULATED BY MITOCHONDRIAL FUNCTION
Martin Picard, Ph.D., Meagan McManus, Ph.D., Center for Mitochondrial and Epigenomic Medicine, University of Pennsylvania and Children's Hospital of Philadelphia, Philadelphia, PA, Carla Nasca, Ph.D., Jason Gray, Ph.D., Laboratory of Neuroendocrinology, Rockefeller University, New York, NY, Erin Seifert, Ph.D., Cynthia Moffat, M.Sc., Pathology, Thomas Jefferson University, Philadelphia, PA, Bruce McEwen, Ph.D., Laboratory of Neuroendocrinology, Rockefeller University, New York, NY, Douglas Wallace, Ph.D., Center for Mitochondrial and Epigenomic Medicine, University of Pennsylvania and Children's Hospital of Philadelphia, Philadelphia, PA
How the organism responds to stress, rather than stressors themselves, is the determinant factor that predispose to disease. To mitigate stress-associated pathogenesis, we must therefore understand cellular factors that influence the nature and degree of stress responses. All physiological systems involved in the allostatic network, including activation of the hypothalamic-pituitary-adrenal (HPA) axis, inflammatory signaling, glucose regulation and gene expression, incur increased energy demand. At the cellular level, this is met by mitochondria, organelles which provide energy and intracellular signals for cellular adaptation. Thus, mitochondrial function could modulate multisystemic physiological responses to stressor.

To evaluate this possibility, animals with normal mitochondria and four genetic mouse models of mitochondrial dysfunction ranging from energy deficiency to mitochondrial oxidative stress were studied. We monitored stress reactivity and recovery from exposure to a 30-min acute restraint stress (ARS) challenge. HPA axis hyperactivation leading to excessive glucocorticoid (CORT) levels was observed in mice with mitochondrial energy deficiency, whereas mitochondrial oxidative stress led to a blunted CORT response due to adrenalin insufficiency. Most mitochondrial defects also caused exaggerated stress-induced hyperglycemia and circulating IL-6 levels. Of the 26 genes investigated in the hippocampus, the expression of 20 (77%) was significantly modulated by at least one of the mitochondrial defects.

As hypothesized, mitochondrial function regulates key aspects of the physiological stress response. Because mitochondria are influenced by behavior, aging, hormones and diet, and can accumulate damage over time (Mitochondrial Allostastic Load), mitochondrial regulation of the stress response suggests a potential mechanism to understand stress vulnerability, and possibly to improve resilience to chronic stress.
TOTAL SERUM CHOLESTEROL, Atherogenic Indices and Their Longitudinal Association with Depressive Symptoms Among US Adults

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Serum cholesterol, both total and lipoprotein fractions, has been associated with mid- and late-life depression. Using longitudinal data on a large and ethnically diverse sample of urban adults, the association between serum lipid profile measured by high or low total cholesterol (TC; >200 mg/dL; <160 mg/dL) and by atherogenic indices, namely high total cholesterol and LDL-C relative to HDL-C, with change in total and domain-specific depressive symptoms over time was examined. Findings were compared by sex. (Hypothesis 1) Additionally, baseline depressive symptoms as predictors for longitudinal change in lipid profile trajectory were examined. (Hypothesis 2) Mixed-effects regression stratified by sex was used. Sample sizes of participants (n) and repeated observations (n) were: Hypothesis 1 (Men: n=826; n=1,319; Women: n=1,099; n=1,817); Hypothesis 2 (Men: n=738; n=1,230; Women: n=964; n=1,678). As hypothesized, a higher level of atherogenic indices was linked to faster increase in depressive symptom scores, particularly depressed affect and interpersonal problems, though this relationship was found only among women. Among men a U-shaped relationship between baseline TC and longitudinal increase in somatic complaints and a direct link between low TC and longitudinal increase in positive affect was found. Upon excluding statin users among women, low TC was associated with slower increase in depressed affect over time, while high TC was associated with faster increase in interpersonal problems. More studies are needed to explain these sex-specific associations.
ARTICLE 138 Abstract 2908

SELF-PERCEIVED CHRONIC STRESS AND BLOOD PRESSURE: RESULTS FROM THE GERMAN HEALTH INTERVIEW AND EXAMINATION SURVEY FOR ADULTS 2008-2011

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The relationship between chronic psychosocial stress, blood pressure (BP) levels and the development of hypertension remains to be elucidated. We assessed the association between BP measures and self-perceived chronic stress using data from the German Health Interview and Examination Survey for Adults 2008-2011 (DEGS1). The survey was conducted by the Robert Koch Institute, Berlin, as a part of the continuous national health monitoring program. Information on self-perceived chronic stress as defined by the Trier Inventory for the Assessment of Chronic Stress Screening Scale (TICS-SSCS) was collected from a working population, aged 18-64 years. After exclusion of those currently using antihypertensive medication, 3,352 study participants remained for analyses. The recently developed occupational job index of Oppenheimer (OJI) was used to establish a measure of work-related stress. Blood pressure was defined as the mean of the second and third measurement from three consecutive readings taken at intervals of approximately 3 min. The TICS-SSCS summary score was significantly and inversely associated with both systolic (B = -0.16, SE = 0.03, p < .001) and diastolic BP (B = -0.10, SE = 0.02, p < .001). Results persisted after adjustment for potential confounders including age, sex, body mass index, alcohol consumption pattern, smoking, physical activity, residential traffic intensity, income status and work environment. The relationship was stronger with a partner (systolic BP: B = -0.09, SE = 0.03, p < .001; diastolic BP: B = -0.08, SE = 0.02, p < .001). The OJI was neither significantly related to systolic nor to diastolic BP in multivariable analyses. We conclude that less subjectively perceived stress is associated with higher BP levels, suggesting that stress perception and the regulation of BP may be linked to each other.

139 Abstract 3004

A SYSTEMATIC REVIEW OF MECHANISMS OF CHANGE IN MINDFULNESS-BASED COGNITIVE THERAPY IN THE TREATMENT OF RECURRENT MAJOR DEPRESSIVE DISORDER

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Background: The investigation of treatment mechanisms of MBCT in randomized controlled trials has considered that MBCT is successful in achieving motherhood, the outcome cannot be measured as a dichotomized category of having children or not. We found no less than 12 variations in how naturally conceived, IVF children, adopted children and stepchildren lived together in one family, and women who did not have their own biological child were not more distressed than the others, and neither were the women who did not become mothers. The present study resulted in two major findings: There are many different ways to achieve motherhood, and one does not create more well-being than the others. When evaluating whether women going through infertility treatment are successful in achieving motherhood, the outcome cannot be measured.

140 Abstract 3006

MODERN FAMILIES: MANY WAYS TO MOTHERHOOD

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BACKGROUND: Infertility treatment is associated with significant stress and distress, and preliminary evidence suggests that even several years after treatment, many women continue to experience feelings of depression, guilt, and isolation. A cohort of 837 women undergoing treatment with assisted reproductive technology (ART) between 2001 and 2006 was established. The aim of a follow-up study in 2014 was to determine whether and in which way the women had become mothers, and – in case of motherhood – whether psychological well-being of the mother differed according to the origin of a child.

METHODS: The present study included 319 out of 782 eligible women who provided questionnaire data regarding different subclasses of child-origin (IVF, stepchild, adopted, non-IVF biological), depressive symptoms (BDI-II) and anxiety (STAI).

RESULTS: Only 39 women (12%) were childless at follow-up, 210 had conceived at least one child by IVF, 94 had at least one biological non-IVF child, and 26 had adopted at least one child. Twelve different combinations of child origins were identified: (IVF, adoptive-IVF, Adoptive-IVF, stepchild, stepchild, stepchild, stepchild, ste...). The women who had not changed in level of depression and anxiety since baseline (t: 0.355-0.493, NS). No differences were found between women with IVF-child (mean depression: 6.32; anxiety 34.0) and other women (depression: 6.33; anxiety: 33.9) in present levels of distress or in changes from baseline (t: 0.009-1.193, NS). Furthermore, no effects were found between different combinations of origin of children (F: 0.213-0.732, NS).

CONCLUSIONS: The present study identified diverse outcomes in two major findings: There are many different ways to achieve motherhood, and one does not create more well-being than the others. When evaluating whether women going through infertility treatment are successful in achieving motherhood, the outcome cannot be measured as a dichotomized category of having children or not. We found no less than 12 variations in how naturally conceived, IVF children, adopted children and stepchildren lived together in one family, and women who did not have their own biological child were not more distressed than the others, and - neither were the women who did not become mothers.

141 Abstract 2926

THE ROLE OF ILLNESS COHERENCE AND DEPRESSIVE SYMPTOMS IN MEDICATION ADHERENCE AMONG UN- OR UNDER-INSURED HEART FAILURE PATIENTS

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Background: Illness coherence as defined by the Trier Inventory of the Spiritual Coherence Scale summary score was 1.193, NS. Furthermore, no effects were found between different combinations of origin of children (F: 0.213-0.732, NS).

CONCLUSIONS: The present study identified diverse outcomes in two major findings: There are many different ways to achieve motherhood, and one does not create more well-being than the others. When evaluating whether women going through infertility treatment are successful in achieving motherhood, the outcome cannot be measured as a dichotomized category of having children or not. We found no less than 12 variations in how naturally conceived, IVF children, adopted children and stepchildren lived together in one family, and women who did not have their own biological child were not more distressed than the others, and - neither were the women who did not become mothers.
expected, decreased levels of illness coherence were significantly related to higher levels of depressive symptoms, $\beta = -.44$, $t = -1.96$, $p = .05$. As expected, increased depressive symptoms were significantly related to poorer adherence, $\beta = -.22$, $t = -3.10$, $p < .001$, and there was an indirect effect of illness coherence through depressive symptoms on adherence, $\beta = -.10$, 95% CI (.01,.27), $p = .05$. In summary, poor illness coherence may indirectly lead to nonadherence via depressive symptoms among un- or under-insured heart failure patients. Interventions aimed at increasing illness coherence may improve adherence and help to decrease healthcare costs and hospitalizations.

142) Abstract 3126
BLUNTED CARDIAC STRESS REACTORS EXHIBIT RELATIVELY HIGH LEVELS OF IMPULSIVITY: A CASE CONTROLLED DOUBLE BLIND RANDOMIZED VIGORteil training
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Blunted physiological reactions to acute psychological stress are associated with a range of adverse health and behavioural outcomes such as obesity, depression, and addiction. All of the corollaries have major detrimental effects for both the individual and the community as a whole. The aim of the present study was to determine whether extreme stress reactors differ in their everyday behaviours. Individuals showing extreme blunted ($N=23$) and exaggerated ($N=23$) cardiovascular reactions to an acute psychological stress task were selected from a sample of second year psychology students at a large university. Two components of impulsivity, namely motor impulsivity and response inhibition, were measured behaviourally through responses to a Stop-signal and circle drawing task respectively. Risk taking was measured using the balloon analogue risk task, and persistence by an unsolvable puzzle paradigm. Blunted reactors exhibited greater impulsivity than exaggerated reactors on both stop-signal, $F(1,41) = 4.99, p = .03$, $n^2 = .10$, and circle drawing, $F(1,43) = 4.00, p = .05$, $n^2 = .085$, tasks. The two reactor groups did not differ significantly in risk-taking or persistence. Individuals showing blunted cardiovascular stress reactions are characterized by greater impulsivity which may contribute to their increased susceptibility to a variety of adverse outcomes including obesity, depression, and addiction.

143) Abstract 3086
IMACT OF TRANSCENDENTAL MEDITATION ON LEADERSHIP EXCELLENCE
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The purpose of the study was to determine whether the Transcendental Meditation™ (TM) program will improve leadership ability and reduce stress. 18 participants of the Georgia Regents University Leadership Academy Executive Leadership Excellence (ELE) program were evaluated on leadership skills and stress levels at pre-test and at the end of the 6-month intervention. The age of the 18 participants ranged from 39 to 66 years with a mean of 52±6.74 years. 10 participants were trained in the TM program and practiced on average once per day. A comparison control group volunteered from the ELE program. Compared to the CTL group, mean leadership scores improved markedly over 6 months in the TM group (p<.04). Perceived stress in the TM group decreased by 2.5±7.9 compared to a slight decrease of 0.7±6.4 in controls but this difference was not statistically significant, (p=34). These findings suggest that the TM program improved leadership skills in executives in a university setting.

144) Abstract 3131
CHARACTERIZING THE LONGITUDINAL RELATIONSHIP BETWEEN HEART RATE VARIABILITY AND HEART FUNCTION IN HEALTHY INDIVIDUALS
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Objective: Cardiac autonomic modulation as determined by heart rate variability (HRV) has been proposed as a marker of cardiovascular health. However, much previous research has been cross-sectional and overlooks the effect of stress which may contribute to age-related heart function decline. We evaluate the effect of stress on autonomic nervous system (ANS) and its role on age-related deterioration of heart filling and relaxation in a 6-years longitudinal study. Since females and Blacks are at higher risk of congestive heart failure with preserved pump function, we hypothesize that there is a sex and race difference in ANS modulation of heart function. Methods: fifty-eight healthy individuals aged 20 to 26 were examined during two visits 6 years apart. Each visit consisted of resting and videogame challenge testing, resting and stress HRV parameters including LF, HF and LF/HF were determined at rest and stress during visit 1 while indices of diastolic function (DF) including the ratio of early to late filling (e/a) was determined during both visits. Regression analyses were conducted using rest e/a ratio at visit 2 as the dependent measure. Regressions were also done separately by sex and by race taking in account e/a ratio at visit 1. Predictors were HRV variables at rest and during stress. Results: Overall DF decreased significantly during stress and across time (all $p<0.001$). The only significant mean difference for sex among the predictors is males are higher than females on LF/HF ratio during stress ($p<0.02$). Comparing Whites and Blacks on the predictors the only significant finding is for the LF/HF with the means for Whites being higher than the means for Blacks at both rest and during stress (all $p<0.005$). Regression results show that overall the HF at rest was not a significant predictor of e/a at follow up when controlling for e/a at baseline. HF during stress was a significant predictor but only for males when looking at males and females separately. Greater HF during the stressor was related negatively to the decrease in follow up e/a. Using the ratio of LF/HF as a predictor, overall results show the ratio during stress being a significant positive predictor of follow up e/a controlling for baseline e/a. When looking at males and females separately we find that result for males only. For females the ratio at rest was also a significant predictor. Looking at Whites and Blacks separately the positive relationship between LF/HF ratio during stress and e/a at follow up was significant for Blacks but not for Whites. Conclusion: Vagal mediated heart rate variability during stress is significantly higher in women and Blacks compared to men and Whites. Greater parasympathetic activity during stress may protect against the degradation of diastolic function overtime.

145) Abstract 3033
PHYSIOLOGICAL RESILIENCE IN CHILDREN WITH DAYCARE HISTORY: CORTISOL, EFFORTFUL-CONTROL, AND DEMOGRAPHIC MODERATORS
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Objective: This study explored cortisol adaptability underlying resiliency and social vulnerability in young children in a naturalistic setting. Methods: Participants: One hundred and nineteen children aged under a twelve month period during transition to school (mean age 49 months). Salivary cortisol was assessed on waking and early evening at three time points: prior to, 2 weeks after, and 6 months after school entry. Effortful-control was measured via the teacher-administered Child Adaptive Behavior Inventory; and parental questionnaires measured length in daycare, marital status, responding parent's age (103 mothers, 71 fathers). Results: Latent Class Growth Analysis (LCGA) revealed two distinct trends in diurnal cortisol pattern; 44% demonstrated a steeper diurnal cortisol decline at all three time points (greater physiological adaptability) and was more likely (OR=61.2; $p=0.002$) to be observed for children who had spent a greater number of months in daycare. Comparing levels of effortful-control across the two groups revealed lower physiological adaptability to be linked with greater
amounts of exerted effortful-control (β=0.23; p=0.036). Physiological adaptability also altered the extent to which demographic factors were linked to effortful-control: children who had a steeper cortisol decline were more likely to have lower exerted effortful control if their parents were partnered (β=0.37; p=0.005), parent was older (β=0.45; p=0.015), or the child was male (β=−0.31; p<0.02).

Conclusion: Whilst starting school is a known social stressor for children, spending time in daycare prior to school entry may enable greater physiological resiliency by influencing adaptability of developing allostatic systems. Such adaptability was observed in the need for less self-monitoring through effortful-control, a key factor in the ability to succeed at school. This research suggests a mechanism of physiological adaptability by which daycare effects may alter how demographic factors impact school readiness.

146) Abstract 2750
MICROBICIDAL POTENTIAL IN HUMAN MACROPHAGES IN ESSENTIAL HYPERTENSION
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Background: Essential hypertension is an important risk factor for coronary artery disease and its underlying process atherosclerosis but involved mechanisms are not fully understood. Both macrophages and superoxide anions have been proposed to play a major role in the pathogenesis of atherosclerosis.

Methods: We studied 30 hypertensive (M: 48.7 ± 2.4 years) and 30 age-matched normotensive (M: 48.6 ± 2.4 years). We assessed macrophage microbicidal potential using the WST-1 assay. The assay bases on the chemical reduction of the cell-impermeable tetrazolium salt WST-1 by superoxide anions that are produced by activated human ex-vivo isolated monoocyte-derived macrophages. All analyses were controlled for potential confounders.

Results: Hypertensives showed higher superoxide anion production and thus higher macrophage microbicidal potential compared to normotensives (F(1,38) = 11.56, p = .001). Complementary analyses comparing mean arterial blood pressure as a continuous measure revealed that higher MAP correlated significantly with higher WST-1 reduction (β = .38, p = .003, Δ R²= .145). These results remained significant when controlling for potential confounders.

Conclusions: Our results indicate increased macrophage microbicidal potential in hypertensives compared to normotensives. This suggests that higher macrophage microbicidal activity may contribute to cardiovascular risk with hypertension.

147) Abstract 3005
PERSONALITY ASPECTS IN THE PSYCHOSOCIAL EVALUATION OF LIVING KIDNEY DONORS
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The relevance of living organ donation is explained by the awareness of an acute shortage of transplant organs on the one hand and a better medical outcome as compared to cadaveric transplantation on the other. However, multiple ethical problems have arisen in this context. Even though most programs in Western countries require some sort of psychosocial evaluation, the implications and consequences of this procedure display great variety. In our study we firstly, wanted to analyse the personality of living kidney donors in comparison to healthy controls. Secondly, we were interested in the personality profile of donors that are considered problematic. 49 consecutive kidney living donors underwent an extensive psychosocial evaluation to assess suitability for donation. Independent of psychosocial evaluation candidates as well as 49 age- and gender-matched healthy controls filled in psychological questionnaires concerning psychological distress (Symptom Checklist 90-R) and personality (Temperament and Character Inventory). There were no significant differences between donors and controls with regard to psychological distress or personality. In 13 candidates (26.5%) donation was assessed as highly problematic. Problematic donors and suitable donors displayed no difference concerning age, gender, formal education, donor-recipient relationship and psychological distress. However, problematic donors scored significantly higher on reward dependence compared to suitable donors and controls (p<0.05).

Ideally the prospective donor should comprehend the risk benefits and potential outcome of the donation for donor and recipient and should be capable to balance risks and benefits freely. Therefore feeling guilty towards the recipient or a personality-based difficulty in adequate distancing from others may cause undue pressure rendering a voluntary decision impossible. Awareness of these personality-based problems is important to optimize psychosocial evaluation and outcome in living kidney transplantation for donor and recipient.

148) Abstract 2494
ACADEMIC STRESS LEVELS AND PSYCHOSOMATIC MANIFESTATIONS IN MEDICAL STUDENTS FROM FIRST, FOURTH AND SEVENTH YEAR OF A PRIVATE UNIVERSITY OF LIMA IN THE YEAR 2012
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Stress and emotional disorders in students are a problem worldwide, especially in medical schools. The objective of the study was to assess the academic stress levels, psychosomatic manifestations and coping strategies in 187 students belonging to the first, fourth and seventh year from the Faculty of Medicine of a Private University. The sample was formed by 52.9 % males and 47.1 % females with a mean age of 23.34 ± 1.70 years. Analysis of frequencies and percentages was used with the statistical program STATA version 12, by sex and year of study. The fisher exact test was used to evaluate the relations among coping strategies, stress levels and psychosomatic manifestations. The results revealed that 77.5% of the students recognized the presence of academic stress; seventh year students exhibited the highest levels, meanwhile, men manifested lower levels of stress as compared with women. The principal situations associated with high level of stress were the work overload, and the professor ‘s evaluations in clinical activities. The coping skills more frequently used in medical students with lowest level of stress were the assertive skills, and the strategy based on development and implementation of a specific plan. Finally, the recurrence frequency of psychosomatic manifestations was moderate, with predominance of psychological reactions in both gender and in all three years of study. Further research is needed in the field of psychosomatic medicine to analyze the alterations of cognitive processes based on psychoendoneuroimmunology changes related to the stress especially in medical students under antidepressant therapy.

149) Abstract 2572
RELATIONSHIPS BETWEEN OPTIMISM AND SUICIDE RISK IN MEDICALLY ILL PERSONS: AN ANALYSIS OF THREE COHORTS.
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Background: The risk of suicide is substantially elevated in persons with medical illness. There has been minimal study of the relationship between optimism and suicidal ideation among patients with medical conditions.

Methods: We analyzed cohorts from three disparate studies to assess the independent relationship between optimism and suicide risk, controlling for depressive symptoms: (a) an observational study of acute coronary syndrome (ACS) patients (GRACE), (b) an intervention study of hospitalized cancer patients with clinical depression or an anxiety disorder (MOSAIC), and (c) an observational study of patients hospitalized for acute suicidality on a medical psychiatry unit (LAPS). The Life Orientation Test- Revised (LOT-R) was used to assess optimism in all studies. In the cardiac studies (GRACE and MOSAIC), item 89 of the PHQ-9 was used to assess suicidality and the remainder of the scale (PHQ-8) used to assess depression. In the LAPS study, the QIDS-SR was used for depression and the Beck Hopelessness Scale (BHS) used for suicidality given the strong link between this scale and completed suicide.

Logistic regression was used to assess the independent association of optimism and depression with suicidality at baseline in the intervention study (MOSAIC), and generalized estimating equations was used in the two observational studies to assess these relationships at all study timepoints (GRACE: baseline, 3 mo, 6 mo; LAPS: baseline, 2 wk, 4 wk, 8 wk), with standard error corrected for clustering by participant. Exploratory meta-analysis was used to assess effects of optimism on suicidality across all three cohorts. Analyses were repeated using LOT-R optimism and pessimism subscales.

Results: In all three cohorts, LOT-R score was significantly and related to lesser suicidality, independent of depression (GRACE: R = .39, p = .001; MOSAIC: R = .35, p = .019; LAPS: R = .28, p = .001). In the cardiac studies, higher pessimism (GRACE: R = .33, p = .013; MOSAIC: R = .28, p = .001) was independently linked to lower suicidality. Interventions specifically targeting optimism in these cohorts may be indicated to modify suicide risk.

150) Abstract 2948

IMPLICIT AND EXPLICIT ATTITUDES REGARDING INTRAUTERINE DEVICES (IUDS) AND ORAL CONTRACEPTION: PRELIMINARY RESULTS

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Introduction: Intrauterine devices (IUDs) are among the most underutilized contraception methods in the United States, with only 5% of women who use contraceptive methods using IUDs as opposed to 15% worldwide (Population Reference Bureau, 2008). Physicians' attitudes towards IUDs may be a factor in preventing physicians from offering such methods to eligible patients (Rubin et al., 2011). The Implicit Association Test (IAT) uses response time to measure the strength of associations between two stimuli, and has been used to identify attitudes, stereotypes and identities (Greenwald, McGhee, & Schwartz, 1998). The IAT is a tool to assess beliefs and attitudes, which influence decision making and may contribute to healthcare disparity (Penner et al., 2010; Cooper, 2008).

Methods: Third year medical students (N = 43, Mage = 25.48 years old, Female = 52.2%) were recruited via email. Participants completed questionnaires and a custom-made IAT, which measured the strength of negative and positive associations between oral contraceptives versus IUDs. Explicit attitudes regarding IUDs were assessed using three items that measured the degree of endorsed IUD support, knowledge, and safety. Participants were asked, "What are your attitude towards IUDs?" Responses were recorded on three 10-point Likert scales. Three of these items were summed to create an explicit IUD attitudes global score.

Results: The largest proportion of participants (41.87%) showed implicit preference for oral contraception. The second largest proportion of participants (32.56%) demonstrated a lack of preference. Implicit preferences for IUD contraception represented the smallest percentage of participants (25.58%). Implicit attitude scores were significantly related to explicit IUD attitude scores (r = .48, p = .001), as well as items measuring explicit support (r = .38, p = .012), knowledge (r = .47, p = .002), and safety (r = .38, p = .013). Surprisingly, higher explicit endorsement of IUD support, knowledge, and safety was related to a higher preference for oral contraception. When controlling for age and gender, explicit IUD attitude (β = .539, p = .001) was a significant predictor of implicit preference scores.

Discussion: Results indicated that a greater proportion of the current sample demonstrated implicit preference for oral contraception as opposed to IUDs. This data is intriguing considering participants endorsed a high degree of support for IUDs when asked explicitly. These data indicate that higher explicit IUD endorsement was associated with a stronger preference for oral contraceptive methods. Future studies should investigate how both implicit and explicit biases affect the reproductive health services offered by health care providers, as well as health care providers in training.

151) Abstract 2881

A FEASIBILITY TRIAL OF MINDFULNESS MEDITATION AND ACUPUNCTURE FOR THE TREATMENT OF BONE PAIN IN WOMEN WITH METASTATIC CANCER (MINDMAP)

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BACKGROUND: Intractable bone pain is reported by 50%-90% of breast cancer patients suffering from bone metastases. Acupuncture (AP) and mindfulness-based stress reduction (MBSR) are two adjuvant therapies that have the potential to provide additional pain control benefits to women with advanced breast cancer and bone metastases given their role in pain management for other cancers and chronic illnesses, but has not been tested in this population. The aim was to investigate the feasibility of incorporating two complementary therapies over a 6-week treatment period into a usual care regime for bone pain in women with Stage IV breast cancer and metastases to the bone.

OBJECTIVES: 1) determine accrual rates and acceptability; 2) determine the feasibility of randomization; 3) estimate the effect size of the treatment conditions on pain.

METHODS: This was a three-arm RCT comparing the impact of MBSR, AP, or usual care on pain, QOL, mood, and salivary cortisol secretion in women with stage IV breast cancer and bone metastases. Participants were recruited from the Tom Baker Cancer Centre in Calgary, Alberta. Each intervention was performed in 6 one-hour individual sessions. Assessments were completed at baseline, week 3, week 6, 4-month, and 1-year follow-up.

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RESULTS: The first year resulted in very low accrual rates when trying to recruit women with stage IV cancer and bone metastases receiving palliative radiotherapy, so the criteria for inclusion were broadened to increase the number of women eligible to participate. Between February 2007 and June 2011, 145 women were screened for eligibility. In total, 12 (8%) participants were accrued and randomized (MBSR n=5, AP n=5, usual care n=2). Of those, only two (17%) participants completed all assessment time points. Change in outcome measures was not significant.

CONCLUSION: Recruitment of sufficient participants to this demanding treatment protocol was not possible when focusing on narrow inclusion criteria of women with stage IV metastatic cancer and bone metastases undergoing radiotherapy. However, once the inclusion criteria were broadened to include non-metastatic patients with any kind of cancer-related pain, recruitment was possible and successful (accrual rate of 69%). However, with the small sample size it was not possible to estimate effect sizes or change in outcome measures. We conclude that it may be feasible to conduct a trial of this nature in a broader sample of breast cancer patients that are experiencing pain, but not likely with a palliative population in this setting.

152) Abstract 3027
PERCEPTIONS OF PAIN, PAIN INTERFERENCE, AND PERSONALITY IN CONGESTIVE HEART FAILURE PATIENTS AWAITING LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION: PRELIMINARY FINDINGS
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Palliative assist devices (VADs) are indicated for congestive heart failure (CHF) patients while waiting for a heart transplant (Bridge) or to improve quality of life for those not eligible for transplant (Destination Therapy). VAD candidates often experience pain, resulting in bursts of sympathetic activity and potentially more damage to the cardiovascular system. Personality factors affect coping with, and perceptions of, pain. Greater perceived pain control is associated with better functioning, including treatment adherence. There is a paucity of research investigating the relationship between psychological variables and pain among VAD candidates. This exploratory study hypothesized that perceived control over pain would be negatively related to pain severity and the degree in which pain interferes with functioning among VAD candidates. Personality traits were explored in relation to the pain experience. Patients undergoing pre-VAD psychosocial evaluation (N=15), as part of routine clinical practice from 10/2010-9/2012 at a large academic medical center, were administered the Brief Pain Inventory, Coping Skills Questionnaire, and the Minnesota Multiphasic Personality Inventory (MMPI-2; 370 items; select scales included). A 2 (SC: Bridge vs Destination Therapy) x 3 (age groups) factorial design was used respectively. Pearson’s r correlations examined relationships among pain, coping, and personality traits.

Patients were 33% female, 53% African American and 47% Caucasian, 48.2±16.5 years of age, had 19.2±5.5% ejection fraction, and diagnosed with CHF 8.4±6.8 years prior to the evaluation. Perceived control over pain was significantly inversely related (p < .05) to: pain severity (r = - .397), pain interference (r = - .765), and scales 1 (r = - .856), 2 (r = -.699), 3 (r = -.780), and 7 (r = -.658) on the MMPI-2. Pain severity and pain interference were significantly positively correlated with Scales 2 and 7 on the MMPI-2 (p < .05). There was not a significant relationship between pain severity and pain interference and MMPI-2 Scales 1 and 3. Perceived control over the pain experience is associated with pain interference, and may extrapolate to perceived control over other physical symptoms (e.g., shortness of breath). Patients who score higher on these MMPI-2 scales may feel less control over their pain experience and may experience psychological distress and express it in more socially acceptable physical terms. Improving perceptions of control over the pain experience and acceptance of emotional distress may be important areas for psychological intervention for VAD candidates.

153) Abstract 2502
HOSTILITY AND PHYSIOLOGICAL RESPONSES TO ACUTE STRESS IN PEOPLE WITH TYPE 2 DIABETES
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Background: Hostility is associated with cardiovascular mortality and morbidity, and one of the mechanisms may involve heightened reactivity to mental stress. However, little research has been conducted in populations at high risk of cardiovascular disease (CVD). The aim of the present study was to assess the relationship between hostility and acute stress responsivity in individuals with type II diabetes.

Methods: 140 individuals (aged 63.71 ± 7.00 years) with type II diabetes took part in a laboratory-based experimental stress testing. Systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), plasma interleukin-6 (IL-6) and salivary cortisol were assessed at baseline, during two stress tasks, and 45 and 75 minutes later. Cynical hostility was assessed using the Cook Medley Cynical Hostility Scale.

Results: Participants with greater hostility scores had heightened increases in IL-6 induced by the acute stress tasks (B = 0.004, p = 0.002), independent of age, gender, cholesterol, polypharmacy, household income, medication and baseline IL-6. Hostility was inversely associated with cortisol output post-stress (B = -0.017, p = 0.002) independent of covariates. No associations between hostility and BP or HR responses were observed.

Conclusion: Hostile individuals with type II diabetes may be susceptible to stress-induced increases in inflammation. Further research is needed to understand if such changes increase the risk of CVD in this population.

154) Abstract 2719
SUSTAINABILITY OF MOBILE HEALTH MEDICATION ADHERENCE AND BLOOD PRESSURE CONTROL PROGRAM AMONG KIDNEY TRANSPLANT PATIENTS: A ONE YEAR FOLLOW UP
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A leading risk factor for graft dysfunction, graft loss and mortality among kidney transplant recipients (KTRs) is medication nonadherence (MNA) combined with poor control of comorbid conditions. Approximately 90% of KTRs have essential hypertension (EH) and BP control is a significant problem. Our preliminary work indicated KTRs have high utilization rates of smart phones and are very receptive to health technology (McGillicuddy et al.2013). We used an iterative design approach guided by self-determination theory and technology acceptance model to develop a patient and provider centered mHealth enabled med adherence BP control program. Twenty KTRs identified via remote electronic monitoring as having MNA (<.80 across 1 mth in taking all meds within 1.5 hrs of designated times) participated in a 3 mth feasibility RCT (McGillicuddy et al. 2014). The mHealth group showed significantly greater reductions in resting SBP at each monthly evaluation compared to the SC group (mean of -20 vs -5 mmHg for SC group across 3 evaluations). Very few mHealth programs have evaluated sustainability of physical risk factor improvements following program cessation. Eighteen former trial subjects (aged 53.3 ± 6.2 yrs) were contacted and all consented to participate in the 12 mth follow-up via remote electronic monitoring. Primary outcome variable was SBP from 3, 6, and 12 month post trial clinic visits. A significant group difference in SBP was observed (p<0.01) indicating the mHealth group exhibited consistently lower clinic-measured SBPs across the 3 follow-up visits (average SBP range of 131.1 to 133.2 vs 140.4 to 153.5 mmHg). Their SBP at 12 mth follow-up was 131.1 vs 153.3 mmHg for the SC group (p<.04). The mHealth group also exhibited greater success in establishing and sustaining KDIGO guideline based SBP control (<131 mmHg) during the 12 mth follow-up (average of 40.3%vs19.4%). These findings provide support that behavioral theory guided patient and provider developed mHealth self-management programs can be sustained following formal program cessation. However, further empirical scrutiny is needed with larger sample sizes to determine program efficacy across longer time intervals upon sustained med adherence, BP control, immunosuppressant blood trough levels, graft function and ultimately graft loss.

155) Abstract 2028
PERSONALITY ASSESSMENT IN LIVER TRANSPLANT: DEVELOPING A GOLD STANDARD FOR LIST INCLUSION
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Currently, there is a significant shortage of organs available for liver transplant candidates. The Organ Procurement Transplant Network (OPTN) reported as of 9/5/14, there were 15,714 liver candidates on the waitlist, but in contrast, there have only been 3,599 donations this year (OPTN, 2014). To address the shortage
of organs available for candidates and improve post-transplant outcomes, psychosocial evaluations have become normative practice (Collins & Labott, 2007; Olbrisch et al., 2002). Researchers agree psychosocial evaluations for list inclusion consist of clinical interviews, psychoeducation, objective personality measures, and neurocognitive testing (Collins & Labott, 2007). However, there is sparse research on the most appropriate measures to use, particularly personality measures. The present study will analyze liver transplant candidates’ raw scores on the five most common personality measures (Millon Behavioral Medicine Diagnostic [MBMD], Personality Assessment Inventory [PAI], and Minnesota Multiphasic Personality Inventory, 2nd Edition- Short Form [MMPI-2-RF]) utilized for psychosocial evaluations (Collins & Labott, 2007; Hurst et al., 2010; Stewart et al., 2013). The analyses will reveal the measures’ sensitivity to needs or potential psychosomatic issues commonly identified for liver candidates (e.g., health behavior, substance use, illness perception, discrimination; Collins & Labott, 2007; Stewart et al., 2013). Preliminary analysis of MBMD scores (n=23) produced significant findings in which candidates appear to function better than the medical population on which it was normed (Scale K [Problematic Compliance]; t=-4.34, p<.001). Scale 7 [Resilience]; t=3.24, p=-.09, p=.001). Scale R [Inactivity]; t=2.80, p=.05). Scale B [Functional Deficits]; t=2.25, p=.05). However, transplant candidates are more likely to present in a desirable manner, perhaps due to the perceived significance of these evaluations (Scale Y [Desirability]; t=-2.32, p=.05). Data will continue to be collected through January 2015 for the MMPI, PAI, and MMPI-2-RF (370 version). Analyses of the three measures will aid in developing a gold standard of personality assessment in liver transplant candidates as part of psychosocial evaluations for list inclusion.

156) Abstract 2590
INTERNET DELIVERY OF MINDFULNESS MEDITATION INTERVENTION IN OLDER ADULTS
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Mindfulness meditation has been shown to improve mood and cognition. However, access can be hindered by issues with group settings and limited mobility, particularly for those with age-related cognitive or functional limitations. Mindfulness meditation interventions that use technology delivery options should be explored in order to make mindfulness meditation available to a broader population. The goal of this preliminary study was to test the achievability of an internet-based mindfulness meditation intervention in older adults aged 65 to 90 years. An education control group was also developed. Both groups consisted of six weekly hour-long sessions and recommended daily practice/homework. Sessions were delivered via internet. Daily practice/homework was monitored by our previously developed iMINDr iPod device (Wahbeh et al, 2014) lent to all participants. Intervention adherence in the meditation group was 75% with an average daily practice of approximately 24 minutes. The groups did not differ demographically or in terms of adherence. An extension of this pilot will further evaluate the affective and cognitive effects of internet-based mindfulness meditation in older adults.

157) Abstract 2623
NEIGHBORHOOD CRIME AND THE ANTHROPOMETRICS OF OLDER ADULTS: GENDER DIFFERENCES
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The neighborhood context plays a critical role in health and well-being in later life (Cornwell & Cagney, 2014). Among the potential sources of environmental stress, crime is considered especially consequential for the mental and physical well-being of urban residents (Browning, Cagney, & Iveniuk, 2012). Burglary is understood as particularly fear-inducing for older adults given its greater likelihood in this population and the potential that home invasion could lead to other forms of criminal activity (O’Neill, 1989). While examining the role of crime in the context of health is not new (e.g., Ferraro, 1995), little is known about the role of gender in conditioning the effects of local stressors on health in later life. Our previous research (Atchley & Browning, 2012) found that younger women, not men, are more likely to be influenced by neighborhood disadvantage in their communities. We seek to understand whether this gender difference also is evident at older ages. We focus on body mass index (BMI) and waist circumference as measures that are relevant for health and potentially indicative of underlying inflammatory processes that may be influenced by the stress of unpredictable and threatening neighborhood social environments. We use data from a nationally representative sample of older adults (65-93 yrs) in the second wave of the National Social Life, Health and Aging Project (NSHAP). Geocoded crime data were derived from the FBI Uniform Crime Report Databases. Since crime rates are higher in urban areas, we limit our analytic sample to urban-dwelling respondents (N=1,708) and aggregate crime reports to the county-level. Regression analyses showed that, even when controlling for physical disorder and social cohesion in neighborhoods, living in a high-crime neighborhood is positively associated with a larger waist circumference for women, but not for men. Similarly, women residing in the highest burglary neighborhoods were more likely to have a higher BMI, but, again, not true for men. Future work will explore associations between crime and health using lower levels of geographic aggregation at the census tract or block group with different types of inflammatory biomarkers such as C-reactive protein and cortisol.

158) Abstract 2962
DEPRESSIVE SYMPTOMS, STRESS, AND SERUM INFLAMMATION LEVELS, AMONG AFRICAN AMERICANS IN A RANDOMIZED COMMUNITY LIFESTYLE TRIAL
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Background. After the age of 55, African Americans are disparately at risk for clinical depression. The objective of our study is to describe the biopsychosocial stress and inflammatory predictors of depressive symptoms among community dwelling African American adults between 55-70 years of age. Circulating inflammatory markers such as interleukin-6 (IL-6) and C reactive protein are higher among older individuals with greater depressive symptomology. Exploring differences in stress biology is a logical way to start to understand depression disparities among African Americans, as they age.
Methods. Control and intervention participants from a community RCT completed baseline demographic, clinical measures, psychosocial questionnaires (e.g. Perceived Stress Scale, and the Center for Epidemiologic Studies Depression Scale (CES-D)) and cut-off scores for IL-6 and C reactive protein were treated as a composite measure of inflammation.
Findings. Of the current sample (n=444), 80% was female, with 97% percent attending at least a high education. The mean age of the sample was 61 years (SD= 4.15). Hierarchical regression models were fit to identify the ability of logged stress and the composite inflammatory variable to logged CES-D-10 scores. Age, education and body mass index (BMI) were forced into all analyses after which we obtained for other predictors. 37% of the variance in CESD-10 scores for the total sample was explained by lower education (β= -0.10, p=0.03), increased stress (β=0.57, p=0.001), and higher composite inflammation (β= 0.78, p=0.01). Females shared similar predictors explaining 40% of the variance in self-reported depression symptoms (e.g. lower education (β= -0.101, p=0.049), increased stress (β= 0.591, p=0.0001), and higher composite inflammation (β= 0.187, p=0.001)). 21% of the variance in CESD-10 symptoms was predicted by only one variable, perceived stress (β= 0.027, p=0.001), among men in our sample.
Conclusions. Findings from this study provide empirical support that stress may influence bio-behavioral systems among aging African American males and females, which create gender-mediated pathways to depression symptomology.

159) Abstract 3119
HEART RATE VARIABILITY PREDICTS THE OUTCOME OF RISK TAKING BEHAVIOR IN JUDGMENT AND DECISION-MAKING
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We have recently shown that heart rate variability (HRV), an index of executive function and inhibitory control, predicts better decision-making overtime within a judgment and decision-making (JDM) paradigm. Thus, inhibitory control, as indexed by HRV, seems to be a key mechanism in JDM situations. Additionally, it is posited that risk taking behavior (RTB) plays a part in JDM and determines associated outcomes – that is, gains and/or losses as a function of RTB. However, to our knowledge, research has yet to investigate the role of inhibitory control indexed by HRV and RTB in JDM. The present investigation attempted to explore such an association in a sample of 32 undergraduate students (11 female, mean age = 19.82). Participants were asked to inflate an air balloon by blowing into it for 5 minutes during a resting period using an electrocardiogram (EKG). Natural log transformed high frequency power was calculated in accordance with Task Force Guidelines (1996) as an index of HRV. Participants completed 30 trials of the Balloon Analog Risk Task (BART). Dependent measures included the average adjusted number of pumps (AvgPumps | average number of pumps on un-exploded balloons), the number of balloon explosions (losses) and the number of pumps. A 37% of the variance in BART score was explained by AvgPumps predicted explosions such that a greater number of AvgPumps positively predicted the number of explosions. (β = .890 (standard error: .234), p < .001). Moreover, results showed that HRV moderated this link (R2change = .105, β = .098 (se: .040), p < .05), such that higher AvgPumps predicted more explosions in individuals with lower HRV (β = .443 (se: .077), p
PRELIMINARY EVIDENCE FOR THE RELATIONSHIP BETWEEN HEART RATE VARIABILITY, NEED FOR AFFECT, AND MEAN ARTERIAL PRESSURE

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Heart rate variability (HRV) is widely recognized as a psychophysiological index of emotional control. Recently, we showed the relationship between HRV and the need for affect (NA), that is, the motivation to approach, and not avoid, emotional experiences (both positive and negative). Specifically, greater HRV was associated with lesser approaching and avoiding of emotional experiences. However, little is known about positive/negative physiological outcomes, such as higher resting blood pressure (BP), associated with approaching and avoiding emotions when emotion regulatory capacity, as indexed by HRV, is low. Thus, the following preliminary investigation explores this relationship in 20 undergraduate students. Continuous HRV and beat-to-beat BP were recorded during a 5-minute exploratory task until NA was assessed using the 26-item Need for Affect Scale, which includes the motivation to avoid (NA-avoid) and approach (NA-approach) subscales, where higher scores reflect greater avoiding and approaching of emotions, respectively. Natural-log transformed root mean of the squared successive differences (lnRMSSD) was used as the primary measure of HRV, and mean arterial pressure (MAP) was used as the BP related variable. Moderation-regression results showed that resting-HRV moderated the link between NA-approach and MAP (R² change = .106, β = -.39 [Standard error: 1.72], p < .05), such that higher NA-approach scores predicted higher resting MAP in individuals with lower HRV (β = .326 [β = .156 (1.10), p < .05, Analysis of the NA-avoid subscale did not produce any similar patterns. These preliminary data suggest that the NA, particularly NA-approach, may have deleterious effects on resting MAP, particularly in individuals with low HRV. As previously mentioned, we showed that lower HRV is associated with approach motivation in the domain of emotional experiences. Thus, the current data extend our previous findings, and overall we posit that individuals with lower emotional control capabilities, as indexed by resting-HRV, who approach emotional experiences, especially when negative, may have higher levels of BP, as indexed by resting MAP – a relationship with major implications for the role of emotions and cardiovascular function and disease.

PHYSICAL ACTIVITY IMPACTS COGNITIVE COMPLAINTS DURING BREAST CANCER SURVIVORSHIP

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Breast cancer survivors often report cognitive problems over the course of cancer treatment, yet it is unclear how lifestyle factors contribute to the trajectory of these symptoms. Given that physical activity benefits cognitive function in healthy individuals, we explored the extent to which physical activity impacted self-reported cognitive function in a longitudinal, observational study of breast cancer survivors. Women (n = 186) were recruited shortly after a breast cancer diagnosis. Participants reported their physical activity and memory and concentration at the pre-treatment baseline visit, 6 months post-treatment, and 18 months post-treatment. At each time point, women who had higher physical activity levels, as indexed by the Godin activity scale for breast cancer survivors, reported better memory and concentration than their less active counterparts (p < .005). Analyses controlled for other relevant factors such as age, education, cancer stage, and chemotherapy treatment. Pre-treatment physical activity was not a significant predictor of change in cognitive complaints over the entire 18-month follow-up period on average. However, women with higher pre-treatment activity levels reported significant decreases in cognitive complaints from pre-treatment to 6-months post-treatment (p < .005); cognitive complaints did not decline significantly for women who reported no or low physical activity. These results suggest that more active breast cancer survivors experience fewer concurrent cognitive problems on average than those who are less active. In addition, physical activity prior to breast cancer treatment may help to buffer against persistent cognitive complaints.
conditions, and for positive compared to negative content. Revenge motivation predicted mean HR ($\beta = 0.29$; adj. $R^2 = .09$, $p < .05$) and suppression of negative memory content ($\beta = 0.27$; adj. $R^2 = .07$, $p < .05$). These relations did not hold for neutral content or HRV. Revenge did not predict suppression of positive memories ($\beta = -.25$; adj. $R^2 = .06$, $p > .05$). That revenge motivation predicts successful suppression of negative but not positive memories may be in line with a cognitive model for an evolved, functional role of revenge, albeit with short-term cardiovascular costs. Lack of associations with HRV suggests that negative thought suppression in the context of revenge may rely on other, perhaps less adaptive mechanisms than inhibitory control.

164) Abstract 2695

**HABITUATION TO THERMAL PAIN IN ADOLESCENT NON-SUICIDAL SELF-INJURY**

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The repeated exposure to cold pain leads to a habituation in pain experience (increased pain threshold and pain tolerance). There is evidence for altered pain processing and pain perception in adolescents with non-suicidal self-injurious behavior (NSSI). Adolescents with NSSI report greater pain tolerance and pain thresholds to thermal pain compared to healthy controls (HC). However, no study previously investigated differences in pain habituation comparing NSSI and HC. The present analysis is based on preliminary data from an ongoing study on pain processing in NSSI. The study protocol comprises the repeated painful stimulation by the cold pressor task with a 15-minute inter-stimulus interval. Participants are asked (i) to immerse their dominant or non-dominant hand (crossrandomized) into cold water (mean water temperature $= 4.15^\circ$C ($0.46$)), (ii) to indicate the onset of pain (pain threshold in seconds, PTh) and (iii) to remove their hand when they can no longer tolerate the pain (pain tolerance in seconds, PTo). Data from a total of 15 adolescents with NSSI and 15 age and sex matched controls was available for the present analysis. In line with previous findings, adolescents with NSSI showed increased PTo (T1: NSSI = 71.2 (77.2), HC = 42.4 (56.0); T2: NSSI = 68.8 (76.2), HC = 37.7 (56.9)) but no altered PTo (T1: NSSI = 114.7 (83.5), HC = 111.4 (97.6); T2: NSSI = 106.8 (85.9), HC = 113.5 (103.1)). The change in PTo from T1 to T2 (APTo) did significantly differ between adolescents with NSSI and HC ($t$(28) = 1.889, $p = 0.035$, MD: -10.1 sec), indicating an increase in PTo in HC and a decrease in NSSI. No difference was found for PTh ($t$(28) = 1.1889, $p = 0.392$, MD: -10.1 sec), indicating an increase in PTo in HC and a decrease in NSSI. This preliminary analysis revealed that the NSSI group showed sensitization and had decreased cold pain tolerance in the second trial. Altered habituation to the repeated experience of pain, might be an important aspect underlying differences in the experience of pain in adolescent NSSI.

165) Abstract 2577

**SOCIAL SUPPORT FROM DIFFERENT SOURCES AND CIRCULATING PRO-INFLAMMATORY CYTOKINES IN WOMEN AFTER SURGERY FOR BREAST CANCER**

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Objective: Social support (SS) is associated with better mental and physical adaptation in women diagnosed with breast cancer (BCa). Low levels of SS predict poorer physiological adaptation to BCa, including higher levels of pro-inflammatory cytokines. However, it is unknown whether specific types of SS from different sources are associated with circulating pro-inflammatory cytokines. It is also unknown whether negative SS relates to inflammation. This study examines whether SS and cytokine levels are associated in patients after surgery for early-stage BCa, and whether specific types of SS from different sources are associated with levels of specific pro-inflammatory cytokines. Methods: Eighty-nine women diagnosed with early-stage BCa were assessed between 2 and 10 weeks after surgery, prior to adjuvant treatment. Negative, instrumental, informational, and emotional support from different sources were assessed with the Sources of Social Support Scale (SSSS). Circulating pro-inflammatory cytokine levels were measured from blood samples by ELISA. Multivariate regressions controlling for age (M=50.34 years), education (M=15.58 years), BMI (M=26.36 kg/m²), and time since surgery (M=40.64 days) were conducted to assess whether SSSS subscales were related to cytokine levels. Results: When controlling for covariates, negative support from friends was significantly positively associated with IL-1β ($\beta = 0.307$, $p = 0.018$) and with TNF-α ($\beta = 0.318$, $p = 0.012$). Instrumental, informational and emotional support did not relate to levels of circulating cytokines. Conclusions: Results extend prior research suggesting that inadequate social support is related to inflammation in women diagnosed with breast cancer by providing data on negative social interactions. Specifically, greater circulating pro-inflammatory cytokine levels are associated with patient reports of receiving negative support (arguments and criticism) from friends after surgery; future research should examine longitudinal relationships between these variables, and whether behavioral interventions designed to improve interpersonal and communication skills and increase social support could impact inflammation.

166) Abstract 2986

**PSYCHOLOGICAL DISTRESS IS ASSOCIATED WITH POORER ENDOTHELIAL FUNCTION IN HIV POSITIVE PERSONS ON STABLE ANTIRETROVIRAL REGIMEN**

Roger C. McIntosh, Ph.D., Psychology, University of Miami, Coral Gables, Florida, Meela Parker, B.S., Alex Gonzalez, B.A., Cornelis Rowaan, B.S., Behavioral Medicine, University of Miami, Miami, Florida, Jeffery Green, Ph.D., Johanna Klaus, Ph.D., Psychiatry, University of Pennsylvania, Philadelphia, Pennsylvania, Martin Bilker, M.D., Cardiology, Maria Llubre, Ph.D., Barry Harwit, Ph.D., Psychology, University of Miami, Miami, Florida, Background. Arterial stiffness or endothelial dysfunction is a subclinical marker of cardiovascular disease risk that occurs in persons infected with the Human Immunodeficiency Virus (HIV). Endothelial dysfunction is one of the most plausible links between HIV infection and atherosclerosis, however several factors such as viral-dependent coagulation and inflammation, cardio-metabolic stress and socio-demographic factors. Psychological distress has been identified as a risk for endothelial dysfunction in both healthy adults and cardiac patients. Despite the prevalence of HIV-related distress and mood disorders and the bio-behavioral pathways linking to immunosuppression, very little is known about the contribution of psychological distress to endothelial dysfunction in persons living with HIV/AIDS. The purpose of this study was to determine how much variance in vasodilation of the brachial artery is accounted for by an HIV-related psychological distress after controlling for HIV-disease, treatment, cardio-metabolic, inflammatory and other sociodemographic risk factors. Methods. One-hundred and forty HIV-positive adults (91 males) on antiretroviral medication regimens completed a clinical intake involving psychosocial surveys, blood samples, anthropogenic and casual measures of systolic blood pressure (SBP) and flow-mediated dilatation (FMD) of the brachial artery. Results. The final model showed excellent fit ($\chi^2$(47) = 55.01, $p = 0.20$, CFI = 0.92, RMSEA=0.04, SRMR=.05) and accounted for 29% of the variance in FMD. The model confirmed a negative path from Distress to FMD ($\beta = -0.19$, $t = -2.20$, $p = .028$). Additional, higher SBP, female gender and non-SSRI anti-depressant treatment regimen were associated with greater endothelial response. Conclusions. After accounting for traditional CV risk factors our model confirmed that higher levels of anxiety, depression and HIV-related stress are associated with endothelial dysfunction in within HIV patients without prior history of cardiovascular disease. Psychological functioning may be an important yet overlooked risk factor for atherosclerosis in HIV/AIDS.

167) Abstract 2684

**PHYSICAL PAINS IN ASIAN AMERICANS: DO SUBGROUP DIFFERENCES EXIST IN RELATIONSHIP WITH COPING METHOD?**

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Physical pain is a common stressor for individuals with chronic health conditions. An important indicator of health outcomes among individuals with chronic conditions is method of coping with illness-related stressors, such as physical pain. Historically, studies have compared problem-focused coping methods to emotion-focused coping methods, and the relationship between more positive (active emotional) versus more negative (avoidant emotional) methods of altering oneself to a stressor and physical health has been understudied. Moreover, it has been suggested coping methods differ between Asian Americans (AAs) and European Americans (EAs), although this has not been examined systematically. Further, past studies of AAs typically have not differentiated South (SAAs; Indian, Sri Lankan, etc.) from East AAs (EAs; Korean, Chinese, etc.), although SAAs are a high-risk population for chronic health conditions and EAs are not considered at risk. The present study sought to examine AA subgroup differences in the relationship between coping methods and physical pains with a sample of 366 (84 SAA, 152 EAA, & 130 EA) young adult students. A regression model (see Table 1) examined the extent to which coping method interacted with ethnicity to predict physical pains (measured by Pennebaker Inventory for Limbic Languidness), above and beyond predictive roles of (1) self-construal cultural differences (measured by Self-Construal Scale), and (2) coping methods (measured by BriefCOPE Inventory). Age, sex, ethnicity, and years in US were also controlled. Cultural self-construals did not play a significant predictive role in physical pains. Regarding coping styles, high use of avoidant emotional coping was associated with greater physical pains in EAs (b = .45, p < .001; see Figure 1). For SAAs, a similar pattern of findings was found but was non-significant. High avoidant coping may influence physical pains to a greater extent among EAs than SAAs, emphasizing a need to encourage other coping methods (i.e., active emotional) among EAs. It is important to distinguish active from avoidant emotional coping as they relate to physical pains, and to carefully consider sampling of “Asians” in studying health.

**Figure 1:** Physical Pains at Low versus High Avoidant Emotional Coping

![Figure 1](image)

168) Abstract 2530

**STIGMA, SYMPTOM LOAD AND FORGIVENESS: CORRELATES OF STRESS IN AN HIV-POSITIVE SAMPLE**

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Human immunodeficiency virus (HIV) weakens the immune system and the body’s ability to fight against common infections (Grossman, Meier-Schellersheim, Paul, & Pickler, 2006). People living with HIV (PLH) experience chronic disease-related stress which can exacerbate immunosuppression and result in disease progression (Cohen, 2006; Leserman, 2008). Stress is a state in which environmental demands exceed available coping resources (Lazarus & Folkman, 1984). Stress is associated with disease risk and negative psychological outcomes such as affective and anxiety disorders (Lobel & Schetter, 1990). PLH encounter stigma- and disease-related stress resulting from prejudice, discrimination and other negative (avoidant emotional) methods. Forgiveness is negatively associated with stress and negative affect and is conceptualized as a coping strategy associated with positive health outcomes and improved immune functioning (Harris et al., 2006; Owen, Hayward, & Toussaint 2011; Toussaint & Web, 2005; Worthington 2006; Worthington, Witvliet, Pietrini, & Miller, 2007). Given the empirically supported independent relationships between these variables, we explore the relationships between stigma, symptom load and forgiveness in a sample of HIV-positive adults living in North Texas. We used non-probability sampling to collect data from PLH who receive services at community-based organizations located in Dallas and Fort Worth, Texas. Participants were required to be English speaking, 18 years of age or older and able to provide documentation of their HIV-seropositive status. Participants provided informed consent.

Our sample consisted of 246 PLH in the DFW metroplex. We found that stress is positively associated with stigma related to negative self-image (β=.24, t(244)=3.99, p<.001) and HIV symptom load (β=.21, t(244)=2.53, p<.001). Forgiveness was negatively associated with perceived stress (β=.18, t(244)=2.92, p<.001). Further, stigma related to negative self-image, symptom load and forgiveness accounted for 24% of the variance in perceived stress. Our findings inform the development of therapeutic methods and interventions designed to reduce stress in people living with HIV; a goal paramount to preventing disease progression and mortality.

169) Abstract 2828

**PROSPECTIVE ASSOCIATIONS BETWEEN SOCIAL INTEGRATION AND LUNG FUNCTION IN THE ELDERLY**

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Objective: This research investigates whether a prospective relationship exists between social integration (SI) - total number of social roles, and lung function in two elderly populations. In addition, mediation and path analyses were undertaken to further elucidate the connection between SI and lung function. Methods: Two longitudinal cohort studies were examined, the Health and Retirement Study (HRS, ages 52-95, n=4,224) and the MacArthur Study of Successful Aging (MSSA, ages 70-79, n=994). Pulmonary function was assessed via peak expiratory flow rate (PEFR). In both cases, multiple linear regressions predicting lung function four years later from baseline SI (and controlling for baseline lung function, age, sex, race, education, weight and height) were performed. A series of behavioral (i.e., physical activity, smoking), physiological (i.e. blood pressure, cortisol, epinephrine) and psychosocial (i.e. affect, social support) factors were tested as mediators of the association between SI and lung function. Path analyses were also conducted to further explore relationships with significant mediators.

Results: Increased number of social roles were found to be prospectively associated with better lung function in both HRS (β=.052, p<.001) and MSSA (β=.067, p=.006). Our findings indicate that the impact of SI works via a graded mechanism (see Figure 1 for HRS results), where lung function improves with each additional social role. Mediation and path analyses of both studies indicate that this relationship can be accounted for by not smoking and increased physical activity among participants endorsing more social roles.

Conclusions: Number of social roles is an important predictor of lung function in the elderly and can be accounted for by smoking status and physical activity.

**Figure 1. Association between 2006 SI and 2010 PEFR, controlling for 2006 PEFR and standard covariates – HRS (Note: Due to low numbers of participants, endorsing 0 to 3 roles have been collapsed)**
170) Abstract 2938
PERCEIVED STRESS AND DEPRESSION MEDIATE THE RELATIONSHIP BETWEEN DISPOSITIONAL MINDFULNESS AND SELF-REPORTED HEALTH
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Objective: Mindfulness interventions have been shown to improve physical functioning among patients with a number of physical health conditions. Evidence suggests that dispositional mindfulness (the ability to attend, non-judgmentally, to momentary changes in our thoughts, feelings, and experiences) might also be important for general physical health and psychological well-being. Self-reported health is correlated with objective health status and is an important prognostic indicator for mortality. This study aimed to delineate associations between dispositional mindfulness and self-reported health in a sample of undergraduate college students. Methods: A total of 265 undergraduates (80% female; M age=21, SD=2.3) recruited from two small, private liberal arts colleges completed an online survey. The survey included the Mindfulness Attention Awareness Scale (MAAS), the Center for Epidemiologic Studies Depression Scale (CES-D), the four-item Perceived Stress Scale (PSS), and demographic and general health questions. Regression and path analyses were used to examine the relationship between the MAAS, the PSS, and the CES-D. Results: A simple regression revealed that greater mindfulness was associated with better self-reported health (β = .28, p < .001). Controlling for gender, path analyses revealed that perceived stress and depression fully mediated the relationship between mindfulness and self-reported health. The hypothesized model demonstrated a good fit to the data (χ²(3) = 4.34, p = .227; CFI = .99; TLI = .98; SMRMR = .04; RMSEA = .04). Mindfulness was negatively related to perceived stress (β = -.53) and depression (β = -.49) and these in turn negatively predicted self-reported health (perceived stress: β = -.19, depression: β = -.18). Conclusions: Lower dispositional mindfulness is associated with worse, self-reported health, even among relatively healthy young adults. After accounting for gender, this relationship is completely mediated by depressive symptoms and perceived stress. The temporal relationship between depressive symptoms, stress, and dispositional mindfulness was not addressed in this study. Future research should aim to disentangle these relationships and understand what factors contribute to levels of dispositional mindfulness in young adults who have not received any formal mindfulness training.

171) Abstract 2995
PERSEVERATIVE COGNITION MODERATES THE ASSOCIATION BETWEEN DISCRIMINATION AND HRV IN AFRICAN AMERICANS
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Racial/ethnic discrimination has been associated with higher blood pressure and greater hypertension risk in African Americans. Recent research has further linked racial/ethnic discrimination with lower heart rate variability (HRV), an important marker of cardiovascular health and functioning (Wagner, Lampert, Tennen & Feinn, 2013). There is growing evidence that racial/ethnic discrimination may be characterized by perseverative cognition (PC), a pervasive pattern of worrisome and ruminate thinking, which has been linked to physiological dysfunction including decreased HRV. Despite these indications, few studies have empirically tested this relationship. In the present research, we examined associations among racial/ethnic discrimination and PC and tested the possible moderating role of PC on associations between racial/ethnic discrimination and HRV. Racial/ethnic discrimination was measured using the Perceived Ethnic Discrimination Questionnaire (PEDQ). Resting HRV data was obtained as part of a larger study. Two primary components of perseverative cognition (i.e., worry and rumination) were measured using the Penn State Worry Questionnaire (PSWQ) and the Rumination Responses Scale (RRS). Discrimination was significantly correlated with the rumination measure (r = .18, p = .02). Regression analyses revealed marginal evidence of moderation of the racial/ethnic discrimination-HRV relationship by rumination (β = .08). In particular, an increase in racial/ethnic discrimination was associated with a more rapid decline in HRV among individuals with lower and average levels of rumination (p’s = .02). In light of evidence that AA’s tend to exhibit higher resting HRV compared to Whites (Hill et al., In Press), the present results suggest that perseverating about past discrimination may contribute to the erosion of this vagal advantage. These data are the first to demonstrate that PC may be a key factor linking discrimination to cardiac vagal function in African Americans.

172) Abstract 3091
ANXIETY IS ASSOCIATED WITH INCREASED SYMPATHOADRENAL ACTIVITY AND VENTRICULAR ECTOPY DURING THE ACUTE POST-MI PERIOD
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Prospective studies have demonstrated that elevated anxiety predicts increased risk of fatal cardiac events in healthy populations and in individuals with significant coronary artery disease; however, the pathophysiological mechanisms underlying this risk remain to be elucidated. The goal of this study was to determine whether anxiety is associated with elevated sympathetic nervous system activity estimated from plasma catecholamines and with ventricular ectopy during the acute post-MI period. Spielberger trait anxiety and plasma catecholamines were measured in 234 patients 48 hours following the start of chest pain. In addition, ventricular ectopy was determined over the subsequent 24-hour period. Anxiety was positively correlated with plasma epinephrine concentration and with 24-hour ventricular ectopy, and these associations remained significant after adjustment for age, size of MI, ejection fraction, smoking, and depression. There was no association between anxiety and plasma norepinephrine. These findings suggest that elevated anxiety symptoms may increase cardiac risk through activation of the sympathetic nervous system.

173) Abstract 2708
EVALUATION OF A MOBILE HEALTH ENABLED MEDICATION ADHERENCE AND BLOOD PRESSURE CONTROL PROGRAM IN HISPANIC UNCONTROLLED HYPERTENSIVE ADULTS
Tatiana Davidson, PhD, Psychiatry, April Favela, B.S., Jorge Villamizar - Escobar, B.S., Brenda Brunner-Jackson, MPH, Martina Mueller, PhD, Nursing, Frank Treiber, PhD, Nursing and Psychiatry, Medical University of South Carolina, Charleston, South Carolina
Hispanics in the US have the highest rates of uncontrolled essential hypertension (EH) compared to other ethnic groups. Medication (med) non-adherence is the leading modifiable behavior to improve blood pressure (BP) control. Current national data indicates that 92% of Hispanics own cell phones and 61% own smart phones (Pew et al. 2013). Our preliminary work also found that Hispanics have high utilization rates of cellular phones including smart phones and they are very receptive to health technology (Price et al. 2013). Using an iterative design approach guided by self -determination theory and technology acceptance model, we developed a patient and provider centered,culturally sensitive, mHealth technology enabled med adherence BP control program. Cells connected electronic med trays provide reminder signals and smart phone messaging reminding patients to take their BPs using a Bluetooth enabled monitor. Culturally-appropriate personalized motivational and reinforcement text and audio messages are sent based upon med adherence rates and BP levels. Electronic med trays were replaced with standard plastic trays after 3 months. Healthcare providers received bimonthly summary reports of med adherence and BP levels. Twenty-two uncontrolled EH Hispanic adults (aged 43.5 ± 10.2 yrs) were identified via medical records and a clinic BP screening. They were randomly assigned to either Smart phone Medication Adherence Stops Hypertension (SMASH) or Standard of Care control group (SOC) for a 9 month efficacy RCT. Following the baseline screening, clinic BP evaluations are conducted at months 1,3,6 and 9. Prior to start of the trial, SMASHers demonstrated ability to use the med tray, BP device and smart phone. SMASHERS showed high adherence is the lead essential hypertension program. Healthcare providers received bimonthly summary reports of med adherence and BP levels. Our preliminary results suggest that SMASH is acceptable and useful in BP control management among EH Hispanics. Once the efficacy trial is completed, refinements will be made to the SMASH program in preparation for a large scale multi-site effectiveness trial.
AVOIDANCE COPING MEDIATES THE RELATIONSHIP BETWEEN PERCEIVED STRESS AND DRINKING BEHAVIORS: A MULTIPLE MEDIATION MODEL

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Background: Problematic alcohol use is a pressing public health concern among today’s college undergraduates. Understanding the influences of stress and coping styles can clarify factors motivating drinking behaviors. Methods: College undergraduates (N=129) were assessed for perceived stress, coping (i.e., emotion- and problem-focused, and avoidance), and drinking behavior (i.e., problematic alcohol use and alcohol-related problems). Results: A multiple mediation model using a bootstrap approach indicated that avoidance coping was a significant mediator of the relationship between perceived stress and both problematic alcohol use [95% CI: .15-.43] and alcohol-related problems [95% CI: .09-.48]. Undergraduates that had more perceived stress scored higher on avoidance coping (ps<.001) leading to greater drinking behaviors (ps<.001). Conclusions: Together, targeting avoidance coping (not emotion- or problem-focused coping) in alcohol interventions among university students may be an effective way to curb problematic alcohol use in this population.

ASSOCIATIONS BETWEEN S100B AND CHRONIC BUT NOT ACUTE STRESS: A PILOT STUDY

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Elevated levels of the calcium-binding protein S100B, which is predominantly produced by astrocytes in the CNS, have been observed in stress-related psychiatric disorders such as depression and schizophrenia. Besides its intracellular function, S100B is able to act on astrocytes, microglia and neurons in an autocrine or paracrine manner. A small number of pilot studies in animals as well as in humans suggest that S100B concentrations in the blood might not only be sensitive to stress-related disease processes but also to acute stress in healthy individuals. However potential mechanisms that could explain associations between S100B and stress reactivity are still underexplored. To the best of our knowledge this is the first study investigating whether the expression of S100B is modulated by the experience of acute mental stress in healthy human subjects, using a standardized laboratory approach. S100B, salivary cortisol and salivary alpha amylase (SAA) were measured at 6 times points before and after the Trier Social Stress Test (TSST) in 30 healthy, middle-aged, male subjects (19-45 years, mean 24.6 ± 5.6). Psychometric assessment included measures of chronic stress (Trier Inventory for Chronic Stress), perfectionism (Frost Multidimensional Perfectionism Scale) and perceived stress before and after the TSST. S100B levels significantly decreased over the course of the stress paradigm. The change in S100B levels was however not related to cortisol, SAA or subjective stress responses to the TSST. Interestingly, significant associations between S100B and indicators of chronic stress could be observed: Subjects who experienced excessive demands (p<0.05) and social conflicts (p<0.01) showed a stronger decrease in S100B levels. A similar pattern was found for individuals with higher perfectionism scores (p<0.05). To summarize, even though significant changes in S100B were observed on the test day, theses changes could not be attributed to physiological or subjective stress responses to the TSST. S100B changes were however significantly associated with chronic stress and perfectionism scores in healthy middle-aged males.

A GRATEFUL MIND: RELATING GRATITUDE TO FACETS OF MINDFULNESS

Lisa M. May, B.S., Biology, Christina M. Karns, PhD, Psychology, University of Oregon, Eugene, Oregon

Gratitude and mindfulness both have strong connections to health – both physical and mental/emotional health, but to what extent are those connections shared or unique? More specifically, is gratitude associated with particular aspects of mindfulness; perhaps reflecting shared cognitive styles or habits between grateful thinking and mindful thinking? To explore these questions, undergraduates completed self-report measures of gratitude (GQ6), mindfulness (FFMQ), and Big Five personality (BFI). Since gratitude involves noticing the good things in life and some aspects of mindfulness involve attention to the present-moment with acceptance, we reasoned that gratitude might relate to two empirically-derived facets of mindfulness, namely (a) Observing, a quality of being present to present-moment perceptions and (b) Acting with awareness, a quality of attentiveness to ones actions. Study 1 (N = 294) revealed that Gratitude relates most strongly to the Acting with Awareness facet of mindfulness with little relationship to the Observing facet. Study 2 (N = 748) replicated this finding while controlling for Big-5 personality traits. A network graph representing the relationships between gratitude, mindfulness facets, and personality shows that gratitude is most closely related to a trio of interrelated mindfulness facets: acting with awareness, describing, and nonjudgment, and two personality factors: conscientious and agreeableness. These results suggest that self-perceived ability to maintain attentional focus without distraction is more closely aligned with gratitude than openness and receptiveness. These exploratory observations studies suggest future experimental manipulations to test for shared connections between gratitude, mindfulness, and health. The relationship between attentional control and gratitude suggests that inducing a grateful state might lead to changes in task performance related to distractor suppression and subsequent changes in health. Or conversely, it may be that decreasing distractibility through intervention might yield changes in gratitude and changes in health behaviors.

WHO NEEDS SOCIAL SUPPORT? HYPERTENSION PREVALENCE AMONG A REPRESENTATIVE SAMPLE OF OLDER US ADULTS REPORTING THEY HAVE, DO NOT HAVE, OR DO NOT NEED SOCIAL SUPPORT

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Social relationship theory posits a universal need for belonging and affiliation. It is possible, however, that some people may not desire social support. Therefore, social relationship theory would be challenged to the extent that people disavow a need for support. Similarly, theoretical models asserting health benefits of social relationships would require revision to the extent that health status is comparable across people who have versus do not desire social support. The goals of the present research were to 1) estimate the proportion of older adults in the US population who report they do not need social support and 2) to compare health risk, as indicated by high blood pressure, across groups who have, don’t have, or don’t need support. Blood pressure was chosen because it is a potent, modifiable CVD risk factor and because hypertension is often more prevalent among people without social support. This study analyzed a large (N = 3691) nationally representative sample of U.S. adults 60 years or older. Social support was assessed by asking participants whether they could count on anyone to provide emotional support or to help them make a difficult decision. Most responded either yes (N = 3371) or no (N = 263) to the question but some (N = 57) reported that they did not need support. An average of up to three blood pressure readings was used to determine hypertensive status (systolic BP > 140 mmHg or diastolic BP > 90 mmHg; or currently taking hypertension medication). Hypertension prevalence was 68% (95% confidence interval [CI] 65-71%) among those with support, 76% (95% CI 67-83%) among people without social support and 64% (49-76%) among those who did not need support. These data show that 1) a very small but legitimate proportion of the older US population does not report needing social support and 2) this group has roughly similar hypertension prevalence to those with support; both patterns suggest limitations in social relationship theory. Further research examining younger adults and additional health risk factors will more precisely determine health risk differences across these groups.

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Gratitude and mindfulness both have strong connections to health – both physical and mental/emotional health, but to what extent are those connections shared or unique? More specifically, is gratitude associated with particular aspects of mindfulness; perhaps reflecting shared cognitive styles or habits between grateful thinking and mindful thinking? To explore these questions, undergraduates completed self-report measures of gratitude (GQ6), mindfulness (FFMQ), and Big Five personality (BFI). Since gratitude involves noticing the good things in life and some aspects of mindfulness involve attention to the present-moment with acceptance, we reasoned that gratitude might relate to two empirically-derived facets of mindfulness, namely (a) Observing, a quality of being present to present-moment perceptions and (b) Acting with awareness, a quality of attentiveness to ones actions. Study 1 (N = 294) revealed that Gratitude relates most strongly to the Acting with Awareness facet of mindfulness with little relationship to the Observing facet. Study 2 (N = 748) replicated this finding while controlling for Big-5 personality traits. A network graph representing the relationships between gratitude, mindfulness facets, and personality shows that gratitude is most closely related to a trio of interrelated mindfulness facets: acting with awareness, describing, and nonjudgment, and two personality factors: conscientious and agreeableness. These results suggest that self-perceived ability to maintain attentional focus without distraction is more closely aligned with gratitude than openness and receptiveness. These exploratory observations studies suggest future experimental manipulations to test for shared connections between gratitude, mindfulness, and health. The relationship between attentional control and gratitude suggests that inducing a grateful state might lead to changes in task performance related to distractor suppression and subsequent changes in health. Or conversely, it may be that decreasing distractibility through intervention might yield changes in gratitude and changes in health behaviors.
DEVELOPING A CULTURALLY SENSITIVE AND SUSTAINABLE OBESITY INTERVENTION FOR PACIFIC ISLAND FAMILIES LIVING IN MICRONESIA (PALAU) USING A COMMUNITY-BASED PARTICIPATORY RESEARCH PARADIGM.

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Background: Pacific Island (PI) communities have the highest prevalence of obesity, globally; the Republic of Palau (Palau) in Micronesia reports as many as 46% of the population is overweight. Unfortunately, evidence-based obesity reduction programs in the Pacific are scarce to nonexistent. We developed a community-based participatory collaboration to address the best methods for delivering obesity interventions in Palau. Methods: We conducted qualitative interviews and administered questionnaires to 55 Palauan key informants, several of whom were part of our local Project Advisory Committee. Participants were queried about factors that contributed to overweight, the best methods for delivering interventions, and comfort with technology. Results: Most participants reported difficulty monitoring food intake during community celebrations (“customs”) and expressed concern that there were few affordable healthy food options available. Participants overwhelmingly favored weight-management programs that involved youth and families; taught them how to make healthier food choices, especially in social situations; and taught them how to increase physical activity. Participants wanted to learn techniques that led to small but sustainable changes, and most were interested in programs that utilized novel technology, e.g., mobile monitoring devices and interactive media. Conclusions: As we collaboratively develop weight-management curriculum in Palau, we are infusing evidence-based practices with the unique cultural, geographic, and economic concerns of this PI community. The new program, designed to support healthy living activities, will be administered by local providers and utilize technology to increase access, engagement, and adherence.

INTEROCEPTIVE SENSITIVITY AND EATING DISORDER RISK: THE MEDIATING ROLE OF INTUITIVE EATING

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Interception, the perception of body sensations, is thought to play a role in the development of eating disorder symptoms. Accurate perception of body sensations is negatively correlated with symptoms of anorexia (Pollatos et al., 2011), bulimia (Klabunde et al., 2013), and sub-clinical levels of disordered eating (Myers & Crowther, 2008). While evidence supports a relationship between interoception and disordered eating, poor interoceptive sensitivity alone is not sufficient to explain disordered eating. Accurate perception of body sensations characterizes intuitive eating, which is the ability to regulate food intake using sensations of hunger and satiety (Herbert et al., 2013). Individuals who eat intuitively are better able to determine when to eat and how much to eat and are less likely to develop problems related to food and weight; disordered eating is marked by a lack of intuitive eating (Herbert et al., 2013; Tylka & Kroon Van Diest, 2013). Based on these findings, we hypothesized that interoceptive sensitivity would negatively predict eating disorder risk and that the relationship between interoceptive sensitivity and eating disorder risk would be mediated by intuitive eating. In our study, 42 undergraduate women completed a heartbeat counting task (Pollatos et al., 2007), to measure perception of body sensations, as well as the Intuitive Eating Scale (Tylka, 2006) and the Eating Disorder Risk Scale of the Eating Disorder Inventory (Garner, 2004). In support of our hypotheses, we found interoceptive sensitivity was positively correlated with intuitive eating (r = 0.33, p = 0.036) and negatively correlated with eating disorder risk (r = -0.40, p = 0.01), and intuitive eating and eating disorder risk were negatively correlated (r = -0.36, p < 0.001). Last, the relationship between interoceptive sensitivity and eating disorder risk was fully mediated by intuitive eating (Sobel z = -2.12, p = 0.04; see Figure 1). Our findings suggest that the lack of intuitive eating may be one variable explaining the negative association between interoceptive sensitivity and eating pathology. It seems individuals who cannot accurately perceive body sensations do not eat intuitively; therefore, they are at greater risk for disordered eating.

Figure 1: Standardized regression coefficients for the relationship between interoceptive sensitivity and eating disorder risk mediated by intuitive eating. The standardized regression coefficient between interoceptive sensitivity and eating disorder risk when controlling for the effects of intuitive eating is presented in parentheses. *p < 0.05.

CHARACTERISTICS OF THE ORTHOSTATIC CARDIOVASCULAR RESPONSE IN ADOLESCENT PATIENTS WITH PSYCHOGIC FEVER

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Background: To determine the characteristics of cardiovascular responsiveness to orthostatic stress in adolescent patients with psychogenic fever. Methods: Twenty-four adolescent patients (mean age 15.5 ± 0.3 years, male/female: 6/18) with psychogenic fever and 24 age- and gender-matched healthy subjects underwent an orthostatic test. Results: The increase in heart rate after standing was significantly higher in psychogenic fever patients (mean heart rate difference between supine and standing position: 22.4 ± 1.4 beats per minute) than in healthy subjects (12.8 ± 1.5 beats per minute) across time (F1 = 20.55, P < 0.001), whereas there was no difference in systolic or diastolic pressure between the two groups. The number of psychogenic fever patients (38%) who met the criteria of postural orthostatic tachycardia syndrome (POTS) was also significantly higher than that of healthy subjects (4%; P = 0.01). When compared with our previous study, the increase in HR to orthostatic stress of adolescent psychogenic fever patients was significantly greater than that of adult patients. Conclusion: This study demonstrates that adolescent patients with psychogenic fever have higher heart rate responsiveness to orthostatic stress than age-matched healthy subjects and adult patients.

BEHAVIORAL PREDICTORS OF PRO-INFLAMMATORY SERUM IL-6 CONCENTRATIONS IN WOMEN UNDERGOING SURGERY FOR SUSPECTED GYNECOLOGIC CANCER


Background: Researchers have identified biomarkers of inflammation, such as interleukin-6 (IL-6), in higher concentrations in cancer patients. Several behavioral predictors of higher IL-6 concentrations have been recognized in animal and human models, including higher Body Mass Index (BMI), sleep disturbance, and current/past smoking history. Few studies have specifically examined the relationships among these behavioral variables and IL-6 concentrations in women within the gynecology oncology context. The current study examined the relationships among BMI, sleep disturbance, smoking history, and serum IL-6 concentrations in women undergoing surgery for a suspected gynecologic malignancy. Methods: Participants were 56 women (M age = 57.94 yrs, SD = 11.03 yrs) screening positive for clinically significant sleep impairment undergoing surgery for suspected gynecologic cancer. BMI was calculated by obtaining height (m2) and weight (kg) from participants’ medical
records. Severity of sleep impairment was captured by the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989). Smoking history (Yes/No) was assessed by participant self-report. Serum IL-6 concentrations were collected immediately prior to surgery and assayed via ELISA. Results: Hierarchical regression analyses controlling for age and presence of poor prognosis gynecologic cancers (ovarian/fallopian tube cancers) revealed IL-6 was not significantly related to severity of sleep impairment (β = -.10, p>0.05). However, as hypothesized, greater IL-6 was related to current/past smoking (β = .27, p = .024) and greater BMI (β = .25, p = .033). The equation accounted for 40% of the variance in IL-6 levels. Conclusions: Modifiable lifestyle factors such as BMI and smoking status are associated with higher concentrations of pro-inflammatory cytokine IL-6 in women undergoing surgery for suspected gynecologic cancer. Future research should seek to identify how lifestyle interventions may be associated with changes in IL-6 concentrations in gynecologic cancer patients as well as how these relationships may be related to clinical outcomes in gynecologic cancer care.

182) Abstract 2882

INFLAMMATION: A MEDIATOR IN THE EFFECTS OF ADIPOSY ON PSYCHOSOCIAL STRESS?
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INTRODUCTION Stress and obesity are two public health threats that have been bidirectionally related to each other. To start therapeutic and preventive actions, underlying mechanisms should be elucidated. One of the possible mediators might be inflammation: obesity is a well-known inflammatory situation and this inflammation might increase stress levels since cytokines can reach the brain and hence impair neuroendocrine activity, neurotransmitter function and neurocircuitry. In the current study, we want to test whether inflammation relates to stress and adiposity and consequently might act as a mediator in the adiposity-stress relation that we have previously observed in our childhood sample. METHODS For the Children Body composition and Stress (ChiBS) study, 330 Belgian primary school children were followed-up during 2 years on their stress levels and adiposity. Stress was measured by parental-reported behavioral and emotional problems (Strengths and Difficulties Questionnaire), three child-reported emotions (anger, anxiety and sadness) and salivary cortisol (4 samples over the day). C-reactive protein (CRP) was measured only at baseline as indicator of overall inflammation. Multilevel regressions were used to test the CRP-cortisol relation cross-sectionally and the CRP-stress relation longitudinally. The cross-sectional obesity-CRP relation was tested with multiple regression. Mediation was tested cross-sectionally with bootstrapping. RESULTS Two subscales of the SDQ i.e. conduct problems and emotional problems were positively associated with CRP cross-sectionally (β = 0.030, p < 0.009) and longitudinally (β=0.046, p<0.038). As shown in the figure, CRP was also related to a lower cortisol awakening response (p=0.002) and a steeper diurnal cortisol slope (p=0.047) but no relations with overall cortisol output were detected. Finally, CRP was associated with higher adiposity (BMI, fat% and waist-to-height ratio p<0.001, beta up to 0.3) but it did not mediate the adiposity-stress relation. CONCLUSION Inflammation could predict the biological stress measure cortisol cross-sectionally and could predict some reported stress measures both cross-sectionally and longitudinally. This supports the hypothesized link between psychology and inflammation. Although this inflammation marker was also related to adiposity, it was no mediator in the adiposity-stress relation. Consequently, future research should look for other mediators that could explain the adiposity-stress relation in non-clinical childhood populations. Self-esteem is one of the mediators that we will test in the upcoming months (to potentially show results at the conference) since it can easily inspire preventive actions e.g. by increasing self-esteem in obese children.

183) Abstract 2847

CORRELATION BETWEEN HEART RATE VARIABILITY AND HEART RATE RECOVERY IN HEALTHY, SEDENTARY INDIVIDUALS
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Objective: Significant evidence suggests that high frequency heart rate variability (HF-HRV) is a noninvasive index of cardiac vagal regulation. Evidence also suggests that heart rate recovery (HRR) from cardiopulmonary exercise testing also is vagally mediated. Both indices are inversely associated with the prevalence of cardiovascular disease, further supporting their vagal origins. Some studies have investigated whether these two indices are related to each other but are limited because of small sample size and reliance on largely male subjects. The main objective of this study is to analyse the relationship between HRR and HF-HRV.

Method: In 98 healthy, sedentary participants, male and females age 20-45, HF-HRV was measured during a resting baseline while seated on a cycle ergometer and prior to a cardiopulmonary exercise test (CPET). Following the CPET and achievement of VO2max, HRR was measured at 60 (HRR60) and 120 (HRR120) seconds after exercise. On each occasion, HF-HRV was measured in the supine position as part of a psychophysiological test.

Results: There was no significant correlation between HRR60 (r=-0.074, p=0.039, p=NS), HRR120 (r=-0.21, r=0.49, p=NS) and HRV in either the seated or supine positions respectively.

Conclusion: Both HF-HRV and HRR are associated with cardiovascular health and are thought to index cardiac vagal regulation. Contrary to expectation, they were not related to each other in young, healthy, sedentary participants. HF-HRV, especially when measured at rest, reflects tonic vagal regulation of the heart whereas HRR, while also an index of vagal activity, may be a more reflexive vagal response after physical challenge. Therefore, they may be independent of each other. Replication of this finding in a larger sample is required.

Keywords: Parasympathetic nervous system, autonomic cardiac control, high frequency heart rate variability, heart rate recovery, observational study, cardiopulmonary exercise, VO2max, vagal cardiac regulation

184) Abstract 2980

ANXIETY, BUT NOT DEPRESSION, MEDIATES STRESS AND SOMATIC SYMPTOMS IN CHINESE
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Introduction: Symptom perception and interpretation of bodily state and somatic symptoms is not empirically examined. The literature has stipulated that stress causes somatic symptoms, and both anxiety and depression are more prevalent in patients with somatic symptoms. However, the pathway of stress leading to anxiety, depression, and somatic symptoms has not been empirically examined.

Objectives: This study examines the relationship between stress, anxiety, depression, and somatic symptoms in the general Chinese population and the mediating role of anxiety and depression in the effect of stress on somatic symptoms.

Methods: Data were collected from 202 Chinese participants in a household survey in Hong Kong. Psychosomatic symptoms were measured by the Chinese version of Patient Health Questionnaire. Perceived stress was measured by Perceived Stress Scale. Anxiety and depression were measured by Hospital Anxiety and Depression Scale. Sociodemographic information was also asked. The mediation relationships were examined by using structural equation modelling. Bootstrapping was performed for enhancing the normality of the sampling distribution of the total and specific indirect effects. Adequacy of the all models was assessed by examining the model fit indexes.

Results: Among the participants, 106 (52%) were female, 128 (63.4) are married and 131 (64.9%) are employed. Based on the PHQ-15 scores, 33 (16.3%) participants had a mild level of somatic symptoms, and 7 (3.5%) participants had a moderate-to-high level of somatic symptoms. Anxiety was a significant mediator of the effect of stress on psychosomatic symptoms (Z = 4.328, p < .001, 95% CI = .061 , .052), even after adjusting for sociodemographic variables. Contrary to some earlier studies, depression was not a mediator of somatic symptoms in this study.
Conclusions: Anxiety mediated the influence of stress on somatosomatic symptoms. The findings informed the health care professionals in primary care of the importance in diagnosing anxiety. When considering prevention and treatment for somatic symptoms, reducing both stress and anxiety is considered important.

185) Abstract 3092
MINDFULNESS AS A PREDICTOR OF MEMORY SKILLS IN PREGNANT WOMEN
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186) Abstract 2772
FAMILISM PROTECTS PSYCHOLOGICAL WELL-BEING AND PHYSICAL HEALTH
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187) Abstract 2601
FAKE SMILES = WORSE HEALTH: THE CONNECTION BETWEEN SMILE TYPE IN STUDENT PHOTOS AND PHYSICAL HEALTH
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Smiles are thought to be indicative of positive affect, and this may be the reason why research has begun to tie them to various positive outcomes. For example, smile intensity in photographs has been connected with greater longevity, life satisfaction, and marital stability. However, no studies have investigated the connections between smile intensity in photographs and current physical health.

Participants (N=251) completed an online survey asking about various physical health indicators such as frequency of visits to physicians or health care centers and self-rated health. Participant student ID photos were coded for degree of smile: no smile (11.6%), “standard” non-Duchenne smile (those involving the cheek muscles but not the muscles around the eyes; 18.3%), or “genuine” Duchenne smile (those involving both the cheek muscles and the muscles around the eyes; 70.1%). Contrary to hypotheses, greater smile intensity was positively correlated with the number of times participants visited a medical practitioner in the past year (r = .125). Results from a Bonferroni multiple comparison test indicated that students who displayed standard (often deemed “fake”) smiles were significantly more likely to have visited a medical practitioner in the past year (M = 5.27 visits, SD = 4.27) as compared with those who displayed no smile (M = 3.59 visits, SD = 3.8) or genuine Duchenne smiles (M = 1.74 visits, SD = 3.2). F(2, 248) = 6.24, p = .002. No connections were found between smiling and self-rated health. This study provides further evidence that coding smiling in photographs can provide useful information, and expands on the current literature by demonstrating that this information can include indicators of current health. Future studies should investigate the mechanisms underlying these findings, such as emotional expression norms.
PREVALENCE AND RISK FACTORS OF MENTAL HEALTH PROBLEMS AND ACUTE SEIZURES AMONG PRESCHOOL CHILDREN IN RURAL KENYA
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Background
The incidence of acute seizures is higher in Africa than elsewhere, but most studies are based on hospital admissions. Behavioral/emotional problems occur in up to 26% of older Kenyan children in the community, but there are no large community-based studies in preschool children, who may benefit from early interventions. Behavioral/emotional problems associated with seizures in children and may be related to the seizures, underlying aetiology, neurological impairments or genetic predisposition. There is little data from Africa to plan interventions.

Methods: We are screening 8,000 children aged 1-6 years for acute seizures with half of these examined for behavioral/emotional problems using Child Behavior Checklist (CBCL) (already adapted and validated for the local population). All children reside in a defined and regularly enumerated area in Kilifi, Kenya. All those who screen positive for seizures and a proportion of those with behavioral problems (CBCL scores >60) are invited to our clinic for clinical examination, neurophysiology and neurocognitive assessments.

Results: Acute seizures were documented in 3.8% of the 3,930 children and behavioral/emotional problems in 13.2% of the 1,213 children screened. Mean scores for behavioral problems were significantly higher in those with seizures compared to those without (46.5 vs. 31.3; p<0.001). Risk factors for acute seizures included family history of seizures (RR=3.46), Frequent hospitalization (RR=6.13) and bed-net use (RR=6.13). Risk factors for behavioral/emotional problems included seizures (RR=3.66), perinatal complications (RR=6.90), snoring (3.90), head injury (RR=3.02), eating soil (RR=4.05) and bednet use (RR=5.02).

Conclusions: Preliminary results show that acute seizures and mental health problems are common in preschool children living in Kilifi, Kenya and previous hospital stays are underscored as the premorbid state of autism, and an acute seizure is managed with support of the child and his family. Acute seizures and emotional problems may be prevented through simple public health interventions aimed at provision of obstetric services, mineral supplementation, moderately treated bed-nets and control of seizures. Further studies are required to understand the role of snoring in these two conditions.

RELATION OF DEPRESSION AND ANXIETY WITH THE SEVERITY OF ACNE VULGARIS AND THE QUALITY OF LIFE
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Background: The most obvious link between depression and AV is through isotretinoin. Depression and an array of psychological conditions including schizophrenia have been seen to be associated with isotretinoin. However recent research has shown that depression has improved with a sustained use of isotretinoin raising the possibility that depression might have been caused by AV itself which improved with treatment by isotretinoin. In the current study, therefore, an attempt was taken to disentangle the effects of AV and its medications on depression and anxiety. Method: 69 consecutive drug free AV patients, meeting inclusion criteria, were assessed. Socio-demographic and clinical data were gathered using a specially designed pro-forma. AV severity was measured by Global Acne Grading Scale. Anxiety and depression were assessed by Hospital Anxiety and Depression Scale. Quality of life was assessed through WHO Quality of Life scale (abbreviated) which assesses the overall quality of life under the subscales of general score, experience, ability, satisfaction and depression. The groups (with or without anxiety or depression) were compared using Mann-Whitney U and Fisher's exact test. The effect sizes were reported as r and Cramers V. Results: 11 (15.94%) patients had syndromal anxiety; 4 (5.79%) had syndromal depression. Patients with anxiety had significantly more severe AV (p=0.01), worse quality of life scores in all the subscales including general score (p=0.01), experience (p=0.00), ability (p=0.04), satisfaction (p=0.03) and depression (p=0.01). Patients with depression did not have significantly different severity of AV than their non-depressed counter parts. Also in various subscales of quality of life they were comparable with those without depression except for general subscale score where the depressed patients had a significantly (p=0.04) poorer score. Conclusions: Before the onset of treatment, AV is not associated with reduced levels of depression (p=0.94), snoring is associated with significantly higher severity of the condition. It also adversely influences the quality of life in this population. Depression, though marginally worsens the quality of life in this population, does not however influence the severity of AV.

HEART RATE VARIABILITY AND ITS RELATIONSHIP TO PSYCHOLOGICAL FACTORS IN PATIENTS WITH CHRONIC HEART FAILURE
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Chronic heart failure (CHF) is a growing health concern, with 5.1 million cases in the United States alone, and a five-year mortality rate. Measures of heart rate variability (HRV) have been linked with CHF morbidity and mortality. Prior research has shown that psychological factors can impact HRV, which may influence cardiac health. However, this has not been assessed in CHF. The present study examined HRV measures of depression, stress, as well as mindfulness in 21 patients with CHF (90.5% male), with a mean age of 64.65 years (SD=10.11), and a mean left ventricular ejection fraction (LVEF) of 47.73% (SD=14.7). Perceived stress was determined using the Perceived Stress Scale, depressive symptoms were measured using the Hospital Anxiety and Depression Scale (HADS-D), and mindfulness was assessed using the Five-Facet Mindfulness Questionnaire. Resting HRV was collected using the Equivail EQ-01 heart rate sensor for ten minutes while the participant was seated quietly in the upright position. Regression analyses adjusting for disease severity (LVEF) revealed a negative relationship between high-frequency HRV power and depression (p=.043, r=-.454, deltaR2=.138) and perceived stress (p=.012, r=-.544, deltaR2=.296). Higher levels of depressive symptoms and perceived stress were associated with lowered HRV. The interaction of both higher levels of depression and perceived stress produced an even stronger decline in HRV (p=.005, r=-.399, deltaR2=.357). In contrast, a positive association was observed for another facet of mindfulness (p=.019, r=.534, deltaR2=.205). This effect on HRV was augmented when another facet of mindfulness, awareness, was higher (p=<.005, r=-.599, deltaR2=.357). Results indicate that perceived stress and depression may be linked to lowered autonomic function, but individuals with CHF could benefit from stronger traits of nonjudgement and awareness. Further interventions should focus on efforts in cultivating these aspects of mindfulness in patients with chronic heart failure.

PSYCHOSOCIAL FACTORS RELATED TO FRUIT, VEGETABLE, FIBER AND FAT CONSUMPTION IN ACC/AHA ASYMPTOMATIC STAGE B HEART FAILURE PATIENTS
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Higher fruit, vegetable and fiber consumption and lower fat consumption is associated with lower heart disease risk. Less is known about the myriad psychosocial factors that are related to diet in patients with established disease. In this presentation, we will report on a cross-sectional study that examined the impact of several depressive symptomology, alcohol use, spirituality and mindfulness, in 277 ACC/AHA asymptomatic stage B failure (HF) patients (95% male) with a mean age of 66.5 years (SD = 10.3) and a mean BMI of 29.9 kg/m2. (SD=DX) The Beck Depression Inventory (BDI) was used to measure depressive symptomology. The Alcohol use Disorders Identification Test (AUDIT) was used to assess current and past alcohol use. Spirituality well-being was measured with the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (SPS). SPS subscales include Faith and Meaning and Peace (MP). Mindfulness was examined using the Five Facets of Mindfulness Questionnaire (FFMQ). Subscales of the FFMQ include observing (OB), describing (DS) acting with awareness (AWA), nonjudgement (NJ) and nonreactivity (NR). The BLOCK Fruit Vegetable and Fiber Screener (FVF) and the BLOCK Fat Screener (FAT) were used to estimate fruit, vegetable and fiber intake and fat intake respectively. A series of regression analyses were conducted with age, sex, BMI and depression (BDI) as independent variables. A series of regression analyses were conducted with age, sex, BMI and depression (BDI) as independent variables. Results indicate that perceived stress and depression may be linked to lowered autonomic function, but individuals with CHF could benefit from stronger traits of nonjudgement and awareness. Further interventions should focus on efforts in cultivating these aspects of mindfulness in patients with chronic heart failure.
psychosocial factors involved in health behaviors may help to enhance interventions aimed at reducing disease risk and progression in this population.

193) Abstract 2544

CORTISOL LEVELS AND SUICIDAL BEHAVIOR: A META-ANALYSIS
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Background: Suicide is a major cause of death worldwide, responsible for 1.5% of all mortality. The causes of suicidal behavior are not fully understood; however, this behavior clearly results from a complex interplay between many different factors. Dysregulated hypothalamic-pituitary-adrenal (HPA) axis activity, as measured by cortisol levels, is one potential risk factor. Method: A systematic literature search identified 24 studies (N = 1,862; 765 suicide attempters & 1090 non-attempters) that met the study eligibility criteria from a total of 417 unique records initially examined. Estimates of effect sizes (r) obtained from these studies were analysed using Comprehensive Meta-Analysis software. In these analyses, we compared participants identified as having a past history of suicide attempt(s) to those with no such history. Study quality, mean age of sample and percentage of male participants were examined as potential moderators. Results: Overall there was no significant effect of suicide group on cortisol (r = .059, p = .242), or for those studies which assessed cortisol in the morning (r = .023, p = .668) or afternoon and early evening (r=0.62, p = .540). However, age was found to moderate the association between cortisol and suicide attempts. In studies where the mean age of the sample was below 40 years the association between cortisol and suicide attempts was positive (i.e., lower cortisol was associated with suicide attempts) and where the mean age was 40 or above the association was negative (i.e., lower cortisol was associated with suicide attempts). Discussion: These findings confirm that HPA axis activity, as indicated by age-dependent variations in cortisol levels, may play an important role in suicidal behavior. The challenge for theory and clinical practice is to explain the complete reversal of the association and to identify its clinical implications.

194) Abstract 2522

PSYCHOSOCIAL ILL-BEING IS ASSOCIATED WITH LOWER CORTISOL AWAKENING RESPONSE: RESULTS FROM A P-CURVE STUDY
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The cortisol awakening response (CAR) refers to the rise in cortisol secretion by the adrenal glands that typically occurs during the first waking hour, with a peak around 20-30 minutes post-waking. Two popular measures of CAR are the increase above the waking cortisol value (CARi), and the area under the curve (AUC) with regard to ground – a measure of total cortisol output across the first waking hour. There have been a number of studies investigating the relationships between psychosocial ill-being and the CAR, but the results from this literature remain ambiguous as there are findings relating psychosocial ill-being to both higher and lower CAR. Some of this ambiguity may arise from file-drawer problems, the presence of Type-I error, and/or variations in statistical practices like strategies for removing outliers or including covariates. Thus, to clarify the relationship between psychosocial ill-being and CAR, it is important to independently examine the strength of the evidence for the set of findings associating (1) ill-being with higher CARi and AUC and (2) ill-being with lower CARi and AUC. P-curve analysis is a recently developed analytic technique designed to assess the evidential value of a set of findings based on the distribution of the p-values of those findings. The current study used p-curve analysis to test the evidential value for the two aforementioned set of findings. To do this, we searched the literature for all papers assessing psychosocial functioning and CAR published between 2009-2014 (k = 45). These were combined with a total of 103 studies investigating the relationship between psychosocial ill-being and CAR published between 2009 to 2009 from a previous analysis of CAR and psychosocial functioning (k = 62; Chida & Steptoe, 2009). Effect sizes from these 107 (45+62) studies were used for p-curve analysis. Strongest evidential value was found for studies associating psychosocial ill-being with lower CARi (k = 30; χ²(60)=88.75, p<.0005) and lower AUC (k = 9; χ²(18)=49.73, p=.0001). There was no evidential value for findings associating ill-being with higher CARi (k = 31; χ²(62)=65.82, p>.3476) and lower evidential value for higher AUC (k = 28; χ²(8)=28.67, p=.089). Taken together, results from the current study support the hypothesis that psychosocial ill-being is associated with lower, not higher, CARi. Future research should focus on clarifying specific mechanisms by which psychosocial ill-being may reduce CAR responses, and on testing the short- and long-term health consequences of these relationships.

195) Abstract 2643

HIGHER HEART RATE VARIABILITY PREDICTS STRONGER PERFORMANCE ON EXECUTIVE FUNCTIONING TASKS IN OLDER ADULTS
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Heart rate variability (HRV) is a vagally mediated index of parasympathetic nervous system activity. Anterior cingulate cortex (ACC) (Thayer), HRV has been proposed to reflect the strength of central networks linked to executive functions and self-regulation. Pharmacological deactivation of the prefrontal cortex leads to decreases in HRV, while engagement of the prefrontal cortex during self-regulatory tasks increases HRV. Self-regulatory performance has also been linked to higher resting HRV in younger adults. To date, most studies of HRV and executive functions have used subjective, self-report questionnaires and/or younger adults; less is known about the relationship between HRV and objective neurocognitive measures in older adults. In the present study, the Trail Making Test A & B (TMT A & TMT B), Rey Auditory Verbal Memory Test (RAVLT), and a subjective measure of cognitive functioning, (MOS Cognitive Functioning Scale; MOS COG) were administered to 112 older adults (Mage = 78). At the time of testing, a ten-minute resting ECG reading was acquired for determination of resting HRV, operationalized as spectral power in the high-frequency (12–40 Hz) range. Multiple regression models predicted neurocognitive performance and subjective cognitive functioning from resting HRV. Age, education, and estimated intelligence were also included as controls in neurocognitive models. Higher heart rate variability significantly predicted better faster (better) scores on TMT A (B = -2.25, SE = .98, p = .02, partial R²= .18) and TMT B (B = -7.70, SE = 3.42, p = .03, partial R² = 20). Higher heart rate variability also predicted higher scores on the executive functioning component of the MOS COG such as relating to the MoA (R² = .111, 5.730, p = .018) and concentration (R² = .206, F(1,111) = 4.866, p = .029). Heart rate variability was not significantly related to objective performance on verbal memory (RAVLT) or to subjective memory items from the MOS COG. These findings provide confirmatory data to suggest HRV is specifically related to objective as well as subjective executive function abilities. In older adults, HRV may reflect the integrity and capacity of prefrontal cortical function, and could be employed as a physiological marker for premorbid impairment.

196) Abstract 2846

PURPOSE IN LIFE AND QUALITY OF LIFE IN ALS PATIENT-CAREGIVER DYADS: EFFECTS OF DISEASE PROGRESSION
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Amyotrophic Lateral Sclerosis (ALS) is a fatal neurodegenerative disease. Previous research suggested that patients maintained their quality of life (QOL) and exhibited psychological resiliency despite physical debilitation. In contrast, caregivers experienced decreased QOL as the patients disease progressed. Existential aspects of QOL may be stable sources of well-being for both patients and caregivers. Purpose in life (PIL) is an existential construct associated with higher well-being and markers of better physical health. The present study examined the stability, variance structure, and trajectory of PIL and QOL in 143 patients with ALS (66% male, M age =60) and 122 caregivers (27% male, M age = 55) from the SeattleALS Patient Profile Project. The Purpose in Life Test and Life Rating Scale were administered over up to 7 waves, each separated by 3 months. Multilevel models had people at Level 2 and waves at Level 1. There was significant variance in PIL and QOL both between and within people (all p < .001). The proportion of total variance in PIL attributed to stable individual differences was 75% for patients and 78% for caregivers, reflecting substantial stability over time. Variance in QOL attributed to stable individual differences was lower than that for PIL: 59% for patients and 57% for caregivers. Growth models indicated that patient disease progression significantly predicted decreases in both caregiver and patient QOL (caregivers: y=.02, SE=.009, p=.03; patients: y=.02, SE=.007, p<.0005) but accounted for more variance among caregivers (7.5%) than patients (1.7%). There were individual differences in the effect of disease progression on QOL (i.e., a random effect) among caregivers but not patients. Patient disease progression significantly predicted decreases in both caregiver and patient QOL (caregivers: y=.05, SE=.10, p<.0001; patients: y=.59, SE=.13, p<.001) but accounted for more variance among patients (12.0%) than caregivers (6.2%). There were individual differences in the effect of disease progression on PIL among patients but not caregivers. Results suggest that disease progression is more deleterious to QOL in caregivers and to PIL in patients, although there are important individual differences among caregivers but not patients. Patient disease progression significantly predicted decreases in both caregiver and patient QOL (caregivers: y=.05, SE=.10, p<.0001; patients: y=.59, SE=.13, p<.001) but accounted for more variance among patients (12.0%) than caregivers (6.2%). There were individual differences in the effect of disease progression on PIL among patients but not caregivers. Results suggest that disease progression is more deleterious to QOL in caregivers and to PIL in patients, although there are important individual differences among caregivers but not patients.
Predicting Inflammation and Well-Being from Marital Strain and Strength in a Longitudinal Sample of Older Adults

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Marital quality has been found to be a powerful predictor of psychological and physiological health over the life course. Although much of the extant research has focused on marital difficulties, marital quality consists of both positive (“strengths”) and negative (“strain”) facets that are largely independent of each other. The present study investigated strength and strain to examine how these indicators predicted inflammatory markers (beta-2 microglobulin or β2μ, and Interleukin 6 or IL-6) as well as psychological well and ill-being in a longitudinal study of married older adults. Participants (63 men and 87 women, Mage = 74.69) were married for an average of 44.54 years (SD = 14.22, Range = 3 to 66). Marital quality (Revised Dyadic Adjustment Scale) was assessed once during the first year of the study. Psychological well-being (positively phrased items from the Geriatric Depression Scale and Perceived Stress Scale), psychological ill-being (negatively phrased items), serum IL-6, and β2μ were assessed semi-annually for up to 3 years (10 total waves). M = 6.85 waves per person. In multilevel models with people at Level 2 and waves at Level 1, when entered together, neither marital strength nor strain significantly predicted levels of β2μ or IL-6 (all p > .15). For psychological well and ill-being, when entered together, higher levels of strength but not strain significantly predicted higher well-being (γ = .4652, SE = .1208, p < .0001, η² = 2958) and lower il-being (γ = .4030, SE = .0919, p < .0001, η² = .3658). In these stable, long-term marriages, marital quality predicted well- and ill-being but not inflammatory markers (β2μ and IL-6). The null findings for inflammatory markers fit with recent cross-sectional work (Whisman & Sbarra, 2012) that found relations between marital quality and IL-6 in younger women but not younger men, older men, or older women. In addition, well-being and ill-being were predicted by marital strength above and beyond marital strain. Marital strain is only one stressor that older adults may face, and having a strong, highly supportive relationship with one’s partner (even if that relationship is sometimes conflictual) likely strengthens older adults’ ability to cope with other difficult situations.

Antidepressant Use, but Not Depression Status, is Associated with Decreased Cardiac Reactivity and Autonomic Dysfunction with Mental Stress

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Objective: Depression has been associated with blunted cardiovascular and neuroendocrine reactivity to psychological stress. However, it is unclear if this effect is due to depression itself or to antidepressant use.

Methods: In 609 patients with documented CAD, mental stress was induced using a speech stressor. Blood pressure and heart rate were monitored continuously from 30 minutes before stress until 20 minutes after the stress. In a subsample of 331 patients, plasma epinephrine and norepinephrine levels were available before stress and two minutes into the stress. Catecholamine levels were log transformed, and cardiovascular reactivity to stress was calculated by subtracting minimum stress (SBP 164 (DM)/diastolic (DBP) blood pressure and heart rate (HR) during rest period from maximum value during stress. Depression status was assessed using Structured Clinical Interview for DSM Disorders (SCID); Beck Depression Inventory (BDI) was used to assess current depressive symptoms and all patients were asked about current use of all medications including antidepressants.

Results: Of 609 patients, 165 (27%) had a lifetime history of major depression, 148 (24%) were taking antidepressants and 76 (12%) had both major depression and were taking antidepressants. In overall population, cardiac reactivity and catecholamine levels increased with stress, but this increase was blunted in subjects taking antidepressants. In models adjusted for demographic and CAD risk factors and baseline levels of respective parameters, only antidepressant use was associated with blunted stress-induced cardiovascular reactivity: 10 mm Hg lower increase in SBP (P < 0.001), 5 mm Hg lower increase in DBP (P < 0.001) and 3 beats per min lower increase in HR (P = 0.003). The increase in epinephrine was also lower in those taking antidepressants (β = -0.27, P = 0.008). Major depression diagnosis showed no significant effect. Controlling for either major depression diagnosis or current depressive symptoms (assessed using the BDI) had minimal or no change in the association between antidepressant use and cardiovascular/neuroendocrine reactivity. Changes in norepinephrine levels were not associated with either antidepressant use or depression status.

Conclusion: Antidepressant use, but not depression, is independently associated with decreased mental stress-induced hemodynamic and neuroendocrine reactivity. Whether this effect is protective towards future cardiovascular events needs further study.

State Negative Mood and Salivary Cortisol Output

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Introduction: The development of many physiological and psychological disorders seems to involve prolonged and excessive exposure to cortisol. Previous studies suggest that everyday psychosocial experiences might systematically influence cortisol output, and these associations might partly explain the link between chronic stress and disease. It is not clear whether different psychological states are associated with different aspects of the diurnal cortisol profile. Our aim was to investigate whether different momentarily assessed moods are related to different cortisol patterns.

Method. Medical and law students (n = 77, aged 18-25) completed three diurnal salivary cortisol profiles (five samples a day) in 2-week intervals in conjunction with self-reported mood state diaries at the time of sampling. Three cortisol parameters, the cortisol awakening response (CAR), the area under the curve (AUC) and the diurnal slope, were analysed in relation to distinct moods averaged across the sampling time-points. Results. Higher average levels of anger/frustration were associated with flatter diurnal cortisol slopes (β = .090; 95% CI = .146 to .033, p < .01), while higher averaged levels of sadness were associated with a significantly higher area under the curve (β = .146; 95% CI = .012 to .114, p < .05), controlling for age, body mass index and smoking. No associations were found between cortisol parameters and the other mood factors: happiness, feeling stressed or tired.

Conclusions. The present study shows distinct associations between the different cortisol parameters and daily negative emotional experiences. Sadness, representing a prevailing psychological state, seems to be associated with overall cortisol output, while frustration and anger might be more acute processes and therefore affect the cortisol decline over the day.

Daily Family Stress and Risk for Cardiovascular Disease during Adolescence

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Psychosocial stress increases risk for numerous diseases, including cardiovascular (CV) disease. However, some adversity may not be detrimental, but rather beneficial, as it facilitates development of resources for dealing with subsequent adversity (e.g., ratter, 1987; Seery, 2011). Emerging evidence supports this notion, showing that some stress compared to high stress is associated with better psychological and physiological outcomes (Seery, 2011; Del Giudice, Hinnant, Ellis, El-Sheikh, 2011). However, a number of issues need to be addressed. First, empirical studies remain few despite longstanding theoretical work. Second, past studies have rarely examined how stress compared to high stress differentially influence physical health despite that stress is known to predict disease. Third, past studies have focused on adults and children despite that adolescence is characterized by great psychosocial and biological change that may be stressful (Spears, 2000). Lastly, although daily stress may offer valuable experiences in dealing with stress, studies have relied on global measures of stress. Therefore, the current study examined U-shaped quadratic relations between daily family stress and risk factors for CV disease (i.e., C-reactive protein (CRP), cholesterol ratio) among adolescents. Participants were 316 adolescents (50% female) from Latino (42.2%), Asian (22.9%), European (28.8%), and other (6.2%) backgrounds. Each night for 15 consecutive nights, adolescents and their parents completed daily checklists that assessed whether they had experienced family-related stressors (e.g., parent argued with spouse, adolescent argued with or was punished by parent). A summary variable was computed to indicate percentage
negative body perceptions but not attribution BE (both $p > 0.1$) predicted lower US and community SSS ratings in both sexes similarly among employed individuals (US: $β = 0.29$, $p = 0.03$; Community: $β = 0.23$, $p = 0.09$). This was true for unemployed individuals as well in terms of links between body perceptions and community status ($β = 0.45$, $p = 0.09$), and attribution BE and US status ($β = 0.33$, $p = 0.20$). However, only for women were body perceptions still linked to US status ($β = 0.47$, $p = 0.06$), while for men, negative attributions emerged as a predictor of lower coerced US (i.e., $β = 0.51$, $p = 0.06$). The current study is the first to identify a link between feelings about one’s body and subjective social status. While body perceptions were important for all employed individuals, sex specific associations emerged among the unemployed. Higher body perceptions were a protective factor in women in terms of their US status ratings, whereas unemployed men reported low US status regardless of body perceptions. Conversely, perceiving more negative appearance judgments by others was associated with lower community status, specifically for men. Overall, these findings suggest that feelings about one’s body represent a risk factor in terms of subjective social status ratings, with distinct implications depending on employment status and sex.

203) Abstract 3115

THREE WAYS OF MINDFULNESS IN STRESS AND HEALTH OUTCOMES IN UNIVERSITY UNDERGRADUATE STUDENTS

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Dispositional mindfulness reflects a natural tendency to notice and be receptive to moment-by-moment experience. It is correlated with greater psychological and physical health across many context and disease states. However, mechanisms of these salutary effects are poorly understood. To illuminate possible mechanisms, we used a stress-health model as the basis for exploring among college undergraduates the associations of mindfulness with perceived stress, physiological stress, measures of health behavior, and subjective well-being. Student subjects ($n = 85$) were predominantly non-Hispanic White (76.9%) females (70%), with a mean age of 19 (SD=1). Questionnaires and a two-day series of saliva samples were collected both at an initial assessment and a second one, 30 days later. Measures included the Mindful Attention and Awareness Scale (MAAS), Perceived Stress Scale (PSS), log-transformed diurnal cortisol mean and diurnal cortisol slope, the Godin Leisure Time and Exercise Questionnaire (GLT), and the Ryff Scales of Subjective Well-being (RSS). For all measures, mean scores were computed over the two assessments. Hierarchical multiple regressions adjusted GPA, hours of paid employment per week, minority status, and living situation in two-tailed tests of the associations of mindfulness with each of the other measures. Student subjects who reported higher dispositional mindfulness reported significantly less perceived stress ($p = 0.026$) and had lower overall mean diurnal cortisol ($p = 0.043$). Mindfulness was associated with greater subjective well-being ($p = 0.000$). No other significant relationships emerged. Results support three of the four hypothesized pathways in our model of mindfulness effects in stress-health pathways. Findings suggest that future studies should explore multiple pathways to fully understand effects of mindfulness on health outcomes. Further work is needed to determine if dispositional mindfulness moderates the effects of mindfulness meditation-based interventions on health outcomes. Understanding the role of dispositional mindfulness in the relationship between psychosocial and physiological/medical outcomes will open the way for more effective mindfulness-based interventions.

204) Abstract 2989

ONE WEEK OF IPAD-BASED MINDFULNESS TRAINING ALTERS SYMPATHETIC ACTIVATION IN COLLEGE UNDERGRADUATES

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Mindfulness training improves mental and physical well-being across many contexts. Computer and smartphone based mindfulness interventions are attractive for their potential cost-effectiveness and feasibility, but few data are available comparing the efficacy of such programs. We piloted an iPod-based mindfulness meditation intervention for reduction of psychological and physiological stress among university undergraduate students. Students ($n = 32$) reported on perceived stress, anxiety, and depressive symptoms and provided psychophysiological data (heart rate and skin conductance) during a 15-minute period of quiet sitting. They were given an iPod Nano with a series of days on which at least one of the family stressors occurred. Adolescents also provided whole blood samples from finger sticks for assessment of CRP, total cholesterol, and high-density lipoprotein (HDL). Cholesterol ratio was computed by dividing total cholesterol by HDL.

Polynomial regression analyses controlling for age, gender, ethnicity, socioeconomic status, and body mass index, assessed the quadratic associations between daily family stress and CV risk factors. Significant quadratic relations emerged for both CRP (b(SE)=2.47(.76), $p<.001$) and US (b(SE)=1.36(.62), $p=.03$). Thus, we examined linear simple slopes at lower levels of stress (i.e., below the mean) and higher levels of stress (i.e., above the mean). At lower levels of stress, more daily family stress was related to lower levels of CRP (b(SE)=1.62(.78), $p=.04$) and unrelated to cholesterol ratio (b(SE)=1.54(.44), $p=.73$). At higher levels of stress, more daily family stress was related to higher levels of CRP (b(SE)=1.42(.66), $p<.05$) and cholesterol ratio (b(SE)=1.41(.45), $p<.01$). Results indicate that lower levels of stress may not be harmful to health; only high levels of stress may increase risk for CV disease during adolescence.

201) Abstract 2510

EXPLORING THE NEURAL CORRELATES OF SELF-AFFIRMATION

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Self-affirmation, a process in which individuals reflect on personal values, has been shown to reduce the negative consequences of self-relevant threats, particularly for those with the greatest vulnerability to these threats. However, the mechanism by which it is understood is not well understood. Thus, to examine the neural and inflammatory correlates of self-affirmation. Given that individuals in self-affirmation studies often reflect on friends and family as their important personal value, we hypothesized that self-affirmation would rely on a similar neural mechanism as social connection. Past research has found that the ventral striatum (VS), a reward-related neural region, is associated with social connection, and thus we hypothesized that self-affirmation would lead to increased VS activity. A pilot study with breast cancer survivors of different age and sex, and age-matched controls (N=14), participants (mean age = 56.8, 80% Caucasian) provided a baseline blood sample and then completed a self-affirmation task in the fMRI scanner. During the self-affirmation trials in the fMRI task, participants chose which of two highly-rated personal values shown (e.g., art or friends and family) was most important to them; during control trials, they chose which of two lower-rated values might be most important to the average American. Neural activity in an anatomical VS region of interest was compared between the trial types to see what patterns of activity were specific to self-affirmation. Blood samples were analyzed for the inflammatory marker C-reactive protein (CRP). There were no differences in VS activity or inflammation between the cancer survivors and controls, so the results were collapsed across all participants. In response to self-affirmation (vs. control), participants showed increased VS activity ($p < .05$) Moreover, higher levels of CRP were associated with greater VS activity to self-affirmation (vs. control) ($p < .001$). We propose that this correlation reflects a mechanism by which vulnerable individuals are more neurally sensitive to the task, reflecting a greater need for the benefits of self-affirmation. These results provide the first evidence for a possible neural mechanism for self-affirmation via the VS, and suggest that this neural response is strongest for those with a biological vulnerability.

202) Abstract 3032

BODY PERCEPTIONS AND PERCEIVED APPEARANCE JUDGMENTS PREDICT SUBJECTIVE SOCIAL STATUS DIFFERENTLY FOR UNEMPLOYED MEN AND WOMEN

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Subjective social status (SSS) assesses one’s perceived position in a social hierarchy. For women, social status and economic opportunities have been linked to appearance judgments by others. Since these judgments often are internalized, low body esteem (BE) may be an important determinant of how women feel about their SSS. Unemployment thereby presents a context in which the negative economic consequences of low body esteem may be particularly salient. A total of 137 full-time employed (62 males) and 140 unemployed (72 males) participants (34.6±10.5yrs) completed the MacArthur US and community SSS ladders as well as the Body Esteem Scale for Adolescents and Adults, which assesses feelings about appearance and weight (body perceptions) and perceptions of appearance judgments by others (attributions).

Men and women did not differ in terms of SSS ratings (both $p > .21$) or body esteem facets (both $p > .11$). Furthermore, controlling for age and BMI, more
of audio narratives based on the Mindfulness-Based Stress Reduction (MBSR) program. Recordings included instructional narratives about attitudinal foundations of mindfulness and guided meditations. Topics included breath awareness, attentive listening, awareness of thoughts and feelings, loving kindness, and attention to the body. Students were asked to listen to the tracks 30 minutes a day for five days. One week later, students returned to the laboratory to repeat data collection. Total listening time and specific tracks used were recorded from iPods. Associations of listening time with changes in perceived stress, anxiety, depression, heart rate and skin conductance were tested in analyses of covariance controlling for age and GPA. Baseline values of outcome variables were included as covariates.

Total listening time was significantly associated with a reduction in skin conductance from baseline to follow-up (p<0.001). No other association reached significance.

Results of this study suggest potential physiological benefits after brief, audio-based mindfulness interventions incorporated into the everyday life of university students. Interestingly, significant psychophysiological effects emerged in the absence of apparent psychological benefit. Mindful awareness of the breath may result in a slower, more regulated breathing rate with direct autonomic effects. Such physiological effects may become apparent more quickly than psychological changes, as in this study, after only one week of mindfulness meditation training.

205) Abstract 2680

STRESS INDUCED ISCHEMIA IN WOMEN AND MEN WITH NONOBSTRUCTIVE CORONARY ARTERY DISEASE: PREVALENCE, SYMPTOMS AND ANXIETY.

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Background: Coronary artery disease (CAD) without obstructive coronary stenosis (nonobstructive CAD) is more prevalent in women as compared to obstructive CAD, and prognosis is not necessarily benign. In routine clinical practice, obstructive CAD is detected by coronary angiography (CAG) or computed tomography (CT-scan). Myocardial perfusion imaging (MPI) is a method to detect stress induced myocardial ischemia, which provides additional information on the presence of ischemic heart disease. We aimed to examine stress induced ischemia, cardiac symptoms and anxiety in men and women with nonobstructive CAD.

Methods: MPI was performed in 96 patients with nonobstructive CAD (10-50% coronary occlusion, mean age = 63.6 years, SD=9.3, 60% women), who participated in the Tweesteden Mild Stenosis (TWIST) observational cohort study. MPI was assessed by Single Photon Emission Computed Tomography, with technetium-99m-sestamibi (MIBI-SPECT) using a rest/stress protocol to detect coronary ischemia either pharmacologically via adenosine (65%), or bicycle exercise testing (35%). Presence of ischemia and cardiac symptoms (chest pain, dyspnea, other) was recorded, and presence of anxiety (HADS-A cut-off ≥8) was assessed at baseline.

Results: Stress-induced ischemia was present in 58% (n=55) of the patients, with no differences between men and women (Table 1). Women reported more stress-induced cardiac symptoms (69% versus 42%, p<0.009), but not more anxiety, compared to men. The overlap in ischemia, cardiac symptoms and anxiety was more pronounced in women compared to men (Table 1). No differences between men and women were observed in ischemic ECG response (18%), heart rate, blood pressure, age, smoking, or physical activity.

Discussion: In this convenience sample of patients with detected nonobstructive CAD, ischemia and cardiac symptoms during stress induced myocardial imaging was prevalent, and showed a stronger association with anxiety in women.

<table>
<thead>
<tr>
<th>Women (N=58)</th>
<th>Men (N=38)</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Only 1 factor present</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress-induced ischemia during MPI</td>
<td>62% (36)</td>
<td>50% (19)</td>
</tr>
<tr>
<td>Cardiac symptoms during MPI</td>
<td>69% (40)</td>
<td>42% (16)</td>
</tr>
<tr>
<td>Anxiety symptoms at baseline</td>
<td>47% (30)</td>
<td>37% (14)</td>
</tr>
</tbody>
</table>

| **Combination of 2 factors** | | |
| Ischemia and cardiac symptoms | 48% (28) | 18% (7) | 8.83** |
| Ischemia and anxiety symptoms | 36% (21) | 18% (7) | 3.52† |
| Cardiac and anxiety symptoms | 33% (19) | 13% (5) | 4.70* |

| **Combination of all 3 factors** | | |
| Ischemia, cardiac symptoms and anxiety | 24% (14) | 3% (1) | 8.06** |

Table 1: Ischemia, cardiac symptoms and anxiety symptoms, stratified by sex

206) Abstract 2486

PHQ-2 SCORES PREDICT ALL-CAUSE MORTALITY IN PATIENTS UNDERGOING ORAL ANTICOAGULATION WITH VITAMIN K ANTAGONISTS

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The typical patient needing long term oral anticoagulation is elder and highly comorbid. Elevated symptoms of depression and anxiety are highly prevalent in chronic medical conditions. However, studies are sparse investigating the impact of elevated depressive symptoms on patients undergoing term oral anticoagulation (OAC). Therefore, we examined in outpatients with long term oral anticoagulation (OAC) whether the 2-item Patient Health Questionnaire (PHQ2), measuring symptoms of depression, is associated with all-cause mortality. The sample comprised n=1,387 outpatients from a regular medical care setting receiving long term OAC with vitamin K antagonists. At baseline, symptoms of depression were assessed with the PHQ2 and the past medical history was taken. The outcome was all-cause mortality within the 24 month observation period (mean follow-up time per patient 15.8 months). During the follow-up n = 201 patients from n=1,387 died. The prevalence rates of elevated depressive symptoms according to PHQ2≥2 and PHQ2≥3 were 40.3% and 16.3% respectively. After adjustment for age and sex, PHQ2≥2 and PHQ2≥3 were associated with an increased death rate by 77% and 2.07% respectively. Additional adjustment for high school graduation, partnership, smoking, obesity, frailty according to the Barthel-index, Charlson Comorbidity Index and stroke / thromboembolic risk slightly attenuated this relationship (PHQ2≥2: hazard ratio [HR] 1.57, 95% confidence interval [95%CI] 1.17-2.11; PHQ2≥3: HR 1.71, 95%CI 1.23-2.39). A medical history of any mental disorder was not related with excess mortality. Elevated symptoms of depression and anxiety are independently associated with all-cause mortality in oral anticoagulation outpatients. The PHQ2 provides valuable prognostic information. The findings emphasize the need for implementing regular screening procedures and the development and evaluation of appropriate psychosocial treatment approaches for OAC patients.
THERAPIST EFFECTS AND EARLY THERAPEUTIC ALLIANCE IN A RANDOMISED CONTROLLED TRIAL OF TREATMENTS FOR CHRONIC FATIGUE SYNDROME.

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Background: Therapist effects are said to occur when different therapists delivering the same treatment obtain different treatment outcomes. Therapeutic alliance refers to the quality of the relationship between therapist and patient and may contribute to therapist effects. Therapist effects could confound the findings of randomised controlled trials. Few studies to date have examined therapist effects and therapeutic alliance in relation to treatment for CFS, a condition in which patients experience severe, long lasting fatigue which is not attributable to other medical diagnoses. Method: Using data from a randomized controlled treatment trial of 296 people with CFS in primary care, we compared outcomes in patients allocated to FR, a nurse led, home based self-help treatment, or SL, a counselling-based treatment. Three therapists delivered both treatments and, unusually, allocation of patient to therapist was randomized. Patients reported on alliance with their therapist after the first treatment session. Fatigue and physical functioning outcomes were measured at the end of treatment and one year later. Regression models, modelling therapist as both a random and a fixed factor, and allowing for therapist by treatment interactions, were used to examine relationships between (i) therapist treatment effect and therapeutic alliance, and (ii) individual therapist and average treatment effects for each therapy. Results: We found therapist effects. One therapist formed stronger alliances when delivering PR than when delivering SL. We found no association between the level of therapeutic alliance and the average treatment effect of a therapist. Conclusions: In a treatment trial of two therapies for chronic fatigue syndrome, the level of therapeutic alliance did not contribute to outcome and there were no therapist effects. This may have been due to randomization of the therapist, which eliminated selection effects. Additionally, compared with standard practice, the therapists received identical training and supervision and were working to a standardised protocol.

FIRST EVALUATION OF A MEASURE OF HEART RATE VARIABILITY AS A NOVEL MARKER OF CARDIOVASCULAR RISK

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Introduction: Recent reviews have demonstrated that low vagally-mediated heart rate variability (HRV) is associated with a range of risk factors for heart disease and stroke including inflammation, glucose, cholesterol, and hypertension. However, to date, clinicians in search of a cutpoint for HRV that indicates elevated risk have had little guidance. In the present study we sought to identify a value for HRV that is associated with elevated risk across a range of known risk factors.

Methods: 6379 healthy, working adults [25% women; mean age=40(10)] from 18 study sites took part in a health assessment that included measures of inflammation [C-reactive protein (CRP) and white blood cell count (WBC)], glucose levels [fasting glucose (FG) and HbA1c], lipids [total cholesterol (TC), triglycerides (TRI) and low-density lipoprotein (LDL)], and blood pressure as well as 24 hour heart rate recordings for the determination of daytime and nighttime vagally-mediated HRV as indexed by the time domain measure of root mean squared successive differences (RMSSD). Logistic regression controlled for age and gender, was used with clinical cutpoints of RMSSD and below to preclinical range for the various risk factors as the dependent variable and RMSSD as the independent variable. Participants above the preclinical range were excluded from analysis.

Results: For daytime RMSSD a value of 30±5 and below indicated elevated risk as indexed by clinical cutpoints for CRP, WBC, FG, TC, LDL, HDL, TRI, and BP (RR range 1.2-1.67). For nighttime RMSSD a value of 35±7 and below indicated elevated risk as indexed by clinical cutpoints for CRP, WBC, FG, HbA1c, TC, LDL, HDL, TRI, and BP (RR range 1.16-1.53).

Conclusion: These results provide the first evidence that a single value of RMSSD may be used with elevated risk across a range of established cardiovascular risk factors. Future work is needed to establish the prospective value of a cutpoint for RMSSD in relation to cardiovascular disease risk.

SUPPORTIVE LEADERSHIP BEHAVIOR PREDICTS SELF-RAIRED HEALTH INDEPENDENT OF JOB STRAIN AFTER 10 YEARS FOLLOW-UP - FINDINGS FROM THE PROSPECTIVE MONICA/KORA STUDY

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Background: Protecting the health of the workforce has become an important issue in the public health field. Recent research has identified supportive leadership behavior (SLB) as a risk factor for workforce health. SLB denotes support in difficult situations but also recognition and feedback on work tasks of the leader. However, prospective evidence is hitherto lacking. This study therefore aims to determine the effect of SLB on poor self-rated health (SRH) after 10 years. Moreover, it is aimed to examine whether this effect was independent of work stress (i.e., job strain).

Methods: The sample (n=901) included employed participants (61% male, mean age 38 years) from the population-based KORA study (Cooperative Gesundheitssurvey in der Region Augsburg) with valid data at baseline (1994) and follow-up (2004). Standardized personal interviews assessed SLB (five items), SRH, as well as job strain (11 items). Logistic regressions estimated odds ratios (ORs) and corresponding 95% confidence intervals for the effect of SLB on poor SRH. Analyses were adjusted for age, gender, lifestyle, and socioeconomic status as well as for SRH at baseline. In a second step, adjustment included job strain.

Results: Lower SLB (summary of SLB) was positively associated with poor SRH at follow-up (OR = 1.34 [1.04-1.72]). Additionally adjusting for job strain did not significantly alter the association (OR =1.33 [1.02-1.73]).

Conclusion: Supportive leadership predicts self-rated health, a global estimate of health, at 10 years follow up.

POSITIVE COUPLE INTERACTION REDUCES STRESS AND FATIGUE

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Background: Happy long-term relationships have been found to promote health. However, most of the data underpinning this finding are cross-sectional and the mechanisms carrying this effect remain unclear. One possible mechanism might be a stress-reducing effect of positive couple interaction. In former studies, a reduction of the stress hormone cortisol through a standardized couple intervention in a laboratory design as well as through intimacy in everyday life could be shown. We were interested in the effect of couple interaction and cortisol levels on stress and fatigue levels in everyday life of couples.

Methods: Forty heterosexual couples (27.64+/- 5.15yrs) reported subjective stress and fatigue levels 4 times a day for 5 consecutive days. Further, they reported if they interacted with their spouse and rated the valence of this interaction. Salivary cortisol was analyzed from samples obtained at the same time points. As time points are nested within persons nested within couples, data were analyzed using three-level hierarchical multilevel modeling.

Results: Positive couple interaction was found to reduce stress (p<.001) and fatigue (p=.037). Cortisol was found to be positively associated with fatigue (p=.049), independently of the valence of couple interaction.

Discussion: This study suggests that real-life positive interactions between spouses might have beneficial effects on stress and fatigue levels. One implication of this finding is that couple interventions should aim at enhancing a positive valence of couple interaction in everyday life in order to promote well-being.

COMPARING STRESSFUL THOUGHTS AND STRESSFUL EXPERIENCES: ONE'S THOUGHTS INDEPENDENTLY PREDICT AFFECT AND RESTRICTIONS IN DAILY LIFE FOR PATIENTS WITH CHRONIC DISEASE

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Although a long line of research has found that the experience of stress is related to poor health, emerging evidence suggests that the extent to which one thinks about stress (such as rumination or worrying) may be as important as one’s health as the stressful experiences themselves. Yet little work has directly compared stressful experiences and stressful thoughts in daily life, nor has the
impact of these been examined for patients with chronic disease for whom symptoms have been shown to be influenced by stress. This study examined whether the experience of stress and having more severe stressful thoughts independently predicted positive affect, negative affect, and restrictions in daily life due to one’s chronic disease. Participants with rheumatoid arthritis or asthma (n = 128) completed a baseline measure of demographics, depression, and anxiety. They then completed seven subsequent days of ecologically momentary assessments measuring the occurrence of stressors and the degree of severity of the most stressful thought they had since the last measurement, their current positive and negative affect, and the extent to which their asthma/arthritis restricted their activities since the last assessment. To test for independent effects, multilevel models were run in which both stressful thoughts and experiencing a stressor were used to predict positive affect, negative affect, and restrictions; these models also controlled for time of day, weekday vs. weekend, participants sex, and age, and baseline depression and anxiety. Both stressful thoughts and experiencing a stressor independently predicted less positive and more negative affect when stressful thoughts were more severe (compared to when participants had less stressful thoughts) and when participants experienced a stressor (compared to when no stressor was experienced). Only stressful thoughts predicted more restrictions in daily life. Findings suggest that one’s mental environment has a unique effect on one’s momentary affect and restrictions due to chronic disease in daily life, and that this effect is independent to the experience of stress. These results can inform interventions aimed at stress-reduction by suggesting that an alternative or supplement to these approaches may be to help prevent individuals from engaging in negative repetitive thinking after they experience stress.

212) Abstract 2976
PTSD SYMPTOMS AND ALCOHOL-RELATED PROBLEMS IN FEMALE SEXUAL MINORITIES: THE MODERATING ROLE OF TENSION REDUCTION EXPECTANCIES

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Sexual minority women report high levels of trauma exposure and subsequent posttraumatic stress disorder symptoms (PTSS; Roberts et al., 2010; Rothman et al., 2011). The self-medication hypothesis suggests that individuals who experience PTSS partake in problematic drinking behaviors to relieve trauma-related distress (Brady et al., 2004); a potential explanation for the high comorbidity between PTSD and alcohol use. Recently, a self-medication model relating general anxiety to hazardous drinking was demonstrated to operate in sexual-minority women (Johnson et al., 2013), such that the effect of anxiety on problem drinking is stronger for women who expect alcohol use to reduce tension. Though general rates of PTSD are elevated in females compared to males, and comorbid substance use is a common indirect pathways leading from PTSD to HIV risk, this model has never been tested with PTSD as a predictor of drinking-related consequences in sexual minority women. To address this gap, we recruited participants from a local PrideFest event, and examined a subsample of 170 women who identified as a sexual minority and reported the short Social Stress Test, six salivary cortisol samples were collected and transformed to baseline de Montréal, Montreal, Quebec, Canada; Nadia Durand, BSc, Research, Institute universitaire en santé mentale de Montréal, Montreal, Quebec, Canada, Alexandra Desrochers, BSc, Psychology, McGill University, Montreal, Quebec, Canada, Olivier Boardon, BSc, Social Work, University of Montreal, Montreal, Quebec, Canada, Jens C. Pruessner, PhD, Psychiatry, Psychology, and Neuroscience, McGill University, Montreal, Quebec, Canada, Edouard Kouassi, PhD, Medicine and Medical Specialties, Alain Lesage, MD, Sonia J. Lupien, PhD, Psychiatry, University of Montreal, Montreal, Quebec, Canada

Background: Social inequalities and workplace stressors often render women more vulnerable than men to many stress-related problems. Sex differences in disease trajectories are likely partially explained by elusive socio-cultural gender-related factors that could further modulate stress physiology and psychological health. The current study aimed to understand the relative contributions of sex, gonadal hormones, gender-roles, and sexual orientation in explaining stress reactive cortisol, allostatic load, and mental health among healthy adults working in Quebec’s largest psychiatric hospital.

Methods: Participants included 204 workers (70% women, age: M=40.4, SE=0.85) from Louis-H. Lafontaine Hospital. During exposure to the Trier Social Stress Test, six salivary cortisol samples were collected and transformed in area under the curve scores representing stress reactive cortisol increases (AUCi) and systemic cortisol output (AUCo). Salivary gonadal hormones (testosterone, estradiol, progesterone) were collected before stress exposure and diurnally over three days. AL was calculated using 20 neuroendocrine, immune, metabolic, and cardiovascular biomarkers. Gender factors and mental health was assessed using well validated questionnaires. Statistical analysis employed sequential regressions in four successive models that included (1) sex and age, (2) gonadal hormones, (3) gender-roles, and (4) sexual orientation as predictors of study outcomes. Results: Elevated cortisol stress reactivity (AUCi) was associated with low testosterone concentrations, masculinity, and same-sex sexual orientation. Cortisol systemic output (AUCo) was associated with being a man, masculinity, and same-sex sexual orientation. AL was positively associated with age, while AL was negatively associated to testosterone concentrations and same-sex sexual orientation. Masculinity was consistently positively associated to mental wellbeing and self-esteem while negatively associated to symptoms of depression, burnout, and trauma. Conclusions: Our findings reveal that binary sex explains but a fraction of cortisol reactivity variation in comparison to gonadal hormones and gender-based factors such as masculinity and same-sex sexual orientation. By contrast, AL was explained by aging, low testosterone, and non-sexual orientation. Masculine gender-roles did not, however, appear to be psychologically deleterious given their relation to positive mental health in this sample composed primarily of women. This study demonstrates the importance of delineating sex/gender factors in psychosomatic research on acute and chronic stress.

213) Abstract 2935
THE SYSTEMATIC EXCLUSION OF SEXUAL MINORITY COUPLES FROM RESEARCH ON RELATIONSHIPS AND HEALTH

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There has been a rise in the number of studies examining health and disparities among lesbian, gay and bisexual (LGB) individuals. However, there is a question as to whether LGBs are excluded from participating in research that does not have a specific LGB focus. Evidence from a review of ‘romantic couple’s research’ (Blair, 2014) and inclusion requirements to register in government Clinical Trials studies (Egleston, Dunbrack & Hall, 2010) suggest that LGB couples may be excluded from participating in research on romantic couples, while same-sex marriage is the topic of a growing number of studies. Two trained raters conducted a search of both the Medline and PsychINFO Ovid databases between November 2011 and January 2013. Search terms included “romantic relationships,” “couples,” “physiology,” and “health,” as well as synonyms of these words. The search was limited to research on romantic relationships and health published in the decade (2002-2012). Participant recruitment and inclusion/exclusion criteria were reviewed in 591 unique articles. Articles were ranked as inclusionary if LGB individuals were recruited and allowed to participate in the study, even if the authors later excluded them from analysis. There was agreement between raters on 97.1% of the articles extracted. Of the total articles reviewed, 88.7% excluded sexual minority couples from participating in their research study. Further, a Chi Square test was performed comparing exclusion rates during the early part of the decade (2002 & 2003, n=52) and last two years of the decade (2011 & 2012, n=52). There was no significant difference in exclusion rates for the two time periods χ² (1, N = 104) = 7.1, p = .678. This suggests that the inclusion of LGB couples in relationship research did not improve in the last decade. Implications of these findings and potential reasons as to why same-sex couples may be excluded from studies are discussed. We provide recommendations for inclusivity of LGB couples in romantic relationships research.
215) Abstract 2718

REACTIVITY TO A SPOUSE’S INTERPERSONAL SUFFERING IN LATE LIFE MARRIAGE: A MIXED METHODS APPROACH
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Despite their well-established benefits, close relationships including marriage can also be stressful and negatively impact health. One example is when a spouse is faced with a partner’s suffering. However, little is known about the types of suffering that are most distressing for husbands and wives. This study used mixed methods to examine older adults’ verbal accounts of an instance when their spouse was suffering. It was hypothesized that talking about a partner’s suffering that is interpersonal in nature (e.g., social conflict, death or separation from a family member) compared to intrapersonal (e.g. chronic pain, loss of a job) would be associated with greater cardiovascular reactivity. It was also hypothesized that husbands would be more likely to talk about their partner’s suffering as interpersonal; whereas wives would be more likely to talk about their partner’s suffering as intrapersonal. Seventy-seven spouses of individuals with musculoskeletal pain were recorded describing their partners’ suffering while their blood pressure was monitored. After the account, spouses described their distress. Speeches were transcribed and analyzed with Linguistic Inquiry and Word Count (LIWC) software and coded for interpersonal content. Multivariate regression analyses were conducted with interpersonal content variables predicting blood pressure and distress. In addition, qualitative analysis with ATLAS.ti was used to explore mechanisms behind quantitative results. Describing partners’ suffering as interpersonal (β=0.26, SE=0.29, p<0.05) and using social (family) words (β=0.39, SE=0.21, p<0.05) was associated with higher systolic blood pressure reactivity. Husbands were more likely to describe partners’ suffering as interpersonal (p<0.05; family words: β=0.52, SE=0.26, p<0.05). Qualitative results suggested shared stressors and bereavement-related distress as potential mechanisms for heightened reactivity to interpersonal suffering. Findings suggest that spouses’ interpersonal suffering may have greater effects on both men and women’s cardiovascular health than intrapersonal suffering, and older husbands may be most affected.

216) Abstract 2525

PATIENT TREATMENT IN EMERGENCY DEPARTMENT HALLWAYS AND PATIENT-PHYSICIAN INTERACTIONS
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Background: Effective interpersonal processes of care (i.e., patient-physician communication, patient-centered decision making, and interpersonal style) are especially important in the emergency department (ED). Prior studies suggest that effective patient-physician communication predicts better patient satisfaction. However, little is known about the specific circumstances and contextual factors that contribute to effective communication. In particular, it is unclear how interpersonal processes differ between interactions that occur in the ED and those that occur in other healthcare settings. We were interested in understanding how effective communication is shaped by the unique workflow practices in the ED that can make effective communication challenging. ED hallway-care is a potential barrier to optimal interpersonal care as patients cared for in these areas are situated in close proximity to other patients, with little or no structural barriers to separate hallway-care spaces. While studies show hallway-care is associated with decreased patient satisfaction, its association with patients’ perceptions of physician interpersonal care processes is unknown.

Methods: This analysis uses data collected from a cohort study of cardiac patients treated in the ED of a large, academic New York metropolitan hospital. To quantify patient perceptions of patient-physician interactions, we analyzed patient responses to the validated 12-item physician subscale of the Interpersonal Processes of Care (IPC) survey. Hallway-care was defined as treatment areas located in open corridors, and non-hallway-care was defined as treatment areas partitioned by doors and curtains (location documented by research assistant observation). Using multivariable linear regression, we analyzed the relationship between hallway-care and patient perceptions of physician interpersonal processes of care, adjusted for participant demographic and clinical characteristics.

Results: Participants were 335 patients being evaluated for acute coronary syndrome (56% men, age 60 ± 13, 49% Hispanic, 16% receiving hallway-care). After adjusting for patient age, sex, ethnicity, Charlson comorbidity index score, and Global Registry of Acute Cardiac Events score, hallway-care was predictive of lower perceptions of interpersonal processes of care (Beta=0.16, p=0.005).

Conclusion: Hallway-care was associated with inferior patient-physician interactions. While the treatment of patients in hallways facilitates patient throughput in the ED, further research is needed on how to optimize patient-physician communication in hallway-care environments.

217) Abstract 2895

ASSOCIATION BETWEEN MAJOR LIFE EVENTS AND RISK FOR BREAST CANCER: A SYSTEMATIC REVIEW
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Breast cancer is the most commonly diagnosed cancer in women worldwide. Some research suggests that negative life events increase breast cancer risk. Examples of negative life events include job loss; separation or divorce; death of a close relation, such as a spouse, parent, or child; and exposure to war or other trauma. The objective of this systematic review is to evaluate existing data regarding the association of major negative life events with increased breast cancer risk, and suggest recommendations for future research. PsycINFO and PubMed were searched for relevant articles, which were included if they were: 1) published peer-reviewed quantitative study, 2) in English, 3) with human participants, that 4) examined the association of major life events with risk for breast cancer. Review articles were excluded, but reference sections from included studies and review articles were also searched. Data extracted from each study were author, year of publication, sample size, study design, mean age of sample, country of participants, negative life events measured, and life stage timing of the negative life events. Included studies were assigned a quality score accounting for sample size, study design, and covariates. Upon review, 20 articles from 8 countries were included; 11 studies were deemed high quality. Most articles (65%) reported data from case-control studies; 25% articles reported longitudinal studies; and 10% reported cross-sectional or quasi-prospective findings. Most studies (60%) showed weak to positive associations between major life events and breast cancer risk, and 40% indicated no association. Of the studies showing no association, 78% were of high quality. Examining the timing of negative life events in relation to breast cancer risk suggested potential effect modification, such that events occurring in early v. later life had a more consistently positive association. One direction for future research is a formal meta-analysis focusing on the study examining negative life events in the early life period, accounting for quality.

218) Abstract 2966

VIVIDNESS OF THE FUTURE SELF AND HEALTH BEHAVIOR
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People often make decisions whose consequences are pleasant in the present but harmful in the future. They eat fast food rather than vegetables, watch television rather than exercise, and otherwise choose immediate gratification over long-term benefit. Recently, it has been shown that people with a stronger sense of continuity between their present and future selves are more likely to make adaptive long-term financial decisions; relatedly, increasing the vividness of the future self can help reduce participants’ subsequent delinquency behaviors. The current study examined an analogous process in the context of health.

Undergraduates (N=295) participated in a diary study during which, each evening for ten days, they reported how many meals’ worth of several different brands of fast food they consumed and how many hours of several different television networks they watched. One or two days before beginning the diary study, participants completed a battery of measures, including a writing task that served as the manipulation of the independent variable. Half of the participants were randomly assigned to write a letter to themselves in three months’ time; this constituted the “self” condition. Half of the participants wrote a letter to themselves in three months’ time; this constituted the “near-self” condition. An independent-samples t-test revealed the predicted difference: participants who wrote a letter to their distant future selves reported eating significantly less fast food in the first day of the study (which began 12 to 36 hours after the manipulation) than participants who wrote a letter to their near future selves (t = 2.18, p = .03, d = .26). In addition, there was a nonsignificant trend: participants in the distant-self condition watched slightly less television on the first day of the study than did participants in the near-self condition (p = .10).

This preliminary evidence suggests that increases to increase connection to the future self may be promising, but future research is needed. Given the modest effect size, a replication is warranted to ensure the stability of the effect. Additionally, it will be important employ an objective measure of dietary choice that does not rely on self-report, and to explore the potential mechanisms by which thinking of the future self influences behavior.
SLEEP EEG AND HIGH-FREQUENCY HEART RATE VARIABILITY ARE RELATED TO RELATIONSHIP FUNCTIONING IN MILITARY COUPLES

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The presence and quality of close relationships are important influences on cardiovascular health and functioning. Cohesive relationships characterized by perceived closeness and frequent shared activities may confer cardiovascular benefits, in part, by promoting sleep depth and improving nocturnal physiology. Service members returning from military deployments and their spouses may be at heightened CVD risk because of disruptions in sleep and relationship functioning. We hypothesized that relationship cohesion would be associated with sleep depth and nocturnal high-frequency heart rate variability (HF-HRV), a marker of parasympathetic tone associated with CVD risk. We also examined sleep depth as a mediator of the association between relationship cohesion and nocturnal HF-HRV. We tested these hypotheses in a sample of healthy, married or cohabitating couples (N=22 couples; 93% Caucasian; Mage = 30.52 years, SD = 4.66), comprised of service members returning from military deployments and their spouses. Couples completed measures of relationship cohesion (Dyadic Adjustment Scale) and depressive symptoms. Continuous electroencephalogram (EEG) data were collected using in-home polysomnography (PSG) in both members of the dyad. Spectral analysis was applied to the EEG data to derive delta power during non-rapid eye movement sleep (NREM), a measure of homeostatic sleep drive or sleep depth. Spectral analysis was also applied to continuous nocturnal ECG data to derive HF-HRV during NREM sleep. All statistical models included covariates of age, sex, body mass index (BMI), and depressive symptoms. In mixed models that accounted for the nesting within couples, greater relationship cohesion was associated with higher NREM HF-HRV (beta = .10, SE = .05) and greater delta power (beta = 1.74, SE = .78), both ps < .05. Greater delta power was also associated with higher NREM HF-HRV (beta = .03, SE = .01, p < .01). The significant association between relationship cohesion and NREM HF-HRV was no longer significant (beta = .06, SE = .04, p = .18) when delta power was added to the model, indicating mediation. These data suggest that relationship cohesion is associated with nocturnal cardiovascular physiology, and that sleep characteristics such as delta power mediate this relationship. The cardiovascular benefits of close relationships may, in part, operate through neurophysiological and autonomic mechanisms during sleep.

PARENT-ADOLESCENT INTERACTIONS AT BEDTIME ARE ASSOCIATED WITH SLEEP DISTURBANCES IN YOUNG, HIGH-RISK ADOLESCENTS

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Young adolescents from low socioeconomic (SES) households are at high risk for long-term adverse psychological and physiological outcomes. Sleep disturbances increase risk for these adverse outcomes. Parent structure regarding sleep disturbances may confer a role in mitigating sleep problems. However, we know little about objective parent-adolescent behavior at bedtime and how it influences optimal adolescent sleep. Participants were 159 predominantly African American adolescents (11.8 years ± 1.16; 52% female) from low SES families. Parent-adolescent dyadic behavior at bedtime was assessed using a novel, semi-structured, videotaped interaction task that was objectively rated. Four coded observations previously linked to sleep disturbances were analyzed: 1) parent expectations about bedtime; 2) parental objectivity regarding bedtime; 3) parental knowledge about bedtime routine; and 4) whether adolescents had a consistent bedtime routine. Separate hierarchical regression models were used to predict scores on the Sleep History Questionnaire; higher scores indicate more sleep disturbances. Parent expectations were not associated with sleep disturbances, but when parents had expectations, higher adolescent adherence to expectations was associated with fewer sleep disturbances, B = -2.27, p = .009. Having an established routine interacted with parental knowledge on sleep disturbances, B = -.164, p = .041. Adolescents had more sleep disturbances when parents were aware that there was no consistent sleep routine; adolescents had fewer sleep disturbances when parents were aware of a consistent routine (Figure 1). Results suggest that factors beyond parental awareness of sleep behaviors contribute to adolescent sleep. Parents may be unaware that consistency is important for optimal sleep. In addition, the parent-adolescent system may not have the structure and adherence needed for optimal sleep. Overall, this novel, ecologically valid approach highlights that adolescent sleep disturbances are associated with dynamic parent-adolescent behaviors. Parent-adolescent behaviors at bedtime, therefore, may be an appropriate treatment target for improving adolescent sleep.
Smoking is reliably associated with elevated depression. Smoking and depression are often linked to poorer health outcomes including lower heart rate variability (HRV) - a proxy for parasympathetic activity or vagal tone. However, the relationship between depression and HRV is not consistently present even within a smoking population; suggesting that depression may not be the best underlying psychological factor to predict physiological outcomes. Perceived stress reactivity assesses an individual’s perception of how different one behaves when facing stress compared to a non-stressful situation. Given that HRV is an estimate of the parasympathetic nervous system’s influence over the sympathetic control of the heart, we examined the relationship among depression, stress reactivity, and HRV in a sample of healthy adults (age = 36.9 ± 9.3 yrs) who were current smokers (N=7) and never smokers (N=6). A moderated hierarchical regression analysis controlling for smoking status revealed that levels of depression and stress reactivity interacted to predict HRV measured during a 5-minute paced breathing task (R2 = .69; AR2 = .40; p < .05). Specifically, individual differences in stress reactivity were not related to HRV in those reporting lower depressive symptoms; however, in those who reported higher levels of depressive symptoms, stress reactivity was inversely related to HRV. Further analyses suggested that reactivity to failure may be driving the relationship between stress reactivity and HRV in individuals who report high levels of depressive symptoms. These findings suggest that high stress reactivity, especially to situations of failure, appear to place a person at risk with regard to the potentially negative impact of depression on HRV. Culturally, people in the US are failure adverse; yet, failure is usually a recurrent part of life. Therefore, the adoption of a self-compassionate or a present-focused mindset in individuals at-risk for depression might be a possible course of action to promote better emotional health and ultimately enhance one’s physical health as well.

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225) Abstract 3153

**TYPE D PERSONALITY INDEPENDENTLY RELATES TO SLEEP LATENCY AND EARLY WAKENING AMONG HEALTHY YOUNG U.S. ADULTS**

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Type D personality reflects a disposition toward distress (negative affectivity) and social inhibition, and it has been related to poorer health outcomes, mostly in European adult cardiac populations. The utility of the Type D Scale (DS-14) in sleep problems (a general health risk factor) beyond the related constructs of depression, perceived stress, and social support were examined in a healthy U.S. college sample of 648 young adults [ages 18-25 years (M = 18.7, SD = 1.02); 59% female; 85% White]. Predictive measures included the DS-14 negative affect (NA) and social inhibition (SI) scales, with covariates of age, sex, Perceived Stress Scale (PSS), Center for Epidemiological Studies-Depression scale (CES-D), and the Interpersonal Support Evaluation List-12 (ISEL-12). Sleep latency, early wakening, and daytime somnolence were assessed by the Pittsburgh Sleep Quality Index (PSQI). The Epworth Sleepiness Scale (ESS) was used as a collateral measure of daytime somnolence. The DS-14 NA and DS-14 SI scales correlated positively with the all sleep outcome measures (rs = .21 to .31; p < .01), except for daytime sleepiness (rs = .05 to .11, p < .01, respectively) in theoretically expected directions. After controlling for age, sex, PSS, CES-D, and ISEL scores in hierarchical linear regression models, DS-14 NA accounted for a small amount of variance beyond that accounted for by covariates in PSQI sleep latency (1%), early wakening (1%) (ps < .05), and daytime somnolence (1%) (n.s.), and ESS daytime somnolence (<1%) (n.s.). DS-14 SI scores were not significantly related to sleep outcomes (ps > .05). The DS-14 NA scale uniquely explains a small amount of variance in sleep latency and early wakening, suggesting that greater negative affect but not social inhibition, associated with the Type D construct is related to poorer sleep. These findings are modest but, given the healthy young sample, could potentially indicate a pathway by which Type D personality may eventually convey health risks at older ages if such patterns persist over time. The type D construct might predict sleep more robustly with samples of varied ages and health status.

226) Abstract 2628

**ILLNESS STATUS, SYMPTOM BURDEN, AND EMPLOYMENT 1 YEAR AFTER BLOOD AND MARROW STEM CELL TRANSPLANTATION**

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Introduction: Recipients of blood and marrow stem cell transplantation (SCT) contend with functional and emotional threats to well-being well beyond the peri-transplant period. Employment status is an important marker for post-transplant adjustment (Kirchhoff et al., 2010; Steinier et al., 2014). The present study is an extension of preliminary results examining correlates of employment

status post-transplant (Morrison et al., 2014). Present analyses examined the relationship between illness status, physical symptom reporting, quality of life, and employment status 1 year post-transplant. Illness status refers to the number of hospitalizations since transplant, current disease status (e.g. improvement, remission), and treatment status (e.g. completed, current). Method: Participants (N=473) from a larger prospective cohort of 1000 were selected because they either had full-time employment (FT; 47.8%) or under-employment (UEH; 52.2%) and volunteered at 1 year post-transplant. Those underemployed for reasons unrelated to health were omitted from these analyses. T-tests and chi square analyses examined group differences. Participants were predominantly married/partnered (79.7%), Non-Hispanic Caucasian (82.2%), males (61.0%) between the ages of 18-75 (mean: 54 years), who received autologous transplant (77.9%). Results: There were no group differences between employment status and sociodemographic or disease variables. Prior preliminary results of this data in a smaller sample (n=208) suggested a correlation between allogeneic transplant and later under-employment (Morrison et al., 2014); however this effect diminished in this larger sample. Employment status was not significantly different across transplant groups (p=.33; Autologous FT: 52%; UEH: 48%; Allogeneic FT: 46.5%; UEH: 53.5%). Other significant differences did emerge. Those employed full-time were more likely to report remitted disease (p<.05; 52.1% FT vs. 47.9% UEH), less likely to require further cancer treatment (p<.05; 29% FT vs. 71% UEH), and reported less fatigue (p<.01), less pain (p<.001), and better overall quality of life (p<.001). Of note, there were no group differences with regard to transplant-related hospitalizations or overall current health. Conclusion: Transplant recipients may return to work even when physical and psychological symptoms persist (Mosher et al., 2009), which may explain the lack of group difference regarding transplant type in the present analyses, along with a potential cohort effect. The full economic impact of transplant-related findings needs further explored. Low employment status post transplant is associated with long term financial problems (Lee et al., 2001) which can exceed those reported by matched healthy controls (Kopp et al., 2005; Hendriks et al., 2002). These findings highlight work reintegration as an important outcome and marker of overall adjustment following transplant.

227) Abstract 3158

ELECTROCARDIOGRAPHIC ABNORMALITY AND INCREASED ANTIBODIES TO HEAT SHOCK PROTEIN 60 IN CHRONIC POST-TRAUMATIC STRESS DISORDER
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Introduction/Background: Research on socio-political conflicts has focused on the association between violence, psychological trauma, and health. PTSD is associated with high levels of sympathetic activation of the autonomic nervous system, therefore individuals with PTSD have a high propensity for (ECG) abnormalities. Heat Shock Proteins (Hsps) play a role in protecting cardiac cells against ischemic injury and antibodies against these Hsps are associated with the development and progression of atherogenesis, coronary heart disease and hypertension. In stressed patients Hsps antibodies have been associated with abnormal (ECG); therefore we in Venezuela investigated the association of ECG abnormalities and the level of Anti-Hsp 60 in chronic PTSD. Method: This is a case control study of women diagnosed with chronic PTSD (n=12) and healthy controls (n=12) matched by age. A clinical exam, resting standard 12-lead ECG, routine laboratory tests, 2 psychosocial tests [the life event scale (Holmes) and the Stress Reactivity Index (SRI-32)]were performed, a serum sample was collected and frozen for determination of Anti-Hsp60. Results: 84% of women with chronic PTSD showed short PR Interval in the ECG(less than 0.12 seconds) versus no abnormality found in controls. 75% of PTSD patients referred to tachycardia. The mean Anti-hsp60 in PTSD patients was 330ng/ml versus 181ng/ml in controls (P<0.05). Pearson correlation showed a moderate tendency that the shorter the PR interval the higher the Anti-Hsp60 concentration. Psychosocial test scores were high in both PTSD and controls. Conclusions: 84% of women with Chronic PTSD had short PR interval and 75% a history of tachycardia. The higher the concentration of Anti-Hsp60 the shorter PR interval (ECG) therefore Anti-HSP 60 could serve as a marker of cardiovascular risk in PTSD.

228) Abstract 3113

EMOTION DYSREGULATION MEDIATES THE RELATIONSHIP BETWEEN BORDERLINE PERSONALITY FEATURES AND POOR SLEEP QUALITY: A CROSS-SECTIONAL STUDY
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Borderline Personality Disorder (BPD) is a serious psychiatric condition marked by severe emotion dysregulation, interpersonal dysfunction, and impulsivity (APA, 2013). In addition, BPD is associated with poor sleep quality (SQ), with as many as 60% reporting chronic sleep disturbance (Selby, 2014). Yet, to date, few studies have investigated which aspects of BPD account for this relationship. However, we suspect that this information could be essential in explaining sleep disturbance in BPD. To begin addressing these questions, we conducted survey studies on two undergraduate samples. In Study 1 (N = 293, 65% Female), we sought to replicate previous findings indicating BPD symptoms are significantly and negatively associated with SQ. Furthermore, we investigated whether the association correlates among facets of BPD symptomatology. We used the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) to measure global SQ as well as the Five Factor Borderline Inventory (FFBI; Mullins-Sweat et al., 2012), which measures 12 facets of BPD symptomatology. Correlational analyses yielded significant correlations (p<.05) for all twelve facets of BPD, with fragility (r = .38, p < .001), anxiety (r = .33, p < .001), and desocialization (r = .32, p < .001) emerging as the most robust correlates. These findings suggest that people with BPD features who display higher levels of emotional disturbance may be at greater risk for poor sleep disturbance. In Study 2 (N = 188, 63% Female), we sought to replicate and extend our previous findings to examine difficulties in emotion regulation (DERS; Gratz & Roemer, 2004) as a mediator for the effect of BPD features on poor SQ. We hypothesized that in addition to replicating findings from Study 1, there would be a significant indirect effect for emotion dysregulation in the relationship between BPD and poor SQ. Correlational analyses indicate that our findings from Study 1 were indeed replicated. To test our mediation model, we first conducted multiple regressions, which confirmed the relationship between BPD and poor SQ (β = .37, p < .001), BPD and emotion dysregulation (β = .71, p < .0001), and finally, emotion dysregulation and poor SQ (β = .41, p < .001). We then used Preacher and Hayes’ (2008) bootstrapping technique to test for indirect effects. Our results indicate that emotion dysregulation mediates the effect of BPD on poor SQ. Therefore, the association between violence, psychological trauma, and health. PTSD is associated with high levels of sympathetic activation of the autonomic nervous system, therefore individuals with PTSD have a high propensity for (ECG) abnormalities. Heat Shock Proteins (Hsps) play a role in protecting cardiac cells against ischemic injury and antibodies against these Hsps are associated with the development and progression of atherogenesis, coronary heart disease and hypertension. In stressed patients Hsps antibodies have been associated with abnormal (ECG); therefore we in Venezuela investigated the association of ECG abnormalities and the level of Anti-Hsp 60 in chronic PTSD. Method: This is a case control study of women diagnosed with chronic PTSD (n=12) and healthy controls (n=12) matched by age. A clinical exam, resting standard 12-lead ECG, routine laboratory tests, 2 psychosocial tests [the life event scale (Holmes) and the Stress Reactivity Index (SRI-32)]were performed, a serum sample was collected and frozen for determination of Anti-Hsp60. Results: 84% of women with chronic PTSD showed short PR Interval in the ECG(less than 0.12 seconds) versus no abnormality found in controls. 75% of PTSD patients referred to tachycardia. The mean Anti-hsp60 in PTSD patients was 330ng/ml versus 181ng/ml in controls (P<0.05). Pearson correlation showed a moderate tendency that the shorter the PR interval the higher the Anti-Hsp60 concentration. Psychosocial test scores were high in both PTSD and controls. Conclusions: 84% of women with Chronic PTSD had short PR interval and 75% a history of tachycardia. The higher the concentration of Anti-Hsp60 the shorter PR interval (ECG) therefore Anti-HSP 60 could serve as a marker of cardiovascular risk in PTSD.

229) Abstract 2952

DIFFERENTIATING UPWARD AND DOWNWARD SOCIAL COMPARISON ORIENTATION: RELATIONS WITH BEHAVIORAL DEMONSTRATION OF COMPARISON AND HEALTH PARAMETERS IN TYPE 2 DIABETES
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Comparisons to others in the social environment have important implications for health and well-being among individuals with type 2 diabetes mellitus (T2DM). Comparisons made to “better off” others (upward comparisons; UC) versus “worse off” others (downward comparisons; DC) can produce different responses and can influence health behaviors. In type 2 diabetes, UC can be associated with short-term stress and SCL-90R scores, but no correlation was found between UC and the Diabetes Quality of Life Scale (DQOL). The current study aimed to investigate the association between UC and DC and diabetes and health parameters. Type 2 diabetes (n=188, MAge=46.6, MBMI=28.8, MA1c=8.06) completed a baseline section of this research, it is also plausible that BPD mediates the effect of emotion dysregulation on poor SQ. As such, we conducted an alternative mediation analysis to test this path, which was not significant, BCI=−0.08, 41. Altogether, our results indicate that emotion dysregulation may be the key component in BPD that contributes to sleep disturbance. Future prospective research using clinical samples is necessary to confirm these results.
DISTRESS IN CARERS OF PATIENTS WITH CHRONIC FATIGUE SYNDROME IS ASSOCIATED WITH ILLNESS PERCEPTIONS AND EMOTIONAL OVER-INVOLVEMENT.
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Background: People with chronic fatigue syndrome (CFS) experience profound fatigue together with other symptoms, which result in substantial disability and social and economic costs. While informal evidence of high levels of distress and burden exist, the impact of CFS on carers or significant others is under-researched. Our study aimed to determine the level of distress in carers of adults patients with CFS and to examine whether illness severity, carer appraisals of CFS, relationship satisfaction and carer Expressed Emotion (criticism and emotional over-involvement) were related to carer distress. Methods: We recruited 51 carers (mean age 48 years, SD=12.9; 29 (57%) parents) of adult patients with CFS attending specialist services in the UK. Carers completed questionnaire measures of distress (GHQ), illness perceptions and relationship satisfaction, and were administered semi-structured interviews to obtain ratings of Expressed Emotion. Their patient partners completed measures of fatigue and physical functioning. Results: 25/51 (49%) carers had GHQ scores indicating significant (caseness) levels of distress. Patient illness duration, fatigue and physical functioning were not related to carer distress status, nor were patient or carer gender. In univariate analyses, carer relationship happiness, emotional over-involvement and more negative perceived consequences of CFS significantly predicted caseness levels of distress in carers. In multiple logistic regression, only emotional over-involvement emerged as a significant predictor of carer distress. Conclusions: The results demonstrate that significant levels of distress are highly prevalent amongst carers of people with CFS; a finding observed across various patient-carer relationship types. Furthermore, the results highlight that carer responses to the experience of CFS, particularly those cognitive, affective and behavioural responses relevant to emotional over-involvement are predictive of increased carer distress. Understanding the relationships between carer responses to illness and distress may be useful in building carer interventions.

ASSOCIATION OF NEIGHBORHOOD CHARACTERISTICS WITH VITAMIN D LEVELS IN PATIENTS WITH ACUTE CORONARY SYNDROMES
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Background: Neighborhood characteristics, such as residential density, racial/ethnic composition, and walkability, are associated with increased levels of vitamin D in the general population. Although both vitamin D and neighborhood characteristics have been associated with disease severity and recurrence in patients with acute coronary syndromes (ACS), no study has examined the association of these two risk factors in this patient population. Methods: At hospital discharge following an ACS event, serum samples were collected from 326 participants in the Prescription Usage, Lifestyle, and Stress (PULS) Evaluation prospective cohort study. The dependent variable, serum 25(OH) D3 concentrations of the primary circulating vitamin D metabolite 25-hydroxyvitamin-D3 (25(OH) D3), was determined by high-sensitivity enzyme-linked immunosorbent assay. Neighborhood characteristics, including residential density, racial/ethnic diversity, and available methods of transportation (walking, personal vehicles, or public transportation), were extracted from the American Community Survey Census (2013). Age, sex, patient-reported race, GRACE prognostic risk score, Charlson disease severity, and BMI were included as model covariates. Results: In a fully-adjusted hierarchical linear regression analysis, neighborhood characteristics explained 3.3% of variance in serum 25(OH) D3 over and above demographic, and clinical covariates. β = 8.02, p = .01), serum 25(OH) D decreased by 8 ng/ml. The odds of vitamin D insufficiency (serum 25(OH) D3 < 20ng/ml) among those who reside in a racially/ethnically diverse neighborhood was 4.96 times the odds of those who do not reside in a racially/ethnically diverse neighborhood (95% CI = 1.37, 17.93, p = .02). Discussion: Our results suggest that racial/ethnic diversity, but not other neighborhood characteristics, are associated with vitamin D levels in the days following an ACS event. Future studies can investigate Vitamin D levels as a possible mediator or moderator in the association of neighborhood characteristics with ACS outcomes. These data add to a growing body of literature on the effects of the physical environment on biological markers and physical health.

DEPRESSIVE SYMPTOMS PREDICT RISKY SEXUAL BEHAVIOR AMONG HIV-POSITIVE MEN WHO HAVE SEX WITH MEN (MSM) IN THE CONTEXT OF MEETING SEX PARTNERS ONLINE
Dean G. Cruess, PhD, Moira Kalichman, MSW, Kaylee Burnham, MA, Tamar Grebler, BA, David Finitis, MA, Charsey Cherry, DPH, Seth C. Kalichman, PhD, Psychology, University of Connecticut, Storrs, Connecticut

Many HIV-positive men search for and meet sex partners online, but using online venues may increase sexual risk behavior and depressive symptoms may further exacerbate this risk. The present study enrolled 117 HIV-positive MSM who reported meeting at least one sex partner online in the last six months and assessed demographic, medical, and psychosocial variables to determine predictors of high-risk sexual behavior. Participants reported meeting the majority of their sex partners online (M=75%, SD=27.1%), and 40% exceeded the clinical threshold for depression on the Center for Epidemiological Studies Depression-Revised scale (CESD-R). In a log-linear multiple regression model controlling for age, depression scores predicted the number of unprotected insertive anal sex with serodiscordant partners (B = 0.052, p=0.001) such that every one-unit increase in CESD-R score increased the predicted number of these high-risk events by 5.4%. Implications of seeking sex partners online and suggestions for web-based behavioral risk reduction interventions are discussed.

PSYCHIATRIC AND TRAUMA HISTORY, PERITRAUMATIC THREAT PERCEPTIONS, AND PTSD IN CARDIAC PATIENTS
Kevin Sandquist, High School Diploma, Statistics, Florida State University, Tallahassee, Florida; Jose Ramos, Bachelor of Science, Public Health, Stanford University, Stanford, California; Carmela Alcantara, PhD, Elena Brondolo, Bachelor of Science, Medicine, Columbia University Medical Center, New York, New York; Donald Emdson, PhD, Medicine and Psychiatry, Columbia University Medical Center, New York, NY

Background: PTSD due to an acute coronary syndrome (ACS; myocardial infarction or unstable angina) is associated with high levels of distress and distress may be useful in building carer interventions.

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events are risk factors for PTSD after a new event, however, the mechanisms by which those factors increase risk are not known. This study tested the hypothesis that prior psychiatric symptoms and trauma exposure are associated with post-ACS PTSD symptoms because they increase perceptions of threat during the ACS.

Methods: 144 ACS patients (44% women; mean age, 61 (SD, 13); 46% Hispanic; 34% Black; 23% White) were enrolled in the ED and interviewed about their current threat perceptions. During their inpatient stay, participants reported on their trauma history (TLEQ), as well as current depression (PHQ) and PTSD symptoms (PCL-C). During a phone interview 1 month post-ACS, participants completed a screen for ACS-induced PTSD (PCL-S). We tested the hypothesis that pre-ACS PTSD, depression, and trauma history would predict ACS-induced PTSD symptoms, and that increased threat perception during the event would mediate those associations. We examined bootstrapped estimates of the indirect effects of each of the 3 pre-ACS variables on post-ACS PTSD symptoms through heightened threat perceptions.

Results: Model 1, F(6,137)= 16.9, p<.001; R2 adj= .40, estimated the association of pre-ACS PTSD, depression, and trauma history with post-ACS PTSD symptoms, adjusted for demographics. Each of the 3 variables was significantly associated with post-ACS PTSD symptoms. Model 2, F(6,137)= 4.7, p<.001; R2 adj= .13, estimated the association of the 3 pre-ACS variables with ED threat perceptions, adjusted for demographics. Only trauma history was significantly associated with threat perceptions. Model 3, F(7,136)=16.1, p<.001; R2 adj= .43, was identical to Model 1, but included threat perceptions, which were significantly associated with post-ACS PTSD symptoms. The 3 pre-ACS variables remained significant predictors. Tests of the indirect effect of pre-ACS PTSD and depression on post-ACS PTSD symptoms through threat perception were nonsignificant. The indirect effect of trauma history on post-ACS PTSD symptoms was statistically significant, B=.15 (90%), 95% CI .002,-.362.

Conclusion: Increased threat perceptions were a significant mediator of the association of prior trauma history with post-ACS PTSD symptoms, but did not explain the association of prior PTSD or depression with post-ACS PTSD symptoms.

235) Abstract 2581

OPTIMISM, RESILIENCE AND EMOTIONAL ADAPTATION AFTER PERCUTANEOUS CORONARY INTERVENTION

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Background – Large individual differences exist in the degree of emotional adaptation after an acute coronary event, which may partly be explained by individual differences in dispositional traits that determine the extent to which a person is able to successfully deal with acute events. Optimism and trait resilience are dispositional traits that may have a favorable effect on health outcomes, but no study has previously examined the effects of these traits on emotional recovery in the immediate period after an acute coronary event. Therefore, we examined the association of trait resilience and optimism with emotional recovery after acute, sub-acute or elective percutaneous coronary intervention (PCI) during the first month thereafter. Methods - Patients undergoing PCI (N=141, mean age= 63.0±10.0; 79.8% male) filled out psychological surveys during hospital admission and at 1 month follow-up to assess trait resilience (DRS 15) and optimism (LOT-R) as dispositional traits and depressive (PHQ-9) and anxiety (GAD-7) symptoms as measures of emotional distress. Because resilience consists of three subcomponents (commitment: meaning & interest; control: having influence; challenge: excited by new experience) that may differentially affect emotional recovery, this was also examined. Mixed linear modeling was used to assess the change in emotional distress over time and to examine trait resilience and optimism as predictors of change, while adjusting for demographics (sex, age, educational attainment) and clinical (acuteity of PCI) covariates. Results – During hospital admission, depression (M=4.5±2.2) and anxiety (M=3.6±2.4) levels were mild to moderate. Trait resilience and optimism correlated r=.41 with each other. Cross-sectional analysis showed a higher level of dispositional optimism and resilience (especially the commitment subscale) to be independently associated with significantly lower anxiety and depression levels during hospital admission (optimism: β=.34 and resilience: β=.36, p<.001). Mixed linear modeling of longitudinal levels of depression and anxiety showed that both optimism and trait resilience were associated with significantly larger reductions of depression (Fig. panels A & B) and anxiety (Fig. panels C & D) over the first month post-PCI, independent of socio-demographic and clinical covariates. The commitment component of resilience was most influential in determining the level and course of depression (β=.34 and anxiety (β=.36, p<.002). Conclusion - Optimism and resilience were both associated with lower levels of depression and anxiety during hospital admission and with a more favorable emotional recovery pattern over the first month post-PCI. Future research should examine the long term effects of optimism and trait resilience, and investigate the specific adaptational skills associated with these two favorable dispositional traits.
236) Abstract 2871

FACIAL COOLING FOR THE MANAGEMENT OF MOTION-INDUCED NAUSEA AND GASTRIC DYSRHYTHMIA
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Background: Facial cooling has been shown to elicit a pattern of physiological responses that is presumed to be a result of increased parasympathetic nervous system (PNS) activation. Nausea and motion sickness are often accompanied by an abnormal pattern of stomach activity called gastric tachyarrhythmia, or more generally, gastric dysrhythmia. Nausea and gastric dysrhythmia are considered by many to be related to decreased PNS activation. It was believed that facial cooling would therefore arrest the development of gastric tachyarrhythmia and relieve symptoms of nausea and motion sickness during exposure to a device that induces the illusion of self-motion. Method: A randomized, independent-groups design was employed in which 30 participants were assigned to one of two experimental groups before exposure to a rotating optokinetic drum. Symptoms of nausea and motion sickness were monitored before and during exposure to the drum, while gastric myoelectrical activity was recorded continuously via electrogastrography. A 6-min baseline period preceded a drum rotation period that lasted a maximum of 16 min. Participants in the facial cooling group were instructed to hold a 10°C gel pack on their foreheads at the beginning of the drum rotation period, and to hold it there for the duration of the session. Control group participants were not given a cold gel pack. It was hypothesized that participants in the facial cooling group would report less severe nausea and other symptoms of motion sickness, and develop less gastric tachyarrhythmia, than participants in the control group. Results: Participants in the control group showed a significant increase in gastric tachyarrhythmia from baseline to drum rotation, t(12)=2.31, p<.05. However, participants in the facial cooling group showed a statistically significant trend for a decrease in gastric tachyarrhythmia in comparison with the control group. Participants in the control group also showed lower prevalence of gastric dysrhythmia and less nausea and other symptoms of motion sickness than facial cooling group participants did, and also tended to request earlier termination of the drum’s rotation, but these differences did not reach statistical significance. Conclusion: Facial cooling prevented the development of gastric dysrhythmia during exposure to a device that induces the illusion of self-motion. In an effort to explain the apparent therapeutic effect of facial cooling, additional studies have begun to explore the extent to which other physiological indices of PNS activation (like increased heart rate variability and decreased skin conductance level) are achieved by facial cooling in this context. More effective and controlled methods of administering the facial cooling are also being developed with larger sample sizes to determine whether symptom ratings might be similarly impacted by a stronger manipulation. These results could have implications for the effective nonpharmacological treatment of nausea in a variety of evocative contexts.

237) Abstract 2688

IS TYPE D PERSONALITY RELATED TO ALL-CAUSE MORTALITY IN COLORECTAL CANCER? A PROSPECTIVE POPULATION-BASED STUDY AMONG 2,543 PATIENTS FROM THE PROFILES REGISTRY
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Background: The goal of this large prospective study was to examine whether Type D personality and its 2 constituting components, negative affectivity (NA) and social inhibition (SI), were associated with all-cause mortality among colorectal cancer (CRC) patients.

Methods: Patients diagnosed with CRC between 2000 and 2009, as registered in the Dutch population-based Eindhoven Cancer Registry received a questionnaire on Type D personality (DS14) and comorbid cardiovascular disease (CVD) on average 5.3 years after diagnosis. Survival status (31-12-2013) was obtained from the Central Bureau for Genealogy. We used a Cox proportional hazard model to estimate the association between personality and all-cause mortality, while adjusting for demographics (age, gender, and educational level), clinical characteristics (time since diagnosis and receiving chemotherapy as primary treatment) and comorbid CVD. Personality was entered as a 4-group categorical variable: ‘reference group’ (NA-SI), ‘SI only’ (NA-SI), ‘NA only’ (NA+SI), and ‘Type D’ (NA+SI+). Analyses were repeated while stratified for age, gender and comorbid CVD.

Results: Almost half of the sample was categorized as the ‘reference group’ (n=1281, 50%), 17% as ‘SI only’ (n=421), 12% as ‘NA only’ (n=309), and 21% as ‘Type D’ (n=532). Among CRC patients in the ‘NA only’ and ‘Type D’ groups showed a (nearly) 2-fold increased risk (HR=2.0, 95%CI=1.4-2.8, p<0.01, and HR=1.7, 95%CI=1.3-2.4, p=0.01) for all-cause mortality. Hence, the adverse effect of personality on survival was driven by the NA component of Type D, regardless of the level of SI. Stratified analyses showed that this adverse effect of NA was limited to older men. In older men without CVD, there was an additional adverse effect of SI on all-cause mortality (HR=2.3, 95% CI=1.2-4.4, p=0.01).

Conclusions: CRC patients with elevated levels of NA have an increased risk of all-cause mortality, regardless of their level of SI. This adverse effect of NA persisted after adjustment for clinical characteristics and was most prominent for older men. There was no effect of SI, except for decreased survival in older men without CVD. In general, these findings suggest that it is the NA component, and not the combination with SI in the Type D construct, that drives the adverse effect of psychological distress on survival in patients with CRC.

238) Abstract 2885

EFFECTS OF INTRanasAL OXYTOCIN ON SOCIAL SALIENCE AS MEASURED BY PERSONAL PRONOUN
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As a hormone implicated in pair-bonding, oxytocin has important implications for human attachment. Recent studies have pointed to the role of context for the behavioral effects of oxytocin. The present study examined whether attachment priming moderated the effect of oxytocin on social salience as measured through language use. In a double-blind, placebo-controlled design, participants (N = 91) received intranasal oxytocin or placebo spray and then engaged in an attachment prime or control writing task. Overall, oxytocin significantly predicted higher personal pronoun use, an implicit marker of social salience, in the attachment priming condition, but not the control. Zooming in on personal pronoun types, they found that oxytocin increased first-person singular use, a known linguistic marker of self-other overlap. These results provide preliminary evidence that oxytocin can affect attachment-related social cognition as reflected in language use. The role that attachment orientation plays in this process will also be investigated.

239) Abstract 2804

THE Trier Social Stress Test 2.0: USING A VIRTUAL WORLD TO ELICIT AN ACUTE CORtisol RESPONSE
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Background: Presenting the standard Trier Social Stress Test (TSST) through virtual reality may convey a distinct advantage over the real world, because it increases control over key elements of the stressor (e.g., confederate facial expressions and gestures). The present study investigated whether a virtual TSST produces similar acute cortisol responses and subjective measures of stress as a real-world TSST. Failure to mount an acute cortisol response to social stress is associated with negative health outcomes. Bereaved adolescents display flatter cortisol reactivity to acute social stress compared to non-bereaved controls (Dietz et. al 2013). The present study examined whether the virtual TSST could elicit a cortisol response in a control versus vs. bereaved group.

Methods: Forty undergraduates, represented as avatars on a computer screen, were randomly assigned to the control group (N = 20) or bereaved group (N = 20). Participants completed a 30-minute relaxation period followed by a double-blind priming study and received either oxytocin or saline. Participants then engaged in the virtual TSST task. Participants were instructed to give a job talk and perform math problems to confederates (also represented as avatars) to induce stress.

Results: There was a higher mean cortisol response in the bereaved group (M = 1.5 ng/mL, SD = 0.2) compared to the control group (M = 0.8 ng/mL, SD = 0.1). There was no significant difference in cortisol response between the two groups (t(38) = 1.7, p = 0.09).

Conclusion: The virtual TSST is capable of eliciting a cortisol response and subjective measures of stress as a real-world TSST. Failure to mount an acute cortisol response to social stress is associated with negative health outcomes. Bereaved adolescents display flatter cortisol reactivity to acute social stress compared to non-bereaved controls (Dietz et. al 2013). The present study examined whether the virtual TSST could elicit a cortisol response in a control versus vs. bereaved group. The results suggest that the virtual TSST is a viable tool for studying cortisol responses to social stress in bereaved and non-bereaved adolescents.
VALIDATION OF THE PSYCHOSOCIAL SCREENING INSTRUMENT OF THE EUROPEAN SOCIETY OF CARDIOLOGY

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Background: Psychosocial factors play a major role in the incidence and prognosis of cardiovascular diseases. Preliminary assessment of psychosocial functioning is an important input for risk factors, triggering earlier initiation of appropriate care. Addressing the need for a quick, easy to use screening tool, the European Society of Cardiology (ESC) constructed a compact 15 item screening list, to be administered as part of the physician’s clinical interview during outpatient follow-up. The current study examined the psychometric properties of the ESC screener in a real-world patient population and examined sensitivity and specificity in comparison with the widely used PHQ-9 and GAD-7 clinical cut-offs for depression and anxiety. Method: 162 patients scheduled for percutaneous coronary intervention (PCI) were included (mean age=64.2±11.3; 78.5% male). Elective PCI patients completed the ESC interview during hospital admission; (sub)-acute patients were interviewed by phone, 1 month post-PCI. Self-report questionnaires for depression (PHQ-9) and anxiety (GAD-7) were completed during hospital admission and 1 month later. The 15-item ESC screener consists of 7 predefined components: low socioeconomic status, work and family stress, social isolation, depression, anxiety, hostility and Type D personality. Results: Factor Analysis revealed the presence of 6 components in the ESC screener (n=162) using Varimax rotation, including 1. Emotional distress; 2. Work; 3. Hostility; 4. Relationship; 5. Social status; 6. Social Inhibition) with strong loadings (Table 1). Some cross-loadings were observed. Cronbach alpha coefficients of the 5 multi-item components were .66, .57, .62, .35, .25 resp. Sensitivity and specificity analysis in a subsample of patients with complete questionnaire data (n=95) showed that the ESC screener had high specificity (i.e. negative screen when depression is absent according to PHQ-9) for depression (94.9%) using the dichotomized PHQ-9 score as a reference, but a much lower sensitivity (i.e. positive screen when depression is present according to PHQ-9; 50%). For anxiety, specificity was also high, at 97.5%, with the dichotomized GAD-7 score as a reference. Sensitivity for anxiety was much lower (36.4%). Measurement moment (during hospital admission vs. 1 month post-PCI) hardly had impact (specificity: depression: Δ=0.7%; anxiety: Δ=1.0%). Conclusions: Factor analysis of the ESC screener revealed 6 components. Specificity of the ESC screener was high. From “non-depressive” patients according to the PHQ-9, the screener assessed 94.9%. For anxiety this percentage was 97.3. The ESC screener seems to be a valid instrument for preliminary detection of potential depression and/or anxiety complaints in PCI patients. Sensitivity scores indicate that more in depth diagnostic assessment is needed as a second step. Future research is needed for (1) further confirmation of the results and (2) further validation of the ESC screening instrument (i.e. other subcomponents).

WEIGHT MAINTENANCE IN COUPLES: POSITIVE AND NEGATIVE PARTNER INFLUENCES ON BMI AND PERCENT BODY FAT

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Purpose: Weight maintenance is critical for health. Among individuals in committed, romantic relationships, messages and feedback from a partner are important inputs that can influence eating and physical habits. Whether these messages are encouraging or disparaging is also important. The present study examined positive and negative partner influence strategies as predictors of 6-month changes in body mass index (BMI) and percent body fat in couples in their first year of living together. This time period was chosen because it is an important transition time for emerging partner influences relevant to weight maintenance.

Method: Heterosexual couples were surveyed about positive partner influences (offered to help and/or showed concern) and negative partner influence strategies (used guilt and/or ridicule) regarding exercise and eating habits. Body fat percentage along with height and weight were collected during a baseline lab session (N = 144, 72 dyads) and again after 6 months (N = 126, 63 dyads). A cross-sectional, dyadic model was used to investigate the effect of partner influence on T2 BMI and body fat percentage, controlling for T1 BMI and body fat.

Results: Results show that for females, positive partner influences predicted a marginally lower BMI at T2, b = -0.42 , t(63) = -1.72 , p = .09. However, for both males and females positive partner influences predicted a significantly higher body-fat percentage at T2, b = .93 , t(48) = 2.42 , p = .02. Additionally, for both males and females negative partner influences predicted a lower T2 BMI b = -.86 , t(64) = -3.18 , p = .002, but marginally higher T2 body fat b = 1.12 , t(47) = 1.71 , p = .09.

Discussion: Both positive and negative messages from partners regarding eating and physical activity were associated with an increased body fat 6 months later, although BMI remained the same (for positive partner influences), and dropped (for negative partner influences). These results suggest that lean body mass was reduced over time when negative partner influences were reported, while at the same time body fat increased. Thus, negative, partner influences seem to be the most detrimental to health in individuals in romantic relationships.

PARTNER PRONOUN USE DURING COUPLE-FOCUSED INTERVENTIONS FOR ALCOHOL USE DISORDERS PREDICTS TREATMENT OUTCOME

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Purpose: The role of partner pronouns in couple-focused interventions for alcohol use disorders is unknown. The current study examined whether changes in partner pronoun use during and following treatment are associated with changes in alcohol use and relationship satisfaction, as measured by the_partner pronoun use and relationship satisfaction. Method: Participants (N = 42) were recruited from a randomized controlled trial of couple-focused treatments for problematic drinking. Participants completed pronoun use outcome measures at baseline, post-treatment, and follow-up. Results: Participants who showed greater decreases in “you” pronoun use during treatment were associated with greater decreases in alcohol use during treatment, b = -0.21 , t(40) = -2.07 , p = .045, and follow-up, b = -0.22 , t(39) = -2.16 , p = .037. Conclusions: Changes in partner pronoun use are associated with changes in alcohol use in couple-focused treatment, and suggest that interventions aimed at changing partner pronoun use during treatment may be beneficial.
A common objective of couple-focused interventions for health problems is to increase partners' collaboration in addressing the problem, but measuring such therapeutic processes can be a challenging scientific task. Although excellent observational coding systems exist for couple research, their implementation tends to be highly resource intensive. Assessing language behavior, and specifically pronoun use, through automatic text analysis is a relatively new approach to the study of relational processes that offers a potentially efficient approach to assessing therapeutic change processes. In a study of partners' pronoun use during couple-focused interventions for alcohol use disorders, we examined first-person (we-talk, I-talk) and second-person (you-talk) pronoun use during therapy as linguistic markers of relationship processes and behavioral predictors of treatment outcome. Thirty-three couples in which one partner abused alcohol participated in either couple-focused Cognitive Behavioral Therapy (CBT) or Family Systems Therapy (FST). Measures of pronoun use for each partner were obtained via computerized text analysis from transcripts of the partners' speech, derived from three video-recorded therapy sessions (early-, mid-, and late-intervention). Consistent with prior couple pronoun research, greater spouse you-talk (a marker of criticism and blame) and I-talk (a marker of an individualistic self-focus) during the intervention predicted unsuccessful treatment outcomes (failure to achieve post-treatment abstinence), but the patients' own pronoun use did not. Greater spouse we-talk (indexing a communal orientation) tended to predict successful treatment outcomes, though the statistical partner effect fell short of significance. Residualized change in spouse we-talk and I-talk over the course of the interventions (controlling for baseline levels) also predicted treatment outcomes, and all findings held when adjusting for treatment type. These findings highlight the utility of text analysis in the investigation of therapeutic change processes and strengthen evidence for the prognostic significance of spouse behavior, in this case indexed via pronoun use, for patient health outcomes.

243) Abstract 2730
GETTING ALONG AND GETTING AHEAD: AFFILIATION AND DOMINANCE PREDICT AMBULATORY BLOOD PRESSURE
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Research indicates that individual differences in interpersonal style are risk factors for cardiovascular disease (CVD). Further, few studies have examined effects of both the individual's own personality characteristics (i.e., actor effects) and the effects of a spouse's personality (i.e., partner effects). This study examined association between ambulatory blood pressure (ABP) and Interpersonal Circumplex (IPC) self-report measures of affiliation (i.e., warmth vs. hostility) and control (i.e., dominance vs. submissiveness). We also examined the influence of these variables on daily diary experiences of state affect.
Methods: 94 married couples (mean age 29) completed the NEO-PI-R, and a 1-day ABP protocol with random interval-contingent measurements using a Suntech monitor and Palm Pilot-based measures of control variables.
Results: multilevel modeling was used to accommodate couples and multiple measurement occasions (Proc Mixed; SAS) and controlled individual differences (BMI, age, income) and potential confounds (e.g., posture, activity). Dominance predicted increases in both systolic and diastolic blood pressure (SBP & DBP) in men, but not women. Individuals high in affiliation had lower SBP. This expected inverse association approached significance for DBP. These associations of affiliation with ABP were not moderated by gender. Across all analyses, no significant first order or higher-order interaction associations were found between partner levels of dominance and affiliation and ABP. Examination of daily diary outcomes revealed associations between actors and partner dominance and affiliation and measures of state affect. Gender moderations were found for dominance, but not affiliation. For example, dominance predicted increases in state positive affect in men, while partner dominance predicted increases in state negative affect in women.
Conclusions: Overall, individuals higher in trait affiliation had lower ABP, as expected, and gender did not moderate this association. In contrast, the expected positive association of trait dominance with ABP was significant among men, but not women, a pattern consistent with prior research on CVR sex differences along these two IPC dimensions. Examination of daily experiences of state affect also revealed associations with dominance and affiliation. These findings demonstrate the value of the interpersonal circumplex in understanding psychosocial risk for CVD.

244) Abstract 2892
COPIING IN CONTEXT: EXAMINING PREDICTORS OF PHYSICAL SYMPTOMS IN BREAST CANCER PATIENTS
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Objective: Breast cancer patients often experience adverse physical side effects of medical treatments. This longitudinal study examined chronic and episodic life stress and cancer-related coping as predictors of physical symptoms in women recently diagnosed with breast cancer. Method: Women with breast cancer (N = 362) completed a life stress interview within three months of diagnosis and measures of cancer-specific approach and avoidant coping and physical symptoms (e.g., pain, fatigue) at study entry and every six weeks through six months. Results: In multilevel models, chronic stress, episodic stress post-diagnosis, and avoidant and approach-oriented coping each predicted higher physical symptom ratings over the study period. Simple effects analyses of significant interactions between stress and coping revealed that approach-oriented coping at six months was associated with higher symptoms for women who had not experienced stressful life events shortly after diagnosis; no relationship was found for women who had experienced episodic stress post-diagnosis. Although avoidant coping was generally associated with higher physical symptoms, cancer-related avoidance in the short term while facing the consequences of recent stressful life events was not related to symptoms. However, avoidance at six months was more harmful for women who had experienced episodic stress post-diagnosis than for those who had not. Conclusions: Results suggest that coping processes are not inherently beneficial or maladaptive; rather, the utility of particular coping processes change over time and with varied circumstances. Screening for stress and cancer-related coping may help identify women at risk for experiencing untoward physical symptoms and inform interventions to improve adjustment.

245) Abstract 2867
ARE RECREATIONAL ACTIVITIES THEMSELVES OR THE TIME STRUCTURE PROVIDED BY THEM, ASSOCIATED WITH LOWER DEPRESSIVE SYMPTOMS?
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Recent literature implicates loss of time structure in depression. However, time structure describes a complex set of behaviors and to date little is known about how the various subcomponents of time structure contribute to depressive symptoms. This question becomes particularly important in high-risk situations like unemployment as well as in treatment-relevant contexts, such as when assessing the beneficial effects of leisure activity (e.g., exercise or social leisure) on depressive symptoms. Specifically, the current study tested the hypothesis that changes in time structure, such as observed in unemployment, would negatively influence the beneficial relationship between leisure activity and depressive symptoms.
Utilizing Amazon Mechanical Turk website to oversample unemployed participants, we assessed depressive symptoms (CESD), exercise and social leisure, as well as time structure (TSQ) in 295 participants (34.2+/-10.7yrs, males=147, employed=140). All analyses controlled for gender and age. Structural equation modeling of cross-sectional data revealed that for employed individuals, time structure partially and for unemployed individuals fully mediated the relationship between leisure activities and depressive symptoms. Interestingly, model fit was excellent only for the unemployed (RMSEA<.05), while it was less than ideal for the employed (RMSEA=.1). Subsequent confirmatory factor analysis revealed significant differences in the latent factor structure of TSQ, with structured routine contributing significantly for the unemployed, but not the employed individuals.
Our findings indicate that although leisure activities are beneficially associated with depressive symptoms, for the unemployed, this effect is dependent on behaviors establishing time structure, most importantly the previously discounted element of structured routines. These observations may not only explain the varying success of employing leisure activities to alleviate depressive symptoms reported in the literature; they further have direct implications for future examinations of how the way unemployed individuals structure their time contributes to the effectiveness of behavioral treatments for depressive symptoms.
increased alpha-amylase response to an acute psychosocial stress challenge in healthy adults with childhood adversity

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Rationale: Childhood adversity is highly prevalent and is linked to lasting psychological and physiological consequences in adulthood. A potential mechanism for negative health outcomes in those with childhood adversity is altered stress reactivity. Previous research has addressed childhood adversity along systematic-pituitary-adrenal system stress reactivity, but there has been relatively less exploration into SNS stress reactivity in this context. The enzyme sAA has been suggested as a marker for SNS reactivity. Understanding the relationship between childhood adversity and the SNS response to stress is imperative because the SNS is thought to up-regulate inflammation, and increased inflammation is associated with disease processes such as metabolic syndrome, coronary heart disease, stroke, autoimmune diseases, select cancers, and premature aging.

Method: Forty-one healthy adult subjects (n=24 male; n=17 female) aged 18-34 years underwent the Trier Social Stress Test (TSST) during afternoon sessions and completed the Childhood Trauma Questionnaire (CTQ). Saliva for measurement of sAA was collected at three time points; before the TSST, immediately following the TSST, and 30 minutes post-TSST.

Results: Overall, CTQ scores were low to moderate, ranging from 37-73 (mean=45.4 ± 8.7 SD). The sample was divided into two groups based on pre-established CTQ cutoff scores: the no trauma group (n=23), and the low-moderate trauma group (n=18). We found that those with childhood trauma had a higher overall sAA response to the TSST (p=0.003). A repeated measures ANOVA revealed that the trauma group had higher sAA values immediately following the TSST (time effect: F(1,8.71), p=0.01). There was also a dose-dependent positive correlation between sAA reactivity and overall CTQ score (r=0.32, p=0.82), and the CTQ subscales of childhood emotional abuse (r=0.34, p=0.028), and emotional neglect (r=0.32, p=0.036).

Conclusions: Healthy adults with a history of childhood adversity show higher overall sAA responses to acute psychosocial stress. Specifically, those with moderate childhood adversity have a heightened sAA response immediately following the stressor, more so than those with low to moderate childhood adversity. We also found that each point increase in overall childhood trauma, and childhood emotional abuse and neglect was incrementally predictive of an increased sAA response. The mechanisms in the connection between childhood adversity, SNS reactivity, inflammation, and the molecular link to disease have yet to be studied and are necessary to fully understand the relationship between childhood adversity and adult health outcomes.

247) Abstract 3088

LINKS BETWEEN SHAME EXPRESSION AND CORTISOL STRESS RESPONSES BEFORE, DURING, AND AFTER PUBERTY

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The Social Self-Preservation theory suggests shame as one important emotion driving Hypothalamus-Pituitary-Adrenal (HPA) axis reactivity. Unfortunately, shame responses do not appear to be the predominant emotion response in healthy young adults, making it difficult to test this hypothesis. However, during puberty, self-consciousness increases and thus this developmental period may provide a context in which links between shame and cortisol stress responses may be particularly salient. The current study thus aimed at comparing links between shame and cortisol responses to acute psychosocial stress during pre-, peri-, and post-puberty. Pre-pubescent (n = 38, 19M), peri-pubescent (n = 35, 17M), and post-pubescent (n = 14, 6M) participants were exposed to the Trier Social Stress Test-Modified (TSST-M). Saliva samples for cortisol assessment were collected throughout the protocol, and facial expression of emotion was assessed using Ekman’s Emotion Facial Action Coding System (EMFACs).

Less than half of all participants (48%) showed any instance of shame during the TSST. Shame was thus treated as a dichotomous variable in subsequent analyses. Comparing the puberty groups, both the pre- and peri-pubescent group were more likely to show shame responses than the post-pubescent group (F(2, 81) = 4.40, p = .006). Repeated-measures ANOVA revealed that the presence of shame predicted exaggerated cortisol stress responses, but not for post-pubescent participants (F(1, 405) = 2.51, p = .032). Our findings suggest that although shame may be a more predominant emotion response to stress during puberty, it may not play a role in HPA reactivity until adulthood. This suggests that rather than being stable, associations between emotion responses to stress and physiological responses to stress may develop and change across the lifespan. Since adolescence is a period marked by significant emotional and biological development, including changes within the HPA axis, understanding these associations may be particularly important in identifying developmentally appropriate, health-promoting ways of dealing with stress.

248) Abstract 2758

STRESS-INDUCED MODULATION OF NF-jB ACTIVATION, INFLAMMATION-ASSOCIATED GENE EXPRESSION, AND CYTOKINE LEVELS IN BLOOD OF HEALTHY MEN

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Acute psychosocial stress stimulates transient increases in circulating pro-inflammatory plasma cytokines, but little is known about stress effects on anti-inflammatory cytokines or underlying mechanisms. We investigated the stress kinetics and interrelations of pro- and anti-inflammatory measures on the transcriptional and protein level. Forty-five healthy men were randomly assigned to either a stress or control group. While the stress group underwent an acute psychosocial stress task, the control group participated in a non-stress condition. We repeatedly measured before and up to 120 min after stress DNA binding activity of the pro-inflammatory transcription factor NF-jB (NF-jB-BA) in peripheral blood mononuclear cells, whole-blood mRNA levels of NF-jB, its inhibitor IkBα, and of the pro-inflammatory cytokines interleukin (IL)-1ß and IL-6, and of the anti-inflammatory cytokine IL-10. We also repeatedly measured plasma levels of IL-1ß, IL-6, and IL-10. Compared to non-stress, acute stress induced significant and rapid increases in NF-jB-BA and delayed increases in plasma IL-6 and mRNA of IL-1ß, IL-6, and IkBα (p's<.045). In the stress group, significant increases over time were also observed for NF-jB mRNA and plasma IL-1ß and IL-10 (p's<.055). NF-jB-BA correlated significantly with mRNA of IL-1ß (r=.52, p=.002), NF-jB-BA (r=.48, p=.004), and IkBα (r=.42, p=.013), and marginally with IL-6 mRNA (r=.31, p=.1). Plasma cytokines did not relate to NF-jB-BA or mRNA levels of the respective cytokine, but data suggest that stress increases in NF-jB-BA that relate to subsequent mRNA expression of pro-inflammatory, but not anti-inflammatory cytokines, and of regulatory-cytokine-antigens. The stress-induced increases in plasma cytokines do not seem to derive from de-novo synthesis in circulating blood cells.
The Impact of Weight Stigma on Physiological Stress, Energy Expenditure, and Health
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Overweight and obese individuals are targets of both subtle and overt stigma in multiple domains including employment, education, and health care. Experiencing prejudice and discrimination is a well-known risk factor for poor health, at least in the domains of race, gender, and sexual orientation. However, little research exists examining the health consequences of weight stigma, despite the fact that the prevalence of weight discrimination is now comparable with racial discrimination in the US. In addition to stigma from others, overweight and obese individuals commonly report self-directed stigma. The research conducted by the presenters provides evidence that the pathophysiology resulting from obesity may, in fact, be mediated by the experience and internalization of weight stigma. This symposium will elucidate those psychosocial mechanisms that adversely affect the health of overweight and obese adults and adolescents, thereby contributing to the development of comorbidities. The first presentation will present a theoretical model of the psychosomatic consequences of weight stigma, and will present correlational, longitudinal, and experimental data linking experiences of weight stigma to cortisol, oxidative stress, and long-term risk of obesity. The second presentation will examine the within-person effects of real-time experiences of weight stigma, showing a robust relationship between weight stigma and higher salivary cortisol and lower actigraphy-based physical activity. The third presentation will explore the association between pressure to be thin and metabolic indices among adolescents. Results indicate that pressure to be thin is significantly associated with fasting glucose and insulin, beyond the effect of excess adiposity. The fourth presentation will elucidate the harmful effects of self-directed weight stigma on exercise motivation and affect. Collectively, these presentations demonstrate the deleterious effects of a community-level macrofactor, weight stigma, on objective and subjective health indices. Using multiple technologies and methods of assessment, the experiments selected are novel, cutting-edge, and vital to the understanding of the psychosomatic sequelae of obesity.

Individual Abstract Number: 2712
Is Weight Stigma Stressful? Evidence from correlational, longitudinal, and experimental studies
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Rates of weight-based stigmatization have steadily increased over the past decade, but the physiological consequences of weight stigma remain vastly understudied, especially when compared to research on other forms of stigma in the domain of race, gender, and sexual orientation. The objective of this series of studies was to test the hypothesis that experiencing weight stigma triggers a physiological stress response. In Study 1, 42 overweight/obese females completed measures of weight stigma, provided fasting blood samples, and underwent 4 days of diurnal salivary cortisol sampling. Results indicated that greater experiences with and awareness of weight stigma were associated with greater cortisol awakening response, higher morning serum cortisol levels, and higher levels of oxidative stress, independent of BMI. Perceived stress mediated the relationship between weight stigma and cortisol awakening response. In Study 2, 110 females were randomly assigned to either experience weight stigma (in the form of rejection from a shopping activity due to body size and shape) or a control condition. Results indicated participants’ perceptions of their own body weight (but not objective BMI) moderated the effect of weight stigma on cortisol reactivity. Specifically, participants who perceived themselves as heavier experienced a sustained increase in cortisol levels, whereas those who perceived themselves as average weight. Finally, in Study 3, weight stigma was examined in relation to long-term BMI trajectories in 2,379 adolescent females in the NHLBI Growth and Health Study. Results indicated that those labeled as “too fat” at age 10 were at higher odds of becoming obese at age 19, controlling for baseline BMI. Together, these studies show that experiencing weight stigma is likely stressful, with physiological consequences that may even extend to obesity. Furthermore, these results suggest that a portion of the pathophysiology of overweight and obesity may be due to chronic exposure to weight stigma rather than adiposity per se.

Individual Abstract Number: 2021
Understanding the real-time within-person responses linking weight stigma to poor health in daily life
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People who report more weight stigma [WS] also experience a wide range of poorer health, social, employment, and other outcomes. Current theory suggests WS produces stressful, dysphoric, and demotivating responses that may explain observed long-term health risks, but very little data examines within-person responses to experiences of WS, particularly in ecologically valid contexts. We examined within-person reactions to momentary experiences of naturally occurring WS, including subjective stress, mood responses, salivary cortisol, and objectively measured physical activity. Overweight/obese adults (n=38, age 21-36, BMI 27-52 [mean=34.7]) completed baseline measures, used smartphones with custom software to collect data for 1 week, and wore a device that collected objective physical activity data every 15 sec. They responded to pseudo-random signals 4x/day on the smartphones, reporting stress, mood, and information on social interactions and WS, and provided saliva samples for cortisol. Participants also completed event reports when experiencing WS at other times, reporting stress, mood, information on the episode, and providing saliva samples. Multilevel models revealed momentary experiences of WS significantly predicted increased stress and worse mood relative to moments without experienced WS. Physically, we also observed higher salivary cortisol and lower physical activity following WS. This study demonstrates that WS experiences predict within-person patterns of responses (as indexed by stress report, dysphoric mood, higher cortisol) and also reduce objectively measured physical activity. These patterns may represent a biopsychosocial pathway linking daily experiences of WS over time to long-term health risks associated with WS.

Individual Abstract Number: 2713
Pressure to be Thin is Associated with Fasting Glucose and Insulin among Lean and Overweight Adolescents
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Objective: Extant research indicates that the comorbidities associated with obesity may be due, in part, to the stress resulting from weight-based stigma, negative body image, and weight-related teasing. For instance, relationships have been observed between 1) perceived weight-based discrimination and nondiabetic glycemic control, 2) exposure to weight stigma and cortisol reactivity, and 3) body dissatisfaction and frequency of self-reported unhealthy days per month. To date, no study has examined the association between weight-related pressure and metabolic indices in adolescents, who are vulnerable to both weight-based teasing, as well as the onset of metabolic-related pathology.

Method: Participants were 300 adolescent healthy volunteers (40% female; 39% non-Hispanic white; 40% overweight; M age = 15.3±1.4y), who completed laboratory tests of metabolic functioning in addition to self-report measures of pressure to be thin from parents and friends and the Eating Disorder Examination interview (EDE). Fasting blood samples were obtained to assess serum glucose and insulin concentrations (and fasting percentage of body mass).Percentages were measured from air displacement plethysmography. Pubertal stage was determined by a physical examination.

Results: Linear regressions revealed that pressure to be thin was significantly associated with fasting glucose (β = .337, t (212) = 2.72, p = .007) and insulin (β = .149, t (212) = 2.09, p = .038) after controlling for pubertal stage, sex, race,
height, lean mass, and adiposity. Pressure to be thin was positively associated with global eating pathology and all EDE subscales (Restrain, Eating, Shape, and Weight Concern) (all ps < .05).

Discussion: Results indicate that adolescents perceiving more pressure to be thin from parents and friends have greater elevations of insulin and blood sugar above and beyond the effect of fat mass. Results are consistent with previous studies indicating that body dissatisfaction and weight-based stigma moderate the effects of body weight on metabolic outcomes. Free fatty acids have been proposed as a mediator between weight stigma and glycemic control; future research is warranted to elucidate the mechanism responsible for this relationship.

Individual Abstract Number: 2714

Weight Bias Internalization, Exercise, and Psychological Well-Being: The Case for Targeting Self-Directed Weight Stigma
Rebecca Pearl, MPhil, Psychology, Rebecca Puhl, Ph.D., Rudd Center for Food Policy and Obesity, John Dovidio, Ph.D., Psychology, Yale University, New Haven, CT

Weight bias internalization, or self-directed stigma, refers to applying weight-based stereotypes to oneself and negative self-evaluation due to overweight/obesity. Similar to weight bias experiences (e.g., discrimination or unfair treatment), weight bias internalization is linked to negative mental health outcomes. However, little research has examined the relationship between weight bias experiences and internalization. Weight bias internalization may be malleable relative to experiences with weight bias, therefore providing a promising intervention target. Furthermore, the effects of weight bias internalization on health behaviors such as exercise are widely unexplored. In 2 studies, we aimed to examine the effects of weight bias internalization versus experiences on exercise and psychological well-being. In Study 1, 177 women with overweight/obesity (Mage=35.48, MBMI=32.81) completed measures of exercise behavior, self-efficacy, motivation, and weight bias internalization and experiences. Results revealed negative correlations between weight bias internalization and all exercise measures, while experiences correlated positively with exercise behavior. Weight bias internalization did not moderate the effects of exercise on weight loss and weight maintenance; however, self-directed stigma was a partial mediator, highlighting a distinct nature.

Compared to participants in the Experience condition, those in the Internalization condition scored higher on weight bias internalization and negative affect and lower on positive affect and self-esteem. Compared to participants in the Experience condition, those in the Internalization condition scored higher on weight bias internalization and negative affect and lower on positive affect and self-esteem. These findings illustrate the uniquely harmful effects of self-directed weight stigma, and carry implications for the need to target weight bias internalization in clinical settings.

Symposium 2809
Saturday, March 21 from 3:00 to 4:00 pm

Biofield Science: Emerging Perspectives on Physiology and Psychosomatic Medicine
Susan Lutgendorf, Ph.D., Psychology, Obstetrics and Gynecology, Urology, University of Iowa, Iowa City, IA, Lorenzo Cohen, Ph.D., General Oncology, Behavioral Medicine, and Integrative Medicine Program, MD Anderson Cancer Center, Houston, TX, Richard Hammerschlag, PhD, Research, Oregon College of Oriental Medicine, Portland, Oregon, Shamini Jain, Ph.D., Psychiatry and Behavioral Medicine, University of California San Diego, LaJolla, CA, Blake Garfein, Ph.D., Medicine, University of California San Francisco, San Francisco, CA, Lorenzo Cohen, Ph.D., General Oncology, Behavioral Medicine, and Integrative Medicine Program, MD Anderson Cancer Center, Houston, TX

The objective of this symposium is to update attendees on current research and address gaps in knowledge surrounding the scientific study of biofields, particularly as they apply to therapeutic models of care. As integral therapies (e.g., Healing Touch, Reiki, and others) and biofield devices (e.g., electromagnetic fields and electric currents) are often used in clinical practice but questions remain regarding their efficacy, mechanisms of action, relationship to mind-body processes, placebo effects, and optimal research methodologies. This symposium brings together leading researchers to update the evidence base for clinical, preclinical, and basic science studies in the area of biofield science and to address knowledge and methodological challenges. The first presentation will include an overview of pre-clinical mechanistic studies using biofield therapies, recent cellular research on bioelectric fields and morphogenesis, electromagnetic and other types of emissions detected from living systems, and an emerging model of biofield physiology. The second presentation will highlight clinical studies using biofield therapies, with particular emphasis on recent findings in patients with cancer, pain, and PTSD. Methodologic issues including dose and delivery, placebo effects, and study design will also be addressed. The third presentation will discuss how devices are being utilized in biofield research, with an emphasis on new developments in which electromagnetic fields and electric current are being applied in medicine, current research on devices to assess human electromagnetic fields, and new research on the use of electromagnetic/biofield devices for the treatment of inflammatory conditions including chronic pain and brain injury. The Discussant will provide integration of these findings and address relevance to Psychosomatic Medicine. The Discussant will also facilitate interactions with audience members on key topics, including replicability, methodology, the role of placebo elements, and directions for future research to enhance understanding of biofield science.

Individual Abstract Number: 2853

Biofield Physiology: Framework for an Emerging Discipline
Richard Hammerschlag, PhD, Research, Oregon College of Oriental Medicine, Portland, Oregon

Endogenous, biologically-based fields (biofields) are becoming increasingly studied as a means by which complex living systems coordinate activity within and between multiple levels of scale that include molecular, cellular and whole organism. As examples, endogenously emitted pulses of ultraweak photons, electromagnetic fields directly related to cardiac and neural activity and patterns of distributed membrane voltage are varied forms of physiological phenomena designated as biofields, each with established properties and proposed biological functions. Given that such varied types of fields are detected during normal physiological activity, the question arises whether they are side effects (epiphenomena) of metabolic events, or are incompletely understood as physiological signaling systems. This presentation will explore the evidence for the latter perspective, that endogenous as well as exogenous biofields influence and direct physiological regulatory systems in a manner that complements the more familiar molecular-based mechanisms, in which regulatory systems respond to endogenous biochemical signals as well as exogenous drugs. Known and postulated biofields will be described, including how they are generated, which physiological systems they may be affecting and which regulatory systems may be altered. As additional specific examples, data will be presented on biochemical and physiological changes in cell cultures and animal models in response to exogenously administered biofield therapies, including external qigong, Healing Touch, Reiki and Therapeutic Touch. Overall, a case will be made that sufficient evidence has accrued to consider biofield physiology as a viable, if nascent-stage, scientific discipline that is likely to expand the current biomedical model of health and disease.

Individual Abstract Number: 2979

Biofield Therapies for Clinical Populations: State of the Science
Shamini Jain, Ph.D., Psychiatry and Behavioral Medicine, University of California San Diego, LaJolla, CA

Biofield therapies are perhaps the oldest clinical application of practitioner-assisted approaches to stimulate healing responses in those suffering from a particular ailment or disorder. Current forms of biofield therapies include Healing Touch, Reiki, Laying-on-Of-Hands, Therapeutic Touch, Pranic Healing, and others. Because patients (particularly palliative care, chronic pain, and cancer patients) are high users of biofield therapies, there is significant interest in understanding whether these therapies are efficacious for certain ailments. Further, there is a need to understand better how these approaches may compare to other models of care in terms of efficacy, and what potential mechanisms of action may be for such approaches. This presentation will highlight the state of the science with respect to clinical applications of biofield therapies. We will summarize the evidence from recent systematic reviews, which indicate strong evidence for biofield therapies in acute pain, moderate evidence for behavioral symptoms of dementia, moderate evidence for pain and anxiety in hospitalized populations, and mixed evidence for cancer symptoms. Recently conducted RCTs with biofield therapies will also be discussed, including the impact of hands-on healing therapy vs. mock therapy and wait-list control group on persistent cancer related fatigue and cortisol variability in breast cancer survivors, effects of Healing Touch vs. treatment as usual for PTSD among returning veterans, and the impact of Healing Touch vs. relaxation on natural killer cell cytotoxicity and depression in cervical cancer patients undergoing chemoradiation. The presentation will interweave discussion of methodological issues, gaps in knowledge, and mechanistically-related hypotheses, including dose and delivery, the role of placebo elements, selection of appropriate biological outcomes, and optimal study designs. The presentation will end with recommendations for best next steps to further rigorous clinical research in biofield therapies.
Biofield Devices: Potential Tools for Measurement, Diagnosis and Treatment
Blake Garfein, Ph.D., Medicine, University of California San Francisco, San Francisco, CA

Biofield devices are physical instruments that are optimally understood and applied in the context of a biofield paradigm, in which an orchestrated flow of information from the subconscious to the organism level regulates biological function. Many devices, spanning diverse applications, have been developed to measure biofield properties, i.e. diagnostic devices, or to manipulate biofield processes, i.e. therapeutic devices. Notably, many devices that are widely accepted and used today in biomedical science have important applications when viewed through the lens of a biofield framework, for example, electroencephalography and electrocardiography-based heart rate variability are electrical recordings that are representative of biological function at the molecular, cellular, and systems levels. Additionally, a novel area of research, involving the non-invasive application of time-varying electromagnetic fields and electric currents to treat disease, is generating important basic science and clinical data and is emerging as an important new discipline in medicine with direct relevance to biofield science. Data will be presented illustrating electromagnetic therapy effects including: mood improvement in treatment-resistant depression; reduction in post-surgical inflammation, pain, and edema; suppressed neuroinflammation after brain injury; and enhanced neuroprotection. Other data presented will highlight direct and alternating electric current treatment effects on pain, mood and anxiety, sleep quality, and memory. Research in this rapidly growing area of non-invasive electrotherapies may have important implications for psychosomatic medicine via expansion of the approaches that are available as interventions for psychological disorders and chronic conditions. As research of biofield phenomenon continues to mature, devices will play an increasingly important role as tools for the objective quantitative measurement of emissions from biofield practitioners and biofield therapy recipients. Additionally, therapeutic biofield device development may create new approaches to healing and, reciprocally, may provide new means to assess human-to-human biofield interactions.

Symposium 3081
Saturday, March 21 from 3:00 to 4:00 pm

Learning from stress: why is it bad for the brain? Structure, function and performance.
Mary-Frances O’Connor, PhD, Psychology, University of Arizona, Tucson, AZ, Tor Wagner, PhD, Department of Psychology and Neuroscience, University of Colorado, Boulder, Boulder, CO, Peter J. Gianaros, PhD, Department of Psychology, University of Pittsburgh, Pittsburgh, PA, Brian Arizmendi, MA, Department of Psychology, University of Arizona, Tucson, AZ, Richard Lane, MD/PhD, Department of Psychiatry, University of Arizona, Tucson, AZ

The cortex shapes our experience of stressful life experiences, and simultaneously is shaped by those same experiences. In this symposium, researchers approach the relationship between the brain and stress from three distinct perspectives, highlighting the range of methods that can be brought to bear on this relationship. The first speaker will cover the role of the ventromedial prefrontal cortex in aversive learning that occurs during stressful experiences. However, he also uncovers the way that interventions based on psychological appraisal can influence prefrontal cortex, and thus mitigate its contributions to pain and distress. The second speaker will describe a stressed population, those with socioeconomic disadvantage, and show how the structure of the brain is changed in this population. Further, he provides evidence of specific biological mechanisms that mediate the relationship between disadvantage and cortical volume. The third speaker will demonstrate how those who fail to adapt to a stressful life event, widowhood, fail to recruit frontal regions when performing a cognitive-emotional task. The discussant will synthesize these findings, suggesting a key role for neuroscience in understanding biopsychosocial factors in stress. That was once a black box between stressful life experiences and health can now be imaged for the structural and functional brain correlates.

Individual Abstract Number: 2949
Disrupted Prefrontal Activity during Emotion Regulation in Complicated Grief: An fMRI Investigation
Brian Arizmendi, MA, Mary-Frances O’Connor, PhD, Department of Psychology, University of Arizona, Tucson, AZ

Complicated grief, marked by a persistent and intrusive grief lasting beyond the expected period of adaptation, is associated with a relative inability to disengage from idiosyncratic loss-relevant stimuli (O’Connor & Arizmendi, 2014). In other populations, functional magnetic activity of reduced cortical volume (95% CIs of mediation coefficients: -0.04 to -0.002 and -0.03 to -0.003), decreased increased cardiovascular risk and a flatter diurnal cortisol slope, but not other HPA measures, independently and simultaneously mediated the association between greater community disadvantage and reduced cortical volume (Woo et al. in press, PLoS Biology) shows that interventions based on psychological appraisal can influence this system and thus mitigate its contributions to pain and distress.

Individual Abstract Number: 3084
Cortisol and cardiovascular risk link community socioeconomic disadvantage to brain morphology
Peter J. Gianaros, PhD, Karissa Miller, MA, Department of Psychology, Anna Marsland, PhD, Psychology, Stephen Mauck, PhD, Department of Psychology, University of Pittsburgh, Pittsburgh, PA

Socioeconomic disadvantage at the community level confers risk for chronic physical diseases, mental illness, accelerated cognitive aging, and premature death. Community disadvantage also associates with biological and behavioral factors that adversely affect the brain, as reflected by reduced tissue volume. Here, we tested for the first time whether community disadvantage relates to reduced cortical volume using objective quantitative measurement of emissions from biofield practitioners and biofield therapy recipients. Additionally, therapeutic biofield device development may create new approaches to healing and, reciprocally, may provide new means to assess human-to-human biofield interactions.

Individual Abstract Number: 3085
Post hoc analysis evidenced activity in the dorsal ACC in the Complicated Grief group when compared to Nonbereaved (n=11) was significantly elevated (t = 9.8, p < 0.001). When compared to Nonbereaved, the Complicated Grief group showed a significantly decreased neural activity in the ventromedial prefrontal cortex (vmPFC) and the right anterior cingulate cortex (ACC) during the emotion regulation task.
and Nonbereaved groups late in the task. These findings suggest a relative inability to recruit the regions necessary for successful grief-related emotion regulation in those with Complicated Grief. This deficit was not observed in recruitment of the orbitofrontal cortex and the rACC during processing of idiographic semantic stimuli in Non-Complicated Grief.
PAPERS

Paper Session: Sleep and Cardiovascular Disease
Saturday, March 21 from 1:30 to 2:45 pm

Abstract 2915

GENDER-SPECIFIC ASSOCIATIONS BETWEEN NAP AND SLEEP BEHAVIOR PATTERNS AND C-REACTIVE PROTEIN IN MIDUS II RESPONDENTS

Jaime Devine, M.S., Neuroscience, Brandeis University, Brighton, MA, Jutta M. Wolf, Ph.D., Psychology, Brandeis University, Waltham, MA

Recent literature suggest that short sleep as well as poor sleep quality are associated with elevated C-reactive protein (CRP) levels, a central inflammatory marker closely linked to cardiovascular morbidity. Interestingly, the above associations are more prominent in women than in men. Despite the known gender-modulated associations between CRP and sleep, little is known about the role of napping behavior in this relationship.

To assess this question, data from N=313 participants (54±/-11.9 yrs., 135 males, BMI: 31.6±/-7.3) of the Midlife Development in the U.S. (MIDUS) II Biomarker study were analyzed. Nighttime sleep was recorded over the course of 7 days via actigraphy and napping behavior via the Pittsburg Sleep Diary. Fasting blood samples were used to assess C-reactive protein (CRP).

Out of 313 participants, 208 reported napping between one and seven times during the study week with frequency of napping not being different between genders. Overall, nappers got significantly less sleep per night (F=8.73; p=.003), had significantly less efficient sleep (F=4.58; p=.03), and exhibited elevated levels of CRP compared to non-nappers (F=5.26; p=.02). Within nappers, cluster analysis revealed three patterns of sleep behavior—infrequent nappers with good night sleep, predominantly nappers with good nighttime sleep (siesta sleepers), and moderate nappers with poor nighttime sleep (insomnolent sleepers). Interestingly, napping men showed comparable CRP levels regardless of their sleep behavior pattern, while women in the insomnolent cluster showed a trend to exhibit elevated CRP levels compared to women in either the predominantly night or siesta sleepers (F=1.44; p=.06).

Assessing nap behavior on the backdrop of nighttime sleep behavior appears to be crucial to further elucidate the role of sleep patterns in health, particularly in terms of risk factors such as elevated CRP. Interestingly, in the current study, poor sleep put specifically women at higher risk for morbidity, while nap behavior may have a protective effect in men.

Abstract 2533

IS DAYTIME NAPPING ASSOCIATED WITH ADOLESCENT CARDIOVASCULAR HEALTH?

Karen P. Jakubowski, BS, Psychology, Martica Hall, PhD, Psychiatry, Anna L. Marsland, PhD, Psychology, Karen A. Matthews, PhD, Psychiatry and Psychology, University of Pittsburgh, Pittsburgh, PA

Methods: Participants were 234 healthy adolescents (mean age = 15.7, 56% black, 53% female). Nocturnal sleep and daytime napping were assessed with both actigraphy and daily diaries across one week. Napping was measured as the proportion of days napped across the study period and the average minutes napped across the study period. CV risk factors included: fasting measures of CRP, interleukin-6 (IL-6), and insulin resistance (homeostatic model of insulin resistance; HOMA-IR); 24-hour SBP (obtained from ambulatory blood pressure monitoring); and sex-standardized waist circumference (WC). Linear regressions were used, adjusting for sex, race, average nocturnal sleep across the study period (measured using the same method as the nap variable of interest), and BMI percentile. Results: Adolescents napped on average 36% of the days as assessed by actigraphy and 18% of the days as assessed by diary. On average, adolescents napped 24 minutes per day by actigraphy across the week-long study period, and 26 minutes per day by diary. More days napped by actigraphy was related to elevated IL-6 [B(SE)=.49(2.2), p=.05] and lower 24-hour SBP [B(SE)= -5.29(2.64), p=.03]. Napping was not associated with WC, HOMA-IR, or hsCRP. Conclusion: No consistent association of napping with CV risk factors was observed. However, actigraphy-assessed napping associated positively with circulating IL-6, a proinflammatory cytokine that is known to impact central inflammatory processes that relate to sleep regulation. Further examination of the direction of this effect is warranted. Diary-reported napping was not associated with any CV risk factors. The results may differ in other age groups who are not as sleep deprived as is the case among adolescents. Overall, napping is an important behavior to monitor to better understand the relationship between sleep and CV health in adolescents.

The work was supported by the National Institutes of Health (HL025767, HL007560).

Abstract 3136

OBJECTIVELY-ASSESSSED SLEEP PREDICTS FRAMINGHAM RISK SCORE NEARLY TWO DECADES LATER

Martica H. Hall, PhD, Christopher E. Kline, PhD, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA, Julian F. Thayer, PhD, Psychology, The Ohio State University, Columbus, OH, Robert T. Krafty, PhD, Statistics, Temple University, Philadelphia, PA, Ellen Frank, PhD, David J. Kupfer, MD, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA

Objective: Despite advances in detection and treatment, cardiovascular disease (CVD) remains the leading cause of death in industrialized nations. Psychosomatic medicine interventions to reduce the prevalence and consequences of CVD have traditionally focused on pathways relevant to waking life including health behaviors and psychosocial functioning. Yet, mounting evidence suggests that sleep is an important determinant of both the pathophysiology and clinical course of CVD, with most of the evidence focused on sleep apnea and subjective reports of sleep duration. The present study evaluated prospective associations among objectively-assessed sleep and Framingham Risk Score measured nearly two decades later. Indices of sleep included both the amount of sleep obtained per night and the amount of slow-wave sleep (SWS), which supports physiological restoration.

Methods: 127 adults (65% female, 94% Caucasian) participated in this longitudinal study. At baseline (T1), participants were 40.9±/-8.8 years old and medically healthy; 60% had major depressive disorder and the remainder of participants had no psychiatric disorders. Participants completed laboratory sleep studies at T1 and a cardiovascular exam at T2, an average of 18.2±/-3.9 years later. Sleep duration and SWS were assessed by polysomnography at T1 and the NHLBI online calculator was used to derive Framingham Risk scores at T2. Linear regression tested prospective associations among T1 sleep and T2 Framingham Risk scores adjusting for T1-assessed body mass index, Hamilton Rating Scale for Depression (minus sleep items), marital status and length of time since baseline.

Results: On average, participants slept for 6.7±/-0.8 hours, including 45.4±/-33.8 minutes of SWS. Framingham Risk scores ranged between 0 and 30 percent, with an average of 6.6±/-6.8%. Sleep at T1 explained 14.6% of the variance in Framingham Risk at T2 [F(6,120)=4.61,p<.000], after adjusting for covariates. There was a negative linear association between each measure of sleep and Framingham Risk, with standardized Beta coefficients of -0.23 for sleep duration and -0.28 for SWS. A significant interaction was also found for sleep apnea. Further, adjusting for sleep apnea did not significantly attenuate associations among sleep duration and SWS with Framingham Risk (p’s =.006 and .002, respectively).

Conclusions: These data extend the literature linking self-reported sleep duration to cardiovascular morbidity and mortality. To our knowledge, these unique data are the first to demonstrate that objectively-assessed sleep duration and amount of SWS are independently and prospectively linked with Framingham Risk. Associations among sleep and risk were independent of other known risk factors including BMI and depression. These data suggest that sleep duration and SWS may be important targets for psychosomatic medicine interventions to reduce cardiovascular morbidity and mortality.

Support: Research support provided by R01 HL104607.

Abstract 2588

MARITAL DISTRESS IS ASSOCIATED WITH NOCTURNAL BLOOD PRESSURE NONDIPPING IN WOMEN, IN PART THROUGH SHORT SLEEP

Wendy M. Troxel, PhD, Behavior and Policy Sciences, RAND Corporation, Pittsburgh, PA, Karen A. Matthews, PhD, Psychiatry/ Psychology/ Epidemiology, Anne Germain, PhD, Daniel J. Buysse, MD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Marital distress is an independent risk factor for cardiovascular disease (CVD), but the mechanisms underlying this association remain unclear. Nocturnal blood pressure nondipping is a key prognostic indicator for CVD, and may be an important, though understudied mechanism linking marital distress with CVD. The current study examines the association between marital distress and nocturnal BP in a normotensive sample of military veterans and their partners (N = 30 couples; 82% Caucasian) and whether objectively measured sleep disturbances mediate this association. We hypothesized that during the day, women exhibit greater physiological reactivity to marital distress than men, we also examine gender as a moderator of the association between marital distress and nondipping at night. Marital distress was measured by questionnaire. Ambulatory BP was measured across 48 hours. The ratio of night/day mean arterial pressure (MAP) served as the primary outcome, with higher ratios indicating greater nondipping. Sleep was measured over two nights in the couples’ homes, using in-home polysomnography (PSG). We evaluated several indicators of sleep continuity, architecture, and duration as potential mediators; however, only short sleep duration met criteria for statistical mediation (significantly associated with both marital distress and MAP ratio).

After controlling for age, gender, body mass index, and depressive symptoms (or post-traumatic stress disorder), there was a significant sex by marital distress
interaction (B = .92; R2 = .15 p < .05). Gender-stratified models showed that for women only, there was a significant positive association between marital distress and higher MAP ratios (B = .51; R² = 30; p < .01); however, the association was non-significant in men. Short sleep duration partially mediated the association between marital distress and MAP ratios in women (40% reduction in R2); however, marital distress remained a significant correlate. These findings make unique contributions to our understanding of the role of nocturnal pathways in the association between marital distress and CVD, and suggest that women have heightened physiological responses to marital distress both day and night.

Abstract 2678
RACE DIFFERENCES IN DIURNAL CORTISOL FUNCTIONING: SLEEP AS A MEDIATOR
Laurel M. Peterson, PhD, Psychology, Bryn Mawr College, Bryn Mawr, PA, Thomas W. Kanarck, PhD, Psychology and Psychiatry, Karissa Miller, MS, Patricia Wong, MS, Barbara A. Anderson, PhD, Psychology, Matthew F. Muldoon, MD, Department of Medicine, Karen A. Matthews, PhD, Psychiatry, Psychology, Epidemiology, Stephen B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA
Emerging research demonstrates race differences in diurnal cortisol slope, an indicator of HPA-axis functioning associated with morbidity and mortality outcomes. However, methodological quality of existing work varies, and it is unknown why African Americans tend to have flatter cortisol slopes than their White counterparts. The present report examines whether race differences in diurnal cortisol slope persist with rigorous data collection methods and extensive statistical controls; and if so, what factors may account for race differences in slope.
Participants included 418 employed African American and White adults (mean age = 42.0 years, 88% White, 52% male) with no cardiovascular disease (AHAB-II cohort, Univ of Pittsburgh). Salivary cortisol was collected 4 times a day for 4 days, along with accelerometry-based assessments of physical activity (Sensewear arm band) and sleep (Actiwatch). Psychosocial constructs (e.g., socioeconomic status, affect, discrimination) and self-report health behaviors (e.g., smoking, alcohol use, physical activity, sleep) were also assessed. Cortisol slope was calculated using within-subject regression and averaged across days, and regression models were run examining 1) demographic (e.g., age, sex, wake time), 2) psychosocial (e.g., socioeconomic status, discrimination), and 3) health indicator (e.g., BMI, self-report and monitor-assessed health behavior) variables as predictors. Race emerged as a significant predictor of cortisol slope (F = 8.96, p < .05) along with total sleep time by actigraphy (F = 15.3, p < .001). Total sleep time partially accounted for the relationship between race and diurnal slope [c.i. = .05 (lower = .001, upper .006) or c.i. = .01 (lower = .002, upper .006)]. African Americans may have flatter diurnal cortisol slopes than their White counterparts, an effect which may be partially attributable to race differences in nightly sleep duration. Sleep parameters should be considered in further research on diurnal cortisol functioning, and research efforts aimed at eliminating racial health disparities should consider the impact of sleep on HPA-functioning.
Supported by HL 40962 and T32 HL007560.

Paper Session: Diabetes Saturday, March 21 from 1:30 to 2:45 pm

Abstract 3121
DEPRESSION AND ANXIETY SCREENS AS PREDICTORS OF 9-YEAR INCIDENCE OF DIABETES
Tasneem Khambaty, M.S., Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN, Christopher M. Callahan, M.D., Anthony J. Perkins, M.S., Indiana University Center for Aging Research, Indiana University School of Medicine, Indiana University, Indianapolis, IN, Jesse C. Stewart, Ph.D., Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN.
Although evidence indicates that both depression and anxiety are associated with an increased risk of diabetes, most studies have examined these correlated emotional factors in isolation. Consequently, we simultaneously examined depression and anxiety screens as predictors of incident diabetes over a 9-year period among older adults. Participants were 1,987 primary care patients initially free of diabetes [M (SD) age: 69.2 (7.3) years, 68% female, 54% African American]. Patients who endorsed either of the two depression items (13.5%) or either of the two anxiety items (41.7%) on the PRIME-MD during routine primary care visits at baseline (1999-2001) were coded as screening positive for depression and anxiety, respectively. Data regarding incident diabetes - defined as either (a) an ICD-9 diabetes code of 250, (b) a positive laboratory value (hemoglobin A1c ≥ 8.5% or fasting glucose ≥ 126 mg/dL), or (c) diabetes medication use between baseline and 12/31/2009 - were obtained from local electronic medical record data merged with Medicare/Medicaid data. Over the 9-year period, 502 (25.3%) cases of incident diabetes were identified. Cox proportional hazards models (adjusted for age, sex, race/ethnicity, hypertension, hypercholesterolemia, body mass index, and smoking) revealed that a positive screen for anxiety, but not depression, was associated with an increased risk of incident diabetes when entered into separate models (Anxiety HR=1.35, p=.001; Depression HR=1.13, p=.33), as well as when entered simultaneously into one model (Anxiety HR=1.35, p=.002; Depression HR=1.01, p=.96). When each of the anxiety screen items were examined in separate models, both the Worry item and the Feeling Anxious item were positively associated with incident diabetes (Worry HR=1.27, p=.01; Feeling Anxious HR=1.26, p=.02). This pattern was also observed when these two models were further adjusted for the depression screen (Worry HR=1.26, p=.02; Feeling Anxious HR=1.24, p=.03). Our findings suggest that older adults with anxiety symptoms may be at an increased risk of incident diabetes, independent of depressive symptoms. More attention should be paid to anxiety as a potential risk factor for diabetes among older adults.

Abstract 2809
THE DIRECTORIES OF DEPRESSION IN AN ONSET COHORT OF ADULTS WITH TYPE 1 DIABETES: SIX YEAR FOLLOW-UP
Oskar Mittag, Sc.D, Hanna Kampling, Dipl.-Psych., Erik Farin-Clatthacker, PhD. Institute for Quality Management and Social Medicine, University Medical Center of Freiburg, Freiburg, BW, Germany, Stephan Herpertz, MD, Frank Petruk, PhD, 2 Department of Psychosomatic Medicine and Psychotherapy, LWL-University Clinic Bochum, Ruhr-University Bochum, Bochum, NW, Germany
Background: Depression is a common comorbidity in diabetes. Meta-analyses indicate that depression is associated with poor glycemic control and increased risk for diabetes related complications. However, studies on depression in adult onset type 1 diabetes are scarce.
Methods: We followed a sample of 313 adults with newly diagnosed type 1 diabetes over six years. Depression was diagnosed by DSM-IV interviews at study intake, and depressive symptoms were assessed yearly using the SCL-90-R depression subscale (age and sex adjusted T scores). To identify typical trajectories of depression over time we applied growth mixture modeling (GMM; software Mplus 7.2).
Results: Mean age of the sample at the time of diabetes onset was 28 years (range=17-40 years); 62 percent were male. The initial one month prevalence rate for major depression (5.8%) was roughly twice that of the total age and gender matched general population. Almost 80 percent of the sample had SCL-90-R depression scores two standard deviations above the mean over the six year period. 25 percent showed a marked increase in depressive symptoms over the six year period; 26 percent showed a marked decrease in depressive symptoms over the six year period. 49 percent showed no change in depression over the six year period. 2 percent showed more than two standard deviations increase in depression over the six year period. These findings make unique contributions to our understanding of the role of depressive symptoms.
Conclusions: The majority of patients with an adult onset of diabetes type 1 exhibit no signs of depression during the six years of observation. However, a smaller group of patients show increasing symptoms over time starting from mild to moderate depression, and they also show poor glycemic control as well as high disease burden in daily life. Results of this study suggest repeated monitoring of depressive symptoms in patients with adult onset of diabetes type 1. 
Abstract 2919
PARENTAL HISTORY OF DIABETES AND DIABETES: MODERATION BY DEPRESSIVE AFFECT AND POSITIVE AFFECT
Vera Tsenkova, PHD, Institute on Aging, University of Wisconsin-Madison, Madison, WI
Family history of diabetes is one of the major risk factors for diabetes but significant variability in this association remains unexplained. Further, powerful effect modifiers such as obesity and physical activity have been documented. To our knowledge, no previous work has examined whether psychological factors also moderate the relationship between family history of diabetes and diabetes. Therefore, we looked at various aspects of one’s emotional landscape and examined the relationships among parental history of diabetes, CESD subscales (depressive affect, positive affect, somatic complaints, and interpersonal) and diabetes in a national sample of adults (MIDUS II, analytical sample: N=1022). As expected, parental history of diabetes was a significant predictor of diabetes for both men (OR=3.55, p<.001) and women (OR=3.2, p<.001) while none of the CESD measures were significant as main effect predictors of diabetes. However, we found that for women, depressive symptoms amplified the relationship between parental history of diabetes and diabetes (p<.05), while positive affect buffered it (p<.01), after adjusting for an extensive set of health and sociodemographic covariates. No effects were evident for men. These results suggest that examining combination of risk and protective factors is key for better understanding the biopsychosocial pathways to multifactorial diseases such as diabetes, with the ultimate goal of developing targeted interventions.

Abstract 2635
SELF-RATED HEALTH AND OCCUPATIONAL STATUS EXPLAIN THE ASSOCIATION BETWEEN STRESS AND INCIDENT DIABETES: EVIDENCE FROM THE IPC COHORT STUDY
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Background: The involvement of stress in the onset of type 2 diabetes is a widespread lay belief but observational studies produced inconsistent results. Based on the hypothesis that positive findings may be explained by residual confounding, the aim of this prospective study was to explore the role of occupational status and self-rated health in the association between perceived stress and incident diabetes.
Methods: The 4-item Perceived Stress Scale was completed at baseline by 27,356 participants aged 18 years or more (18,124 men, mean age ± SD: 45.9 ± 11.9 years), who had two health checkups subsidized by the French national health care system. All subjects were free from diabetes at baseline, defined as having a fasting blood glycaemia ≥7mmol/L or using antidiabetic drugs.
Results: After a mean follow-up of 5.2 ± 2.1 years, 664 participants (2.4%) had incident diabetes. After initial adjustment for age, gender, family history of diabetes and time interval between visits, the association between baseline perceived stress and diabetes at follow-up was significant (OR [95% CI] 1.31 [1.15-1.49]). This association remained significant (OR 1.20 [1.04-1.37]) after further adjustment for smoking status, alcohol intake, physical activity, high-density lipoprotein cholesterol, triglycerides, waist circumference, Body Mass Index and high blood pressure. In contrast, this association disappeared (OR 1.04 [0.90-1.19]) after further adjustment for occupational status and self-rated health only. Odds ratios (OR) are given per 5-point increment of the 4-item Perceived Stress Scale (i.e., the difference between the 25th and the 75th percentile).
Conclusion: In this large prospective study, self-rated health and occupational status accounted for the association between stress and incident diabetes.

Abstract 2519
PSYCHOLOGICAL RESOURCES AND GLUCOREGULATION IN JAPANESE ADULTS: FINDINGS FROM MIDJA
Jennifer M. Borkin Boylan, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, Carol D. Ryff, PhD, Psychology, University of Wisconsin, Madison, Madison, WI
Background. Rates of type 2 diabetes have increased dramatically in Japan in recent years, yet little research has focused on psychological factors that contribute to healthy glucoregulation in this population. Further, literature on psychological resources predicting better physical health has primarily utilized Western samples, and it is unknown whether these results will generalize to an Eastern cultural context. Objective. To examine associations among psychological resources and glucoregulation in Japanese adults. The resources under investigation included hedonic (i.e., life satisfaction, positive affect) and eudaimonic (e.g., environmental mastery, purpose in life) well-being familiar to Western conceptualizations of the “good life” as well as resources that may be more relevant in an Eastern cultural context such as gratitude, positive disengagement, and ikigai (i.e., a reason for being). Method. Data came from the Midlife in Japan (MIDJA) Study, with participants randomly selected from the Tokyo metropolitan area. A subsample completed biological data collection (N=382; 56.0% female; M(SD)age = 55.5(14.0) years). Glucoregulation outcomes included glycosylated hemoglobin (HbA1c) and diabetic status (non-, pre-diabetic, or diabetic). Models adjusted for age, gender, educational attainment, smoking, alcohol, chronic conditions, and body mass index. Results. Several psychological resources predicted healthier glucoregulation profiles (i.e., lower HbA1c and lower risk of pre-diabetes or diabetes) in fully adjusted models, including personal growth, purpose in life, self-acceptance, life satisfaction, gratitude, and positive disengagement (p’s < .05). A one SD increase in well-being was associated with a 1-2% decrease in HbA1c. Results further remained significant after adjusting for negative affect. Conclusion. Overall, results support salubrious associations among psychological resources and glucoregulation measures, independent of traditional risk factors, in a sample of Japanese adults. Though longitudinal research is needed, current results support the promotion of well-being as an effective target for intervention given the potential for improved mental and physical health.

Paper Session: Trauma and Health
Saturday, March 21 from 3:00 to 4:00 pm
Abstract 3016
THE ROLES OF PTSD AND DEPRESSION SYMPTOM SEVERITY IN LINKING MILITARY STRESSORS AND FUNCTIONAL HEALTH OUTCOMES IN MALE AND FEMALE VETERANS OF OEF/OIF
Brian N. Smith, PhD, Department of Psychiatry, Boston University School of Medicine, Anna L. Tycik, BS, Women's Health Sciences Division, Dawne Vogt, PhD, Department of Psychiatry, Boston University School of Medicine, National Center for PTSD, VA Boston Healthcare System, Boston, MA
Background: Exposure to potentially traumatic stressors during military deployment puts service members at risk for health problems and reduced quality of life post-deployment. The relationship between stressor exposure and functional health is complex, with numerous factors potentially impacting the likelihood of subsequent health problems. Posttraumatic stress disorder (PTSD) and depression are associated with poor health in both civilians and veterans, and thus represent potential pathways of risk. The present study examined associations between key military stressors (warfare exposure and perceived threat) and post-deployment functioning, with a focus on the potential mediating roles of mental health symptomatology.
Methods: Participants included 1,043 veterans (54% female) assessed within two years after return from deployment to OEF or OIF. The DRR-2 was administered to assess deployment factors, PTSD symptoms were assessed using the PCL-M, depression symptoms were assessed via an adapted version of the BDI-PC, and physical and mental health-related quality of life (HRQOL) and functioning were assessed using the SF-12. A regression-based path analysis framework was applied for estimating direct and indirect effects of warfare exposure and perceived threat on physical and mental HRQOL. Pathways were tested in multiple mediator models, and indirect effects were examined via bootstrapping. All analyses adjusted for gender, ethnicity, and post-deployment life stressors.
Results: PTSD was found to be a significant mediator of warfare exposure and perceived threat as predictors of both physical and mental HRQOL. With the exception of the warfare exposure-physical health association, indirect paths for depression symptoms were also significant. The indirect path through PTSD was significantly stronger than the path through depression in all of the analyses.
Conclusions: Study results suggest that salient deployment stressors are associated with reduced quality of life and functioning, and that risk mechanisms through PTSD and depression largely account for these associations. PTSD appears to be a particularly strong risk mechanism, underscoring the need for PTSD-related services in this population.
Table: Tests of direct and indirect pathways linking deployment stressors and functioning.

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<td>.28***</td>
<td>.023</td>
<td>.23, .33</td>
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<td>.03**</td>
<td>.011</td>
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<td>.04*</td>
<td>.017</td>
<td>.01, .07</td>
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<tr>
<td>IV to PTSD Sx to DV (ab1)</td>
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<td>IV to depression Sx to DV (ab2)</td>
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<td>.041</td>
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<tr>
<td>IV to depression Sx to DV (ab2)</td>
<td>-.09*</td>
<td>.016</td>
<td>-.12, -.06</td>
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*p < .05; **p < .01; ***p < .001

Abstract 2798
IMPAIRED AUTONOMIC MODULATION AND ABNORMAL CIRCADIAN VARIATION IN MALE TWINS WITH POSTTRAUMATIC STRESS DISORDER
Lei Weng, MPH, Epidemiology, Emory University, Atlanta, GA. Viola Vaccarino, MD, PhD, Epidemiology, Emory University, Decatur, GEORGIA. Rachel Lampert, MD, Medicine, Yale University, New Haven, CT. J. Douglas Brenner, MD, Psychiatry, Emory University, Atlanta, GA. Jack Goldberg, PhD, Epidemiology, University of Washington, Seattle, Washington. Forrester Lee, MD, Medicine, Yale University, New Haven, CT. Amit J. Shah, MD, MSCR, Epidemiology, Emory University, Atlanta, GA. GEORGIA

Background: Posttraumatic stress disorder (PTSD) is a prevalent disorder, especially amongst veterans. A core symptom is sleep disturbance related to flashbacks, hypervigilance, alcohol abuse, and nightmares. This may lead to impaired autonomic modulation at night and downstream sleep-related pathophysiologic effects. We investigated the relationship between PTSD and nighttime heart rate variability (HRV), a measure of autonomic modulation, in a group of Vietnam era veteran twins.

Methods: One hundred and thirty-four middle-aged veteran male twins (67 pairs) from the Vietnam Era Twin (VET) Registry were evaluated using ambulatory ECG monitoring to measure HRV. Each pair was examined together and performed similar activities during monitoring at Emory University. PTSD status was assessed with the Structured Clinical Interview for Psychiatry Disorders. Mixed-effects regression models were used to examine the association of current PTSD (symptoms within 30 days) and nighttime HRV (11 PM until 7 AM), while adjusting for potential confounding factors, including socio-demographic factors, cardiovascular (CVD) risk factors, drug/alcohol abuse, and beta-blocker use. Within-pair analysis of PTSD discordant twins controlled for possible unmeasured familial and genetic factors.

Results: Current PTSD (n=16) was associated with lower low-frequency (LF) HRV during nighttime both in models evaluating twins as individuals, and within 15 pairs discordant for current PTSD. In models adjusted for sociodemographics and traditional CVD risk factors within PTSD discordant pairs, the twins with PTSD had a 48% lower nighttime LF HRV (p=0.01) than their control brothers without PTSD. No interaction with zygosity was found. PTSD was also associated with significantly lower high-frequency (HF) and very-low-frequency (VLF) nighttime HRV in unadjusted and adjusted models. When comparing nighttime to daytime HRV, LF HRV decreased at night by 36% compared to the day in PTSD twins, while it increased by 7% in those without PTSD. The difference between PTSD and no PTSD was significant (p=0.02) within discordant pairs in adjusted models.

Conclusion: Nocturnal LF HRV was lower in PTSD veterans than those without, and showed a different circadian pattern, with LF HRV decreasing at night in PTSD, and increasing in controls. This may presumably be due to nighttime symptoms in PTSD, for example. Further study of this relationship is warranted and may have clinical implications towards CVD risk reduction in PTSD.

Abstract 2691
PRE- AND POST-OPERATIVE LEVELS OF STRESS HORMONES CAN PREDICT SYMPTOMS OF POST-TRAUMATIC STRESS FOLLOWING TOTAL KNEE REPLACEMENT SURGERY
Julie K. Cremeans-Smith, PhD, Psychological Sciences, Kent State University at Stark, N Canton, OH, Kenneth Greene, MD, Orthopaedics, Cleveland Clinic, Cleveland, OH, Douglas L. Delahanty, PhD, Psychological Sciences, Kent State University, Kent, OH

The cognitive and behavioral symptoms of posttraumatic stress disorder (PTSD) are accompanied by, and may be predicted from, alterations in physiological stress systems. However, studies to date have largely assessed stress biomarkers following trauma exposure, limiting understanding of whether alterations in stress physiology exist prior to trauma exposure or develop in response to the stressful event. The present study examined the relationship of pre- and post-event stress hormones to post-traumatic stress symptoms (PTSS) in a surgical population.

Participants were 110 patients (35 males and 75 females) between the ages of 49 and 90 (M=69.2) undergoing unilateral total knee replacement surgery (TKR). The majority of the sample was Caucasian (92.8%) and undergoing TKR for the first time (75.5%). Catecholamine and cortisol levels were measured in 15-hour urine samples collected prior to and 1-month following surgery, and participants completed the Impact of Event Scale 1- and 3-months following surgery. Final regression models controlled for relevant demographic characteristics, pre-operative depressive symptoms, and volume of the urine sample. Patients with higher urinary cortisol levels prior to surgery reported more PTSS 1-month following surgery (R2 = .087; β = .307, p = .054). Baseline catecholamine levels were not related to post-operative PTSS. One month following surgery, patients with higher urinary epinephrine levels reported more PTSS (R2 = .106; β = .345, p = .007). In addition, levels of norepinephrine 1-month following surgery were positively related to 1-month intrusions (R2 = .114; β = .356, p=.026), but neither avoidance symptoms nor total PTSS. Results of the present study suggest that patients’ PTSS 1-month following surgery can be predicted on the basis of pre- and post-operative levels of stress hormones. PTSS are associated with severe pain and functional limitations following surgery, the ability to predict its occurrence from biomarkers has significant implications for the development of targeted interventions.
Abstract 2975
POSTTRAUMATIC STRESS DISORDER SYMPTOMS AND HYPERCOAGULABILITY IN ACUTE CORONARY SYNDROME PATIENTS
VY T. Ho, BS, Daichi Shimbo, MD, Medicine, Columbia University Medical Center, New York, NY; William Whang, MD, MS, Medicine, Columbia University Medical Center, New York, New York, Melissa J. Chang, MS, Joan Duer-Hefele, RN, Donald E. Edmondson, MD, MPH, Medicine, Columbia University Medical Center, New York, NY

Background: Posttraumatic stress disorder (PTSD) after an acute coronary syndrome (ACS) event is associated with an increased risk of cardiovascular events and mortality (Edmondson et al., 2013). Thrombus formation over a disrupted atherosclerotic plaque underlies recurrent cardiovascular events after an ACS event. We examined the associations of PTSD with coagulation parameters including activated partial prothrombin time (aPTT) and prothrombin time (PT) levels in post-ACS patients.

Methods: The Reactions to Acute Care in Hospitalization (REACH) study is an ongoing observational cohort study of psychosocial factors and cardiaco/mortality risk in cardiac patients being evaluated for ACS. Patients underwent coagulation testing including aPTT and PT in the emergency room and completed the PTSD Checklist-Civilian version (PCL-C) based on a prior traumatic event. Demographics, confirmed ACS status, anticoagulant history (warfarin, aspirin, and heparin), Global Registry of Acute Coronary Events (GRACE) score, and Charlson comorbidity index were taken from chart review.

We conducted separate analyses in the full sample and in the subsample with confirmed ACS. Linear regression was used to test whether PCL-C scores were associated with hypercoagulability (aPTT, PT, platelet count) with adjustment for demographic and clinical variables, anticoagulant history, and ACS type (for confirmed ACS cases) as a sensitivity analysis.

Results: In the full sample of 188 patients (56% men, age 61 ± 13), after adjustment for demographic and clinical variables, and history of anticoagulant use, higher PTSD symptoms were associated with lower aPTT values (β = 0.17, p = 0.01). Although the associations were in the same direction, PTSD symptoms were not significantly associated with PT values or platelets. In the subanalysis limited to only confirmed ACS patients (N = 64), PTSD symptoms were not significantly associated with hypocoagulation, although the effect size for aPTT was similar to the full sample (β = 0.13).

Conclusions: Findings suggest that PTSD may be associated with reduced aPTT, a marker of clotting speed, and they provide preliminary evidence that the hypercoagulable effects of PTSD may be partially explained by hemodynamic instability.

Paper Session: Social Relationships and Health
Saturday, March 21 from 3:00 to 4:00 pm

Abstract 2783
DAYTIME SALIVARY CORTISOL SECRETION IS ASSOCIATED WITH THE QUALITY OF DAILY LIFE MARITAL INTERACTIONS AS MEASURED BY ECOLOGICAL MOMENTARY ASSESSMENT
Mark C. Thomas, BS, Psychology, University of Pittsburgh, Pittsburgh, Pennsylvania, Thomas W. Kamarek, PhD, Barbara Anderson, PhD, Karissa Miller, Masters, Psychology, University of Pittsburgh, Pittsburgh, PA, Laurel M. Peterson, PhD, Psychology, Bryn Mawr College, Bryn Mawr, PA, Stephen B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, Pennsylvania

Although emerging evidence suggests that marital quality may have broad implications for health risk, global measures of marital quality have not been found consistently associated with differences in salivary cortisol secretion. It is possible that the quality of marital interactions during daily life relate more reliably to adrenocortical activity. Here, we examined whether positive and negative marital interactions in daily life would be associated with differences in daytime salivary cortisol secretion. In a sample of 320 healthy, employed middle-aged adults who were married or living with a partner in a marital relationship (mean age = 42.5 years, 85% white, 51% men), global measures of marital quality were calculated from ecological momentary assessments for 4 days (3 work and 1 non-work), with participants rating the presence and quality of current or recent partner interactions on positive and negative characteristics (e.g., agreeableness and conflict). We measured cortisol area under the curve (AUC) using five samples collected from wake time to bedtime (0 minutes, 30 minutes, 4 hours, 8 hours, bedtime) during each monitoring day, averaged across days. After adjusting for demographic and lifestyle covariates, the relative frequency of positive marital interactions associated positively with mean daily AUC (F = 5.06, b = 33.19, p = .0251). Conversely, the relative frequency of positive marital interactions was associated with lower AUC, but only for females (F = 4.17, b = -73.35, p = .0420). Global measures of marital quality (DAS) were not related to daytime salivary cortisol indices. Daily marital interactions may be associated with daytime salivary cortisol secretion, a plausible mechanism linking marital quality and health. EMA measures of marital interaction appeared to outperform global measures of marital quality in this study, suggesting that these indices may provide more sensitive markers of the behavioral triggers of cortisol secretion. These data also have implications for understanding possible gender differences in the effects of marital quality on health.

Paper Session: Emotional Regulation and Stress Response
Saturday, March 21 from 4:00 to 5:00 pm

Abstract 3133
THE EFFECT OF EMOTIONAL APPROACH COPING, SOCIAL SUPPORT AND EMOTIONAL EXPRESSION ON STRESS REACTIVITY: AN EXPERIMENTAL TEST
Heidi S. Kane, PhD, School of Behavioral and Brain Sciences, University of Texas at Dallas, Richardson, TX, Joshua F. Wiley, MA, Christine Dunkel Schetter, PhD, Theodore F. Robles, PhD, Psychology, University of California Los Angeles, Los Angeles, CA

Emotional expression and seeking social support are commonly employed coping strategies. However, the degree to which these strategies are effective at reducing physiological and psychological stress reactivity may depend on individual differences. Emotional approach coping (EAC) involves the tendency to process and express emotions in response to a stressor. The purpose of this study was to experimentally examine how EAC moderates the effects of emotional expression to and social support from a romantic partner on physiological and psychological stress reactivity. We brought (N=137) couples to the lab and randomly assigned one partner (the participant) to perform a stressful speech and arithmetic task. We then manipulated whether or not participants expressed their thoughts and feelings about the task to their partner via written notes (emotional expression vs. no-expression), and whether or not participants received supportive messages or responses to their expressions from their partner (social support vs. no-support). We examined physiological (cortisol and salivary alpha amylase, sAA) and psychological (negative affect) reactivity to, and cognitive recovery (post-task rumination and self-appraisals) from the task. Results revealed that irrespective of support, higher EAC was associated with greater sAA reactivity in the express condition, but not in the no-express condition. Additionally, the effect was moderated by greater cortisol reactivity in the expression/support condition, but was associated with attenuated cortisol reactivity in the expression/no-support condition. Finally, irrespective of expression, higher EAC was associated with less negative affective reactivity, less negative rumination, and increased self-esteem in the support condition, but not in the no-support condition. These findings suggest
that for those high in EAC, emotional expression “in the moment” in response to a stressor can increase stress reactivity, particularly in the absence of a supportive response. In contrast, receiving social support “in the moment” reduces stress reactivity and promotes recovery for those high in EAC.

**Abstract 2732**

**OPIOIDS AND SOCIAL BONDING: THE EFFECT OF NALTREXONE ON FEELINGS OF SOCIAL CONNECTION**

Tristen K. Inagaki, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Lara A. Ray, PhD, Psychology, University of California, Los Angeles, California, Michael R. Irwin, M.D., Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA, Baldwin M. Way, PhD, Psychology, The Ohio State University, Columbus, OH, Naomi I. Eisenberger, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA

Having and maintaining close social bonds is so critical to health, well-being, and normal functioning that bonding has been referred to as a basic need, much like the need for food and water. In fact, being deprived of care and support early in life results in severe cognitive, social, developmental, and health consequences throughout development. Although humans require close social bonds to survive and thrive, few studies have explored the experience of social connection and the resulting positive, contented feelings associated with being close to others. Furthermore, little is known about the neurochemical mechanisms that help support social bonds, especially in humans. According to the brain opioid theory of social attachment, opioids, neurochemicals known for their association with feelings of euphoria, may underlie the contented feelings associated with social connection and may be critical to continued bonding. However, the role of opioids in feelings of connection toward close others has not yet been examined in humans. In a double-blind, placebo-controlled, crossover study of naltrexone (an opioid antagonist), 31 volunteers took naltrexone for 4 days (25 mg on days 1 and 2, 50mg on days 3 and 4) and placebo for 4 days (separated by a 10-day washout period). Participants came to the laboratory once on the last day of taking naltrexone and once on the last day of taking the placebo to complete a task designed to elicit feelings of social connection. Participants also completed daily reports of feelings of social connection while on naltrexone and placebo. In line with hypotheses, and for the first time in humans, results demonstrated that naltrexone (vs. placebo) reduced feelings of connection both in the lab and in daily reports. These results highlight the importance of opioids for social bonding with close others, lending support to the brain opioid theory of social attachment and furthering our understanding of the neurochemical mechanisms that contribute to social bonding and connection.
ATTACHMENT STYLES AND ITS RELATIONSHIP TO SYMPTOM SEVERITY IN SOCIAL ANXIETY DISORDER

Stefanie Rambau, Diplom Psychologist, Franziska Geiser, MD, Alexandra Kleiman, PhD, Ingo Wegener, PhD, Anne Sarah Koch, Diplom Psychologist, Rupert Contini, MD, PhD, Department of Psychiatry and Psychotherapy, Bonn University Clinic, Bonn, North Rhine-Westphalia, Germany

Attachment theory provides a helpful framework to understand the development and maintenance of social anxiety disorder (Vertue, 2003). Little is known concerning the influence of specific attachment styles on symptom severity. As part of the research project Social Phobia Research participants have been investigated with regard to their attachment styles. The present study compared 222 participants with social anxiety disorder and 70 healthy controls (HC). To determine attachment styles, the German version of the Attachment Styles Questionnaire (ASQ) has been used. The ASQ allows the description of participants along the following attachment dimensions: secure, fearful, preoccupied and dismissing. Moreover, social anxiety symptom severity has been assessed with the German version of the Social Phobia Inventory (SPIN). To measure depression symptoms and severity the German version of the Beck Depression Inventory (BDI) was utilized. An analysis of covariance as well as an regression analysis (AV: SPIN; UV: ASQ) have been calculated. Probands with social anxiety disorder, compared to HC, were significantly older (p<0.001), more depressed (p<0.001) and had higher symptom rates of social anxiety (p<0.001). There were no significant gender differences between both groups. The analysis of covariance with age, depression severity and severity of social anxiety symptoms as covariates revealed that probands with social anxiety disorder, compared to HC, showed significantly higher rates with regard to the preoccupied style (p<0.001) as well as the fearful style (p<0.001) and significantly lower rates with regard to the secure style (p=0.001). There were no significant differences between both groups with regard to the dismissing style. Looking only at the probands with social anxiety disorder, the stepwise linear regression analysis revealed that particularly the preoccupied attachment style is associated with higher social anxiety symptom severity (p<0.001). This regression model accounts for 20.8% of the variation in symptom severity. Our results suggest that persons with social anxiety disorder show insecure attachment styles more frequently. These findings shed light on the importance of attachment security for psychotherapy in these patients.

IMPACT OF PSYCHOLOGICAL HEALTH ON THE ENDOTHELIAL FUNCTION AND THE HPA-AXIS ACTIVITY IN HEALTHY ADOLESCENTS

Yun Chen, PhD, Walter Osika, MD, PhD, Frida Dangardt, MD, PhD, Peter Friberg, MD, PhD, Department of Moleculer and Clinical Medicine, The Sahlgrenska Academy, University of Gothenburg, Gothenburg, Please Select, Sweden

Objectives: The development of adolescent psychological health and its relationship to the endothelial function and the hypothalamic-pituitary-adrenal (HPA)-axis activity were examined in a cohort of healthy adolescents in a longitudinal study.

Methods: A total of 162 adolescents (94 females) participated in both baseline and follow-up assessments. Psychological health was evaluated by self-report using the Beck Youth Inventories of Emotional and Behavioral Pattern (BYP) and the Depression Anxiety Stress Scale (DASS). Endothelial function was assessed using a peripheral artery tonometry device. The HPA-axis activity measured as cortisol awakening response (CAR) was assessed only at the follow-up by collecting two saliva samples, immediately after awakening and 15 min later. Physical activity, smoking and parental education were assessed by questionnaires.

Results: Females reported psychosomatic complaints and males reported increased depression over three years. Regression analysis showed that in males, negative emotions over 3-year, especially anger (β=−0.332, p=0.018) and disruptive behaviour (β=−0.39, p=0.006), were important determinants for changes in the endothelial function after adjusting for age, parent’s education, changes in blood pressure, physical activity and smoking over three-year. In females, negative emotion over 3-year especially anxiety (β=−0.272, p=0.027) was inversely associated with CAR, while positive emotion such as self-compassion (β=0.356, p=0.004) was positively associated with CAR after adjusting for age, BMI and smoking at three-year follow-up, sampling season, awakening time and parent’s education.

Conclusion: Our study provides new evidence supporting the contention that emotional status during adolescence plays an important role in the regulation of the endothelial function and the HPA-axis activity.
Descartes University of Medicine, Paris, Ile de France, France, Frederic Lomison, MD, PhD, Psychiatry, Paris Descartes University of Medicine, Paris, Ile de France, France, Cedric Lemogne, MD, PhD, CL-Psychiatry, European Georges Pompidou Hospital, INSERM U894, Paris Descartes University of Medicine, Paris, Ile de France, France

Background: Association between obesity and alexithymia has already been documented, but the role of alexithymia on responsiveness to bariatric surgery has not been explored yet.

Objective: To examine whether post-operative changes of psychosocial characteristics in obese patients are associated with baseline alexithymia.

Methods: 308 obese patients (82.8% females), aged 40.5 (SD: 12.1), with a mean Body Mass Index (BMI) of 45.2 (6.4) were assessed prior to bariatric surgery with several psychosocial questionnaires including Toronto Alexithymia Scale (TAS), BDI (depression), SF36 (quality of life), and EDI (eating disorders). 102 of them completed the same questionnaires again 14.1 (2.5) months after surgery. Analyses were weighted by the reverse of the probability of having follow-up data, computed via a logistic regression based on baseline characteristics.

Results: At baseline 31.6% of the patients could be considered as alexithymic, according to the French cutoff (≥56). Several psychosocial scores were poorer in alexithymic patients. At follow-up all of the SF36 dimensions, except Mental Health, and three EDI dimensions (Drive for Thinness, Bulimia, and Body Dissatisfaction) improved. ANOVAs of psychosocial scores changes as dependent variables, with categorical TAS score as main effect, found an alexithymia effect, with an improvement only in alexithymic obese patients and no change or even an impairment in non alexithymic individuals, for SF36 Mental Component Summary (P=0.038) and EDI Body Dissatisfaction (P=0.032), Ineffectiveness (P=0.037), Interpersonal Disturb (P=0.003), Lack of Interoceptive Awareness (P=0.012) and Maturity Fears (P=0.005). In any case, when adjusting for the corresponding baseline score, this moderating effect disappeared.

Discussion: Alexithymic obese patients are characterized by higher psychosocial burden than their non alexithymic counterparts and look more responsive to bariatric surgery regarding psychosocial benefits. Results are relevant for clinical management of obese patients, but could also indicate a regression towards the mean phenomenon, rather than a specific effect of alexithymia.

254) Abstract 3043
TRANSLATING BASIC BEHAVIORAL SCIENCE OF LEARNING AND MOTIVATION INTO AN ADAPTIVE COMMUNITY-BASED OBESITY TREATMENT FOR AFRICAN AMERICAN ADOLESCENTS
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African American adolescents are disproportionately affected by obesity, and the few trials focusing on this group have had limited success. In a sequential multiple assignment randomized trial, 181 youth ages 12 to 16 years with primary care providers and their caregivers were randomly assigned to 3 phases of home-based versus office-based delivery of motivational interviewing (MI) plus skills building. After 3 months, non-responders to first phase treatment were re-randomized to continued home-based skills or contingency management. Primary outcome was percent overweight and hypothesized moderators were adolescent baseline PA, executive functioning, the relative reinforcing value of food. There were no significant differences in primary outcome between home-based or office-based delivery or between continued home-based skills or contingency management for non-responders to first-phase treatment. However, families receiving home-based treatment initially attended significantly more sessions in both phases of the trial, and families receiving contingency management attended more sessions in the second phase. Overall, participants demonstrated decreases in percent overweight over the course of the trial, and adolescents with higher executive functioning, higher baseline PA and lower RRV lost more weight. Future directions include a basic behavioral science study using a multiple baseline design to understand the relationship between RRV, executive functioning, IMRI and food choices in this group and the development of PA interventions.

255) Abstract 3044
IMPROVING HEALTH OUTCOMES WITH HOME-BASED PERSONAL FITNESS COACHING IN YOUNG ADULTS WITH HIV
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African Americans (AA) have higher rates of many chronic diseases that may be improved with physical activity (PA). PA may improve the immune system and cardiovascular risks of young adults with HIV. The purpose of the study was to examine feasibility and acceptability of FLEX, a home-based PA program integrated with Motivational Interviewing (MI). We first conducted a focus group with 10 AA young adults (ages 19 to 27; 80% male). Results suggested that PA was a desirable intervention, and that home-based would be convenient and acceptable to the majority of participants. The modality preferred by most was resistance training. After extensive manualization with an interdisciplinary team, FLEX consisted of an initial MI session followed by 3 months of high intensity interval training (HIIT)and resistance bands with a motivational PA and adherence goal setting at the end of each session using a tapered design: one month with 3 visits per week, a second month with 2 visits per week, and a 3rd month with 1 visit per month. Participants were encouraged to add independent PA sessions, and they are also taught self-monitoring PA and medication adherence. For the initial MI pilot, young adults were recruited from the local youth HIV clinic. Eligibility included HIV, ages 16 to 24, physician PA clearance, and suboptimal PA. Of 13 eligible, only 2 refused consent. Of the 11 consented, 9 also met age-matched criteria for obesity. Youth completed a fitness assessment at baseline and 3 months. To date, 6 young adults have completed the program. Of 24 sessions, a mean of 16 sessions were completed (70%). Preliminary findings with data available from 5 youth suggest improvements at 3 months in strength assessments, and reductions or maintenance of BMI. Six-month follow-up data including health outcomes will also be presented. Exit interviews revealed high participant satisfaction and a strong desire to continue the program beyond 3 months, but that 3 sessions per week were too difficult to schedule. The manual was subsequently revised to a 6-month program where the first 3 months consist of 2 sessions per week and the second three months consists of 1 session per week (36 sessions). Data from this new protocol will also be presented.

256) Abstract 3047
TRANSLATING THE NEUROSCIENCE OF PROSPECTIVE MEMORY INTO A NEW ADHERENCE INTERVENTION FOR YOUTH WITH HIV
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Medication adherence rates among youth living with HIV are inadequate to effectively manage the disease, and novel interventions grounded in basic behavioral science are needed. Emerging evidence suggests that prospective memory (PM) could represent an important piece of the puzzle. PM is defined as the neurocognitive capacity to successfully form, maintain, and execute an intention at a particular point in the future in response to a specific cue. We first conducted theory-driven laboratory studies to improve three components of PM using a within-subjects design and traditional cognitive neuroscience tasks (strategic encoding, monitoring, and cue salience) in 60 youth with HIV (ages 16 to 24). Results suggested that encoding and cue salience manipulations improved PM in youth in the lab, but the monitoring manipulation did not. We subsequently tested a single session visualization and cue-intention pairing adherence intervention followed by text message reminders for visualization (Imagine That). We are currently testing “Imagine That” in an innovative multiple baseline design with trajectory analysis in 24 youth (12 with substance use and 12 youth without). Immediate post-test data of this second phase will also be presented.

257) Abstract 2698
SELF-KINDNESS MEDIATES EFFECTS OF MINDFULNESS ON DEPRESSION IN BREAST CANCER SURVIVORS: MULTIPLE MEDIATION ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL
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Background: Mindfulness meditation may improve psychological distress among individuals with cancer. However, mechanisms for intervention effects have not been determined. Mindfulness may lead to improvements in emotion regulation strategies, including decreased use of maladaptive strategies such as rumination, and increased use of adaptive strategies such as cultivating self-kindness. Little research has examined whether these strategies contribute to reductions in distress, or compared the magnitude of their effects. The current study tested these associations in a sample of breast cancer survivors enrolled in a mindfulness meditation randomized controlled trial. Specifically, we tested whether changes in rumination and self-kindness across the trial mediated reductions in depressive symptoms.

Method: Participants were 71 women who had completed treatment for early-stage breast cancer. Women were randomly assigned to either a 6-week
mindfulness intervention, with one 2-hour session per week (n=39), or wait-list control (n=32). Pre and post-intervention, participants completed measures assessing depressive symptoms (Center for Epidemiologic Studies Depression Scale), rumination (Rumination-Reflection Questionnaire) and self-kindness (Self-Compassion Scale-Self-kindness). Single and multiple mediation models with bias-corrected bootstrapping were used to test indirect effects.

Results: Women were on average 47 years old (SD=7.7) and 4.1 years post-cancer diagnosis (SD=2.4), with elevated distress at study entry, CESD mean 16.68 (SD=10.07). In single mediation models, reductions in depressive symptoms in the intervention group were mediated by decreased rumination (b = -2.03, 95% CI [-4.94, -3.11]) and increased self-kindness (b = -4.44, 95% CI [-7.92, -1.98]). The multiple mediation model revealed that only increases in self-kindness mediated intervention effects on depressive symptoms (b = -3.73, 95% CI [-7.33, -1.60]), while decreases in rumination did not.

Conclusion: Our results suggest that increases in self-kindness play a central role in reducing psychological distress following mindfulness meditation. Positive emotion regulation strategies may be an important target for future interventions.

258) Abstract 2672
IMPROVED MOOD WITH AEROBIC EXERCISE TRAINING IN INDIVIDUALS WITH TRAUMATIC BRAIN INJURY
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An estimated one in 100 civilians living in the US is affected by long-term disability from traumatic brain injury (TBI) (Zaloshnja, Miller, Langlois, & Selassie, 2008). Survivors of TBI experience emotional, physical, and cognitive distress in addition to barriers interfering with physical and social activity, making them prone to secondary and chronic conditions (Driver, Ede, Dodd, Stevens, & Warren, 2012). Exercise training has previously been shown to elevate mood in other patient populations (Dunn et al., 2005).

The purpose of the study was to examine the relationship between cardiorespiratory fitness and mood in individuals with TBI. Changes in mood were measured before and after acute bouts of aerobic exercise. In addition mood state and cardiorespiratory fitness were measured at baseline and after 12 weeks of vigorous aerobic exercise training.

Total number of participants enrolled in this study was 12 (with 10 completing the protocol). All participants were living independently in the community. A supervised aerobic exercise-training program of vigorous intensity was carried out for 12 weeks after baseline testing. The Profile of Mood States Short Form (POMS-SF) was used to measure subjects’ self-perception of mood and the impact of physical aerobic exercise on their mood states. Cardiorespiratory fitness was determined from cardiopulmonary exercise tests (CPET). A significant improvement in mood across the course of the study was found, which appeared to be consistent with acute improvements observed following individual bouts of training (see Figure). Changes in mood from baseline to follow-up were associated with improvement in CPET measures including time on treadmill, work rate, oxygen consumption, and oxygen consumption at anaerobic threshold (p<0.05).

In individuals with TBI, vigorous aerobic exercise training was shown to improve mood state. This improvement in mood was related to improvements in cardiorespiratory fitness.

259) Abstract 3021
PSYCHOLOGICAL, BEHAVIORAL, AND PHYSIOLOGICAL RESPONSES TO ACUTE PAIN: CROSS-CULTURAL DIFFERENCES
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Over 100 million Americans suffer from pain everyday with minority groups disproportionately representing this statistic. Research into factors that might explain this disparity is imperative to forming interventions that relieve pain and improve quality of life. Pain sensitivity varies cross-culturally, for example, Hispanic populations have been shown to exhibit heightened sensitivity to experimental pain. Understanding these types of variations has important implications for treating pain and in discerning group differences in response to certain kinds of stressors commonly used in psychosomatic research (e.g., the cold pressor task). Pain, of course, is a multidimensional phenomenon. Thus, it is critical to consider whether these cultural differences are associated equally with differences in psychological, behavioral, and physiological responses to pain.

In the current study, UCI students and community members (N=200, 79% female, Mage=20.6, 25% Hispanic, 48.5% Asian, 18% Caucasian, 8.5% Other) were exposed to two minutes of the cold-pressor task (i.e., immersing their hand in bucket of ice water maintained at 4 degrees Celsius). Pain attitudes and demographic information was collected at baseline. During the pain task, whether the participant kept their hand in the cold water the entire time was recorded (up to 2 minutes). After the cold pressor task, self-reported pain and distress were measured. The data for this study was taken from a larger, ongoing mood induction study so all analyses control for experimental condition. Results revealed that Hispanic participants were more likely to withdraw from pain early versus other groups, β = -28.19, t(194) = -2.14, p = .03. Both ethnic background and gender explained a significant amount of variance in withdrawal from the pain task, R² = .09, F(7, 194) = 2.57, p = .02. While no differences were found when examining self-reported pain (p > .05), there were differences in self-reported distress where Whites reported significantly less distress than the rest of the sample, β = -.28, t(191) = -2.33, p = .02. However, ethnic background did not explain a significant amount of variance in self-reported distress (p > .05). Self-reported differences did not translate into physiological reactivity (i.e. heart rate, heart rate variability and blood pressure) differences. This implies that cultural differences in pain sensitivity may be primarily perceptually based as opposed to physiologically based.

260) Abstract 2931
BASELINE HEART RATE VARIABILITY MEASURES AS CORRELATES OF EARLY TERMINATION OF EXPOSURE TO A HEAD MOUNTED DISPLAY
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The purpose of this experiment was to identify the relationship between baseline heart rate variability measures associated with parasympathetic nervous system activity (PNS) and early termination of exposure due to simulator sickness in a Head Mounted Display (HMD) paradigm. HMDs have been shown to generate significant sickness, often termed simulator sickness. Previous work has identified PNS activity at baseline as a potential predictor of sickness. Seventy two Clemson University students participated in a study to look at simulator sickness in an HMD paradigm. Before the experimental task, participants were equipped with ECG and respiration monitoring equipment. Participants stood during a five-minute baseline while the experimenter explained the task to the participant and then were instructed to watch a video presented through the HMD. Participants were exposed to a two minute washout period and then a two minute exposure period to the HMD paradigm. Participants were instructed to continue watching the display, or to stop watching the display and signal the experimenter if they felt nauseous or sick.

Figure. Changes in score on the POMS-SF prior to and at the completion of acute bouts of exercise across the weeks of the intervention.

Values are expressed as mean (SE). * indicates statistically significant (p<0.05) change in mood comparing mood at the completion of an acute bout of exercise to mood prior to beginning an acute bout of exercise. ** indicates statistically significant (p<0.01) changes in pre-exercise mood prior to beginning an acute bout of exercise across the duration of the intervention.
participant. Participants donned an HMD and completed five trials of an object location task. Participants reported their subjective sickness symptoms via the Simulator Sickness Questionnaire and Motion Sickness Assessment Questionnaire. If the participant felt they were experiencing too severe sickness they were instructed to tell the experimenter and the experimental task would be terminated early. A significant correlation between the logarithmic function of high frequency heart rate variability (logHF) and early termination was found, r(70) = .27, p = 0.24. Significant differences in baseline slope, mean successive differences, and logHF were also found between participants who terminated the experiment early and participants who completed the experiment (t(70) = 1.95, p = .028; t(70) = 1.793, p = .039; t(70) = 1.793, p = .039; t(70) = 2.302, p = .012, respectively). Results from this experiment indicate there are physiological differences in baseline RSA between those who experience extreme simulator sickness and those who do not. This experiment found there are significant correlations between certain baseline physiological measurements and early termination rate in an HMD task. These results indicate it may be possible to predict if a participant will need to stop an HMD task early due to sickness symptoms based on their baseline RSA data.

261) Abstract 3114
SOCIAL SUPPORT BUFFERS AGAINST THE NEGATIVE EFFECTS OF DEPRESSION ON PAIN AMONG CHINESE BREAST CANCER SURVIVORS
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Pain is a persisting problem among cancer survivors. Identifying its determinants and associated conditions, such as depression, is imperative in order to improve quality of life (Moye et al., 2014). Chinese Breast Cancer survivors (CBCS) are an understudied population, suffering from many negative physical and psychological outcomes including pain and depression. In addition, Chinese Breast Cancer Patients report inadequate social support (So et al., 2009). Because social support predicts pain and depressive symptoms among breast cancer survivors, CBCS’ pain may be exacerbated by the combination of their depressive symptoms and a lack of social support. Using data collected from 96 CBCS, we conducted secondary data analyses using a multiple regression model to determine whether social support significantly moderates the relationship between depressive symptoms and pain. CBCS completed the Brief Symptom Inventory, the MOS Social Support Scale, and the Brief Pain Inventory. After centering the variables and computing the interaction term (Aiken & West, 1991), the two predictors and the interaction term were entered into a regression model. Results indicated that higher levels of depressive symptoms were associated with higher levels of pain severity ($b$ = 1.003, p = .005), and greater social support was associated with lower pain severity ($b$ = -0.568, p = 0.045). The interaction between depression and social support was also significant ($b$ = -0.530, p = 0.035). Simple slopes for the association between depression and pain were tested for low and high levels of social support; the slope for low social support was marginally different than zero ($p$ = 0.057), and the slope for high social support was non-significant ($p$ = 0.731). Patients who reported high levels of depressive symptoms and low social support also reported experiencing the most pain. Although previous research has reported that Asian Breast Cancer patients may not have as great of a need for social support, stress, and more burdensome caregiving showed poorer pain outcomes, including exposure to screening maladaptive behaviors, and DHEAS (dehydroepiandrosterone sulphate) concentrations. As expected, caregivers scored worse on psychosocial and caregiving variables than controls. However, they had comparable neutrophil function and hormone levels to that of controls. Neutrophil function and cortisol were higher in older adults, while DHEAS was lower. Importantly, participants who reported higher depression, anxiety, stress, and more burdensome caregiving showed poorer neutrophil function and lower DHEAS. This has implications for interventions to lower infectious disease risk in vulnerable stressed groups.

262) Abstract 2466
CAREGIVING STRESS AND NEUTROPHIL IMMUNE CELL FUNCTION AND STRESS HORMONE LEVELS IN YOUNG AND OLDER CAREGIVERS
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The combination of ageing and stress and their impact on innate immunity was investigated using comparable caregiving models. Parents of children with developmental disabilities were recruited and compared to older caregivers for a spouse with dementia. Age- and sex-matched controls were also assessed. Participants were assessed on health behaviours, psychosocial status, and caregiving characteristics, as well as neutrophil cell function (phagocytosis and ROS generation, essential to killing bacteria like pneumococcus and serum cortisol, cortisone and dehydroepiandrosterone sulphate (DHEAS) concentrations. As expected, caregivers scored worse on psychosocial and caregiving variables than controls. However, they had comparable neutrophil function and hormone levels to that of controls. Neutrophil function and cortisol were higher in older adults, while DHEAS was lower. Importantly, participants who reported higher depression, anxiety, stress, and more burdensome caregiving showed poorer neutrophil function and lower DHEAS. This has implications for interventions to lower infectious disease risk in vulnerable stressed groups.

263) Abstract 2476
HOW DISCRIMINATION GETS UNDER THE SKIN: ASSOCIATION OF DAILY DISCRIMINATION WITH BMI, PHYSICAL ACTIVITY, AND CRP LEVEL
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There has been extensive research on the effects of perceived discrimination on health outcomes such as stress, cardiovascular disease, diabetes, and cancer. However, few studies have examined the underlying behaviors or physiological processes through which perceived discrimination might impact chronic health outcomes, such as body mass index (BMI), amount of physical activity (PA), and C-reactive protein (CRP), an inflammatory marker. In this study, regression analyses tested the relationship of daily discrimination, a form of perceived discrimination that looks at how often one experiences different types of discrimination on a day to day basis, with BMI, MET hours per week (MHW) of PA, and CRP levels. The sample was drawn from the biomarker data of the National Survey of Midlife Development in the U.S. (MIDUS, N of analytic sample = 1255). There were racial differences between Whites and African-Americans: almost all African-Americans were younger, had significantly lower incomes, and had significantly higher daily discrimination (p < .001), BMI (p < .001), and CRP levels (p < .001). Higher levels of daily discrimination were associated with higher BMI (p < .001). Daily discrimination was also associated with less frequent vigorous PA (p < .01), but was not associated with total PA (p = .49) or moderate PA (p = .29). These findings suggest the possibility that experiencing discrimination can influence chronic health outcomes through its effects on BMI and vigorous PA levels. These findings may also contribute to understanding the stark racial differences and health disparities between Whites and African-Americans: There may be differences in psychosocial stress exposure, including exposure to discrimination, as African-Americans have experienced a long history of societal and interpersonal discrimination in the U.S. It will be critical to examine other potential underlying mechanisms for these effects, including maladaptive methods of coping such as binge eating or junk food.

264) Abstract 3140
EMOTIONAL CLARITY AND IMPULSE CONTROL ARE CORRELATED WITH RESTING HEART RATE VARIABILITY WHEN CONTROLLING FOR RUMINATION AND ANXIETY
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Heart rate variability (HRV) is widely recognized as a psychophysiological index of emotion regulation (ER) capabilities. Recently, we showed resting-HRV to be related to subjective reports on difficulties in ER, however, little is known about which facets of ER individuals with low HRV perceive to be most difficult. The following investigation attempted to examine this in 183 undergraduates (98 female, 60 minority, Mean Age = 19.34, SD = 1.9). Furthermore, given the existing evidence on the association of HRV, rumination, and anxiety, and that these potentially tie into the association of HRV and ER, we aimed to control for such confounding effects. Continuous heart rate (HR) data was measured for a 5-minute baseline-resting period using an electrocardiogram (EKG). The root mean square of the successive differences
Depression Inventory indexed depressive symptoms. Cross-sectional data were obtained from 79 adults with SCD. Hierarchical multiple regressions examined predictors of the number of hospitalizations. Variables were entered as follows: 1) sociodemographic controls; 2) depressive symptoms; 3) social support; 4) social support X depressive symptoms. Simple slopes analysis aided in the interpretation of significant interactions. Depressive symptoms were consistently and positively associated with the number of hospitalizations in the past year (p < 0.05). A significant interaction was observed (B=10, p=0.02). Unexpectedly, depressive symptoms were predictive of more hospitalizations among patients reporting high levels of emotional support, while patients reporting more depressive symptoms and low emotional support had the fewest hospitalizations. The findings suggest that depressive symptoms are associated with healthcare utilization among adults with SCD. High levels of emotional support may increase healthcare utilization among patients reporting more depressive symptoms. Rather than buffering, greater emotional support appears to exacerbate the effect of depressive symptoms on healthcare utilization. Overly solicitous support may reinforce poor coping and ultimately result in greater healthcare utilization.

267) Abstract 2841

LIFESTYLE DIFFERENCES IN THE CO-OCCURRENCE OF DEPRESSIVE SYMPTOMS AND METABOLIC ABNORMALITIES: FURTHER EVIDENCE FOR A METABOLIC SUBTYPE OF DEPRESSION?

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Background: One possible pathway linking depression with chronic illness is a disturbance in metabolic or immuno-inflammatory functioning. Recently, "metabolic depression", or depression with co-occurring metabolic abnormalities, has been proposed as a biological subtype of depression that may explain this association. Method: There were 708 participants from the English Longitudinal Study of Ageing. High depressive symptoms were based on a score of 4 or more on the 8-item Centre for Epidemiologic Studies – Depression (CES-D) scale. Metabolic abnormalities were defined as having 3 or more metabolic risk factors (hypertension, impaired glycemic control, systemic inflammation, adverse high-density lipoprotein cholesterol, adverse triglycerides, and central obesity). A logistic regression analysis was performed that compared the comorbid depression and metabolic abnormalities group (DEPMET) to the group with depressive symptoms but without metabolic abnormalities (DEPnoMET; reference), as the binary outcome variable. Independent variables included age, sex, marital status, employment status, education, total non-pension household wealth quintile, smoking status, frequency of physical activity, frequency of alcohol consumption, as well as self-rated health. Results: A total of 318 participants were in the DEPMET group and 390 participants were in the DEPnoMET group. For the DEPMET group, odds of being retired versus employed were 2.49 (95% CI 1.41, 4.40) and the odds of being in the lowest wealth quintile versus the highest wealth quintile were 2.69 (95% CI 1.38, 5.24). The odds of low (OR= 2.11, 95% CI 1.09, 4.08) and moderate (OR=2.14, 95% CI 1.16, 3.94) physical activity versus high physical activity, as well as fair/poor self-rated health (OR=1.95, 95% CI 1.32, 2.89) versus a good/very good rating were significantly greater in the DEPMET group than the DEPnoMET group in a model adjusted for socio-demographic characteristics and other health-related variables. Conclusion: These results provide further evidence for a biological subtype of depression that is specifically associated with physical activity. Future research should aim to examine the longitudinal associations between depression, metabolic abnormalities and the incidence of chronic medical illness.

268) Abstract 2636

SMOKING ACCOUNTS FOR THE ASSOCIATION BETWEEN DEPRESSIVE SYMPTOMS AND ABSOLUTE NEUTROPHIL COUNT IN THE IPC COHORT STUDY.

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Depressive symptoms have been associated with chronic low-grade inflammation, including elevated white blood cell count, notably neutrophil count. However, both high neutrophil count and depressive symptoms are frequent in smokers. The present study examined the cross-sectional association between depressive symptoms and neutrophil count, and explored whether smoking status could explain this association.

Methods

Absolute neutrophil count was measured among 44,806 participants (28,534 men) (mean [standard deviation] age = 38.9 [11.4] years), without history of chronic disease or current medication. Depressive symptoms were assessed with a validated 13-item questionnaire (Questionnaire of Depression 2nd version, Abreviated). Smoking status was self-reported and categorized in 5 classes (non-smoker, ex-smoker, current smoker of 1-10 cigarettes/day, 11-20 cigarettes/day, >20 cigarettes/day). Age, alcohol intake, perceived health status, body mass index, glycemia, physical activity, living status, occupational status and education were included as covariates. Associations were examined with general linear models and causal mediation analyses.

Results

Depressive symptoms were positively associated with neutrophil count after adjustment for age and sex (p<0.001). Although this association remained significant after adjustment for all the covariates except smoking (p=0.014), it was no longer significant after further adjustment for smoking only (p=0.25). Causal mediation analyses revealed that smoking status successfully mediated the association (p<0.001), accounting for 51-70% of its total variance.

Conclusion

Smoking may confound or mediate the association between depressive symptoms and absolute neutrophil count. These results advocate for including an accurate measure of cigarette smoking in future studies addressing this association and may constitute an impetus for re-analyzing old datasets.

269) Abstract 2649

TRAIT REFLECTION INTERACTS WITH SEX TO PREDICT COGNITIVE OUTPUT DURING STRESS AND RECOVERY; TRAIT RUMINATION DOES NOT

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Dispositional repetitive thought (DRT) consists of tendencies for negative thought (rumination) and positive or neutral thought (reflection) (Trapnell & Campbell, 1999). After a social-evaluative stressor, rumination is positively associated with release of the stress hormone cortisol. Although less studied in relation to cortisol, reflection is generally considered to be protective against stress (Segerstrom et al., 2010). Additionally, sex affects cortisol output in response to acute psychosocial stress such that men generally have higher cortisol output than women. To further understand the relationships between rumination, reflection, sex, and cortisol, this study explored whether trait rumination and trait reflection predicted cortisol output during a laboratory stressor and recovery, and whether these relationships differed by sex.

Healthy students (N = 91, 48% men) completed a social-evaluative stress task and provided salivary cortisol at -2, +5, +18, +25, +40, and +53 min relative to the stressor. Ruminaton and reflection were measured with the Ruminaton-Reflection Questionnaire (Trapnell & Campbell, 1999). Area under the curve with respect to ground (AUCG) was the cortisol criterion.

In two separate linear regressions, either rumination or reflection was a predictor, along with sex and the interaction between rumination/reflection and sex, of AUCG. Neither rumination (p = 0.65) nor the rumination by sex interaction (p = 1.77) predicted AUCG. Sex (p = 0.04) and the reflection-sex interaction (p = 0.03) predicted AUCG. Overall, men had greater AUCG cortisol than women. However greater reflective tendencies predicted lower AUCG (β = -0.19) in men. Women showed the opposite pattern; higher reflection predicted higher AUCG cortisol (β = 0.29). Multiple state-level mediators and alternative explanations were tested post-hoc (e.g., mood, stressor appraisal) but none were significant.

In men, reflective tendencies may be protective during stress and recovery; the opposite seems to be true for women. Further work is needed to understand how sex interacts with DRT and the state-level mechanisms by which DRT affects the HPA-axis.

270) Abstract 2936

NIGHT FALLS DAY: DOES PHYSICAL ACTIVITY INFLUENCE SLEEP REACTIVITY?

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Objective: Sleep reactivity, defined as the extent to which sleep is disturbed in response to an acute stressor, is highly prognostic for future insomnia. As a modifiable health behavior, physical activity is associated with lower self-reported and psychophysiological reactivity to daytime stressors. Although it is unknown whether or how physical activity, the association could potentially explain the association between physical activity and reduced insomnia risk and emphasize its importance as an intervention target to protect against insomnia and its downstream consequences on health and functioning.

The purpose of this study was to examine whether objective and subjective measures of physical activity were associated with self-reported sleep reactivity. Methods: 102 adults (61% female, 94% Caucasian, 60.0±8.7 yr) participated in the study. 91 participants reported or collected diary measures of physical activity (FIRST scores for each category: sedentary=18.4±1.1, insufficiently active=15.7±1.5, physically active=12.9±1.9). In contrast, diary-based MVPA was not significantly related to sleep reactivity (β=-0.07, P=.48). Conclusions: Meeting objective criteria for sufficient physical activity is associated with lower sleep reactivity. As reduced sleep reactivity may constitute a pathway through which physical activity reduces insomnia risk, future work should explore whether increasing physical activity in at-risk individuals (e.g., high FIRST scores) can mitigate the risk of insomnia and its health consequences.

271) Abstract 2589

THE ROLE OF PSYCHOLOGICAL DISTRESS IN SURVIVAL AMONG WOMEN WITH COLORECTAL CANCER: RESULTS FROM OVER 15 YEARS OF FOLLOW-UP WITH THE NURSES' HEALTH STUDY

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Methods: Women diagnosed with colorectal cancer between 1976 and 1988 (n=195; mean age 59 years in 1988) from the Nurses’ Health Study reported symptoms during the 1992 (n=275; mean age 63 years in 1992). Analyses targeting cancer stage, time since diagnosis, and time since death included women alive and included adjustment for potential confounders. Similar analyses were conducted with depressive symptoms, first reported in 1992, among women diagnosed between 1976 and 1992 (n=275; mean age 63 years in 1992). Analyses targeting cancer-related death will also be conducted.

Results: Among the sample with measured anxiety, there were 100 deaths. Anxiety symptoms were not significantly linked to increased risk of overall mortality (fully adjusted model: HR=1.15; p=0.52; CI: 0.75–1.76). In the sample with measured depression, there were 124 deaths. Depressive symptoms were significantly associated with an increased risk of overall mortality in the demographics/health status-adjusted model (HR=1.44; p=0.05; CI: 0.99–2.08), and marginally in the fully adjusted model (HR=1.38; p=0.10; CI: 0.94–2.04),
where current smoking and physical activity were strongly associated with death.

Conclusion: Anxiety did not appear as a significant risk factor of overall mortality among women with colorectal cancer, although this may be due to limited power. While depressive symptoms were associated with an increased risk of death after adjusting for demographics and health status, the relation was attenuated by the inclusion of health behaviors. These findings suggest that active smoking and low levels of physical activity may mediate the relationship between depression and overall mortality. Hence, effective interventions could target these health behaviors, especially in depressed patients, to improve the survival rates of women with colorectal cancer.

272) Abstract 2825
PERCEIVED STRESS IS ASSOCIATED WITH EARLY Atherosclerosis in Unemployed individuals: evidence from the Paris Prospective Study III.
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Background
Perceived stress may be associated with poor cardiovascular health, in particular through atherosclerosis, but observational studies have yielded discrepant results. The present study examined the association between perceived stress and intima-media thickness (IMT), a marker of early atherosclerosis, and explored the potential moderating role of occupational status on this association using baseline examination data of the Paris Prospective Study III.

Methods
IMT was measured in the right common carotid artery 1 cm below the bifurcation, in a zone free of discrete plaques, using non-invasive high-resolution echotriangulation. Perceived stress in the past month was measured with the 4-item Perceived Stress Scale. The association between perceived stress and IMT was explored using linear regression analysis and regression coefficients beta (β) were given per 1-point increment of the 4-item Perceived Stress Scale. Results
The study population includes 5,084 participants (3,478 men) aged 55.9 on average (standard deviation: 0.1), and who were free of personal history of cardiovascular disease and not on psychotropic drugs at baseline examination. Occupational status was categorized in 4 classes: (1) high (e.g., managers) (48.4%); (2) medium (e.g., clerks or first-line supervisors) (30.1%); (3) low (e.g., blue collar workers) (8.3%); and (4) unemployed participants (i.e., seeking employment) (13.2%).

No significant association was seen between perceived stress and IMT after adjustment for socio-demographic, self-rated health and cardiovascular risk factors (β [95% CI] 0.09 [-0.22,2.00]). However, stratified analysis indicates a significantly robust association between perceived stress and IMT in unemployed participants (β [95% CI] 3.22 [0.34,6.11]) after multivariable adjustment. Associations of same magnitude were found in participants with low occupational status but without reaching a statistically significant level.

Conclusion
The current study suggests that association between perceived stress in the past month and IMT depends on employment status. These results may account for previous conflicting results and partially explain why measures of psychological stress are more tightly linked to cardiovascular health among individuals facing social adversity.

273) Abstract 3067
A PRELIMINARY ASSESSMENT OF MULTIPLE HEALTH FACTORS IN TYPE II DIABETICS TO GUIDE INTERVENTION
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Despite a myriad of health initiatives aiming to improve the treatment of type II diabetes, these methods are incomplete without a behavioral approach. Thus, novel treatments, including behavioral measures, are warranted in order to improve the management of this complex disease. The purpose of this current study was to examine preliminary data from a group of type II diabetics in order to assess the need for a novel, multidisciplinary behavioral intervention; in addition to investigating relationships between behavioral and biological factors. Poorly managed patients (N = 11) were recruited from an endocrinology clinic in the Southwest and were asked to take part in a fasting blood draw and complete a battery of questionnaires as part of an initial assessment. HbA1c was procured from medical records and surveys measured demographics, self-care behaviors (e.g., physical activity, diet, medication adherence, blood-glucose testing, etc.), depressive symptoms, general perceived stress, and diabetes-related stress. Levels of Interleukin-6, C-reactive protein, gamma-prime fibrinogen, and advanced lipid measures were extracted from blood plasma.

Results indicated that the sample reported notably high levels of depressive symptoms and perceived stress, while indicating low engagement in self-care behaviors (See Figure 1), with all participants being overweight/obese according to body mass index classifications. Participants also had significantly high levels of HbA1c and Interleukin-6, alongside moderate levels of C-reactive protein. Moreover, maintaining a proper diabetes-specific diet was positively associated with high-density lipoprotein cholesterol size, whereas blood-glucose testing behavior was positively associated with large high-density lipoprotein particle concentration. These results characterize this group as being poorly controlled and at high-risk for complications and development of co-morbidities. These findings provide necessary preliminary data justifying the need for intervention, with emphasis on diet and better blood-glucose testing behaviors. Future research should assess changes over time in the factors identified here following behavioral intervention.

274) Abstract 2977
FEELING REFRESHED WHEN WAKE UP? THE IMPACT OF NOISE TOLERANCE
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Waking up without feeling refreshed is a manifestation of inadequate sleep quality or duration. Continual lack of feeling refreshed may impair cognitive performance of other types of physical and mental functioning. Sleep quality has been shown to be associated with hyperacusis, i.e. reduced tolerance to noise, in elders. However, the association may be confounded by prognostic factors such as age, anxiety and stress, and assessing the presence of hyperacusis was relied on self-report. Therefore, this study aims to assess more generally the association of noise tolerance on sleep disturbance in the general population. We conducted a population-based household survey in 196 Hong Kong Chinese individuals (94 males, 48%) from 80 households who have rated their feeling of refresh when wake up (FRWU) on a 0 (=not at all) to 10 (=fully) scale, and assessed for noise tolerance by loudness discomfort level (in decibels [dBs]). The participants were also asked to complete a battery of questionnaires...
comprising demographics, the Perceived Stress Scale (PSS, range=14-70), and the Hospital Anxiety and Depression Scale (HADS, range=0-21 for either anxiety or depression). The mean age of respondents was 39 years (SD=16, Range=15-95). Their mean rating of feel refreshed when wake up was 6.5 (SD=1.8) and that of noise tolerance was 69 dB (SD=4). Moreover, their mean PSS score was 27.3 (SD=4.6, Range=14-44) and mean HADS-anxiety score was 5.3 (SD=3.6, Range=0-15), and mean HADS-depression score was 4.9 (SD=3.0, Range=0-15). By a linear mixed effects analysis, a 1 dB more in noise tolerance was significantly associated with 0.1 unit (SE=0.03, p=0.037) increase in FRWU. After adjusting for age, gender, household income, daily hours of aerobic exercise, smoking, alcohol drinking, stress, anxiety and depression, noise tolerance remained significant with the coefficient of 0.1 (SE=0.04, p=0.002). In addition, smokers had significantly lower PSS (r=0.08, p=0.004) and HAD-anxiety (r=-0.2, SE=0.04, p=0.001) and PSS (r=-0.1, SE=0.03, p=0.012) were significant confounders.

This study demonstrates that individuals with higher noise tolerance would feel more refreshed when wake up. This suggests the need of additional clinical consideration of reducing noise sensitivity in patients with sleep complaints.

275) Abstract 3028

RUMINATION INDUCTION AFTER A TSST PREDICTS NON-HABITUATION OF SALIVARY ALPHA-AMYLASE RESPONSES TO REPEATED STRESS

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Rationale: Rumination, past-centered negative, unadaptive, and repetitive thoughts or a pattern of depression. The response-stylies theory states that when stressed, some people tend to ruminate while others tend to distract themselves. Furthermore, the perseverative cognition theory proposed that rumination can prolong the physiological experience of a stress event. Together, this might point to a role of rumination in the stress-disease relationship.

Previous research has addressed the role of post-stress rumination in cardiovascular stress reactivity, but no studies to date have experimentally investigated this relationship. We therefore set out to test whether manipulating rumination after stress leads to higher salivary alpha-amylase (sAA).

Method: Thirty-six healthy young adult subjects (n=13 male; n=23 female) aged 18-27 years underwent the Trier Social Stress Test (TSST) during two afternoon sessions on consecutive days. Immediately after completion of the first TSST, participants were randomly assigned to either a negative, stress-focused rumination writing task (n=18) or a distracting writing task (n=22). Saliva for measurement of sAA was collected at three time points relative to both TSSTs: immediately before, immediately after, and 15 minutes after each TSST. sAA responses from baseline to peak on each study day were calculated, and the difference between these scores was used as a measure of habituation.

Results: The TSST induced sAA increases on both study days that was not different between days (t(34)=1.14, p=.89). When comparing conditions, there was a significant difference in habituation, with the distraction group showing an overall decrease in sAA responses from day 1 to day 2 (mean change=-1.9, SD=4.9 U/ml), and the rumination group showing increased sAA responses to the TSST on day 2 (mean change=23.8 U/ml; t(34)=-2.5, p=0.016).

Conclusions: Taken together, individuals who were in a rumination induction condition after an acute stressor showed sensitization of the sAA response to the second TSST, while those in the distraction group showed habituation of the sAA response. These novel findings indicate that post-stress interventions may be effective at moderating adaptation of the SNS to repeated stress. Future work will focus on using rumination reduction strategies after stress to facilitate adaptation of the SNS to repeated stress.

276) Abstract 3087

ASSOCIATIONS BETWEEN AFFECTIVE REACTIONS TO STRESS AND SLEEP

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Negative emotional responses to stress and poor sleep quality have been associated with the development of inflammation, cardiovascular disease, and other adverse health outcomes (e.g., Kubzansky, 2007; Mullington, Haack, Toth, Serrador, & Meier, 2009). Additionally, it has been suggested that increased sleep quality can buffer the negative effects of stress on health (Brindell & Conklin, 2012). This buffering effect may be reflected in a decrease in negative emotional responses to stress or an increase in positive emotional responses to stress. We examined these possibilities in a sample of 83 female college students who gave a brief speech to two evaluators. Participants completed the PANAS-X before and immediately after the stress task. Participants also completed the Pittsburgh Sleep Quality Index, which assesses self-reported quality and duration of sleep. In response to stress there was a significant increase in negative affect (NA; p<0.01) and no change in positive affect (PA; p>0.05). Participants who reported overall lower sleep quality and shorter sleep duration had more NA (e.g., sadness) prior to the stress task, r=.31, p<.01. Also, sleep quality was associated with NA during the stress task, r=.21, p=.05. Sleep quality was not associated with PA (e.g., joviality) before or after stress, r<.12, p>.30. However, sleep duration was positively correlated with PA during stress, r=.23, p=.05. When we examined affect response comparisons with sleep with regressions controlling for baseline levels of affect, we found that sleep duration remained associated with PA, though marginally (b=.26, p=.06). No other sleep and affect associations were significant with p>.30. Although sleep did not significantly predict affective responses to stress after we controlled for baselines, poor sleep was associated with more NA throughout the experiment session. Also, longer sleep duration was associated with more PA during stress and with PA responses to stress. This suggests that sleep may have protective effects that compensatorily bolstered PA during stress. That is, during stress, better sleep may protect PA, which potentially buffers against the adverse effects of stress. Consistent with this possibility, increased PA reactions to the speech task were significantly associated weaker NA reactions, r=-.25, p<.05. Thus, the association between sleep and PA reactions to stress may be indicative a sleep-related, health-protective biopsychosocial mechanism.

277) Abstract 2851

LOWER HIGH-FREQUENCY HEART RATE VARIABILITY IN EARLY PREGNANCY MEDIATES THE ASSOCIATION BETWEEN MATERNAL DEPRESSED MOOD AND INCIDENT GESTATIONAL HYPERTENSION

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Background: Mounting evidence suggests that psychological distress contributes to hypertensive disorders of pregnancy, but mechanisms remain unclear. While relatively lower cardiac vagal control, indexed by lower high-frequency heart rate variability (HF-HRV), is implicated in psychological distress and hypertensive disorders in non-pregnant adults, research in pregnancy is limited. The aim of this study was to investigate whether HF-HRV during pregnancy mediates the association between depressed mood and gestational hypertension. Methods: Ambulatory heart rate was continuously recorded for two days in early (22 weeks) and late (32 weeks) pregnancy in a sample of 287 healthy women. Three 5-minute segments of HF-HRV (30 min post-waking, 1100h, 2100h) were derived from each day of heart rate measurement, calculated using the Fast Fourier method and log-transformed. Depressed mood (Edinburgh Postnatal Depression Scale) was aggregated across time points, and gestational hypertension was determined by chart review following delivery. Physical activity during HRV measurement was assessed by wrist actigraphy. Mediation analyses were used to quantify the indirect effect of depressed mood on incident gestational hypertension through HF-HRV, while adjusting for physical activity, age, and pre-pregnancy body mass index.

Results: A bias-corrected bootstrap confidence interval indicated an indirect effect of depressed mood on gestational hypertension via HF-HRV in early (b = 0.02, SE = 0.02; 95% CI 0.002, 0.072) but not late pregnancy. Relatively worse depressed mood was associated with lower HF-HRV in early (b = -0.01, SE = 0.01, p = .012) and late pregnancy (b = -0.02, SE = 0.01, p = .001). In early, but not late pregnancy, relatively lower HF-HRV was associated with greater odds of developing gestational hypertension (OR = 0.17, 95% CI 0.033, 0.893), such that a one-unit increase in log HF-HRV corresponded to being 83% less likely to develop gestational hypertension.

Conclusions: Though it has been proposed that reduced cardiac vagal control may link psychological distress to hypertensive disorders, this is the first study to demonstrate a mediation effect in pregnant women. These results suggest changes in cardiac vagal control associated with depressed mood are evident early in pregnancy and may influence gestational hypertension, either directly or as a vulnerability marker. Further prospective research with standardized blood pressure measurement is needed to clarify associations among psychological distress, vagal function, and hypertensive disorders of pregnancy.
amount of evidence suggests that race related stressors, such as stereotype threat (ST), negatively contribute to such health disparities. ST occurs when negative stereotypes associated with a particular group are made salient. Recently, we showed heart rate variability (HRV), a psychophysiological marker of stress and health, to be decreased in ethnic minorities following an ST manipulation. However, it is posited that rumination, defined as the tendency to engage in negative and repeated thought patterns, plays an important role in the experience of race-related stress and associated distress. Thus, the following investigation sought to explore the role of rumination on the link between ST and physiological outcomes, as indexed by HRV. Continuous HRV data was collected as 81 participants (46 Female, 48 AAs, mean age = 19.91) who were randomly assigned to one of three experimental conditions: (i) explicit ST manipulation in which the prime was presented in a blatant manner; (ii) implicit ST manipulation in which the prime was presented in a subtle manner; (iii) and the control condition. First, participants completed a 5-minute baseline-resting period, followed by the ST or control manipulation. All participants then completed a cognitive task, followed by a 5-minute resting-recovery period. Change scores (HRV-change) from baseline HF-HRV to recovery HF-HRV were calculated to examine ST’s impact on HRV. Ruminative tendencies were assessed using the Ruminative Responses Scale (RRS). A regression model, including condition, RRS scores, and ethnicity (AA & EA) as predictors, and HRV-change as the outcome, showed a 3-way interaction (R2change = .056, β = -.041 (Standard error (SE): .019), p<.05). In minorities only, there was a main effect of condition on HRV-change (β = 1.136 (.526), p<.05) such that AAs in the explicit ST group showed the largest decrease in HRV from baseline to recovery in comparison to the implicit ST (no change) and control groups (increased HRV). However, this relationship was moderated by RRS scores, such that only those with higher RRS scores showed this pattern (β = -.761 (.191), p<.05). Lower RRS scores did not change HRV in any condition (β = -.038 (.184), p = .839). EAs show no related or significant results. These data provide psychophysiological evidence of the deleterious effects ST and rumination tendencies may have on overall mental and physical health in AAs.

279) Abstract 3054
SEVEN HABITS A DAY KEEPS POOR PHYSIOLOGY AWAY
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Introduction: Almost fifty years ago, analyses from the Alameda County Study demonstrated that level of engagement in 7 daily health habits influenced longevity. The present study examines the practice of these 7 daily health habits half a century later and the association of such practices with physiological well-being.
Methods: Data come from the Biomarker Substudy of the National Survey of Midlife in the U.S. (MIDUS; n= 1153). The 7 health habits included never having smoked, exercising regularly, sleeping 7-8 hours, drinking moderately, maintaining healthy weight, being a healthy diet, and being”. The groups were calculated to examine ST’s impact on HRV. Ruminative tendencies were assessed using the Ruminative Responses Scale (RRS). A regression model, including condition, RRS scores, and ethnicity (AA & EA) as predictors, and HRV-change as the outcome, showed a 3-way interaction (R2change = .056, β = -.041 (Standard error (SE): .019), p<.05). In minorities only, there was a main effect of condition on HRV-change (β = 1.136 (.526), p<.05) such that AAs in the explicit ST group showed the largest decrease in HRV from baseline to recovery in comparison to the implicit ST (no change) and control groups (increased HRV). However, this relationship was moderated by RRS scores, such that only those with higher RRS scores showed this pattern (β = -.761 (.191), p<.05). Lower RRS scores did not change HRV in any condition (β = -.038 (.184), p = .839). EAs show no related or significant results. These data provide psychophysiological evidence of the deleterious effects ST and rumination tendencies may have on overall mental and physical health in AAs.

281) Abstract 3049
DEPRESSION AND ANXIETY IN PATIENTS WITH CHRONIC LIVER DISEASE AND ITS RELATION WITH QUALITY OF LIFE: A CROSS SECTONAL STUDY
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Background: Chronic liver disease (CLD) is a long standing and debilitating condition where comorbid psychiatric conditions add on to the morbidity. Symptoms such as fatigue, pruritus and abdominal discomfort from ascites have been shown to impair quality of life in chronic hepatitis, cholestatis and cirrhosis. A broad biopsychological perspective has been provided by previous researchers to provide a better understanding of the aetio-pathogenesis of CLD. Methods: 75 consecutive CLD patients were assessed for depression and anxiety through Hospital Anxiety and Depression Scale and for quality of life through the abbreviated version of WHO Quality of life scale. The data was analyzed using Statistical Package for Social Sciences (SPSS) 16.0 for Windows. Patients were grouped as with or without anxiety and depression. The groups were compared using Mann-Whitney U test and Fishers exact test for continuous and categorical variables, respectively. Results: Both anxious (p=.005) and depressed (p<.001) patients were significantly older than their non-anxious and non-depressed counterparts. Significantly higher proportion of patients with depression were married (p=.002) and employed (p=.014) than those without. Both the patients with anxiety and those with depression had significantly poorer quality of life in all measurable domains, than those without anxiety or depression. Conclusion: When clinically significant anxiety and depression are present as comorbidities in CLD patients, they significantly worsen the quality of life in them.

282) Abstract 3138
MEDICAL AND PSYCHOSOCIAL CORRELATES OF TRAJECTORIES OF THE COURSE OF CFS ILLNESS
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The course of Chronic Fatigue Syndrome (CFS) is known to be variable. However, just what proportion gets better or worse is not known, and not much is known about what variables (medical and psychosocial) may be related to improvement. Methods: As part of a multisite study of 203 patients with CFS/ME, clinical coordinators were asked to review charts and describe whether the patients improved, stayed the same, or worsened over both the entire course of the disease as well as within the past 6 months. They were also asked to describe the
reasons why they think the patients improved or worsened. A variety of quantitative variables were considered in relation to improvement as well: acute vs. gradual onset, duration of illness (<3 years, >3 years), gender, CFS symptom cluster (fatigue, sleep, pain, GI disturbance, cognitive dysfunction, autonomic dysfunction, endocrine, inflammatory, or neuromuscular symptoms), depression and anxiety (including the use of antidepressants or anti-anxiety medications).

Results: From the time the clinician first saw the patient 43% improved, 31% stayed the same, and 26% got worse. Restricting this to the last 6 months 21% improved, 61% remained the same, and 19% got worse. Those with acute onset were more likely to improve over the course of treatment (44% of those with acute onset improved vs. 34% improved for those with gradual onset). In addition, those with shorter duration of illness (<3 years vs. >3 years) were more likely to have improved (31% versus 17%) over the past 6 months. Other variables will be tested for their relationship to improvement including depression and anxiety, and the use of antidepressants or anti-anxiety medications, which over half of the sample were taking. Qualitative reasons for improvement over the course of treatment were written in and will be described.

Conclusion: Although a significant number of patients with CFS improved over the course of treatment, many failed to improve. Those with acute onset and shorter duration of illness were more likely to improve. Further analyses of psychosocial variables and course of illness may give us insight about why some patients improve and others do not.

283) Abstract 3019

RELIGIOUS STRUGGLE PREDICTS ACUTE STRESS DISORDER SYMPTOMS IN CARDIAC PATIENTS

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Background: Some patients report religious struggle (belief that God is punishing or has abandoned them) in response to stressful or traumatic events. Previous studies suggest that religious struggle is associated with the development and maintenance of PTSD symptoms after traumatic events, and with depression in heart failure patients. No studies, however, have assessed religious struggle in a real-time clinical setting, immediately after treatment for an acute life-threatening event. We examined whether religious struggle immediately after a cardiac event was associated with concurrent Acute Stress Disorder Symptoms in response to the event.

Methods: The Reactions to Acute Care and Hospitalization (REACH; R01 HL117832) study is an observational cohort study of emergency department (ED) patients being evaluated and admitted for suspected acute coronary syndrome (ACS). Following their transfer from the ED, 127 patients completed the Brief Religious Coping Questionnaire (RCOPE), which assesses positive religious coping and religious struggle, and the Acute Stress Disorder Scale (ASDS). ASDS symptoms were regressed on demographic (age, sex) and clinical (Global Registry of Acute Coronary Events cardiac prognosis score and Charlson comorbidity score) covariates, positive religious coping, and religious struggle.

Results: Participants were 56% men, age 58 ± 14.5, and the mean ASDS score in the sample was 30.5 ± 13.4. Participants reported substantially more positive religious coping (mean 9.9 ± 2.7) than religious struggle (mean 2.4 ± 0.9); 22% percent of participants reported at least some struggle. After adjustment for demographic and clinical covariates, each increase of 1 point in religious struggle was associated with a 4.5 point increase in ASDS score, β = 0.32, p<.001; model, F(6, 120)=3.5, p=.003.

Conclusion: Although relatively rare, religious struggle is associated with increased ASD symptoms in the first days after an acute cardiac event. Since ASD symptoms are predictive of subsequent PTSD symptoms, these results suggest that a more holistic approach to patients that are being evaluated for ACS could include awareness of the impact of negative religious attributions for the event.

284) Abstract 2749

THE EFFECTS OF WINNING AND LOSING ON CARDIOVASCULAR AND PSYCHOLOGICAL RESPONSES TO COMPETITION

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Background: Competition is a psychological stressor which can perturb the cardiovascular system (e.g., heart rate (HR), blood pressure (BP), pre-ejection period (PEP), heart rate variability (HRV)). Furthermore, competition has been shown to alter psychological variables such as anxiety. Even though the outcome (win/loss) is an important aspect of competition, little is known about the effects of winning or losing on these psychophysiological responses to competition. Aim: This study examined the effects of competition outcome on the cardiovascular and psychological responses to a competitive task. Methods: Forty-three males (Mage = 19.5, SD = 1.0 years) completed 2 competitive computer car races. Race 1 was manipulated to make it more or less likely to win, followed by race 2, which was performed with normalised settings for all participants. Questionnaires pre- and post-race assessed anxiety experienced before and during both competitions. Cardiovascular activity was measured continuously during rest and competition with impedance cardiography. Results: Separate 2 Group (winners, losers) x 3 Time (baseline, race 1, race 2) ANOVAs revealed that both competitions provoked increases in HR, systolic and diastolic BP, HRV (p<.05). During race 1, winners experienced a greater reduction in HRV compared with losers (p < .05). Two Group (winners, losers) x 2 Time (before, during) ANOVAs revealed that competition produced similar increases in anxiety for winners and losers (p’s < .05). However, winners interpreted their anxiety during the manipulated race as more facilitative than losers (p < .05). During race 2, these interpretive differences in anxiety no longer existed between winners and losers. Conclusion: Winning or losing a competition induces similar increases in beta-adrenergic influence on the heart but psychological responses differ, whereby winners perceive their anxiety as more facilitative than losers. However, the initial interpretative facilitations associated with winning are not maintained when competing in successive competitions.

285) Abstract 2907

A PSYCHOSOCIAL INTERVENTION IN PATIENTS WITH CORONARY ARTERY DISEASE SHOWS DIFFERENT EFFECTS IN MEN AND WOMEN - NEW FINDINGS FROM THE SPIRR-CAD TRIAL

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Introduction: Depressive symptoms and Vital Exhaustion (VE) predict an unfavorable course of coronary artery disease (CAD). Women with (CAD) have a higher psychosocial burden compared to men. To attenuate psychological symptoms, some studies have systematically tested effects of psychotherapy, but few have looked at men and women separately. The Stepwise Psychotherapy for Reducing Risk in CAD study (SPIRR-CAD) offered the possibility to examine psychological differences between men and women and their change over time. Methods: In this trial, 450 men (78.9%) and 120 women (21.1%) with CAD (age ≤ 75 y), who had mild to moderate depression (scoring 8 or higher on the Hospital Anxiety and Depression Scale (HADS)), were randomized to a stepwise psychotherapy intervention. Measures of depression, exhaustion, and coping style (HADS, MQ, FKV) were collected at baseline and 18 months follow up. Results: Men had more severe heart disease (EF, history of MI, CABG; p<0.05), whereas women had higher psychosocial burden (negative affect): They were more likely to live alone (w57%, m32%), had lower education and employment rates (all p<0.05) and higher anxiety (p=0.005), depression (p=0.03) and exhaustion (p=0.001). The psychotherapy intervention showed a significant gender effect: women reduced VE from 29.4 ± 8.1 to 22.1±11.7 in the IG and from 29.2±8.2 to 25.1±11.3 in the CG significantly more than men, which reduced VE from 23.4±10.8 to 21.2±9.7 in the IG and from 23.6±10.7 to 19.3±11.3 in the CG (F 4.02; p=0.046). Patients with depressive coping style (FKV) showed a lower decrease of VE (β=0.12; p=0.02). Conclusion: Women showed higher psychosocial impairment than men but a better response to the intervention in reducing VE. Strategies in psychosocial interventions may need to differentiate between men and women with CAD. Intervention programs specifically tailored to women’s or men’s psychological and biological needs may be more effective.

286) Abstract 2913

RESILIENCE AS A MODERATOR OF THE ASSOCIATION BETWEEN CHRONIC PAIN AND DEPRESSIVE SYMPTOMS IN THE ELDERLY: RESULTS FROM THE KORA-AGE STUDY

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Background: Pain is frequent in elderly people and, especially if widespread, associated with poor mental health. However, a resilient personality may protect against the adverse effects of chronic pain. We investigated whether the association of chronic local pain (CLP) and chronic widespread pain (CWP) with depressive symptoms is moderated by trait resilience in a cross-sectional sample drawn from the population-based KORA-Age study in Southern Germany.
MANAGING HIGH CHOLESTEROL: RELATIONSHIPS AMONG STRESS, DEPRESSION, ADHERENCE AND INFLAMMATORY MARKERS

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More than 71 million Americans have high cholesterol, however only one-third of them have the condition controlled (CDC, 2011). Even though the number of patients with high cholesterol is growing rapidly, there has been a dearth of information that examines the relationships among adherence, stress, depression and inflammatory markers in these individuals. The purpose of this pilot study was to examine these relationships in an older population. It was hypothesized that unmanaged cholesterol would be associated with higher perceived stress, depression, and inflammatory markers, as well as with worse adherence. A total of 36 individuals were recruited from a medical clinic in the Southwestern United States and were required to be on a stable dose of statin for their high cholesterol. Participants completed questionnaires regarding adherence, perceived stress and depression, as well as had biological indicators of cholesterol and inflammation taken. Of these participants, 17 had their condition completely managed and 19 were unmanaged. Results of the pilot study indicated that having unmanaged cholesterol was associated with higher levels of perceived stress, r = .59, p = .04 as well as higher levels of interleukin 6, r = .70, p = .01. Although not significant due to a small sample size, there were trends showing that people with unmanaged cholesterol were associated with lower levels of depression (r = -.34), overall medication taking adherence (r = -.31), medication refill adherence (r = -.31), taking medications with meals (r = .00) and planning ahead for refills (r = .28). Unexpectedly, managing cholesterol was not associated with C-reactive protein (r = .09). Overall, these findings suggest that unmanaged cholesterol is associated with higher levels of perceived stress and specific inflammatory markers, with trends towards depression or adherence. Future research, with a larger sample, is warranted to determine if negative affect predicts managing cholesterol and the role that adherence and inflammation play.  

SYMPTOMS OF POSTTRAUMATIC STRESS DISORDER, SLEEP QUALITY, HOSTILITY AND BLOOD PRESSURE IN YOUNG ADULTS WITHOUT A KNOWN TRAUMA HISTORY

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Theoretical models suggest that posttraumatic stress disorder (PTSD) is associated with altered sympathetic nervous system responses to stress. Patients diagnosed with PTSD have been shown to have blood pressure dysregulation, sleep disruption and elevated levels of hostility. However, it is presently unknown if these constructs are associated with subthreshold PTSD symptomology in healthy, young adults without a known trauma history. We examined the relationships among PTSD symptoms, sleep quality, hostility, and resting blood pressure in 85 healthy, young men (n=42) and women (n=43). Participants between 18-35 years of age (mean age = 21.6 years) provided resting blood pressure levels in a laboratory setting, then completed the PTSD Checklist, Pittsburgh Sleep Quality Index and the Cook-Medley Hostility Scale. Results show PTSD symptoms were strongly associated with poorer sleep quality [r(83) = .504, p<.001] and higher hostility scores [r(83) = .513, p<.001] in the total sample. In young women, PTSD symptoms were associated with higher hostility scores (p = .002) but not sleep quality (p > .1). In young men, PTSD symptoms were associated with poor sleep quality and higher hostility scores (p < .01), but were also associated with higher resting diastolic blood pressure [r(40) = .330, p = .033]. Multiple regression suggests that both hostility and sleep quality independently predict PTSD in men. Moreover, the association between PTSD scores and blood pressure in men was mediated, at least in part, by poor sleep quality. These findings suggest that poor sleep quality may underlie some of the autonomic nervous system disturbance in the expression of clinical PTSD symptoms, at least in men. Moreover, these data raise the possibility that behavioral interventions that include sleep hygiene techniques and restructuring of hostile attitudes could potentially serve as preventive interventions for PTSD and related anxiety symptoms.

287) Abstract 2934

MANAGING HIGH CHOLESTEROL: RELATIONSHIPS AMONG STRESS, DEPRESSION, ADHERENCE AND INFLAMMATORY MARKERS

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More than 71 million Americans have high cholesterol, however only one-third of them have the condition controlled (CDC, 2011). Even though the number of patients with high cholesterol is growing rapidly, there has been a dearth of information that examines the relationships among adherence, stress, depression and inflammatory markers in these individuals. The purpose of this pilot study was to examine these relationships in an older population. It was hypothesized that unmanaged cholesterol would be associated with higher perceived stress, depression, and inflammatory markers, as well as with worse adherence. A total of 36 individuals were recruited from a medical clinic in the Southwestern United States and were required to be on a stable dose of statin for their high cholesterol. Participants completed questionnaires regarding adherence, perceived stress and depression, as well as had biological indicators of cholesterol and inflammation taken. Of these participants, 17 had their condition completely managed and 19 were unmanaged. Results of the pilot study indicated that having unmanaged cholesterol was associated with higher levels of perceived stress, r = .59, p = .04 as well as higher levels of interleukin 6, r = .70, p = .01. Although not significant due to a small sample size, there were trends showing that people with unmanaged cholesterol were associated with lower levels of depression (r = -.34), overall medication taking adherence (r = -.31), medication refill adherence (r = -.31), taking medications with meals (r = .00) and planning ahead for refills (r = .28). Unexpectedly, managing cholesterol was not associated with C-reactive protein (r = .09). Overall, these findings suggest that unmanaged cholesterol is associated with higher levels of perceived stress and specific inflammatory markers, with trends towards depression or adherence. Future research, with a larger sample, is warranted to determine if negative affect predicts managing cholesterol and the role that adherence and inflammation play.  

288) Abstract 2663

PSYCHOLOGICAL DIAGNOSTICS IN YOUNG PATIENTS WITH A RISK OF DEVELOPMENT OF TEMPORAL MANDIBULAR JOINT (TMJ) MALFUNCTION.

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The aim of the study was to evaluate the psychological health status of a group of patients.The group included 72 students of Tver state medical academy with an age range of 19-30 years, previously ranked according to somatic disorder characteristic - temporal mandibular joint (TMJ) malfunction. The patients completed a detailed psychological questionnaire. The ranking was carried out with the Hamburg test of the abbreviated survey of malfunction where the students were divided into 3 groups: 1) without TMJ malfunction symptoms (the control group) – 15 patients; 2) the risk group – 21 patients; 3) with TMJ malfunction symptoms - 36 patients. The results obtained with the coping strategy (CS) method (analogue of Lazarus method) are presented in table 1. The statistical estimate was done with the
290) Abstract 2982

PROBLEMATIC MOBILE PHONE USE AND PSYCHOSOMATIC SYMPTOMS: DOES FIVE-FACTOR MODEL OF PERSONALITY TRAITS MATTER?
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Introduction: In the information technology era, mobile phone has become an inevitable way of communications and interactions. There has been some evidence on the potential negative impact of mobile phone use on health. On the other hand, previous studies have found that personality traits may affect mobile phone usage, as well as physical and psychological health. There is a dearth of research that investigated the associations among problematic mobile phone use, personality and psychosomatic symptoms, which are the physical presentations of psychological distress.

Objectives: This study aims to address possible associations among problematic mobile phone use, personality traits, and psychosomatic symptoms.

Methods: A total of 644 participants were recruited in university-based communities in Hong Kong and Australia. Psychosomatic symptoms were measured by the PHQ-15. Personality traits were assessed by using 60-item five-factor model NEO-FFI. Problematic mobile phone use included feeling annoyed with no phone signal, perceived low mood without phone use, waking up by phone calls or text messages at night and frequency of text messages. The associations of problematic mobile phone use, personality and psychosomatic symptoms were analysed by using structured multiphase regression modelling.

Results: The participants aged 18-83, recruited in Hong Kong (68.2%), 54.9% being students and 42.7% being employed. The prevalence of psychosomatic symptoms was high, with 76.9% reports anxiety, 66.9% depression and 65.4% somatization. The 4-factor model fit the regression models, waking up by phone calls or text messages at night (Z = .754, p = .011, 95% CI = .171, 1.337) was significantly associated with psychosomatic symptoms after adjusting the personality traits. Among the five types of personality traits, neuroticism (Z = .203, p = .0001, 95% CI = .151, .254) was found to be the risk factor for psychosomatic symptoms.

Conclusions: This study concluded that there were significant associations among problematic mobile phone use, personality and psychosomatic symptoms. Public health prevention strategies could include education on attitudes towards communications and interactions with others and helping people to set limits for mobile phone use, in particular, at night.

291) Abstract 2543

ELUCIDATING THE DIMENSIONAL STRUCTURE OF POSTTRAUMATIC STRESS DISORDER AFTER ACUTE CORONARY SYNDROME
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Background: Acute coronary syndrome (ACS) can induce posttraumatic stress disorder (PTSD) in some cases, which predicts increased risk for recurrent ACS and mortality (Edmondson et al., 2011). PTSD is often conceptualized as a homogeneous diagnosis, but evidence suggests that the disorder is a heterogeneous construct comprising fear, dysphoria, and distress elements (Zoellner et al., 2014).

Examining PTSD symptom dimensions and how they relate to clinically-relevant outcomes can further understanding of manifestations of ACS-trauma-related psychopathology and mechanisms of risk. We conducted the first study of the dimensional structure of ACS-induced PTSD symptoms in the REACH study, an observational cohort study of emergency department (ED) predictors of medical and psychological outcomes after ACS.

Methods: REACH participants were recruited during evaluation for ACS in the ED. One month after ED admission, 293 individuals were administered the PTSD Checklist-Civilian version via phone to measure ACS-induced PTSD symptoms. Confirmatory factor analyses compared 3-factor DSM-IV, 4-factor dysphoria, 4-factor numbing, and 5-factor dysphoric arousal models of PTSD symptom structure. The model fit was investigated in men (n=159) and women (n=132).

Results: The 4- and 5-factor models had excellent fit indices (CFI>0.98, TLI>0.98, RMSEA<.04), and fit better than the 3-factor DSM-IV model. The 5-factor dysphoric arousal model was not associated with statistically significant improvement in model fit over the 4-factor models (p>0.05), and the correlation between the hyperarousal and numbing symptom dimensions of the 4-factor numbing model was essentially unity (r = .99).

Conclusions: Findings suggest that ACS-induced PTSD symptoms are best-represented by a 4-factor structure that distinguishes between specific (e.g., re-experiencing) and nonspecific (dysphoria) symptoms of PTSD. Future research will test which dimensions predict greatest risk of recurrent ACS.

292) Abstract 2779

IS FATIGUE RELATED TO THE PHYSIOLOGICAL AND PSYCHOLOGICAL RESPONSES TO ACUTE MENTAL STRESS?
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Background: Fatigue has been associated with reduced physical and psychological wellbeing. As it is defined as a general lack of energy and motivation, it is likely to influence the way an individual responds to acute psychological stress. To our knowledge, detailed examinations of associations between fatigue and physiological and psychological responses to stress, including the perceptions of the task, have yet to be conducted. Aim: To investigate the associations between fatigue and physiological as well as psychological responses to a mental stress task.

Methods: 170 healthy participants (age = 18.4 [0.5] years, 141 females) completed a mental arithmetic task. Fatigue was measured using the Multidimensional Fatigue Index. Blood pressure and heart rate were recorded during rest and the stress task. Perceptions of cognitive and somatic anxiety (intensity and perceived impact on performance) were assessed pre- and post-task. Task ratings such as how difficult, challenging and threatening they perceived the task, and how well they thought they performed were measured post-test.

Results: The task induced significant increases in blood pressure and heart rate (p<.001). During the task, both cognitive and somatic anxiety increased and were perceived as being more debilitating towards performance (p<.05). Fatigue was not related to physiological responses but was associated with the perceptions of the task, perceived impact of cognitive anxiety on performance, or performance (p<.05).

Fatigue was significantly associated with perceptions of performance (r = -.19), difficulty (r = .23), stressfulness (r = .20), and threat (r = .17) and the perceived impact of cognitive anxiety on performance (r = -.16). Conclusions: Although fatigue was not related to physiological reactivity, anxiety intensity or performance of the stress task, it was related to the perceptions of the task. More specifically, the higher the fatigue the higher the ratings of difficulty. More debilitating towards performance, perceived the task to be more difficult, more stressful, more as a threat, and thought they performed poorer. Therefore, by negatively influencing the perceptions of a stressful situation, fatigue could influence how individuals cope with or approach a stressful task.

293) Abstract 2705

THE RELATIONSHIP BETWEEN CELL FREE DNA AND TELOMERE LENGTH IN WOMEN UNDERGOING IN VITRO FERTILIZATION
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Introduction: Elevated plasma cell free DNA (CFD) and shortened telomere length have both been connected to a myriad of pathologies. CFD are DNA fragments found outside the nucleus, evidence of apoptotic or necrotic processes. In previous studies our group found elevated CFD levels in women who did not conceive from in vitro fertilization (IVF). Telomerases are nucleotide repeats located at the ends of the chromosome that function primarily to protect genomic DNA from damage during replication. Shortened telomere length in peripheral leukocytes has been found to be related to the risk of unexplained recurrent pregnancy loss. Method: This small study explored the relationship between CFD and telomere length in a sample of 20 women undergoing IVF treatment. We collected blood for analysis at three time points during the IVF cycle without an additional prick (T1: During the baseline estrogen level blood test; T2: during ovum pick up and T3: during the b&hCG blood test). Pearson correlations were conducted between telomere length, CFD and cortisol at all time points. Partial correlation analysis, controlling for cortisol at each time point was then conducted. Results: We found an inverse relationship between plasma CFD and leucocyte telomere length in women undergoing IVF. In addition, plasma cortisol was found to be related to both telomere length and CFD, however the independent relationship remained after controlling for cortisol. CFD at T1 and telomere lengths at T2 were statistically significantly related (r=-.817, p<.001). Telomere lengths at T3 were statistically significantly related with cortisol levels at T3 (r=-.546, p<.05). CFD at T3 was statistically significantly related to cortisol at T3 r=.417, (p=.05). Telomere length at T2, after controlling for cortisol, was statistically significantly related to CFD at T3 (r = -.539, p=.05). Conclusions: To the best of our knowledge; this is the first study to explore the relationship between CFD and telomere length in women undergoing IVF. While this study is too small in order to make
conclusive statements, it seems that plasma cortisol may play a role in the complex relationship between DNA integrity, telomere length and fertility. One potential mechanism that may explain the relationship between elevated CFD and shortened telomere length is the p53 pathway which is activated when telomeres become critically short and potentiates apoptotic processes that may be responsible for elevated CFD levels.

294) Abstract 2651
THE IMPACT OF WORK BURNOUT ON SLEEP QUALITY, POSITIVE AND NEGATIVE EMOTIONS IN MEDICAL RESIDENTS: IMPROVING WELLBEING IN GRADUATE MEDICAL EDUCATION
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Objective: Burnout during residency years, in particular training to obtain a medical specialty, has been well recognized. Often, burnout has been associated with poor sleep quality and negative affectivity, such as depression. However, aspects of positive emotion that have been linked to improved physical and mental health, such as trait forgiveness (TF), have been poorly explored. We examined the association between negative and positive affectivity with burnout in medical residents from various specialties.

Methods: Using an online questionnaire, medical residents (n=87) from various residences, (Family & Internal Medicine, Surgery, Psychiatry) at Larkin Community Hospital (South Miami, FL), completed standardized measures for depression (negative affect; CES-D), TF (positive affect), sleep quality (PSQI), and work burnout (Shirrom-Melamed Burnout Measure; SMBM; measuring overall burnout and three subscales; physical fatigue, emotional exhaustion, and cognitive weariness). Multiple regression analyses were used to measure the relationships between depression, sleep quality, and trait forgiveness with burnout scores. Results: Analyses indicated that depression and TF (but not sleep quality) were significant (p <.05) independent predictors of overall burnout variance (squared semi-partial correlations of 28.6% and 3.8% versus 1.6%, respectively). Subscale burnout analyses and depression were significant predictors of variance for physical fatigue (28.8%), emotional exhaustion (14.67%), and cognitive weariness (22.9%). Poor sleep quality was only a significant predictor for variance in physical fatigue (2.4%), while emotional exhaustion and cognitive weariness were not (.5% and .6%, respectively). Additionally, TF was a significant predictor of variance for physical fatigue and cognitive weariness (2.8% and 3.6%), but not for emotional exhaustion (2.7%). For all analyses, directionality of coefficients indicated increased burnout was associated with increased depression, poorer sleep quality, and less TF. Conclusions: Overall, results demonstrate that residents with increased burnout and low sleep quality had low TF and higher negative affectivity. These results are the first to propose TF as a significant independent predictor from negative affect indicators. Prospective studies to investigate the mediation of positive affect and work burnout, as well as potential interventions to improve positive affect in medical residents, are warranted.

295) Abstract 2484
A SUPPORTIVE ROMANTIC PARTNER INTERACTION DIFFERENTIALLY INFLUENCES MEN AND WOMEN’S PAIN RATINGS TO AN ACUTE PAINFUL PROCEDURE
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Background: Social influences can alter a variety of aversive stimuli, including pain. Further, social influences often function differently in men and women, and women have been found to process pain differently. Methods: Using an online questionnaire, participants (N=229) were asked to engage in a supportable dyadic interaction with one's significant other on men and women's subsequent experience of acute pain.

Methods: Twelve heterosexual pain-free young adults and their romantic partners attended two laboratory sessions separated by one week. Each session consisted of baseline, experimentation, second baseline, pain, and recovery phases completed in a fixed order. During the experimentation phase participants either: 1) joined their partners in the same room for a warm contact period where they sat facing one another and were asked to talk about a time they had spent together that had made them feel closer as a couple (experimental condition), or 2) remained isolated and read aloud from the first chapter of an introductory statistics textbook (Control condition). Couples were separated for baseline, control, second baseline, pain, and recovery phases. Pain was induced by submersing the non-dominant hand in cold (2°C) water until the pain became unbearable, to a maximum of 5-minutes. Pain threshold, intensity, and unpleasantness were rated immediately following pain testing. The second laboratory session was identical to the first with the exception of the experimentation task completed.

Results: There was a condition by sex interaction on pain intensity, F(1, 21) = 4.27, SE = 106.48, p < .05, ηp2 = .17. Females reported lower pain intensity following warm contact than control, Md1 = 11.83, t(11) = 2.20, p < .05, while men reported no difference between the two conditions, Md1f = 0.66, t(11) = 0.07, p > .05. No statistically significant differences were observed for pain unpleasantness or pain discomfort.

Conclusion: A supportive interpersonal conversation differentially influenced pain ratings to the cold pressor among men and women. Women reported less pain to the cold pressor following a warm interpersonal conversation with their significant other, an effect that was not observed for men. These results could have important implications for the clinical management of acute pain.

296) Abstract 2639
EFFECTS OF APPROACH- AND AVOIDANCE-ORIENTED COPING DEPEND ON DISEASE CONTROLLABILITY
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Objective: Chronic diseases vary in their controllability, and research suggests that the efficacy of disease-directed coping attempts varies as a function of disease controllability. The present experiment investigates whether the match between approach- and avoidance-oriented coping and disease controllability predicts psychological adjustment.

Method: Healthy undergraduate students (N = 92) participated in a 2 (high vs. low control) x 2 (approach vs. avoidance coping) experimental study. Participants learned about a fictitious enzyme, tisomerase, and were told tisomerase deficiency was caused by genetics (low control) or behavioral factors (high control). They were told that tisomerase deficiency was a risk factor for developing chronic diseases. Next, they performed a saliva test designed to indicate tisomerase deficiency. Participants were finally asked to spend five minutes making a list of at least ten ways they could learn more about tisomerase deficiency (approach) or to spend five minutes rank ordering a national list of hospitals and to try hard not to think about their results (avoidance/suppression). Psychological adjustment was assessed by measuring positive affect (PA) and negative affect (NA) at three time points: study entry (Time 1), immediately following tisomerase deficiency results (Time 2), and after the coping manipulation (Time 3).

Results: Following tisomerase deficiency induction, all participants demonstrated a significant decrease in PA (d = .55, p < .001) and an increase in NA (d = .33, p < .001) indicating that the induction was effective. There was an effect of control x coping interaction for Time 3 PA (O2 = .07, p = .011), but not for NA (p > .05). In the high control condition, participants in the approach-coping compared to avoidance-coping condition had significantly higher Time 3 PA controlling for Time 2 PA (d = .94, p < .003). This effect was not observed when control was low (d = -.11, p = .93), however.

Conclusions: Using experimentally manipulated disease control and coping, this study demonstrates that the effects of approach-oriented and avoidance-oriented coping on positive affect depend on the degree of perceived disease control. For controlling but not uncontrollable health stressors, interventions promoting approach-oriented coping and discouraging avoidance-oriented coping, such as suppression, may be helpful. Future research should explore additional coping strategies that may be effective for uncontrollable aspects of illnesses, such as coping through acceptance, positive reappraisal, and emotional approach.

297) Abstract 2737
RESTING VAGAL ACTIVITY IN CHRONIC PAIN PATIENTS: A META-ANALYSIS
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The meta-analysis aimed to systematically review differences in vagus nerve activity indexed by time- and frequency-domain measures of heart rate variability (HRV) in chronic pain patients compared to healthy controls. An extensive search of the literature revealed 55 studies that reported HRV in chronic pain patients compared to healthy controls. Included studies yielded a total of 86 comparisons that were subjected to meta-analysis and meta-regression on several population- and study-level covariates. Meta-analysis was
performed on time- (root-mean-square of successive R-R interval differences (RMSSD)) and frequency-domain measures (high-frequency (HF) HRV) of vagally-mediated HRV. True effect estimates as adjusted standardized mean differences (SMD; Hedges g) combined with inverse variance weights using a random effects model were computed. Chronic pain patients show lower HRV than healthy controls indexed by RMSSD ($Z = 4.14$, $p < .0001$; $g = .34$; 95% CI ($-0.50$, $-0.18$); $k = 25$) and HF ($Z = 4.30$, $p < .0001$; $g = .49$; 95% CI ($-0.42$, $-0.16$); $k = 51$). Meta-regression on covariates revealed significant differences by clinical etiology, age, gender, and length of HRV recording. The implications of these findings are discussed and directions for future research are provided.

298) Abstract 2880

**RACIAL DIFFERENCES IN CORTISOL SECRETION ACROSS THE TRIER SOCIAL STRESS TEST**

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Altered cortisol secretory patterns have been proposed as a partial explanation for racial disparities in negative health outcomes given they have been linked to a variety of medical conditions (Harrell et al., 2011; McEwen, 1998). Past studies have shown differences among racial groups’ diurnal cortisol patterns (Cohen et al., 2006; DeSantis et al., 2007; Hajat et al., 2010). Comparatively fewer investigations have focused on the differences among racial groups’ cortisol secretion in response to a psychosocial stressor. Chong et al. (2008) found Blacks had lower levels of cortisol secretion across the Trier Social Stress Test (TSST) compared to Whites. In prior work, we found Hispanics had significantly steeper rise and recovery in cortisol secretion across the TSST compared to Asian Americans (Garber et al., in preparation). In this study, we examine Blacks’, Hispanics’, and Whites’ cortisol secretion across the TSST, hypothesizing that Blacks will have lower cortisol secretion, and Hispanics higher cortisol secretion when compared to Whites.

Participants were 43 male and female students from Roosevelt University. The sample comprised of 20 Black, 7 Hispanic, and 16 White participants. Overall cortisol secretion was assessed using Area Under the Curve analyses relative to ground (AUCG) and intercept (AUCI). Whites did not differ from Hispanics or Blacks on either cortisol outcome measure, and Blacks and Hispanics showed no difference in AUCG or AUCI. However, there was a significant difference in AUCG for Black ($M=333.17$) and Hispanic ($M=523$) groups ($t(25)=2.41$, $p=0.02$). Hispanics had greater cortisol secretion across the TSST compared to Blacks. The findings from this study did not replicate prior research that found Whites had a greater overall cortisol response to the TSST compared to Blacks (Chong et al., 2008). However, greater cortisol secretion for Hispanics compared to Blacks represents a novel outcome similar in nature to our previous findings. Hispanics may have a biological stress response system that is more reactive to social evaluative threat than Blacks and Asian Americans. Taken together, these findings raise questions about cultural factors that may explain biological responses to stress.

299) Abstract 2696

**FEASIBILITY OF A TAI CHI CHUAN RANDOMIZED CONTROLLED TRIAL AMONG YOUNG ADULTS WITH SYMPTOMS OF ANXIETY.**

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This feasibility study used a 3-arm randomized controlled trial design to determine optimal levels of instruction in Tai Chi Chuan (TCC) in the target population of young adults age 18-40 who indicated that they had mild to severe symptoms of anxiety on the Generalized Anxiety Disorder (GAD-7) screening measure. Seventy-five young adults (M age = 21.13, SD = 3.5) were randomized to one of three groups: (1) self-study of education materials (placebo control), (2) self-study materials plus 10 weeks of TCC meeting 2 times per week for one hour for each class period, or (3) self-study materials plus 10 weeks of RCT classes meeting 2 times per week plus an instructional DVD designed to encourage practice outside of class. The overall retention rate was 80%, and no significant differences were found across the three groups in terms of retention rates. A qualitative review of reasons for withdrawing from the study or being unable to attend classes found time management issues to be a frequently reported concern. Intent-to-treat analyses found no differences in groups across time. When only retained subjects were included in analysis of pre-intervention and post-intervention scores, no significant differences were found on State-Trait Anxiety Scale (STAI) scores or Pittsburgh Sleep Quality Index (PSQI) scores for participants in the Control group. Tai chi participant scores on both the State-Trait Anxiety Inventory (STAI) and PSQI were found to be significant from pre- to immediate post-intervention as did PSQI scores. Tai chi may be a promising intervention for anxiety and poor sleep quality in young adults.

300) Abstract 2475

**PREDICTING PHYSICAL HEALTH DECLINE OVER TIME AMONG CANCER CAREGIVERS**

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Distressed caregivers often report poor physical health (PH), yet the extent to which individual differences in psychological distress and caregiving factors are associated with caregivers’ long-term health decline remains unclear. This study examines changes in caregivers’ PH during the 8 years after patients’ cancer diagnosis, and how caregivers’ psychosocial factors of objective and subjective caregiving stress, depressive symptoms, social support, and caregiving esteem relate to their PH change.

Caregivers (N=632;63% female; age M=53.18) provided data in a nationwide study at 2 (T1), 5 (T2), and 8 (T3) years after their family member’s cancer diagnosis. Self-reported age, gender, education, income, relationship to patient, and employment status at T1 were covariates. Objective caregiving stress (patient’s cancer severity), subjective caregiving stress (Stress Overload subscale of Pearlin Stress Scale), caregiving esteem (Caregiver Esteem subscale of Caregiver Reaction Assessment), social support (BESL), and depressive symptoms (CES-D) were assessed at T1 as predictors. PH (MOS-SF-12 PCS) was assessed at T1 through T3 as outcome. Caregivers overall had comparable PH levels to the US population at all time-points (49.11 < Ms < 50.61). Latent growth modeling showed significant decline in caregivers’ PH over time (slope=-.081, $p<.001$). The structural equation model predicting change in caregivers’ PH fit the data well ($\chi^2(12)=18.87$, $p=.09$; RMSEA=.03; CFI=.99; SMRMR=.02). Older age, male gender, less education, lower income, and being unemployed were related to poorer PH at T1. Besides these covariates, greater objective and subjective caregiving stresses were related to poorer PH at T1 ($p$s<.01). Depressive symptoms measured at T1 were the only significant predictor of changes in PH over time (B=-.070, $p=.01$), although unrelated to T1 PH: caregivers with higher depressive symptoms at T1 showed faster PH decline over the next 6 years.

Findings highlight the unique contribution of caregivers’ depressive symptoms to their PH decline across long-term survivorship, beyond the effects of other major psychosocial factors. Interventions that successfully reduce depressive symptoms should be delivered to family caregivers of cancer patients during early survivorship, as these interventions could benefit caregivers’ psychological health and dampen their PH decline. Future studies examining biobehavioral pathways linking depressive symptoms and PH decline among cancer caregivers are warranted.

301) Abstract 2925

**LAVENDER ESSENTIAL OIL AROMATHERAPY DOES NOT REDUCE CARDIOVASCULAR REACTIONS TO ACUTE PSYCHOLOGICAL STRESS IN THE LABORATORY: RESULTS FROM A PRELIMINARY RANDOMIZED CONTROL TRIAL.**

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Background: Exaggerated cardiovascular reactivity to psychological stress is predictive of cardiovascular morbidity and mortality. Separate literature has suggested that aromatherapy aids in alleviating stress. While a paucity of research exists, aromas have been associated with improvements in psychological and physiological health states. Aim: The study aimed to evaluate cardiovascular reactivity and recovery during an acute psychological stress task in the presence of lavender essential oil. Methods: Participants (N=64) were randomly assigned to one of three conditions: control with no aroma, lavender oil, or melaleuca oil (active-control). Aromas were diffused for the entirety of the task. Heart rate (HR), systolic (SBP), and diastolic blood pressure (DBP) were measured during 10-minute phases of baseline, stress, and recovery. Post-stress task and olfaction perception questionnaires were completed. Reactivity was defined as the difference between the average stress and baseline phases. Group differences in demographic variables, cardiovascular measures, reactivity, recovery, and stress and olfaction anxiety were analyzed using separate chi-squares and ANOVAs. Results: No significant group differences were found for demographic variables, cardiovascular measures, post-stress inventories, HR and DBP reactivity, or recovery. SBP reactivity was significantly different between groups, $F(2, 61)=5.18$, $p<.008$, $n^2=1.245$, as was how the groups perceived the aroma in terms of relaxation, $F(2, 61)=4.49$, $p=.015$, $n^2=1.126$. HR and invigoration, $F(2, 61)=6.76$, $p=.002$, $n^2=.182$. Post-hoc tests revealed that the melaleuca group had significantly higher SBP reactivity than the control group; while the lavender group, compared to the control group, found the smell of lavender to be more relaxing and invigorating. A time x condition interaction was significant for both SBP and HR. Notably, but not significant, across all
phases, the control group consistently maintained lower cardiovascular measurements and reactivity in comparison to the aroma groups. Conclusion: During acute psychological stress, the presence of therapeutic aromas seemingly elicits an activating cardiovascular response. Despite the perception of positive affect and olfactory appeal, reactivity was not reduced and recovery was not accelerated when lavender aroma was present. Implications and limitations will be discussed.

302) Abstract 2988
PREGNATAL ADVERSITY PROGRAMS ADULT HEALTH IN FEMALE RATS: EFFECTS OF FOOD RESTRICTION, STRESS, AND CHOCOLATE
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Adversity during gestation can program health trajectories of both mother and offspring over the lifetime. This pilot study explored the effect of different types of challenges during pregnancy—food restriction, stress, and stress followed by chocolate—health and development of both mothers and their female offspring. Stressed dams were exposed to variable chronic stress over the second half of pregnancy. Stress Plus Chocolate dams experienced variable chronic stress and received chocolate chips immediately following stress. Food Restricted dams received 80% of their standard food intake during the second half of pregnancy. The different forms of prenatal adversity led to overlapping, but distinct outcomes in both the dams and their female offspring. Stressed mothers showed significantly lower levels of licking and grooming, compared to either the food restricted dams or the control group (p<0.01). In chocolate restricted dams, those who experienced any type of prenatal adversity demonstrated an increased weight gain trajectory starting at adolescence, compared to the control group. Pups that were prenatally stressed exhibited significantly lower average basal IL-6 levels compared to the Food Restricted group (p=0.021), while the Control and Stress Plus Chocolate offspring had intermediate levels of plasma IL-6. Offspring that experienced prenatal stress showed more climbing behavior in the forced swim test, compared to the other groups, suggesting increased active coping and lower learned helplessness. Offspring in the Stress group climbed for 37.0 sec more than, over twice as long as, the Stress Plus Chocolate group (p=0.032), and for 32.7 sec more than the Control group (p=0.10), but did not differ from the Food Restricted offspring. Specific prenatal challenges led to overlapping, but distinct effects on offspring health and development. Maternal chocolate consumption minimized the effects of stress on IL-6 and behavior in the forced swim test. Early life experiences, particularly in utero, play a critical role in development and help shape later physiological consequences in offspring, likely based on fetal adaptation to the predicted environment, as communicated via the mothers experience.

303) Abstract 2920
THE ROLE OF SOCIAL CONSTRAINTS AND RESTRICTIVE MASCULINITY ON FUNCTIONING IN YOUNG ADULT TESTICULAR CANCER PATIENTS
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Background: Restrictive masculinity in male cancer patients might contribute to declines in functioning and quality of life. This impact might be particularly sensitive to ones interpersonal environment. This study examines the relationship of restrictive masculinity with psychological, social, and daily functioning in young adult (ages 18-29) testicular cancer survivors and the potential influence of social constraints. Social constraints, or perceptions that ones environment is unresponsive to disclosure and emotionality, hinders effective coping resulting in psychological and physical symptoms. This study investigates relationships among masculinity, social constraints, and health-related functioning. Methods: Young adult men (N=171, M age=25.2 SD=3.32) with a history of testicular cancer completed questionnaires as part of a larger study of health, emotionality subscale) (Levant & Fischer, 1996); and the physical, social, and daily functioning subscales of the Functional Assessment for Cancer Therapy (Levant, 1997). Results: Linear regressions revealed that higher masculinity was associated with lower social (B = -.53, p<.01) and daily (B = -.57, p<.01) functioning. No significant relationship was observed for physical functioning. Higher social constraints was associated with lower daily functioning (B = -.22, p<.05), but not with social or physical functioning. Social constraints moderated the relationship of masculinity on social (B = -.20, p<.05) and daily (B = -.22, p<.05) functioning such that high social constraints was related to lower functioning for men high on masculinity (see Fig 1a and 1b). All analyses controlled for depression, anxiety, and time since diagnosis. Conclusion: Restrictive masculinity and a constrained interpersonal environment negatively impacts cancer-related functioning. Possessing a restrictive masculine self-image combined with a social environment closed to disclosure may be particularly detrimental to cancer-related functioning. More work that identifies targets of intervention and biopsychological mechanisms is needed.

304) Abstract 3118
MEDIATORS AND MODERATORS OF PLACEBO EFFECTS IN PSYCHOSOMATIC AND PSYCHIATRIC DISORDERS
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In randomized placebo-controlled studies on psychosomatic and psychiatric disorders, high placebo response rates have often been recognized, and predictors were investigated in some meta-analyses. To identify predictors of high placebo responses in psychiatric and psychosomatic disorders, we reviewed 30 meta-analyses and systematic reviews consisting of more than 500 placebo-controlled studies. A relation to high placebo responses was only repeatedly discussed for three out of 20 factors that were registered in these articles: 1. low symptom severity at baseline; 2. more recent studies; and 3. unbalanced randomization with more patients randomized to drug than to placebo. In contrast, experimental studies with psychological, imaging, and genetic approaches have not yet been successful in identifying predictors of placebo responses in healthy participants or patients. Therefore, predictors of placebo responses should be further investigated. However, it is unlikely that there is only one mediator that will explain it all but there may be different individual moderators responsible for placebo responses in psychosomatic and psychiatric disorders and beyond.

305) Abstract 2754
SEEING IS BELIEVING: IMPACT OF THE SOCIAL MODELLING OF MEDICATION SIDE EFFECTS ON PLACEBO AND NOCEBO EFFECTS
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Objective: To date, a small number of studies have investigated the influence of social modelling of improvement on the placebo effect, and social modelling of symptoms on the nocebo effect. However, crossover effects, including the influence of the social modelling of symptoms on the placebo effect have not been examined. This study investigated the impact of the social modelling of side effects following placebo medication ingestion on both placebo and nocebo effects. It also investigated whether medication branding (brand or generic labelling) moderated social modelling effects. Methods: 82 university students took part in the study which was purportedly investigating the impact of fast-acting beta-blocker medications (actually placebos) on pre-examination anxiety. After taking the medication, participants were randomised to either witness a female confederate report experiencing side effects or no side effects following taking the same medication. Differences in symptom reporting, blood pressure, heart rate and anxiety were assessed between the social modelling of side effects and no modelling groups. Results: Seeing a confederate report side effects reduced the placebo effect in systolic (p=0.009) and diastolic blood pressure (p=0.033). Seeing a confederate report side effects also increased both total reported symptoms (M=7.35, SE=0.54 vs M=5.16 SE=0.53, p=0.005) and symptoms attributed to the medication (M=5.27, SE=0.6 vs M=3.04, SE=0.59, p=0.01), although the effect
on symptoms was only seen in female participants. Females who saw the confederate report side effects reported approximately twice the number of symptoms as those in the no modeling group. There was no effect of social modelling on heart rate or anxiety. Medication branding did not influence placebo or nocebo outcomes.

Conclusions: The social modeling of symptoms can substantially reduce or eliminate the placebo effect. Viewing a confederate display symptoms after taking the same medication increases symptom reporting in females. These findings have implications for medication efficacy, side effects, medical care utilization, and adherence to treatment.

306) Abstract 2547
IMPACT OF MINDFULNESS MEDITATION ON BLOOD PRESSURE MODULATION: A RANDOMIZED EXPERIMENTAL STUDY.
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Although research demonstrates that mindfulness meditation (MM) decreases psychological stress, meager evidence exists on its physiological benefits (e.g. limited to findings of decreased heart rate and blood pressure). Therefore the purpose of this study was to extend the current MM-physiologic literature into spectral analysis of heart rate and blood pressure variability. We hypothesized that a brief MM intervention would decrease blood pressure and reduce sympathetically dominated power spectrum of heart rate variability (HRV). Undergraduates (N=77, Mage=20.14, SD=1.37, 88% Female) volunteered and were randomly allocated into either a control or an experimental MM condition. Heart rate and blood pressure were measured and a 15min rest/meditation intervention was conducted. Participants were then seated and given a 10min rest period. Baseline measures of brachial BP and 5min of beat-to-beat finger BP were taken. Controls remained seated and didn’t move/talk for 15min. MM participants listened to a guided MM lasting 15min. Beat-to-beat BP and ECG were recorded during these 15 min. All procedures were approved by the University’s IRB. Physiological outcomes were examined via a 2 (baseline/intervention) x 2 (control/MM) x 2 (CO2 levels) mixed model ANOVA for each HRV metric (i.e., low, medium, and high frequency component of systolic BP) from baseline to intervention in MM participants than in control participants. Results demonstrate MM to have positive effects on HRV and BPV suggesting that MM may be clinically pertinent. As opposed to LFSBP that may have a respiratory component, oscillations of DBP are related to fluctuations in vascular resistance due to sympathetic and baroreflex regulation of vasomotor tone. These findings extend the current literature relating MM to physiology into HRV and BPV parameters. Future studies are needed to determine if MM can longitudinally influence cardiovascular health.

307) Abstract 3127
DOES RACE PREDICT BLUNTED CARDIOVASCULAR REACTIVITY TO ACUTE MENTAL STRESS?
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Introduction: Increased hemodynamic responses to psychological stress have been associated with heart hypertension and other adverse cardiovascular outcomes. However there is emerging evidence that blunted cardiovascular reactivity to stress is related to adverse health outcomes as a marker of reduced physiological capacity due to autonomic dysfunction from prolonged stress exposure. African Americans (AA) have higher levels of chronic stress from socioeconomic deprivation and discrimination and have more hypertension and worse cardiovascular outcomes than Non-African Americans (NAA). Differences in hemodynamic responses to stress may play a role. Methods: A total of 636 patients (179AA) with confirmed coronary artery disease (CAD) underwent a standardized mental stress challenge. Heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) were obtained during a resting period, a speaking task, and a recovery period. The rate-pressure product (RPP) was calculated as SBP x HR. Hemodynamic reactivity with mental stress was evaluated as the difference in RPP at rest and during mental stress. Depressive symptoms were measured with the Beck Depression Inventory-II (BDI-II). Results: As compared to NAA, AA patients were younger, had lower education and income, and higher prevalence of CAD risk factors and more depressive symptoms (BDI-II mean scores 9.9 vs. 7.7, p<0.005). AA patients had higher SBP and DBP during all three periods than NAA. However, hemodynamic reactivity with stress was significantly lower in AA than NAA (RPP 3110 vs 3611, p<0.02). Adjusting for baseline RPP, age, gender, depressive symptoms and use of antidepressants did not substantially alter the association. However, after adjusting for CAD risk factors and beta-blocker use the association was attenuated and no longer significant (p=0.13). In the final model, baseline RPP, current smoking, depressive symptoms, anti-depressant use, and BMI were significantly associated with a lower RPP response to mental stress. Conclusions: AA patients with CAD, compared with NAA, have persistently elevated blood pressure throughout mental stress but tend to have lower hemodynamic reactivity to stress. CAD risk factors such as BMI and diabetes partially explain these different responses to stress. Whether blunted cardiovascular reactivity to stress is related to worse outcomes in AA needs further study.

308) Abstract 2706
THE DELBOEUF CONCENTRIC CIRCLE ILLUSION, VISUAL ATTENTION, AND EXCESS ADIPOSY IN ADOLESCENT GIRLS
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Among the many known correlates of the American obesity epidemic is an increase in the average diameter of the dinner plate (Itterum & Wansink, 2011) after 1980. The increase in plate size has been theoretically related to the Delboeuf illusion, a perceptual illusion, that diminishes the perceived size of the plate’s central contents. It has been argued that this misperception could promote excess food intake and weight gain. In the present investigation, we tested the association between the Delboeuf effect and various indicators of adiposity among girls aged 14-18 yo. During a separate test of attention and information processing, we examined event-related electroencephalographic potential differences associated with adiposity in these girls. The latter test was used to determine if the Delboeuf illusion was related to a more general impairment in attention, and to neural processing of, novel stimuli. The analysis revealed an unexpected result. Girls with a body mass index percentile >85, or with greater triceps skinfold thickness, exhibited less sensitivity to the Delboeuf illusion than girls with normal adiposity: the match-to-sample size accuracy difference between trials with larger versus smaller outer rings was -21% (sd=26, n=76) in the excess adiposity group and -31% (sd=19, n=81) in the normal adiposity group (t=2.7, p<0.006). The excess adiposity group also exhibited a significantly smaller P300 response at Fz, Cz, and Pz electrodes to a novel visual stimulus during a separate selective attention task. The findings suggest that overweight adolescent girls are not more easily deceived by the Delboeuf illusion than their normal weight peers. Instead, the opposite appears to be true. When the Delboeuf findings are considered in combination with the P300 findings from the attention task, the overweight girls might simply be less sensitive to visual cues in their environment. The implications of these findings for weight loss and weight management therapies should be considered. Supported by PHS Grant P60AA03510.

309) Abstract 2620
SLEEP DISTURBANCE AS A PREDICTOR FOR FATIGUE, PAIN, AND DISTRESS FOLLOWING SURGERY FOR GYNECOLOGIC CANCER: A FOCUS ON INTRADIVIDUAL VARIABILITY
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Purpose: Sleep disturbance has increasingly become recognized as a significant symptom occurring during the cancer survivorship continuum. Individuals undergoing cancer treatment also commonly experience symptoms such as fatigue, pain, and psychological distress, which appear to worsen in the context of poor sleep. However, it is less clear how these factors vary within individuals across time. Therefore, the purpose of this analysis was to within the extent to which day-to-day sleep patterns are associated with day-to-day levels of fatigue, pain, and distress in women undergoing surgery for gynecologic cancers.
Methods: Participants were 24 women (Mage=59.0 yrs, SDage=11.6 yrs) with recent, surgically-confirmed gynecologic cancers and significant pre-surgical...
sleep disturbance. Approximately 4–6 weeks post-surgery, participants completed 2 consecutive weeks of sleep diaries in which they recorded daily total wake time (TWT), total sleep time (TST), fatigue, pain, and psychological distress. Hierarchical linear modeling (HLM) was used to examine intrapersonal variability (IV) within these relationships. Results: As hypothesized, longitudinal HLM demonstrated significant within-person relationships between sleep disturbance and reports of fatigue, pain, and distress. Patients with elevated TWT (β=.03, t(19.60)=2.22, p<.05) emerged as significant predictors, suggesting that following a night of poor sleep (e.g. above average TWT, below average TST), participants reported above average fatigue. Within-person TWT also emerged as a significant predictor of pain, β=.03, t(17.70)=2.13, p<.05, and psychological distress, β=.06, t(18.37)=3.55, p<.01. Conclusions: Sleep, fatigue, pain, and distress show day-to-day associations during the postoperative period in women with gynecologic cancer. These results suggest the utility of future research examining whether reducing sleep variability through treatment (e.g. CBTI) may have a positive impact on fatigue, pain, and psychological distress in cancer. Treatment efficacy may be maximized at points that cancer patients are most vulnerable to such symptoms, particularly post-surgery and/or during adjuvant treatment.

310) Abstract 3017

OPTIMISM AS A MODERATOR OF PSYCHENEUROIMMUNE PATHWAYS IN LUNG CANCER PATIENTS

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Lung cancer patients experience emotional reactions to their diagnosis including distress, anxiety, and depression. Individual difference factors such as optimism may influence patient outlook in clinically meaningful ways. Optimism may foster better emotional and psychological adjustment to cancer and could moderate stress/coping pathways. Data on physiological effects of optimism appears dependent on the contextual nature of stress. We hypothesized that optimism would moderate relationships between cancer-specific distress, emotional outcomes (anxiety, depression), and immune parameters (cytokines) in lung cancer patients.

Non-small cell lung cancer patients (n=56) completed questionnaires and provided blood samples. Hierarchical regressions adjusting age, cancer stage, and income explored optimism as potential moderator of relationships between cancer-specific distress, emotional outcomes, and serum cytokines.

Cancer-specific distress was associated with increased anxiety and depression, but optimism did not moderate these relationships. No direct effects of optimism were observed, but optimism moderated several relationships between emotional outcomes and immune functioning: Highly anxious patients with more pessimistic dispositions had increased pro-inflammatory cytokines IL-6 (p=.008) and TNF-alpha (p=.001). In contrast, depressive symptoms in the context of high nesmisis were linked with an anti-inflammatory immune response (IL-10; p=.025). There was also a main effect of depression such that patients with high symptom levels had higher IL-10 (p=.005).

The association between specific emotional symptoms and immune responses differed depending upon patients’ levels of optimism. It is interesting that the optimism/anxiety interaction was associated with pro-inflammatory responses (IL-6, TNF-alpha), while the optimism/depression interaction was associated with an anti-inflammatory immune response (IL-10). This suggests that in the context of emotional distress, pessimistic patients may have greater immune dysregulation. Specific physiological responses may be a function of both emotional symptoms and optimistic disposition.

311) Abstract 2967

RISK AND PROTECTIVE FACTORS FOR DEPRESSIVE SYMPTOMS IN YOUNG WOMEN EXPERIENCING CHRONIC FINANCIAL STRESS

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Objective: Stressor-related emotional expression often predicts improved psychological adjustment to serious life stressors, but dispositional factors may modify the utility of emotional expression. Using an experimental paradigm, the current study investigated the influence of dispositional factors (i.e., emotional acceptance, rumination, coping self-efficacy) on the effect of emotional expression on depressive symptoms in young Latina and non-Latina White women experiencing chronic financial stress. Method: Women (N = 98) were randomly assigned to discuss their emotions regarding their financial stress (EMO condition) or the facts regarding their finances (CTL condition) during two laboratory sessions two to five days apart. Depressive symptoms were assessed at baseline and one-week follow-up. Results: Depressive symptoms were elevated at baseline and remained high (M CES-D = 16.74, SD = 10.22) at one-week follow-up, with no significant difference between conditions. Greater emotional acceptance and coping self-efficacy, as well as lower rumination, predicted a decline in depressive symptoms at follow-up (ps < .05). Effects of emotional acceptance and coping self-efficacy did not vary by condition, but a significant interaction emerged (b = -.093, p = .015), such that greater rumination significantly predicted increased depressive symptoms in the CTL condition (t = 3.75, p = .001) but not in the EMO condition (t = .75, p = .46). Conclusions: Given the persistently high depressive symptoms among this group of young women facing chronic financial stress, identification of risk and protective factors for depressive symptoms is crucial. Findings suggest that emotional acceptance and coping self-efficacy may be important protective factors for individuals coping with chronic financial stress. Among those high in dispositional rumination, discussion of finances without the opportunity to express emotions related to financial stress may perpetuate rumination and, in turn, exacerbate depressive symptoms. In contrast, stressor-related emotional expression can buffer the relation between rumination and higher depressive symptoms.

312) Abstract 3039

TRAUMA AND PAIN IN PATIENTS AWAITING TOTAL PANCREATECTOMY WITH AUTO ISLET CELL TRANSPLANTATION (TPAIT)

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Chronic pancreatitis (CP) is a debilitating disease characterized by distressing symptoms (e.g., chronic pain, nausea, vomiting). Total pancreatectomy with auto islet cell transplant (TPAIT) is a surgical procedure to treat CP when other methods have failed, with the goal of improving a patient’s quality of life by reducing pain and opioid medication use, while optimizing glycemic awareness. While the relationship among trauma, pain, and drug misuse is well documented; it has not been examined in TPAIT candidates. The present study hypothesized that trauma symptoms and abuse would be positively related to pain severity, daily pain interference, and opioid medication use. Patients undergoing pre-TPAIT psychosocial evaluations (N=30) as part of routine clinical care from 7/2010–8/2012 at a large academic medical center completed the PTSD Checklist – Civilian Version (PCL-C), Brief Pain Inventory, and Cerebral Opioid Misuse Measure (COMM) to assess trauma symptoms, pain, and opioid misuse, respectively. General abuse history was obtained by self-report. Pearson’s r correlations examined relationships among trauma, abuse, and pain. Linear multiple regression examined the relationship between trauma and abuse with opioid misuse. (Note: p < .05 for all significant relationships presented).

Patients were 30% male, 10% African American and 90% Caucasian, 42.5±9.8 years of age, and had been diagnosed with CP on average 7.8±5.8 years prior to the evaluation. Trauma symptoms were significantly positively correlated with pain severity (r = .481) and pain interference (r = .677). There was not a significant relationship between abuse and: trauma, pain severity, or pain interference. Pain severity and interference were not significantly related to opioid misuse. However, trauma symptoms (β = .555) and abuse history (β = .382) explained a significant proportion (42%) of variance in opioid misuse (F(2, 18) = 6.521).

Patients undergoing a psychosocial evaluation for TPAIT who endorsed more trauma symptoms also reported increased pain and pain interference; further trauma and abuse history accounted for a significant amount of variance in opioid misuse. The present study is the first of its kind to investigate the relationships among trauma, pre-surgical pain, pain interference, and opioid misuse in a sample of patients with CP. The results highlight the utility of psychosocial evaluation and intervention throughout the trajectory of treating CP patients who are being considered for TPAIT- surgery intended to reduce/eliminate pain and opioid medications.
THE INTERACTION OF DEPRESSIVE SYMPTOMS AND ENDOTHELIN-1 PREDICTS POOR LONG-TERM PROGNOSIS IN YOUNGER PATIENTS WITH ACUTE CORONARY SYNDROME
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Objective: Although the relationship between depression and adverse post-coronary event (i.e. myocardial infarction [MI], unstable angina) prognosis has been consistently demonstrated, very few investigations have focused on younger patients. Importantly, the studies that did examine the modulating effect of age on the relationship between depression and post-event prognosis suggest that the influence of depression on prognosis could be more robust in younger subgroups. The particular mechanisms by which depression may contribute to poor post-event prognosis in younger patients have yet to be definitively determined. Endothelin (ET)-1 is a potent endogenous vasoconstrictr which has been previously linked to adverse post-event outcomes. In this study we examined the interactive effects of depressive symptoms and ET-1 on 2-year prognosis in younger patients with acute coronary syndrome (ACS).
Methods: The sample (n=153) included males ≤50 years of age and females ≤55 years of age who participated in a larger study. Blood samples for ET-1 assessment were collected within 2-3h of ACS admission. Depressive symptoms were assessed with the Beck Depression Inventory (BDI) II within 2-5 days of admission. The post-event prognosis was defined as a composite of major adverse events, including recurrent MI, urgent revascularization and all-cause mortality. Adverse events were ascertained by annual telephone calls and EMR chart extraction. In the statistical analyses, ET-1 was treated as a transformed continuous variable (ET-1). BDI-II score was treated as a continuous variable. The interactive effects of depressive symptoms and ET-1 on post-ACS prognosis were examined in simple and multivariable logistic regression models.
Results: The mean BDI-II score was 13.67 (SD = 10.76). The mean ET-1 was 1.68 pg/mL (SD=1.04 pg/mL). During the follow-up period, 23 patients experienced major adverse events. In unadjusted analyses, the interaction of BDI-II score and ET-1 predicted prognosis (Wald Chi-Square = 3.850, p=0.05). The relationship remained significant (Wald Chi-Square = 4.913, p=0.027) after adjusting for demographic characteristics, comorbidities and peak troponin levels.
Conclusions: In this cohort of younger ACS patients the interaction of depressive symptoms and ET-1 independently predicted prognosis. Thus the relationship of depression to post-ACS outcomes in younger patients may be in part due to pathological vascular processes. Larger studies are needed to validate the findings of the present investigation.

Table 1. Unadjusted and Adjusted Logistic Regression Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Wald Chi-Square</th>
<th>p-value</th>
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<tr>
<td>Unadjusted model</td>
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<tr>
<td>BDI-II Score</td>
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<td>4.273</td>
<td>.039</td>
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<tr>
<td>ET-1</td>
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<td>.022</td>
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<td>BDI-II Score X ET-1</td>
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<td>.050</td>
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<td>Adjusted model</td>
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<td>.027</td>
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<tr>
<td>ET-1</td>
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<tr>
<td>BDI-II Score X ET-1</td>
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</tr>
<tr>
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<tr>
<td>LVEF</td>
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<td>.420</td>
</tr>
<tr>
<td>Peak Troponin</td>
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<td>.848</td>
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<tr>
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<tr>
<td>Current Smoking</td>
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<td>1.678</td>
<td>.195</td>
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</tbody>
</table>

Abbreviations: BDI-II = Beck Depression Inventory-II; ET-1 = Endothelin-1; LVEF = Left Ventricular Ejection Fraction
Note: No adjustment was made for pulmonary disease or kidney disease as, due to the nature of the parent investigation, patients with chronic pulmonary disease and/or chronic kidney disease were excluded from participation

Somatization following a major natural disaster
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It is widely believed that trauma is linked to increases in somatization, but this understanding is based largely on cross-sectional studies, and reports of early traumas that are difficult to verify. Few prospective longitudinal studies have shown this relation, and none using a well-documented trauma. This study reports on a sample of college students who completed measures of somatization, along with several other theoretically relevant measures of psychopathology risk, in the months before an EF-4 tornado struck the college town in which participants lived. We assessed levels of tornado exposure and reassessed somatization in a subset of the original sample 6-8 months after the tornado. Latent regression analyses were performed to test the effects of several risk factors on changes in somatization. Pre-tornado risk factors were anxious and avoidant attachment, depression, neuroticism, and self-esteem. Testing risk factors separately, only pre-tornado neuroticism directly predicted increases in somatization, and the effect of tornado exposure on change in somatization was moderated by both neuroticism and anxious attachment. When all previously significant risk factors were tested in a single model, the direct effects of tornado exposure and neuroticism predicted increases in somatization. The results confirm that exposure to a random trauma does indeed increase somatization in a dose-responsive pattern. In addition, it appears the risks conferred from neuroticism and insecure attachment overlap.

Circadian variation of cardiac autonomic modulation in a rigorously healthy working population: Results from the MICS-cohort
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Introduction: Heart rate variability (HRV) fluctuates in a pattern of diurnal variation, with a peak of parasympathetic dominance during night time. Blunted increases at night are associated with decreased vagal tone and unfavorable health outcomes. We aim to examine the socio-demographic, work and health behavior attributes of the circadian pattern of HRV in a rigorously healthy working population.

Methods: We analyzed RMSSD from 931 (mean age 39±10; 78% males) 24-h HR-recordings collected at 4 distinct study sites of the Mannheim Industrial Cohort Study (MICS) in healthy working adults. Healthy was defined rigorous as indicating explicitly “No” to any of the following diagnoses: high blood pressure, high lipids, high sugar, respiratory diseases (e.g. Asthma, COPD), angina pectoris, stroke, infarction, CHD, depression, burnout, other chronic diseases, cancer and taking beta blockers. First, 3 individual-level cosine function parameters were estimated to quantify the circadian variation: Mesor (M, the 24h mean), amplitude (A, the distance between M and the highest value of the cosine curve, and acrophase (θ, the time of the highest value of the cosine curve). Second, random-effects meta-analysis was used to estimate the impact of age group (18-24/25-34/35-44/55-67, shift work (Y/N), a typical employment (Y/N), the hierarchical position (division manager/ project leader/ employee/ skilled worker/ semi-skilled worker), smoking or doing sweat-rich activities on M, A, and θ.

Results: Older age and being female is associated with lower M, A, and θ. Particularly, age related decline in M and A was more pronounced in the younger age groups (see figure 1). Working shift is associated with higher oscillation A. Being temporary employed is associated with lower M. Individual sport behavior increased M and A. Smoking and hierarchical position had no significant impact on CAM parameters.

Conclusions: Decreased circadian variation in physiology is associated with poorer health. In the present study older age, gender and work-related characteristics were associated with less circadian variation in HRV. Particularly, age declined in both the overall mean (M) and the oscillation (A) indicating a decrease of nocturnal parasympathetic activity.

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HPA-AXIS ACTIVITY IN SUBTYPES OF DEPRESSION: EXAMINING ASSOCIATIONS WITH EMOTION REGULATION IN TERMS OF RUMINATION
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Alterations in HPA axis activity in Major Depression (MD) are well documented. The direction of endocrine dysregulation however depends on a number of factors such as depression severity or chronicity as well as depression subtype. Furthermore, there is growing evidence for a relationship between a heightened tendency to ruminate and HPA axis regulation in depressed and healthy subjects. The aim of the present study was therefore to investigate possible associations between trait rumination and psychoneuroendocrine dysregulations in different subtypes of depression (atypical and melancholic subtype based on DSM-IV criteria) compared to healthy individuals. In 39 depressed patients and 23 healthy controls (20-63 yrs.; mean 43 ±12) the Cortisol Awakening Response (CAR) was assessed at two consecutive days and once after premedication with dexamethasone. Depression severity was measured with the Hamilton Depression Rating Scale. Rumination was determined using the Response Styles Questionnaire. No differences in basal HPA axis activity and feedback regulation emerged for the atypical and melancholic subtype of depression. Atypical depressed patients displayed a significantly lower CAR (area under the curve with respect to ground, AUCg p=0.009) than healthy controls, however not after dexamethasone suppression. With respect to the total sample we observed a significant association between trait rumination and basal HPA axis activity. Subjects with high levels of symptom-oriented rumination had a lower CAR (AUCg p=0.004, AUC with respect to increase, AUCI p=0.008), controlling for sex, BMI and depression severity. Furthermore, an interaction effect emerged for symptom-oriented rumination and sex with respect to morning cortisol levels, showing that the association between high trait rumination and a lower CAR is stronger in men (AUCg p=0.03, AUCI p=0.05). To summarize, in the present study lower basal HPA axis activity was related to maladaptive emotion regulation in terms of increased symptom-oriented trait rumination, especially in women. No differential effects of rumination on basal HPA activity and feedback regulation were found for the atypical and melancholic subtype of depression.
obesity. Yet, eating behaviors, such as restraint, susceptibility to external cues, and emotional eating have been understudied among ethnic minority groups, including AAAs. The present study used a sample of 372 (220 AA & 152 EA) young adult students to test the extent to which eating behaviors interacted with ethnicity to predict BMI above and beyond the predictive roles of (1) ethnicity, and (2) routine restraint, compensatory restraint, susceptibility to external cues, and emotional eating behaviors (measured by Weight-Related Eating Questionnaire; see Table 1). Age, sex, and years in US were controlled. EAs had higher BMI as compared to AAs (B = 18, p < .001). Low compensatory restraint was associated with higher BMI in EAs (B = -.22, p = .043; see Figure 1). Similarly, high susceptibility to external cues was associated with higher BMI in EAs (B = .30, p = .003; see Figure 2). Findings with AAs were non-significant. Overall, EAs appear to be at greater risk than AAs for increased BMI due to disordered eating behaviors. The relation between eating behavior patterns and BMI among AAs does not appear to align with traditional eating behavior theories, emphasizing a need for future research on eating dysfunction in AA populations. Overall, an ethnic interaction account is supported suggesting a need to consider Asian ethnicity when looking at BMI and eating-related disorders.
INVESTIGATING THE BI-DIRECTIONAL ASSOCIATION BETWEEN SLEEP DURATION AND INFLAMMATION: RESULTS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING.
Kimberly J. Smith, PhD, Life Sciences, Brunel University, Uxbridge, Middlesex, UK
Research has been increasingly showing that there is a U-shaped association between sleep duration and inflammation. However, there are few studies that have examined the bi-directional relationship between sleep duration and inflammation (as measured by CRP) in a cohort of older adults. Data from waves 4 and 6 (2008/2009- 2012/2013) of the English Longitudinal Study of Ageing (ELSA) were analysed for this study. A total of 2954 were included in the high CRP leading to sleep duration analysis. A total of 3349 people were included in the sleep duration leading to high CRP analysis. Sleep duration was assessed with a single-stem self-report question (short duration < 6, optimal duration 6-8, long duration > 8 hours per night). CRP was categorised as high (≥3mg/dL) or low (<3mg/dL). Confounders included age, sex, chronic illness, lifestyle and BMI. Statistics included cross tabulations and logistic regression.

Results showed that there was no evidence of a significant association for sleep duration at baseline leading to high CRP at follow up. Unadjusted analyses showed people reporting either a short duration (OR 1.16, 0.80-1.69) or long duration of sleep (OR 0.73, 0.40-1.35) at baseline were no more likely to have high CRP at follow-up. However, there was evidence that high CRP was associated with sleep duration at follow-up. Those people who had high levels of CRP at baseline were more likely to report either short sleep duration (OR 1.36, 1.08-1.70) or long sleep duration (OR 1.33, 1.04-1.71) at follow-up. However, these effects were both attenuated after adjustment for confounders.

Results from this study indicate that in this older cohort that there is evidence for increased CRP at baseline leading to both short and long sleep duration, but this effect is likely due to confounders examined.

AN EXAMINATION OF SEX DIFFERENCES IN PSYCHOLOGICAL, PHYSIOLOGICAL, AND PHYSIOLOGICAL FUNCTIONING IN A HIGH-STRESS UNDERGRADUATE SAMPLE
Meghan Sharp, B.A., B.S., Summer Anderson, B.S., Christyn Dolbier, Ph.D., Psychology, East Carolina University, Greenville, North Carolina

Introduction: The psychological and physical effects of stress differ between sexes. Although utilizing more coping strategies, women are more likely to experience depressive, anxiety and somatic symptoms related to stress. Research has examined sex differences in stress physiology, but relationships among physiology and symptomatology between sexes remain unclear. The current study explored relationships among psychological and physical stress symptoms, physiological markers of the sympathetic-adrenomedullary (SAM) and hypothalamic-pituitary-adrenal (HPA) axis stress response systems, and stress moderators of personal control and coping in high-stress undergraduates.

Method: Participants (N=70) included healthy students (Mage=19) scoring above 30 on the 10-item Perceived Stress Scale (α=.86). The majority were female (80%) and White (70%). Measures collected during a mid-morning lab visit included the Cognitive Somatic Anxiety Questionnaire, Center for Epidemiologic Studies Depression Index, Cohen Social Dysfunctional Anxiety Scale, and the Clinical Epidemiological Studies Depression Inventory (CES-D). Findings were tested with regression models that controlled for parental depression (assessed with the CES-D) to reduce this important source of bias. Regression results indicated that caregivers’ CSI scores significantly predicted somatic symptoms in their children (β = .31, p = .03) but the children’s CSI scores did not (β = .21, p = .10). Secondary regression analyses using the CSI’s Exposure to Neighborhood Disorder (ND) and Exposure to Violence (EV) subscales yielded essentially similar findings; a child’s symptoms were significantly associated with a parent’s ND scores (β = .30, p = .03) and marginally with a parent’s EV scores (β = .23, p = .08). The latter correlation may reflect range restriction due to the fact that the EV scale contains fewer items than the ND scale. The overall pattern of results suggests that children’s perceptions of neighborhood disorder and violence, although positively correlated with their parents’ perceptions (p = .01), are not associated with the child’s somatic complaints (p = .85). Child and parent factors that may explain this interesting pattern of associations require further investigation.

INTERACTIONS BETWEEN MINDFULNESS PROSPECTIVELY PREDICT CHANGES IN INFLAMMATION AMONG PRESYMPTOMATIC HEART FAILURE PATIENTS
Meredith A. Pang, PhD, Kathleen L. Wilson, MA, Psychiatry, University of California, San Diego, La Jolla, CA, Kelly Chin, BS, Brian Knight, BS, Research Service, VA San Diego Healthcare System, La Jolla, CA, Christopher Pruitt, BS, Laura S. Redwine, PhD, Paul J. Mills, PhD, Psychiatry, University of California, San Diego, La Jolla, CA

Mindfulness is a multifaceted construct associated with well-being. We previously reported that certain aspects of mindfulness, particularly interactions between facets (e.g., observing & nonreactivity to inner experiences), were associated with less inflammation in a cross-sectional sample of ACC/AHA presymptomatic Stage B heart failure (HF) patients. We attempted to extend our initial findings by examining whether composite mindfulness, individual facets of mindfulness & interactions among mindfulness facets prospectively predicted changes in inflammation across 6 months. Mindfulness was examined using the Five Facets Mindfulness Questionnaire (FFMQ). We observed 19 participants describing, acting with awareness (AWA), nonjudgement of inner experiences & nonreactivity to inner experiences. Inflammatory biomarkers included log-transformed BNP, sST2, IL-6 & TNF-α. The sample consisted of 35 Stage B HF patients (78% white, 97% male) with a mean age of 70 years (SD=7.3) & a mean BMI of 28.6 kg/m2 (SD=6.4). Inflammatory biomarkers at 6 months were predicted from age, BMI, baseline levels of each respective inflammatory biomarker & FFMQ Total. There was a significant inverse relationship between FFMQ Total & BNP (β=-0.08, SE=0.03, t=-2.26, p=.03, R2change=.14) such that higher baseline FFMQ Total scores were associated with smaller increases in BNP at 6 months. Next, inflammatory biomarkers at 6 months were predicted from age, BMI, baseline levels of each respective inflammatory marker & the 5 separate FFMQ subscales. In these analyses, there were no significant relationships between any individual FFMQ subscale & change in inflammatory biomarkers. Finally, we included theoretically-relevant interactions between FFMQ subscales in the models & found that AWA X nonjudgment significantly predicted IL-6 changes (β=-2.00, SE=0.04, t=-2.62, p=.012) & marginally predicted IL-6 changes (β=-2.14, SE=0.04, t=-2.08, p=.046). Higher endorsement of AWA was associated with smaller increases in TNF-α & IL-6 over time, but only when endorsement of nonjudgment was also high. Observe X nonreactivity significantly predicted IL-6 changes (β=-4.41, SE=0.04, t=-3.40, p=.004) such that higher levels of observing were associated with smaller increases in IL-6. These results only when the interaction effect was also considered. Examining interactions between facets of mindfulness may be important in understanding how mindfulness relates to physiology & ultimately well-being.
SOCIAL SUPPORT IS ASSOCIATED WITH DIURNAL CORTISOL RHYTHMS IN LONG-TERM OVARIAN CANCER SURVIVORS

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Methods: Ovarian cancer patients were recruited pre-surgery and completed self-report measures of perceived social support (Social Provisions Scale) and provided salivary cortisol samples 3 times per day for 3 days at diagnosis and at 1 year. Patients who were still living at 5 years post-surgery were re-contacted (n=27; early stage n=19; advanced stage n=8), completed self-report measures and again provided salivary cortisol samples. Patients receiving active chemotherapy were excluded from analyses at the time-points of active chemotherapy. General Linear Models were used to determine associations between social support and diurnal cortisol rhythm at each time-point and prospectively.

Results: Total social support was relatively stable over time (pre-surgery (M=88.5±5.90); 1 year (M=85.9±9.68); 5 years (M=84.9±7.74)) and measures at each time-point were highly correlated (p<0.001). In contrast, diurnal cortisol slopes showed partial correlations (p<0.05) with quality of life measures and were correlated (p<0.05) to each other (all ps > .225). At 5 years, survivors with higher levels of total social support and social attachment had more normalized diurnal cortisol slopes (β = -.034, p<.013; β = -.045, p<.001, respectively) controlling for disease stage and age. Although social support was not related to diurnal cortisol slope across-sectionally at baseline or at one year, social support at one year was prospectively related to a more normalized diurnal cortisol slope at 5 years (β = -.044, p<.001).

Discussion: Higher levels of social support and social attachment were associated with more normalized diurnal cortisol rhythms in long-term ovarian cancer survivors. Furthermore, greater social support at one year predicted a more normalized 5 year diurnal cortisol profile. These findings provide initial evidence of neuroendocrine mechanisms that may link social support with a survival advantage for women with ovarian cancer.

EXPLORING THE RELATION BETWEEN PERSONALITY AND C-REACTIVE PROTEIN: A MEDIATION MODEL OF RECOVERY

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From a multilevel view, personality relies on neurobehavioural systems that mediate its relation with health outcomes. Recent research proposes a cholinergic anti-inflammatory pathway to mediate the association of emotional-motivational personality traits (e.g. social inhibition, negative affectivity) to inflammation. Empirically, results are mixed. The present report explored whether the association between personality and high-sensitivity C-reactive protein (hs-CRP) is mediated by cholinergic and ß-adrenergic recovery. In order to overcome typical methodological flaws, we used factor analysis and activation components to locate personality and autonomic systems on appropriate levels of specificity and reliability (Stemmler, 2001).

Within the DIASH-CHF study hs-CRP levels and a questionnaire (e.g., Type-D Scale, Self-efficacy Scale) were available for N = 1105 participants with chronic heart failure. Personality scales were submitted to factor analysis and yielded 2 higher order factors: Behavioral Inhibition vs. Behavioral Activation. For a subsample (N=90, 42m, 65y [52-80]) we recorded ECG/ICG data for baseline, paced arithmetic, and recovery periods. We aggregated activation components to obtain physiologically informed estimates of cholinergic and ß-adrenergic processes, and computed recovery scores (recovery - arithmetic). All analyses controlled for confounders, mediation models applied bootstrapping procedure. The relation of hs-CRP and Negative Emotionality was moderated by Behavioral Inhibition (p=0.02 vs. no mediation, 0.52 for no mediation vs. observed). Behavioral Inhibition predicted hs-CRP, total effect C90% −0.56 to −0.16. Controlling for cholinergic and ß-adrenergic stress recovery indicated a partial mediation, direct effect C90% −0.49 to −0.08, indirect effect C80% −0.21 to −0.02. Both, ß-adrenergic and cholinergic recovery were needed to establish that mediation.

Despite the small sample size, we showed that cholinergic and ß-adrenergic influences partially mediate the relation between inhibited personality and inflammation. We discuss the methods used and suggest Gray’s behavioral inhibition vs. activation model as a useful but neglected framework of personality in psychocardiology.

PERCEIVED SOCIOECONOMIC STATUS DISCRIMINATION AND SUBJECTIVE SLEEP QUALITY IN AFRICAN-AMERICAN AND WHITE ADULTS

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Research on perceived discrimination and risk for chronic diseases has grown, but much of this work has focused on racial discrimination or overall mistreatment. Less is known about perceived discrimination on the basis of socioeconomic status (SES), despite the fact that SES is one of the most powerful social determinants of health. We examined the cross-sectional association between perceived SES discrimination and subjective sleep quality, an emerging risk factor for poor health. We also examined whether associations varied by SES or race – given well-documented Black-White disparities in sleep quality.

Participants were 425 African-American and White adults (67.5% female, 50.6% African-American, 55.3% college educated) aged 30-65 from the Morehouse & Emory Team Up to eliminate Cardiovascular Health Disparities (META-HEALTH) study. Perceived SES discrimination was assessed with a modified version of the 10-item measure. Subjective sleep complaints were assessed with the Pittsburgh Sleep Quality Index. SES and race-stratified linear regression analyses were conducted to examine the association between perceived SES discrimination and subjective sleep quality after controlling for demographics, perceived racial and gender discrimination, financial and general stress, BMI, and depressive symptoms. Compared to Whites, African-Americans reported higher levels of both perceived SES and racial discrimination (both p-values <0.0001), but not gender discrimination (p=0.1). In race-stratified models, perceived SES discrimination was significantly associated with subjective sleep quality in African-Americans after adjusting for demographics (β=1.58, p<0.01). The association remained significant after adjustment for other forms of discrimination (neither of which were significantly associated with sleep quality), BMI, and stress (β=1.49, p<0.01); but was reduced to marginal significance after adjusting for depressive symptoms (p=0.06). No significant associations were observed in Whites (p>0.1). No consistent patterns emerged in SES-stratified models. Findings suggest that perceived SES discrimination may be an important risk factor for subjective sleep quality among African-Americans. However, it may be important to further examine the role of depressive symptoms as a pathway through which SES discrimination might influence sleep.

DISCORSANCE BETWEEN MOOD AND PSYCHOPHYSIOLOGICAL ACTIVITY IN ABSTINENT SMOKERS

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This study examined the extent to which adrenergic, self-report mood, withdrawal symptoms, and craving measures are improved in abstinent smokers over four weeks of abstinence. One hundred and thirty eight smokers interested in smoking cessation and 33 nonsmokers participated in a study aimed at identifying stress-related psychobiological predictors of relapse. Smokers set a quit date and then attended four weekly post-quit follow-up sessions. Participants completed subjective mood and stress measures, and rested for 45 minutes during which saliva samples were collected for the measurement of cortisol concentration. Smokers also provided measures of craving, withdrawal symptoms, and tobacco use. Carbon monoxide (CO) and cotinine measures were also assessed in all smokers during each visit to verify smoking status. Smoking relapse was defined as smoking cigarettes seven consecutive days post-quit. Mood measures and saliva samples were collected from non-smoking individuals in parallel with smokers. A series of repeated measures analysis of variance were conducted. The results indicated that 1) relapsers had greater negative mood and distress than abstainers and nonsmokers (p <0.05), 2) no difference was observed between abstainers and nonsmokers in those measures, and 3) relapsers had smoking and withdrawal symptoms than abstainers (p<0.05). Cortisol did not differ between relapsers and abstainers. Correlational analysis revealed that pre-quit measures of distress, craving, and withdrawal symptoms were positively associated with cigarette smoking and CO levels during the follow-up visits (p<0.05). Reported average number of cigarettes per day after relapse was 50% less than that of pre-quit. These results suggest that
ASSOCIATIONS OF GHERLIN AND ADIPOGENIN WITH CHILDREN'S PSYCHOSOCIAL STRESS.
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BACKGROUND In the hormonal pathways from stress to dietary intake and energy homeostasis, neuropeptide Y, insulin and leptin are frequent cited substances. In more explorative and experimental research, the stomach hormone ghrelin and the adipocytokine adiponectin have also been suggested to affect stress and mood. In addition, these two hormones might be important in the link between stress and disease since ghrelin is an orexigen and adiponectin is anti-inflammatory, insulin-sensitizing and energy-regulating. Consequently, insight in their role can inspire us to intervene in the morbidity of psychosocial stress. In the current study, we will test the relation of stress with adiponectin and ghrelin serum levels in children.

METHODS Children (5-10y) were participating in the Belgian ChiBS study 2010. Adiponectin (N=366) and ghrelin (N=286) were analyzed in sober serum samples. Psychosocial stress was examined with the Strengths and Difficulties Questionnaire (parental report on emotional, social and conduct problems) and in self-reported negative emotions (anger, sadness, anxiety). RESULTS These hormones were not linked to age, sex or body fat%. Non-parametric correlations revealed a positive relation of adiponectin with anger (r=0.112; p=0.034) and conduct problems (r=0.151; p=0.005). Ghrelin was negatively related to emotional problems (r=-0.152; p=0.011). DISCUSSION In a non-clinical sample of children, adiponectin was related to more and ghrelin to less reported stress. The results show a clear distinction between inflammatory, insulin-sensitizing and energy-regulating. Consequently, insight in their role can inspire us to intervene in the morbidity of psychosocial stress. Nevertheless, the associations were weak (r smaller then 0.2). The results seem somewhat in contrast with the hypothesized anti-depressant effects of adiponectin but are in agreement with the hypothesized stress-buster effect of ghrelin. Concerning ghrelin, future research should also test the difference between sober and nourished status since ghrelin is highly influence by this. A major limitation is the cross-sectional and observational nature of our analysis, but in 2015 we will be able to test the longitudinally effects and its association with hair cortisol.

331) Abstract 2658

OLANZAPINE INDUCED ACUTE HEPATOTOXICITY: DO WE OVERLOOK THIS POTENTIAL SIDE EFFECT?
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Introduction
Atypical anti-psychotics can cause isolated increase in hepatic aminotransferases. The aminotransferase elevations that occur with Olanzapine are typically self-limited and rarely clinically significant. We report a unique case of a patient who presented with altered mental status (AMS), and isolated elevated transaminases secondary to Olanzapine.

Case Presentation
The patient is a 55-year-old married Caucasian female with long history of schizoaffective disorder who presented with profound AMS, hallucinations, and decreased oral intake for four weeks. Eight months ago she was started on Lithium 600mg, Olanzapine 40mg, and Bupropion 150mg. She was evaluated by her psychiatrist during this period. Patient medications were administered by her husband and had no history of alcohol or illicit drug abuse. No history of over the counter/ herbal medications or chronic or nonalcoholic or fatty liver disease. The comprehensive metabolic panel, acetaminophen/ lithium/ ammonia levels were normal except an isolated elevated aspartate aminotransferase 754 U/L, alanine aminotransferase 822 U/L. Liver Ultrasound was normal. She was continued on Bupropion, Lithium and Olanzapine was discontinued. Hepatic transaminases dramatically started trending down and within three weeks became normal. She was rechallenged on Olanzapine 10mg with gradual titration to 20mg daily with close monitoring of hepatic transaminases over the following two weeks. After two months post hospitalization follow up she was found to be doing well both physically and psychiatrically.

Conclusion
Olanzapine induced transaminitis has been a well-known side effect but there remains unanswered questions regarding the pathophysiology behind Olanzapine induced hepatotoxicity. As per our knowledge this is the first case ever reported in which patient developed AMS with elevated transaminases on scheduled Olanzapine. Olanzapine is a widely used drug for the treatment of both thought and mood disorders. The purpose of this case report is to highlight that AMS with elevated transaminases can be an insidious but serious side effect during treatment and need awareness amongst clinician’s to regularly monitor liver function test and to have effective approaches for the prevention of Olanzapine induced hepatotoxicity.

332) Abstract 2468

INTEGRATING MINDFULNESS INTO INDIVIDUAL PSYCHOTHERAPY: ONE YEAR CURRICULUM FOR PSYCHIATRY RESIDENT AND TWO CASES DEMONSTRATION.
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Background: Most of the mindfulness-based groups are in large urban areas resulting in training workshops for the interested psychiatry resident limited. Therefore, this resident and psychotherapy supervisor mutually developed a one year training curriculum for learning and implementing mindfulness into individual psychotherapy. Methods: To be able to perform mindfulness-based individual psychotherapy, the resident met with the psychotherapy supervisor weekly for one year. During the supervision hour, we discussed the resident’s daily formal and informal mindfulness practice experience, mindfulness research articles, and individual psychotherapy cases. The resident participated in 8 week MBSR and MBCT programs as well as a mindfulness retreat day. The mindfulness based individual psychotherapy for two depressive patients with chronic medical diseases under was performed. Results: The details of one year mindfulness psychotherapy curriculum is shown in table 1. We demonstrate the patient information, mindfulness approach and the clinical outcome of two depressive patients with chronic medical illness who had individual mindfulness-based psychotherapy with the resident (table 2). The first patient is a 49-year-old Caucasian man with a history of chronic recurrent depression, and traumatic brain injury. The resident included practices from meditation, body scan, and mindful walking were assigned in this case. We discussed several concepts of mindfulness such as decentering from unpleasant thoughts, and developing a new way to relate with unpleasant past experiences. The patient reported that the intervention helped him to “get his mind off the gerbil wheel cycle”. The second case is 40 year old African American woman who suffered from severe recurrent depression after being diagnosed with SLE. The minimal laboratory interventions were in this case as well. In this case, sitting meditation, and chair yoga. We discussed several concepts that helped in alleviating her depressive symptoms such as the connection between unpleasant thoughts/emotions and SLE. At the end of the psychotherapy course, she drew a picture of herself before and after mindfulness practice showing how she related to the SLE differently (picture 1). Conclusion: We described the design of the mindfulness training curriculum to meet the resident’s academic goals. Self-practice and participation in mindfulness groups are crucial for better understanding of the mindfulness concepts and practices. A psychotherapy supervisor trained in mindfulness practices personally and professionally provided important learning resources, gave feedback to the resident’s self-practice, and also gave guidance to each psychotherapy session. With this training curriculum, we believe the trainee will be able to integrate and expand mindfulness into his/her future clinical practice.

333) Abstract 2703

EXPERIENCES OF PHYSICAL AND EMOTIONAL ABUSE ARE ASSOCIATED WITH BLUNTED CARDIOVASCULAR REACTIONS TO PSYCHOLOGICAL STRESS
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Background: Blunted cardiovascular reactivity to psychological stress has been associated with early adversity and traumatic life experiences. However, most studies on exposure to trauma capture this adversity as either a binary variable or as a function of frequency. Aim: The aim of the study was to examine how both the type of traumatic experience (emotional or physical) and the additive effect of two types of trauma relates to cardiovascular reactivity to acute psychological stress in young adults. Methods: Participants (N=125) were screened using the Revised Stressful Life Events Screening Questionnaire (SLES-Q-R). A sub-sample of participants (age, M=19.7, SD=1.03 years, 81% female) were then semi-randomly selected to attend a laboratory session and were categorized as: no abuse (NA; n=16), physical abuse (PA; n=17), emotional abuse (EA; n=17), or physical plus emotional abuse (PPEA; n=14). Heart rate (HR), systolic blood pressure (SBP), and diastolic blood pressure (DBP) were measured at baseline and during a standard laboratory mental stress task. Reactivity was calculated as the average measure during the baseline period subtracted from the average measure during the mental stress task. Group differences in demographic characteristics,
baseline cardiovascular activity, and cardiovascular reactivity were analyzed using separate chi-square and ANOVA.

Results: There were no significant differences between groups in age, gender, baseline cardiovascular activity, or DBP reactivity. There were significant differences in HR reactivity, F(3,60)=2.94, p=0.04, pη2=0.128, and SBP reactivity, F(3,60)=3.39, p=0.024, pη2=0.145. Post-hoc analyses revealed that the PA and PPEA groups had significantly lower HR and SBP reactivity compared to the NA group. While not statistically significant, it is notable that the PPEA group had lower reactivity means than those in the PA or EA groups.

Conclusion: Our data accord with previous work suggesting a relationship between traumatic life experience and bruntivity. While the clinical implications and mechanism behind bruntivity remain unclear, future work should explore these relationships further to better understand how bruntivity may manifest as increased risk for poor health outcomes among individuals exposed to trauma.

334) Abstract 3151
THE ASSOCIATION OF INTRA-INDIVIDUAL REACTION TIME VARIABILITY AND RESTING HEART RATE VARIABILITY: A REPLICATION AND EXTENSION
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Higher intra-individual reaction time variability (IV), a measure of inattention and impulsivity, is associated with declines in cognition and found in individuals with mental disorders. Resting vagally-mediated heart rate variability (vmHRV), a psychophysiological index of self-regulatory capacity is related to mental health, cognitive control, and predicts all-cause mortality. We recently showed a modest negative correlation (r = −.215) between resting vmHRV and IV. The current investigation sought to reassess the strength of the relationship between IV and resting HRV in a larger sample of apparently healthy subjects. Continuous heart rate data was measured as 98 undergraduate students (57 Female, 42 ethnic minorities) individuals completed a 5-minute baseline period, a target detection task (Simon Effect task), and a 5-minute recovery period. Resting HRV was assessed using high frequency (HF) HRV at baseline. During the Simon Effect task participants were to inhibit distractor items (i.e. arrow) and respond to the correct positioning of a target (i.e. dot). IV was assessed using the mean standard deviation (SD) of reaction time. Regression results, controlling for accuracy and reaction time, showed that resting HRV significantly predicted IV during the Simon Effect task (β = −.151, p<.05). These data support our earlier findings from a smaller sample, showing that HRV is negatively related to IV. Moreover, the current modest effect size is more likely to be representative in comparison to our previous analysis. Increased IV is characteristic in various mental diseases, including schizophrenia and depression, that are characterized by frontal lobe dysfunction, and are also associated with alterations of HRV. Overall, our results suggest that future research should examine both IV and HRV when assessing cognitive decline and mental health realted outcomes as combining both can potentially lead to a better understanding of the relationship between cognitive capacity and mental and physical health.

335) Abstract 2474
PSYCHOSOCIAL PREDICTORS OF MORTALITY FOLLOWING LUNG TRANSPLANTATION
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Background: Lung transplantation has become an increasingly common treatment for patients with end-stage lung disease. Despite the frequency and cost of transplantation, the medial survival time following transplantation remains approximately 8 years. While medical factors such as native disease and disease severity impact survival after lung transplantation, the relationship between early post-transplant psychosocial function and post-transplant survival has not been widely studied. We therefore examined the relationship between 3 different measures of distress early after transplantation and long-term survival in a sample of post-transplant participants from the INSPIRE trial. Methods: One hundred thirty two lung transplant recipients (28 cystic fibrosis [CF], 64 COPD, 33 IPF, 17 other) were available for participation following transplantation. Patients underwent both medical and psychosocial assessments 6 months following transplantation, which included the Beck Depression Inventory (BDI), Spielberger Anxiety Inventory (STAI), and General Health Questionnaire (GHQ). Patients were then followed for up to 12.5 years following transplantation. Results: Over the course of follow-up, 74 (56%) of participants died during a median of 8.3 years after transplant. Controlling for demographic factors, native disease (e.g. CF, COPD, IPF, or other), disease severity, and posttransplant rejection, elevated BDI (P = .030) and GHQ scores (P = .012) were associated with increased mortality, whereas STAI-state (P = .369) and STAI-trait (P = .349) anxiety were unrelated to outcome. CF patients (P = .054) and patients with higher forced expiratory volume (FEV1; P = .034) also tended to exhibit lower mortality. Conclusion: Higher levels of distress and depression measured 6 months following lung transplantation are associated with greater long-term mortality after controlling for other demographic and medical predictors. Further studies are needed to determine if interventions designed to reduce early posttransplant depression and distress translate into improved outcomes.

336) Abstract 2788
THE EFFECT OF A TARGET BITE COUNT AND PLATE SIZE ON FOOD INTAKE.
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The purpose of this study was to determine if an instruction to take fewer bites than typically taken, would reduce intake and overcome the known environmental cue of plate size, where eating from larger plates causes individuals to eat more, without affecting subjective hunger or bite size. In a previous study, 55 participants (34 F, BMI=23±3.7, age=19±2.4) ate ad libitum macaroni and cheese served family style while eating from either a small plate or a large plate, measured up to 1-3 other individuals at the table. In that study, participants ate 114±35 gms and took 12±4 bites from the small plate, and 195±111 gms and took 20±6 bites from the large plate. In the current study using the same paradigm, 60 participants (33 F, BMI=22.8±3.1, age=18.5±1.1) were given bite count feedback and instructed to take only 12 bites while eating from either a small plate or a large plate. Participants ate 135±52 gms and took 12±3 bites from the small plate and 177±63 gms and took 12±2 bites from the large plate. There was a main effect of instruction (F[1,111]= 25.4, p < .001) and instruction (F[1,111]= 25.4, p < .001) on the number of bites taken as well as a plate size by instruction interaction (F[1,111]= 24.04, p < .001), i.e., the presence of the instruction overcame the effect of plate size. There was also a main effect of plate size on grams consumed (F[1,111]= 23.07, p < .001), i.e., those eating from a larger plate consumed more, but no significant effect of instruction or interaction. There was a main effect of plate size on hunger change (F[1,111]= 7.23, p < .05), i.e., those eating from the larger plate reported greater fullness after the meal. There was also a moderate interaction between plate size and instruction on hunger change (F[1,111]= 3.62, p = .06), i.e., the plate effect on hunger only occurred in the no instruction condition. There was no main effect of instruction on hunger. There was a main effect of instruction on bite size (F[1,111]= 15.0, p<0.001) i.e., those given the instruction took significantly larger bites, but no main effect of plate size, nor an interaction. These results suggest that simple interventions can decrease intake when instructed to limit their bites but will increase their bite size to compensate for the reduced bite allowance.

337) Abstract 2619
NEURAL CORRELATES OF PERCEIVED STRESS MANAGEMENT SKILLS IN REACTION TO ACUTE PSYCHOSOCIAL STRESS INDUCTION
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Background: While perceived stress management skills attenuate peripheral endocrine stress responses, potential associations with central stress responses are unknown. Here, we investigated whether perceived stress management skills related to neural activation changes in response to an acute psychosocial stress induction using functional magnetic resonance imaging (fMRI). Methods: 26 healthy, middle-aged men (M=53 years, SD=13) underwent a standardized psychosocial stress task (Montreal Imaging Stress Task [MIST]) during a functional imaging scan. Perceived stress management skillswere
assessed using the Inventory for Assessment of Stress Management Skills (ISBF). Blood pressure was measured pre and post task.

Results: Whole brain regression analyses of stress-related brain activations (compared to a control condition without social evaluative stress) showed a neural correlate within the insular cortex (t=4.57, p=0.005, uncorrected, k=12), with a positive linear relationship with perceived stress management skills (r=0.68, p<0.001). Whereas participants with lower perceived stress management showed a stress-related reduction in brain activity within the right posterior insular cortex, participants with higher perceived stress management skill showed an increase in stress-related activity of this brain region.

Conclusions: Our results indicate a specific stress-induced neural correlate of perceived stress management skills within the right posterior insular cortex. This suggests a central mechanism for stress protection with elevated perception of stress management skills.

338) Abstract 2728
PSYCHOLOGICAL AND CARDIOVASCULAR RESPONSES TO TEAM AND INDIVIDUAL COMPETITION
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Background: Competition can elicit psychological and cardiovascular perturbations such as anxiety and emotions, as well as heart rate (HR), blood pressure (BP), total peripheral resistance (TPR), and pre-ejection period (PEP). These responses can differ depending on the nature of the competition (e.g., exacerbated changes in HR and PEP have been observed during interpersonal competitions compared with intrapersonal competitions). However, little is known about the cardiovascular responses alongside emotions, anxiety, and challenge and threat appraisals experienced in team and individual competitions.

Aim: This study investigated whether competition type (i.e., team vs. individual) influenced subsequent psychological and cardiovascular responses. Methods: Twenty-nine males (Mage = 21.14, SD = 2.20) completed a team and individual tennis computer game. Cardiovascular activity (BP, HR and impedance cardiography) was measured during resting baseline and both competitions. Challenge and threat appraisals, anxiety, anger, dejection, happiness, and enjoyment were assessed immediately prior to and after each competition. Results: Separate 2 time (pre, post) x 2 competition (team, individual) ANOVAs confirmed participants felt more challenged and somatically anxious (p's < .05) during both competitions compared to baseline. Time (baseline, team competition, individual competition) ANOVAs confirmed both competition tasks induced increases in HR, BP, and TPR compared with baseline (p's < .05). The team task was more threatening than the individual competition and this was accompanied by a reduction in cardiac output (p's < .05). The individual competition elicited greater feelings of anger and dejection as well as more substantial increases in HR, and a reduction in PEP (p's < .05) compared to the team task. Conclusions: An individual competition may be associated with greater cardiovascular perturbations and elicit more negative emotions while a team competition may result in more feelings of threat. Therefore, interventions to help individuals cope effectively with competition should be tailored to the context of the competition.

339) Abstract 2455
AUTONOMIC EMOTIONAL RESPONSING IN DYSPHORIA: EVIDENCE FOR THE POSITIVE ATTENUATION HYPOTHESIS
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Depression is conceptualized as a disorder of emotion. Accordingly, a growing number of studies have examined how depressed mood affects emotional responding, leading to the formulation of the negative potentiation, positive attenuation, and emotional context insensitiveness (ECT) hypotheses. At the physiological level, the support for each of these hypotheses has been mixed due to several issues, such as 1) the tasks used to induce autonomic reactivity (i.e., passive viewing tasks), 2) recording of physiological measures inadequate to examine the activity of both autonomic branches (e.g., skin conductance level), and 3) the recruitment of clinically depressed patients undergoing antidepressant treatment. To overcome these limitations, the present study examined the subjective and cardiac autonomic modulation during an emotional imagery task, including pleasant, neutral and unpleasant scripts, in unmedicated individuals with dysphoria (N = 25) vs. without dysphoria (N = 29). Self-reported valence and arousal ratings, and recording of physiological measures (i.e., mSSD, β-adrenergic sympathetic, i.e., T-wave amplitude) activities were collected during the task. No differences between groups in cardiac autonomic responding to neutral or unpleasant scripts, and in subjective measures, were noted. Conversely, heart rate significantly increased from baseline to the imagery of pleasant scripts in individuals without dysphoria (p < .001), but not in individuals with dysphoria (p = .10). Moreover, mSSD significantly decreased from baseline to the imagery of pleasant scripts in participants without dysphoria (p < .05), but not in individuals with dysphoria (p = .17). Clearly, our data suggest that dysphoria is characterized by blunted cardiac autonomic reactivity in response to positive rather than negative emotions, thus supporting the positive attenuation hypothesis. Our findings also suggest that the reduced vagally mediated heart rate increase in response to pleasant stimuli may reflect a decreased sensitivity to positive emotions, which, in turn, may be implicated in the development of major depression.

340) Abstract 2757
LESS EFFICIENT SLEEP IS ASSOCIATED WITH GREATER SUBCLINICAL CARDIOVASCULAR DISEASE AMONG MIDLIFE WOMEN
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Background: Research has shown associations between poor reported sleep and elevated cardiovascular disease (CVD) risk factors. Few studies have examined actigraphy-assessed sleep in relation to subclinical CVD. Moreover, poor sleep, particularly sleep continuity, is common during the menopausal transition, a time of accelerated CVD risk for women. We hypothesized that lower sleep efficiency and shorter sleep time would be associated with greater subclinical CVD among midlife women transitioning through the menopause.

Methods: 174 nonsmoking peri- and postmenopausal women ages 40-60 without a history of heart disease; not taking hormone therapy, beta blockers, calcium channel blockers, insulin or SSRI/SNRI antidepressants; and not nightshift workers were studied. Women underwent a carotid ultrasound to assess carotid intima media thickness (IMT) and plaque, three days of wrist actigraphy to quantify sleep, a blood draw, psychosocial questionnaires, physical measures and 24 hours of physiologic monitoring to quantify vasomotor symptoms.

Results: Separate 2 time (pre, post) x 2 competition (team, individual) ANOVAs confirmed participants felt more challenged and somatically anxious (p's < .05) during both competitions compared to baseline. Three time (baseline, team competition, individual competition) ANOVAs confirmed both competition tasks induced increases in HR, BP, and TPR compared with baseline (p's < .05). The team task was more threatening than the individual competition and this was accompanied by a reduction in cardiac output (p's < .05). The individual competition elicited greater feelings of anger and dejection as well as more substantial increases in HR, and a reduction in PEP (p's < .05) compared to the team task. Conclusions: An individual competition may be associated with greater cardiovascular perturbations and elicit more negative emotions while a team competition may result in more feelings of threat. Therefore, interventions to help individuals cope effectively with competition should be tailored to the context of the competition.

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HEALTH RISKS IN MIDLIFE WOMEN: THE ROLES OF CUMULATIVE TRAUMA AND POSTTRAUMATIC STRESS

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Trauma is associated with physical health, though the cause is unclear: Is it due to trauma or to mental health problems that arise following trauma exposure? This study clarified the roles of cumulative trauma and current posttraumatic stress (PTS) symptoms in health risks that predict mortality: Health-related quality of life (HRQoL) including self-rated health, recent unhealthy days, and activity limitation; and biological risk scores derived from two laboratory tests, the complete blood count and comprehensive metabolic panel. Based on patterns in the literature, we hypothesized (1) more cumulative trauma would predict poorer HRQoL, but this would be explained by PTS symptoms, and (2) cumulative trauma and PTS symptoms would each independently and positively predict risk scores. We also evaluated correlations between HRQoL and risk scores. Healthy, postmenopausal midlife women with divorce histories (n = 190) completed validated measures of HRQoL and PTS symptoms. Cumulative trauma was operationalized using two count variables: intimate partner abuse exposures, and other lifetime traumatic events. A subset of 68 women provided blood for assessment of biological risk scores. Multiple regression analysis tested contributions of cumulative trauma and PTS symptoms to physical health risks. For HRQoL, hypothesized were partially supported: More cumulative trauma predicted poorer self-rated health (p < .01), but this was explained by PTS symptoms (p < .05);, and activity limitation; and biological risk scores derived from two laboratory tests, the complete blood count and comprehensive metabolic panel. Based on patterns in the literature, we hypothesized (1) more cumulative trauma would predict poorer HRQoL, but this would be explained by PTS symptoms, and (2) cumulative trauma and PTS symptoms would each independently and positively predict risk scores. We also evaluated correlations between HRQoL and risk scores. 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Background: Chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) is a debilitating immune-related illness that is characterized by a cluster of interrelated symptoms such as fatigue and unrefreshing sleep. Insufficient sleep and sleep disorders have been linked to inflammation in the context of other diseases. The aim of this study was to evaluate the relationship between subjective sleep quality, fatigue, and inflammation in a sample of women suffering from CFS/ME.

Methods: Ninety-five women diagnosed with CFS/ME self-reported sleep quality with the Pittsburgh Sleep Quality Index (PSQI), and fatigue severity and extent of interference with the Fatigue Severity Inventory (FSI). CFS/ME-related symptoms were assessed by the CDC Symptom Inventory for CFS. Circulating inflammatory cytokines in plasma were assayed using a multi-plex ELISA system. Associations were determined by univariate regression analysis using age as a covariate.

Results: Poor sleep quality was positively correlated with inflammatory cytokines associated with CFS/ME, including IL-6 (p=0.031), and TNF-α (p=0.060), when controlling for age. When controlling for age and fatigue severity, poor sleep quality was positively correlated with inflammatory cytokines IL-1α (p=0.031), IL-6 (p=0.009) and TNF-α (p=0.002). PSQI-derived measures of sleep disturbances were positively correlated with IL-6 (p=0.010). Poor sleep quality related to greater fatigue severity (p=0.031) and fatigue-related interference with daily activities (p=0.005). Additionally, poor sleep quality predicted CDC core symptom severity (p=0.002) and frequency (p=0.001) by the CDC Inventory. However, neither index of fatigue was correlated with inflammatory cytokines IL-1α (p>0.050).

Conclusion: Poor sleep quality is associated with greater levels of circulating pro-inflammatory cytokines, greater fatigue and the severity and frequency of CFS/ME symptoms. Poor sleep quality is associated with inflammation, independently of its effect on fatigue severity. Further research should examine biobehavioral processes that may concurrently modulate inflammation and the symptoms of CFS/ME, and may have implications for future interventions aimed at improving sleep quality.

345) Abstract 2963

PERCEPTIONS MATTER: ASSOCIATIONS BETWEEN SUBJECTIVE SOCIAL STATUS AND HEALTH OUTCOMES IN YOUNG ADULTHOOD

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Research indicates that subjective social status (SSS), or an individual’s perception of his/her position in the social hierarchy, is an important predictor of health. However, the majority of this work has relied on middle- and older-age populations, with few studies examining the predictive validity of SSS at earlier ages. Therefore, the present study sought to investigate the influence of SSS on psychological, physical, and behavioral health outcomes above and beyond objective measures of socioeconomic status (SES) in a sample of young adults. Cross-sectional data came from Wave IV of the National Longitudinal Study of Adolescent Health. On average, participants (N=3655) were 29 years old (SD=1.79; range 25-34 years), with a relatively equal gender distribution (47.9% male). SSA was assessed via the MacArthur Scale of Subjective Social Status, which utilizes a scale represented by a 10 rung ladder. Hierarchical regression analyses controlled for age, gender, education level, and total household income. As expected, SSS was positively correlated with education (r=.37, p<.001) and income (r=.35, p<.001). Regression analyses revealed that SSS incrementally predicted the following above and beyond controls: self-rated health (β=.11, p<.001); psychological health outcomes: depressive symptoms (β=-.54, p<.001), perceived stress (β=-.42, p<.001), stress reactivity (β=-.14, p<.001); physical health outcomes: BMI (β=.23, p<.01), waist circumference (β=.52, p<.01), high sensitivity C-reactive protein (β=.04, p>.01), diastolic (β=.30, p<.01) and systolic blood pressure (β=.32, p<.05); and behavioral health outcomes: poor sleep (β=.24, p<.01), tobacco use (β=.97, p<.001). Results suggest that SSS is a robust correlate of both self-report and objective health outcomes in young adulthood. Further, these effects were observed above and beyond the influence of objective SES measures, implicating SSS as an important psychosocial risk factor to consider when examining social standing and health. This study contributes to a better understanding of health inequalities in young adults and has meaningful implications for behavioral interventions among young individuals with low SSS.

346) Abstract 2785

EATING BEHAVIORS AND ORAL HYGIENE BEHAVIORS INFLUENCE SALIVARY ALPHA-AMYLASE

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Objectives: Due to the growing interest in salivary alpha-amylase (sAA) as a non-invasive marker of autonomic activity there is also an increased need for the study of possible confounders like eating behaviors and oral hygiene behaviors (OH behaviors) as a starch-degrading enzyme has been demonstrated to be influenced by food consumption. Thus, sAA levels might be altered depending on eating habits like vegetarianism or omnivorism. With regard to sAA’s binding capacity to the bacterial surface, another methodological issue of relevance is oral hygiene (OH) behavior like using electronic toothbrushes or dental floss.

Methods: Using an ambulatory assessment design, we obtained data on habitual and momentary eating and drinking behaviors, habitual and momentary OH behaviors, together with sAA collected by passive drool in 62 healthy, normal-weight, non-smoking adults (30 women, 31 vegetarians, 23.0±3.4yrs, 21.7±2.1kg/m²) 6 x/day (awakening, +30min, 11am, 2pm, 6pm, 9pm) for 4 consecutive days.

Results: Controlling for sex, repeated measures ANOVA showed slightly higher overall sAA activity in vegetarians compared to non-vegetarians (p<.005). Hierarchic linear models (HLM; controlling for sex) showed higher sAA activity after having eaten, especially after high-carbohydrate and salty food. In addition, the intake of water, juice, and coffee predicted higher sAA at the following time point. Looking at daily sAA output (area under the curve), HLM showed no effect of eating habits but lower sAA output on days with alcohol consumption. Subjects habitually using electronic toothbrushes (n=20) showed a more pronounced daily rhythm especially in the morning hours (p=.051). More pronounced rhythms were observed for sAA subjects who had used dental floss in addition to using a traditional toothbrush and –paste. No effect of gingival bleeding or habitual number and duration of teeth brushing could be observed. Dental floss use during testing was related to higher sAA output while there was no effect of teeth brushing or gingival bleeding.

Discussion: These results show that habitual and current eating behaviors as well as habitual and momentary oral hygiene behaviors are important confounders in the assessment of daily salivary alpha-amylase activity. Researchers are strongly advised to address these issues by controlling for recent food consumption and drinking, and by acknowledging subjects’ eating habits like vegetarianism and habitual OH behavior like using electronic toothbrushes or dental floss. This will help to further strengthen the use and interpretation of sAA activity in stress research.

347) Abstract 2506

FATIGUE PARTIALLY MEDIATES THE RELATIONSHIP BETWEEN PERFECTIONISM AND HEALTH OUTCOMES

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Perfectionism is a complex construct that includes both adaptive and maladaptive traits. The Perfectionism Inventory (PI), measures several facets of this construct including conscientious perfectionism and self-evaluative perfectionism (Hill, et al., 2004). In previous studies, maladaptive facets of perfectionism have been associated with increased fatigue (Arpin-Cribbie & Cribbie, 2007) and negative health outcomes (Hadjistavropoulos, et al., 2007). No study to date, however, has examined the relationship between the facets of perfectionism, fatigue, and physical health outcomes. The current study consisted of a sample of 143 young adults (70.4% female, 80.4% Caucasian) who completed self-report measures of perfectionism (PI; Hill, et al., 2004), fatigue (Multidimensional Fatigue Symptom Inventory (MFSI); Stein, et al., 1998), and physical health outcomes (Southern Methodist University Health Questionnaire (SMU-HQ); Watson & Pennebaker, 1989). Regression analyses showed that overall perfectionism significantly predicted health outcomes (β=.26, p<.01). Further examination revealed that self-evaluative perfectionism significantly predicted health outcomes (β=.30, p<.005), but conscientious perfectionism did not (β=-.12, ns). Two bootstrap analyses were conducted using the procedures outlined by Preacher and Hayes (2008) to examine whether fatigue mediates this effect. The first model was run with health outcomes as the dependent variable, overall perfectionism as the predictor, and fatigue as a proposed mediator. The β estimates for the C path from perfectionism to health decreased from .26 (p<.01) to .21 (p<.001) after fatigue was included as a mediator, consistent with partial mediation; and examination of confidence intervals revealed a significant indirect effect (CI:.01-.15). The second model examined if self-evaluative perfectionism was entered as the predictor; analyses showed partial mediation and a significant indirect effect (β: decreased from .30 (p<.001) to .21 (p<.01); CI:.01-.15). These results support the hypothesis that fatigue is important in understanding the relationship between perfectionism and poor health outcomes.
THE EFFECTS OF COPING STRATEGIES ON MENTAL HEALTH IN INDIVIDUALS WITH TYPE 2 DIABETES: PROSPECTIVE ANALYSES
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Individuals with Type 2 diabetes are at greater risk of developing a number of mental health conditions, including depression, anxiety, and diabetes-related distress. Cross-sectional studies suggest that specific coping strategies are associated with these mental health conditions in individuals with Type 2 diabetes, however, these associations have not been examined prospectively. This study sought to determine if cross-sectional associations between coping strategies and mental health outcomes held when examined prospectively. Data was collected annually for three years from a community sample of 1742 adults with Type 2 diabetes. Coping strategies were measured at baseline. Major depressive syndrome, elevated anxiety symptoms, and moderate/severe diabetes-related distress were assessed at each time point. Cross-sectional analyses showed that task-oriented coping was negatively associated with the likelihood of having each of the three conditions, emotion-oriented coping was positively associated with the likelihood of having each condition, and avoidance-oriented coping showed no association. Prospective analyses revealed that among individuals who had neither major nor minor depressive syndrome at baseline, emotion-oriented coping positively predicted the likelihood of developing major depressive syndrome during follow-up; task- and avoidance-oriented coping were not predictive. The same pattern was seen for elevated anxiety symptoms and moderate to severe diabetes-related distress. Cross-sectional results were consistent with several past studies, but differed from prospective results. Emotion-oriented, but not task- or avoidance-oriented, coping appears to play a role in the development of major depressive disorder, elevated anxiety symptoms, and moderate to severe diabetes-related distress. Future research should explore the pathways underlying observed associations. Results inform the development of mental health interventions for individuals with Type 2 diabetes and underscore the importance of examining prospective relationships.

DO TRAUMATIC EVENTS BUILD RESILIENCE AND PROMOTE SURVIVAL THROUGH SOCIAL SUPPORT IN GYNECOLOGIC CANCER?
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Stress-related psychosocial factors, such as life-event stress and depression, predict cancer mortality whereas social support enhances survival; social support may buffer the effects of stress on mortality in a cancer population. Trauma history may intensify stress related to diagnosis and treatment and complicate survivorship. Recent traumatic stress has been associated with increased distress and depressive symptoms in gynecologic cancer patients. Few studies have examined the predictive value of traumatic experience, whether in childhood or recently: we investigated the predictive value of traumatic stress history in gynecologic cancer survival. Women within five years of diagnosed ovarian (n=21) or endometrial (n=24) cancer provided current demographic and medical data, retrospective reports of childhood and recent (past 5-years) trauma, cancer-specific distress, and depressive symptoms. Survival data were obtained for 39 patients. Cox Proportional Hazards analyses adjusted traditional prognostic indicators (age, cancer type, stage), and tested the prognostic value of traumatic stress history on survival from study entry and initial diagnosis. Childhood trauma was not predictive of cancer survival. Counterintuitively, women with severe recent trauma lived significantly longer, an effect apparent over nine years (p<.08). Descriptive Kaplan-Meier plots showed that extended survival was only apparent in women who reported strong social support. The most frequently reported traumatic events were death of a loved one and conflict with a partner. No other psychosocial predictors of mortality emerged. These results highlight the importance of social support in the context of trauma and cancer. The Kaplan-Meier plots suggest that women who experienced severe trauma prior to study entry lived longer, in the presence of strong social support. The interaction of social support and traumatic stress should be explored in future research studies. Data also highlight the need for more comprehensive and source-specific social support assessment in psychosocial oncology. Social support following trauma may foster resilience to other stressors, such as a cancer diagnosis.
cigarettes, and 11.4% had used e-cigarettes in the past 30 days. Among current cigarette smokers, 83.1% had ever used an e-cigarette compared to 25.4% of lifetime non-smokers, X2 (1) = 118.72, p = .000. We regressed having ever used e-cigarettes on the following measures of anxiety: current symptoms of anxiety (GAD-2), lifetime diagnosis of anxiety disorder, and anxiolytic prescription. Participants with anxiolytic prescription were 2.2 (95% CI: 1.03-4.59) times more likely to have used e-cigarettes. In a subsequent hierarchical logistic regression, only sex and current cigarette use were significant predictors of e-cigarette ever use (ps = .000), while none of the measures of anxiety remained significant. These findings suggest that e-cigarette use and correlates of use warrant further monitoring.

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