71st Annual Scientific Meeting
March 13-16, 2013

“IMPACT AND INNOVATION”

Meeting Abstracts

InterContinental Miami
Miami, Florida, USA
### American Psychosomatic Society 71st Annual Scientific Meeting
**Miami, Florida – March 13 - 16, 2013 – Program Schedule-at-a-Glance**

Abstracts are grouped by symposia, followed by all of the paper presentations, and conclude with all of the poster presentations.

#### Wednesday, March 13
- **8:00-12:30** Young Investigator Colloquium
- **1:30-4:30** Half Day Workshops: Meta-analysis; Assessment and Treatment of Depression in Medically Ill Patients
- **5:00-6:00** Opening Session/Distinguished Scientist Award
- **6:00-7:30** Citation Poster Session (p. A49-A59) and Reception
- **7:30-8:30** Student Mixer

#### Thursday, March 14
- **8:15-9:15** Plenary Session: Beyond Allostatic Load
- **9:15-9:45** Data Blitz
- **10:00-11:00** Symposium 130: The Impact of Mindfulness-Based Interventions (p. A2-A3)
  - Paper Session: Social Rejection, Exclusion and Evaluation (p. A19-A20)
  - Paper Session: Sleep and Fatigue (p. A20-A21)
  - Paper Session: Socioeconomic Status and Health (p. A21-A22)
- **11:15-12:30** Invited Symposium: Psychosomatic Science in the Media
  - Symposium 131: Social and Emotional Neurobiology (p. A3-A4)
  - Paper Session: Cancer (p. A22-A24)
  - Paper Session: Acute and Chronic Stress (p. A24-A25)
- **12:30-1:30** Lunch on your own/Roundtable Lunches/Committee Meetings
- **1:45-3:00** Invited Symposium: Positive Psychobiology
  - Symposium 124: Innovative Methods at the Intersection of Biobehavioral Medicine (p. A5-A6)
  - Paper Session: Depression, Insulin Sensitivity and Diabetes (p. A25-A27)
- **3:15-4:15** Symposium 120: Blunted Physiological Responses to Acute Psychological Stress (p. A6-A7)
  - Paper Session: Relationship Quality and Health (p. A27-A28)
  - Paper Session: Obesity and Overweight (p. A28-A29)
  - Paper Session: Biobehavioral Models of Psychiatric Health (p. A29-A30)
- **4:30-5:30** Plenary Session: How APS Tames Both Psychobabble and Neuromania
- **5:30-7:00** Poster Session 1 (p. A60-A95)

#### Friday, March 15
- **8:15-9:15** Plenary Session: A Fantasy for Future Clinical Decision-Making: The Groundwork
- **9:15-9:45** Data Blitz
- **10:00-11:00** Symposium 126: Childhood Roots of Adult Cardiovascular Risk (p. A7-A8)
  - Paper Session: Autonomics and Blood Pressure (p. A30-A32)
  - Paper Session: Physical Activity (p. A32-A33)
  - Paper Session: Dyadic Approaches (p. A33-A34)
- **11:15-12:30** Invited Symposium: Socio-Cultural Factors and Cardiometabolic Health in Hispanics/Latinos
  - Symposium 143: Autonomic Nervous System Activity in the Metabolic Syndrome (p. A8-A10)
  - Paper Session: Emotion, Physiology and Health (p. A35-A36)
  - Paper Session: Interventions (p. A36-A38)
- **12:30-1:30** Lunch on your own/Roundtable Lunches/Committee Meetings
- **1:45-3:00** Invited Symposium: The Next Generation of Patient Reported Outcomes: The PROMIS® Initiative as a Prototype
  - Symposium 140: Accelerated Cellular Aging: Impacted by Psychological and Behavioral Factors… (p. A10-A11)
  - Paper Session: Psychoneuroimmunology (p. A38-A39)
  - Paper Session: Depression and Cardiovascular Disease (p. A39-A41)
  - Paper Session: Rumination (p. A41-A42)
  - Paper Session: Maternal-Fetal Health (p. A42-A43)
- **4:30-5:30** Plenary Session: Why Do Americans Live Shorter, Less Healthy Lives?
- **5:30-7:00** Poster Session 2 (p. A96-A132)
- **7:30** Past Leader Dinner

#### Saturday, March 16
- **8:15-9:45** Members Meeting
- **10:00-10:30** Data Blitz
- **10:30-12:30** Awards Presentations and Lectures: Paul D. MacLean; Herbert E. Weiner; and Patricia R. Barchas Awards
- **12:30-1:30** Lunch on your own/Roundtable Lunches/Committee Meetings
- **1:45-3:00** Symposium 118: Sleep and Disease: Autonomic and Inflammatory Pathways (p. A14-A15)
  - Symposium 113: Psycho-Oncology Meets Psychoneuroimmunology at the Cutting Edge (p. A17-A18)
  - Paper Session: Trauma and PTSD (p. A43-A45)
- **3:15-4:15** Paper Session: Discrimination (p. A45-A46)
  - Paper Session: Pain (p. A46-A47)
  - Paper Session: Psychoneuroendocrinology (p. A47-A48)
- **4:30-5:30** Presidential Address: To Sleep, Perchance to Heal
- **5:30-7:00** Poster Session 3 (p. A133-A166)
- **7:30** Banquet
physiological hyper-responsiveness. This first talk will feature changes characterized by heightened sensitivity to emotional stress and present results from a randomized clinical trial (RCT) of MBSR for better understanding mechanisms. The first talk in this symposium will integrate, and critically analyze the three presentations to highlight innovations in scientific approach and to discern clinical impact. The impact of mindfulness-based interventions will summarize, management, meditation, and psychophysiology, will summarize, and critically analyze the three presentations to highlight innovations in scientific approach and to discern clinical impact.

Individual Abstract Number: 249

MINDFULNESS-BASED RELAPSE PREVENTION FOR SUBSTANCE USE DISORDERS: EFFECTS ON HEMODYNAMICS AND CARDIAC VAGAL CONTROL UNDER STRESS

Haley Douglas, BS, Psychology, University of Washington, Seattle, WA; Elizabeth Shilling, BA, Kathleen Lustyk, PhD, Psychology, Seattle Pacific University, Seattle, WA

Mindfulness-based relapse prevention (MBRP) incorporates Relapse Prevention (RP) skills with mindfulness training to increase awareness and skillful action in high-risk situations in substance abusers. MBRP increases tolerance of negative states and moderates effects of craving on relapse. Low tonic and attenuated phasic high frequency heart rate variability (HF-HRV) responses to stressors characterize various clinical conditions. A lack of coupling between HF-HRV and heart rate reactivity (HRR) to stressors has been observed in some clinical conditions such as PTSD (Sahar et al., 2001). Increased tonic and phasic HF-HRV have been observed following treatment for various clinical conditions including substance use disorders. Yet, hemodynamic responses have not been assessed following MBRP for substance use. Thus, the present study assessed hemodynamic and self-reported anxiety and craving in response to a cognitive stressor after 8-weeks of RP (n = 12), MBRP (n = 12), or post-detox standard aftercare (SA; n = 12). Electrocardiography was continuously monitored while blood pressure and self-reported anxiety and craving were assessed at timed intervals. SA revealed vagal withdrawal in response to the stressor with HF-HRV decreasing from baseline to stressor. Conversely, HF-HRV increased for MBRP. On RP, MBRP reported less anxiety and craving post-stressor than SA.

MBRP stressor-induced increases in HF-HRV were inversely related to anxiety. Tonic HF-HRV was highly correlated with HRR in MBRP but not RP or SA, suggesting that cardiac vagal control contributes to regulation of HRR following MBRP. The absence of correlation for RP and SA suggest self-regulation is lacking, as the vagal brake was not recruited during stress. Changes in low frequency (LF)-HF HRV ratio were highly correlated with HRR for RP but not MBRP or SA suggesting that the vagal brake is not modulating sympathoexcitatory circuits involved in stress. Our findings will be discussed in light of neurovisceral integration model and polyvagal theory which propose higher brain and cardiac vagal mechanisms over stress responses as adaptive and thus potentially beneficial to substance abusers desiring abstinence.
between pre- and post-MBSR measures of baseline status, reactivity change scores (stress – baseline values), and recovery change scores (recovery – baseline values) revealed significant decreases in baseline resting levels of SBP and DBP (p=.01 and p=.02, respectively), as well as significant improvements in SBP and DBP recovery following MBSR (p=.04 and p=.004, respectively). Only NE reactivity was significantly decreased post-MBSR (p=.04). Significant changes (p=.001) in both self-reported mindfulness (Five Facet Mindfulness Questionnaire) and sleep quality (Pittsburgh Sleep Quality Index) following MBSR training did not explain changes in cardiovascular or catecholamine outcomes in ANCOVA models. Taken together, results are consistent with the possibility that MBSR could buffer emotional, cardiovascular, and catecholamine responses to personally salient emotional stress, with possible implications for reducing stress-related cardiovascular disease risk.

Symposium 131
SOCIAL AND EMOTIONAL NEUROBIOLOGY IN HEALTH AND DISEASE
Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Naomi I. Eisenberger, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Tor D. Wager, PhD, Psychology and Neuroscience, University of Colorado, Boulder, Boulder, Colorado
Brain-body interactions link environmental, social, cognitive, emotional, and genetic factors to health and disease vulnerability. Our understanding of these interactions is progressing rapidly, as driven by recent methodological and conceptual advances in human neurosciences. Importantly, such advances are being increasingly integrated within the field of biobehavioral medicine, and they are providing a more detailed characterization of the neurobiological mechanisms at play in the pathophysiology of chronic illnesses and syndromes. Accordingly, the goal of this symposium is to highlight these advances in theory and research, the brain-body interactions and the brain-body interactions at the interface of neuroscience and biobehavioral medicine. Specifically, presentations will focus on: (1) the neurocognitive processes that translate perceptions of social connection and social support into bodily and emotional feeling states, as well as the health outcomes related to these interpersonal factors; (2) the neural circuitry linking emotion regulation to atherosclerotic cardiovascular disease risk via systemic inflammatory pathways; (3) the neurochemical and genetic factors impacting the embodiment of social sensitivity to both positive and negative social experiences; and (4) the functional roles that conceptual knowledge and emotional meaning generation play in the processing of physical and social pain by the brain. Attendees of this symposium will be exposed to emerging findings, principles, and multilevel methodological approaches guiding current and future research on the neurobiological basis of biobehavioral health and disease.

Individual Abstract Number: 248
NEURAL ACTIVITY DURING EMOTION REGULATION RELATES TO PRECLINICAL ATHEROSCLEROSIS VIA AN INFLAMMATORY PATHWAY
Peter J. Gianaros, PhD, A Marsland, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, A Hariri, PhD, Psychology, Duke University, Durham, NC, D. Kandel, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, J. J. Gross, PhD, Psychology, Stanford University, Stanford, CA, S. B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA
Cognitive reappraisal is an adaptive form of emotion regulation that alters (e.g., dampens) emotional responding by reframing interpretations of emotional stimuli. In brain, cognitive reappraisal engages prefrontal systems that also monitor and control peripheral alterations in autonomic, endocrine, and immune activity. We suggest that such prefrontal functionality during cognitive reappraisal may be relevant to cardiovascular disease by comprising part of a neural pathway linking individual differences in emotional regulation to atherosclerosis through effects on peripheral mechanisms. To test this hypothesis, midlife community volunteers (N=157; age 36-54; 80 women) who were free of current DSM-IV Axis 1 diagnoses performed an event-related, functional magnetic resonance imaging (fMRI) task involving cognitive reappraisal of negative emotional stimuli. Also measured were cortisol and body mass index, and race (Caucasian vs. non-Caucasian), greater reappraisal-evoked activity in dorsolateral and ventromedial prefrontal cortex covaried with greater IMT and IL-6. Independent of the same covariates, greater IL-6 statistically mediated the association of IMT with activation in these brain regions across individuals. These findings were revealed by voxel-wise multiple regression and indirect mediation analyses controlling for multiple statistical testing at a false-discovery rate corrected threshold of 0.05, with all cluster sizes of k > 193. Individual differences in emotion regulation may relate to atherosclerotic cardiovascular disease risk via a neuroinflammatory pathway.

Individual Abstract Number: 272
SOCIAL INFLUENCES ON HEALTH: SEROTONINERGIC MECHANISMS
Baldwin M. Way, Ph.D., Psychology, The Ohio State University, Columbus, OH, Dominik Schoeber, Ph.D., Psychology, University of Freiburg, Fribourg, Switzerland, Benjamin Karney, Ph.D., Thomas N. shower, Ph.D., Psychology, University of California at Los Angeles, Los Angeles, CA
Social influences on health have been well-documented in epidemiological studies, but identifying the mechanisms responsible for these effects has proved challenging. One approach that may help to identify the pathways by which social interactions influence health-relevant physiology is to examine potential neurochemical mediators. The serotonin system is one system that is likely to be critical in these effects as it appears to affect responsivity to social interactions. Using a genetic approach, markers of variation in serotonin signaling were found to be associated with both cortisol response to social stress as well as cardiovascular reactivity. These serotoninergic effects also appear to carry over to social support as well, where serotoninergic genetic variation affects the transmission of affect between married couples during laboratory interactions. These genetic findings will be corroborated with data from pharmacological manipulations affecting the serotonin system. Together, these findings demonstrate that the neurotransmitter serotonin is a critical moderator of emotional reactivity to social interactions and is likely to be critically involved in eliciting the health benefits derived from social relationships.

Individual Abstract Number: 336
SOCIAL NEUROSCIENCE AND HEALTH: USING THE BRAIN TO UNDERSTAND THE LINKS BETWEEN SOCIAL PROCESSES AND HEALTH
Naomi I. Eisenberger, Ph.D., Psychology, UCLA, Los Angeles, CA
It is well-established that lacking social ties increases the risk of morbidity and mortality, whereas having social ties reduces this risk. However, the neurocognitive mechanisms that translate perceptions of social disconnection or connection into health-relevant physiological changes are not well-understood. This talk outlines two neural systems that may mediate the relationship between social ties and health. I will first review several studies showing that experiences of social disconnection may trigger health-relevant sympathetic and inflammatory responding through neural regions involved in physical and social pain. I will then suggest that experiences of social connection may relate to health through reward-related activity which can inhibit threat-related responding. Specifically, I will review two studies showing that the threat-reducing effects of both receiving and giving social support rely on reward-related regions that are associated with reductions in threat-responding. Implications of this framework for understanding the links between social ties and health will be discussed.

Individual Abstract Number: 659
DIFFERENTIAL NEURAL SUBSTRATES FOR PHYSICAL AND SOCIAL PAIN
Tor D. Wager, PhD, Psychology and Neuroscience, University of Colorado, Boulder, Boulder, Colorado
Much research on affective brain systems focuses on traditional distinctions such as valence and arousal. These are studied using a variety of materials: Faces, words, standardized images, emotional
recall cues, social and physical stressors, and others. Implicit in these approaches is that brain responses to, e.g., aversive images can tell us something about negative emotion and/or social stress. Here, I argue that different types of affective experiences involve quite different brain systems, and thus it is necessary to study specific affective processes as they relate to specific health outcomes. In support of this view, I present a study (N = 60) that compares physical pain to ‘social pain’ elicited by viewing an ex-romantic partner. Both types of ‘pain’ activate a common circuit, involving dorsal anterior cingulate, anterior insula, medial thalamus, and other shared regions. However, the brain systems that are most diagnostic of each type involve different (uncorrelated) patterns of fMRI activity within these regions. Machine learning analyses trained to differentiate physically painful vs. nonpainful stimuli yield a pattern that can discriminate painful vs. nonpainful somatic stimuli with 90% accuracy (P < .001), even when applied prospectively to new individual participants. However, prediction is at chance for socially painful vs. nonpainful events. Conversely, machine learning analyses trained to differentiate socially painful vs. nonpainful events can be diagnostic of social pain in new individuals (77% accuracy, P < .01), but prediction is at chance for physical pain. The patterns of activity that are most diagnostic of each condition within the anterior insula, cingulate, and other regions are uncorrelated (e.g., r = 0.02 for anterior cingulate). These results argue that different kinds of emotional experiences involve differentiable brain mechanisms. Thus, emotional events of the same valence are not interchangeable, which provides new ‘leverage points’ for understanding the relationships between specific emotional experiences and specific outcomes.

Symposium 132

LIGHTS OUT: SLEEP, NOCTURNAL PHYSIOLOGY, AND THE SOCIAL CONTEXT

Wendy M. Troxel, PhD, Health Division, RAND Corporation, Pittsburgh, PA, Heather E. Gunn, PhD, Psychology, University of Utah, Salt Lake City, UT, Matthew R. Cribbet, MS, Psychology, University of Utah, Salt Lake City, Utah, Heidi S. Kane, PhD, Psychology, Wayne State University, Detroit, Michigan, Julianne Holt-Lunstad, PhD, Psychology, Brigham Young University, Provo, Utah.

Sleep is a critical health behavior and one that is typically shared between husbands and wives or romantic partners. Until recently, however, sleep research has largely neglected to consider the social context of adult sleep. By the same token, researchers who have studied the impact of social relationships on health behaviors and outcomes, have largely neglected to consider the night, including how social factors influence nocturnal physiology and sleep. The purpose of this symposium is to address this critical gap in the literature by presenting four talks that focus on links between the social context and nocturnal physiology or sleep. The first presentation utilizes a theoretically-derived interpersonal framework to examine how interpersonal stressors are linked with subjective sleep complaints. The second presentation will present data that examines the association between adult attachment style and nocturnal blood pressure dipping in healthy, co-sleeping couples. The third presentation will present data on sleep, couple interactions, and ambulatory heart rate variability. The final presentation will present data from a study of families examining the effects of self-disclosure and perceived partner responsiveness on sleep quality and sleep efficiency in couples. The discussant, an expert on social relationships and health, will synthesize these presentations and present a framework for considering how the social environment may influence physiological and behavioral pathways both day and night. Learning objectives for this symposium will be: 1) To identify novel nocturnal mechanisms and behaviors that may account for the health effects of close relationships; 2) To identify specific characteristics of the interpersonal environment that are linked with sleep and nocturnal physiology; and 3) To utilize innovative methodologies and analytic strategies to evaluate the relationship between social factors and nocturnal physiology and sleep. Ultimately, this research may identify novel mechanisms underlying robust links between social relationships and morbidity and mortality.

Individual Abstract Number: 474

ADULT ATTACHMENT, CLOSE RELATIONSHIPS, AND NOCTURNAL BLOOD PRESSURE: A NEW MECHANISM?

Wendy M. Troxel, PhD, Health Division, RAND Corporation, Pittsburgh, PA, Daniel J. Buysse, MD, Amy Begley, MS, Psychiatry, Karen A. Matthews, PhD, Psychiatry, Psychology, and Epidemiology, University of Pittsburgh, Pittsburgh, PA

The presence and quality of close relationships are prospectively linked with cardiovascular (CV) morbidity and mortality. Prevailing theory suggests that close relationships, particularly those that provide a sense of safety and security, confer CV benefits by attenuating physiological stress responses. Although numerous studies support this hypothesis, the focus on potential mechanisms has largely been restricted to daytime physiological pathways. However, evidence suggests that elevated nocturnal blood pressure (BP) has unique prognostic significance for CV morbidity and mortality. The current study examines the relationship between the security of adult attachment relationships and nocturnal BP in a sample of healthy, married or cohabiting couples (N = 46 couples; 80% Caucasian). Attachment was measured by the Experiences in Close Relationships questionnaire, yielding two scores: anxious attachment and avoidant attachment. Ambulatory BP was measured across 48 hours and night/day BP ratios were calculated. For parsimony we present mean arterial pressure (MAP). All statistical models included covariates: sex, age, sleep latency, selected sleep index, depressive symptoms, and actigraphy-assessed sleep fragmentation. In mixed models that accounted for nested data within couples, we found a significant positive relationship between attachment anxiety and night/day MAP ratio, indicating that anxiously attached individuals had a higher nocturnal relative to daytime BP, i.e., reduced nocturnal “dipping” (Beta = .01; p = .05). We also found a marginal sex*avoidant attachment interaction for the night/day MAP ratio such that for women, higher attachment avoidance was associated with higher MAP ratio (Beta = .03; p = .07). To our knowledge, this is the first study to demonstrate an association between adult attachment and elevated nocturnal BP. These findings contribute to our understanding of potential nocturnal physiological pathways that may account for the health effects of close relationships. Supported by HL093220.

Individual Abstract Number: 474

AN INTERPERSONAL ANALYSIS OF PSYCHOSOCIAL STRESS AND SLEEP

Heather E. Gunn, PhD, Kenneth L. Critchfield, PhD, Julia E. Mackaronis, MS, Psychology, University of Utah, Salt Lake City, UT, Laura E. McArthur, PhD, Child & Adolescent Services, UCSF, San Francisco, CA, Holly K. Raw, MS, Matthew R. Cribbet, MS, Paula G. Williams, PhD, Psychology, University of Utah, Salt Lake City, UT

Interpersonal stress is related to sleep disturbance and a small literature has shown that attachment styles are associated with sleep quality (SQ). However, little is known about specific interpersonal responses to stress and how they relate to SQ and cognitive pre-sleep arousal (PSA). The current study examined links between stress-related interpersonal responses including affiliation (friendliness vs. hostility) and interdependence (autonomy vs. entrenchment) and PSA and SQ. Using a structured interview, 76 participants (53% female) described a recent stressful event. Responses were objectively coded using Structural Analysis of Social Behavior, a circumplex-based model in which specific behaviors are based on dimensions of overall affiliation and autonomy. SQ and cognitive PSA were assessed with the Pittsburgh Sleep Quality Index (PSQI) and the Pre-sleep Arousal Scale, respectively. Separate regressions for cognitive PSA and PSQI were conducted with affiliation, autonomy, and the affiliation x autonomy interaction as predictors. Overall affiliation was inversely associated with cognitive PSA (ß = -.32) and PSQI scores (ß = -.28; p< .05). There was no effect of autonomy or the affiliation x autonomy interaction on either sleep measure. Behaviors that comprise the affiliation dimension were further explored. Specifically, stressor narratives characterized by more trust in others were associated with lower PSQI scores (r = -.31), indicating less sleep complaints. In contrast, stressor narratives characterized by hostile distancing (withdrawal) were associated with higher cognitive PSA (r = .37). This innovative approach to examining stress and sleep suggests that trusting others in the context of stress is associated with better SQ, whereas distancing from others may enhance nighttime arousal, perhaps via increased rumination. Findings support previous research examining attachment style and sleep, but offer specificity in ways that
interpersonal patterns, such as trust and walling off, are associated with sleep. Use of an interpersonal framework has implications for understanding the mechanisms underlying psychosocial stress and sleep. Addressing specific interpersonal behaviors that promote affiliative responses to stress may represent a novel treatment target to improve insomnia interventions.

Individual Abstract Number: 501
ASSOCIATIONS AMONG RELATIONSHIP QUALITY, SLEEP QUALITY, AND HIGH FREQUENCY HEART RATE VARIABILITY
Matthew R. Cribbet, MS, Paula G. Williams, PhD, Holly K. Rau, MS, Lindsay R. Vaux, MS, Psychology, University of Utah, Salt Lake City, Utah
The presence and quality of close relationships are important influences on physical health. Mechanisms linking relationship quality and health have focused primarily on psychological, behavioral, and physiological changes in response to stress. These traditional mechanisms account for some, but not all associations between relationship quality and health. When placed within the context of a close relationship, sleep can be conceptualized as a health behavior through which key aspects of social behavior and relationship quality may influence health and well-being. This presentation will describe the findings from a study that examined associations among dimensions of relationship quality and health and wellbeing, and high frequency heart rate variability (HF-HRV), an indicator of regulatory capacity in close relationships and a biologically plausible mechanism for those associations. Twenty-nine community participants (mean age = 27.41 years) and their co-sleeping, romantic partners (mean relationship length = 6 years, 5 months), completed measures of depression (Beck Depression Inventory; BDI), relationship quality (Impact Message Inventory Circumplex Version, IMI-C) and sleep quality for self and partner (Pittsburgh Sleep Quality Index; PSQI). In a laboratory session, resting HF-HRV for participants was assessed. Following the laboratory session, participants wore an ambulatory impedance cardiography/HRV monitor for two nights and two days. Sleep was measured with actigraphy and sleep diaries for three consecutive nights following the laboratory session. Associations between participant and partner sleep quality and relationship quality were assessed in an Actor-Partner Interdependence Model (APIM). Model fit was good ($\chi^2(12) = 12.4$, $p = .413$, CFI = .988, RMSEA = .035). Preliminary findings show that when both partners ($B = .28, p < .05$) and participants ($B = .27, p < .05$) perceived their romantic partner as more controlling, their own ratings of sleep quality on the PSQI during the prior month were poor. These findings remained significant after controlling for participant and partner sleep quality and depression. Follow-up analyses will examine associations among participant’s resting HF-HRV, relationship quality, sleep quality, and overnight physiology (HF-HRV). Implications of the study findings for understanding the mechanisms underlying links between close relationships and health will be discussed.

Individual Abstract Number: 507
DAILY SELF-DISCLOSURE AND SLEEP BEHAVIOR IN COUPLES
Heidi S. Kane, PhD, Richard B. Slatcher, PhD, Psychology, Wayne State University, Detroit, Michigan, Bridget Reynolds, PhD, Rena Repetti, PhD, Psychology, University of California Los Angeles, Los Angeles, CA, Theodore Robles, PhD, Psychology, University of California Los Angeles, Los Angeles, California
An emerging literature provides evidence for the association between relationship processes and sleep, an important factor in health and well-being. However, we still know very little about the specific relationship processes that affect sleep behavior. Self disclosure (telling a partner thoughts, feelings and information) is a relational process linked to relationship satisfaction, perceived partner responsiveness, and health. Therefore, the goal of this study was to examine how self-disclosure is associated with sleep behavior. As part of a larger study of family processes where only 1 parent was required to participate, mothers (n=47) and fathers (n=39) from 47 families completed 56 days of daily diaries. Parents were 44 years of age on average (SD = 7.5) and had been married 16.20 years on average (SD = 6.63, range = 1.3 – 27.6). Parents completed both evening diaries assessing disclosure, relationship satisfaction and perceived partner responsiveness and morning diaries assessing the prior night’s sleep. The sleep diary assessed sleep quality, the subjective perception of the prior night’s sleep, and sleep efficiency, the percentage of time asleep while in the bed for the prior night. Results revealed an association between daily fluctuations in self-disclosure and sleep outcomes for mothers, but not fathers. For example, on days when mothers disclosed more thoughts, feelings and information to their partner than their average level of self-disclosure their sleep quality ($b = .098, p = .01$) and sleep efficiency ($b = .575, p < .01$) that night improved. These associations remained significant after controlling for daily fluctuations in relationship satisfaction and day of week (weekday vs. weekend day). Perceived partner responsiveness and relationship closeness were examined as potential mediators. These results are the first to demonstrate that, especially for women, discussing thoughts and feelings with a spouse promotes better sleep. They also suggest that sleep behavior is one pathway through which relationships and self-disclosure influence health.

Symposium 124
INNOVATIVE METHODS AT THE INTERSECTION OF BIOBEHAVIORAL MEDICINE AND SOCIAL/PERSONALITY PSYCHOLOGY: HOSTED BY THE SOCIAL PERSONALITY HEALTH NETWORK
A Janet Tomiyama, Ph.D., Psychology, UCLA, Los Angeles, CA, Sarah D. Pressman, Ph.D., Psychology & Social Behavior, University of California, Irvine, Irvine, CA, Elliot T. Berkman, Ph.D., Psychology, University of Oregon, Eugene, OR, Megan L. Robbins, Ph.D., Psychology, University of Arizona, Tucson, AZ, Tara L. Gruenewald, Ph.D., Davis School of Gerontology, University of Southern California, Los Angeles, CA, Michael F. Scheier, Ph.D., Psychology, Carnegie Mellon University, Pittsburgh, PA
Stress, neuroticism, relationship quality, socioeconomic status – these are but a few of the constructs used by researchers in psychosomatic medicine. They are also key examples of constructs from personality and social psychology. Just as our field has benefited by testing interdisciplinary hypotheses using these constructs, so too can we benefit from using innovative methods from the field of social and personality psychology. This symposium will bring together four researchers using cutting-edge methods to conduct research in social/personality psychology in the context of health and medicine. Each presenter will provide a crash course in their respective methodology, and then provide an example of that methodology in a personality/social psychological domain as it relates to health. Michael Scheier will discuss how to incorporate personality measures in health research and how a researcher can use the distinction between contextual and operational definitions of depression to understand how personality scales are actually being measured. Elliot Berkman will describe an innovative new way of gathering Ecological Momentary Assessment (EMA) data using text messages, and illustrate its distinct advantages over traditional EMA methods. Megan Robbins will describe the Electronically Activated Recorder (EAR) as a naturalistic observation method that records snippets of ambient sounds from participants’ moments in the momentary environments. She will discuss research using the EAR in tandem with Linguistic Inquiry and Word Count (LIWC) that provide powerful ecological measures of health-related social processes. Finally, Tara Gruenewald will discuss how to integrate laboratory-based exposures, naturalistic experience sampling techniques, and social neuroscience approaches into large, population-based social epidemiological study designs. This session is hosted by the Social Personality Health Network (spnetwork.org), which has the overarching goal to advance the scientific study of social and personality psychology in health contexts.

Individual Abstract Number: 180
TEXT MESSAGING FOR EXPERIENCE SAMPLING: AN INNOVATIVE WAY TO ASSESS REAL-WORLD HEALTH BEHAVIORS
Elliot T. Berkman, PhD, Psychology, University of Oregon, Eugene, OR
The antecedents and consequences of behaviors relevant to major public health epidemics (e.g., cigarette smoking or excessive consumption of energy dense foods) are often fleeting or otherwise difficult to assess with traditional laboratory measures. For example, relapse during cigarette smoking cessation is often precipitated by brief moments of craving triggered by real-world stimuli (e.g., being offered a cigarette by a friend). In these cases, researchers have successfully
used a sampling technique known as ecological momentary assessment (EMA) to measure health-relevant variables in situ and near real time. One major barrier to greater adoption of EMA in social, personality, and health psychology has been the large investment required in terms of equipment (e.g., personal digital assistants for each participant) and/or time (e.g., coding responses recorded in daily life using a small paper-and-pencil measure). In this talk, I will describe an innovative new way of gathering EMA data with short message service (SMS) text messages. The significant advantages of using text messaging for EMA include its low cost, high and increasing adoption rate particularly among underserved populations, pervasiveness across everyday contexts, ability to assess behaviors near real time, and extensive user fluency. I will describe the method, discuss advantages and disadvantages relative to other methods of EMA (e.g., personal digital assistants, signaled paper-and-pencil assessments), and provide examples of how the method can be used to measure health-relevant behaviors in vivo during two longitudinal studies (on cigarette smoking cessation and dietary restriction). As part of this overview, I will also detail specific services available in the US for researchers interested in adopting SMS for EMA. Finally, to demonstrate the potential range of uses for text messaging in health contexts, I will present two recent studies that use text messaging as part of an intervention to reduce cigarette smoking. Together, the methods and studies I describe show that text messaging is an innovative, low-cost, and highly reliable way of collecting fine-grained assessments of health behaviors in the real world.

Individual Abstract Number: 181

INNOVATIVE REAL-WORLD ASSESSMENT OF HEALTH-RELEVANT SOCIAL PROCESSES: THE EAR AND LIWC IN PSYCHOSOMATIC MEDICINE
Megan L. Robbins, Ph.D., Matthias R. Mehl, Ph.D., Psychology, University of Arizona, Tucson, AZ

Social behavior and environments have strong ties to psychological and physical health. However, whereas the measurement of physiological processes has rapidly progressed, the measurement of psychosocial context continues to rely largely on participants’ self-reports. The Electronically Activated Recorder (EAR) is a naturalistic observation method that periodically and unobtrusively records snippets of ambient moment-to-moment ambient sounds from participants’ momentary environments. In tracking naturally-occurring conversations, using it in tandem with Linguistic Inquiry and Word Count (LIWC), researchers are able to extract the rich psychological information contained in spoken word use without relying on self-report and in-lab methodologies. LIWC is an automatic text analysis program that yields relative usage frequencies for numerous word categories (e.g. we-talk, swear words). Data from a study of 52 couples coping with breast cancer who wore the EAR one weekend while the patient was on treatment will be used to illustrate how the EAR and LIWC in tandem provide powerful ecological measures of health-related (language based) social processes and how this approach can aid in identifying the role that automatic social behaviors play in health and disease.

Individual Abstract Number: 182

A TALE OF TWO TRADITIONS: THE MARRIAGE OF SOCIAL-PSYCHOLOGICAL AND EPIDEMIOLOGICAL APPROACHES FOR ADVANCING UNDERSTANDING OF SOCIAL RISK AND PROTECTIVE FACTORS FOR HEALTHY AGING
Tara L. Gruenewald, Ph.D., Davis School of Gerontology, University of Southern California, Los Angeles, CA

Social psychologists and social epidemiologists often target the same social risk and protective factors in research aimed at understanding healthy aging, yet these fields often seem quite distant from each other. Given the similarity in ideology, the chasm between these two fields may be primarily methodological. The brief, “snapshot” measurements over broad time intervals typical of social epidemiological investigations are often viewed as too limited by many social psychologists for understanding complex psychosocial processes and factors contributing to healthy aging, although social psychologists are often envious of the size and representativeness of many epidemiological samples. Social epidemiologists, on the other hand, often view as problematic the loss of generalizability that accompanies the more select samples typical of much social psychological research, but appreciate the virtues of social psychological paradigms for understanding basic mechanisms underlying biopsychosocial and health associations. Given that the advantages of one tradition are the disadvantages of the other and vice-versa, there has been increasing effort to unite the approaches of these two disciplines within single investigations. This presentation will provide a brief overview of such efforts in several large-scale investigations of healthy aging, highlighting those which have integrated laboratory-based exposures, more naturalistic experience sampling techniques, and social neuroscience approaches into population-based social epidemiological study designs. A more in-depth overview of the potential advances in knowledge that can result from the marriage of research traditions in these two fields will be provided by a discussion of the mixed method approach for understanding socioeconomic disparities in health in the national Study of Midlife in the U.S. (MIDUS). A discussion of the benefits and challenges of such unions will also be presented in hopes of charting the most promising path forward in understanding social risk and protective factors for healthy aging.

Individual Abstract Number: 183

HOW TO INCREASE THE IMPACT OF RESEARCH ON PERSONALITY AND HEALTH
Michael F. Scheier, Ph.D., Psychology, Carnegie Mellon University, Pittsburgh, PA

The purpose of this presentation is to enhance the quality of the research done on personality and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health by better acquainting researchers with issues and health. The presentation will begin by highlighting ambiguities among existing scales in what it is that they measure, and discuss how a researcher can use the distinction between conceptual and operational definitions to understand better what scales are actually measuring. The wisdom of decomposing personality scales into basic components will also be discussed, as will the misleading inferences that can arise if single dimensional scales are tried in “critical tests” against multifaceted scales. Many of these points will be illustrated concretely by examining the evolution of a particular scale designed to measure dispositional optimism (the Life Orientation Test), and comparing it to other measures of optimism that have been proposed. The major take away point of the presentation is simple, and it is to keep things simple in personality research.

Symposium 120

BLUNTLY PHYSIOLOGICAL RESPONSES TO ACUTE PSYCHOLOGICAL STRESS.
Anna C. Phillips, PhD, School of Sport & Exercise Sciences, University of Birmingham, Birmingham, West Midlands, William Lovallo, PhD, Health Sciences Center, University of Oklahoma, Oklahoma City, OK, Susanne R. de Roon, PhD, Clinical Epidemiology, Biostatistics and Bioinformatics, University of Amsterdam, Amsterdam, Noord-Holland, Annie T. Ginty, PhD, School of Sport & Exercise Sciences, University of Birmingham, Birmingham, West Midlands, Brian M. Hughes, PhD, Psychology, National University of Ireland, Galway, University Road, Galway, Peter Giamatos, PhD, Psychology, University of Pittsburgh, Pittsburgh, Pennsylvania

The reactivity hypothesis proposes that cardiovascular reactivity to psychological stressors, if exaggerated, can promote the development of cardiovascular disease. Low or blunted reactivity to acute stress has been regarded as benign or protective. However, recent evidence suggests that low cardiovascular and cortisol reactivity to stress may also have serious consequences for health. Low or blunted reactivity is associated with health outcomes including, smoking, alcohol and other substance addictions, chronic pain, economic adversity, poor self-reported health, exercise addiction, eating disorders, and poorer cognitive function. These associations emerge independently of stress task effort. Many of the correlates of blunted reactivity, such as depression and obesity, are characterised by behavioural expressions of disordered motivation, thus, blunted reactivity may be a peripheral marker of neurologically based central motivational dysregulation which is unconscious. This innovative
symposium will explore cutting edge research on the correlates, predictors and/or causes of blunted reactivity, and describe the potential biological and neural pathways and implications for health. Our speakers will cover associations between blunted reactivity and neural activation to stress; the metabolic syndrome; and whether blunting is a suppressed response or lack of response. We aim to highlight what is currently known regarding this new conceptualization of the reactivity hypothesis and where this field is headed in terms of developing our understanding of the link between reactivity and health.

Individual Abstract Number: 123

BLUNTED CARDIOVASCULAR AND CORTISOL STRESS REACTIVITY AND THE METABOLIC SYNDROME
Susanne R. de Rooij, PhD, Clinical Epidemiology, Biostatistics and Bioinformatics, University of Amsterdam, Amsterdam, Noord-Holland, the Netherlands

The metabolic syndrome is a constellation of interrelated metabolic risk factors that predisposes to the development of type 2 diabetes and cardiovascular disease. Clinical manifestations of the syndrome include glucose intolerance, insulin resistance, central obesity, dyslipidemia and hypertension. Recently, it has been shown that adiposity is associated with blunted cardiovascular and cortisol responses to psychological stress. The aim of the present study was to investigate the influence of blunted metabolic syndrome reactivity on cardiovascular and cortisol stress reactions. We performed a psychological stress protocol in a population-based cohort of 725 late middle aged men and women. The stress protocol included three stress tests (Stroop, mirror drawing and speech) during which cardiovascular activity was continuously measured and saliva cortisol samples were taken. We assessed prevalence of the metabolic syndrome in the 10% lowest and 10% highest stress reactors (max-stress response minus baseline activity). Metabolic syndrome was defined according to the International Diabetes Federation. Prevalence of the metabolic syndrome was higher in those with low heart rate reactivity than in those with high heart rate reactivity (52% compared to 29%, p < .01). This association survived adjustment for sex, age and basal activity (p = .02, but disappeared after adjustment for waist circumference (p = .82). There were significant differences in metabolic syndrome prevalence between those with low and high cortisol reactivity (53% compared to 45%, p = .43). The metabolic syndrome was more prevalent among people with blunted cardiovascular stress reactivity. This association could be explained by increased waist circumference suggesting that blunted cardiovascular stress reactivity is associated with an increased risk for type 2 diabetes and cardiovascular disease via increased adiposity.

Individual Abstract Number: 124

BLUNTED CARDSIC STRESS REACTIVITY RELATES TO NEURAL HYPOACTIVATION
Annie T. Ginty, PhD, School of Sport & Exercise Sciences, University of Birmingham, Birmingham, West Midlands, UK, Peter J. Gianaros, PhD, Department of Psychology, University of Pittsburgh, Pittsburgh, PA, Stuart W. Derbishire, PhD, Psychology, Anna C. Phillips, PhD, Douglas Carroll, PhD, Sport & Exercise Sciences, University of Birmingham, Birmingham, West Midlands, UK

Whereas exaggerated cardiovascular reactions to psychological stress have been associated with inflammatory cardiovascular disease, blunted stress reactions have been related to a host of outcomes such as depression, obesity, addiction, and bulimia. Previous functional magnetic resonance imaging (fMRI) studies provide evidence that some of these correlates of blunted stress response may be linked with relatively reduced activation in frontal and subcortical limbic regions during inhibitory control tasks that engage executive function processes and emotional perception tasks that require the processing of inhibitory control tasks that engage executive function processes. We aimed to investigate whether blunted cardiovascular and cortisol stress responses were linked with reduced activation in neural regions associated with the processing of affective stimuli, the anterior midcingulate cortex (aMCC) and insula. To test this, we recruited healthy adults (N=21; 10 males, 11 females) and examined blunted stress response in aMCC and insula. We performed a psychological stress protocol in a population-based cohort of 725 late middle aged men and women. The stress protocol included three stress tests (Stroop, mirror drawing and speech) during which cardiovascular activity was continuously measured and saliva cortisol samples were taken. We assessed prevalence of the metabolic syndrome in the 10% lowest and 10% highest stress reactors (max-stress response minus baseline activity). Metabolic syndrome was defined according to the International Diabetes Federation. Prevalence of the metabolic syndrome was higher in those with low heart rate reactivity than in those with high heart rate reactivity (52% compared to 29%, p < .01). This association survived adjustment for sex, age and basal activity (p = .02, but disappeared after adjustment for waist circumference (p = .82). There were significant differences in metabolic syndrome prevalence between those with low and high cortisol reactivity (53% compared to 45%, p = .43). The metabolic syndrome was more prevalent among people with blunted cardiovascular stress reactivity. This association could be explained by increased waist circumference suggesting that blunted cardiovascular stress reactivity is associated with an increased risk for type 2 diabetes and cardiovascular disease via increased adiposity.

Individual Abstract Number: 125

IS ‘BLUNTING’ A SUPPRESSED RESPONSE OR A NON-RESPONSE? AN EXPERIMENTAL TEST USING SLEEP-RESTRICTION AS AN ACUTE STRESSOR
Brian M. Hughes, PhD, Psychology, National University of Ireland, Galway, University Road, Galway, Ireland, Siobhán Howard, PhD, Psychology, Mary Immaculate College, University of Limerick, South Circular Road, Limerick, Ireland, Éanna D. O’Leary, H. Dip Psych, Psychology, National University of Ireland, Galway, University Road, Galway, Ireland, Jack E. James, PhD, Psychology, Reykjavík University, Menntavegi 1, Reykjavík, Iceland

One question about blunting is: does it represent a suppression of an otherwise normal cardiovascular stress response, or simply the failure of the system to even initiate such a response? Cross-sectional studies cannot tell us whether at-risk groups who exhibit blunting (e.g., persons with depression) would exhibit more mid-range stress responses in the absence of the identified risk factor (e.g., depression). Experimental designs in which risk factors can be introduced or withdrawn should help clarify the nature of blunting, at least in some cases. We conducted a controlled study using sleep restriction as a manipulable acute stressor. Seventy young healthy women participated in a laboratory study following either partial sleep restriction, where they received just 40% of their usual sleep, or following a complete night’s rest. Cardiovascular measures were taken during an 8-minute baseline period and during a 6-minute social stress task. We also assessed participants for Type D personality, which has previously been shown to be associated with blunting, in order to help control out the possible confounding effects of trait-level cardiovascular risk. Mixed ANOVA analyses identified that, across the study, Type D individuals showed lower overall blood pressure levels, regardless of sleep status, F(1, 66) = 4.96, p = .029, illustrating a cross-sectional blunting effect. For non-Type D participants, the group ordinarily viewed as not at risk, the application of sleep restriction was shown to engender a level of blunting that was of the same magnitude as the blunting shown by Type Ds, F(1, 66) = 5.18, p = .026. This study is the first to examine the blunting of cardiovascular responses in healthy adults in an experimental manner, and suggests that blunting is akin to the suppression of a normal stress response rather than to a failure to respond. In addition, this study replicates the association of blunted reactivity with psychological variables that themselves have been linked with poor health outcomes. This study may help explain why sleep restriction is itself implicated in poor cardiovascular health.

Symposium 126

CHILDHOOD ROOTS OF ADULT CARDIOVASCULAR RISK: FOCUS ON EARLY RESILIENCE
Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Jennifer McGrath, PhD, Pediatric Public Health Psychology Laboratory, Concordia University, Montréal, QC, Edith Chen, PhD, Psychology, Northwestern University, Evanston, IL, Greg Miller, PhD, Psychology, Northwestern University, Evanston, IL

The Children’s Heart Health Team (CHHT) is a not-for-profit, charitable organization that works to understand the origins during childhood of adult cardiovascular disease. Clinical manifestations of the syndrome include glucose intolerance, insulin resistance, central obesity, dyslipidemia and hypertension. Many CVDs with ultimate outcomes in adulthood actually have their origins during childhood. Primordial prevention has relevance and utility because it is recognized that many CVDs with ultimate outcomes in adulthood actually have their origins during childhood. Primordial prevention is deemed important, relatively little is known about early psychosocial factors that protect young people from being on a high cardiovascular risk trajectory. The purpose of this symposium is to present theory-driven empirical data on protective psychosocial factors in children and adolescents. The first paper evaluates the impact of “reserve capacity” (bank of intra- and interpersonal resources) on metabolic syndrome indices and night/day blood pressure ratios (nondipping). It reports that among high school students from lower to middle socioeconomic status (SES) families, positive resources (e.g. optimism, self-esteem) and pleasant interactions
throughout the school day are related to lower risk for metabolic syndrome indices and nondipping, with the latter apparent in blacks. The second paper presents data suggesting that engaging in “shift and persist” strategies (reframing stressors more benignly and persisting with future optimism) and having supportive role models protect low SES youth from elevated IL-6. The third paper reports that among children living in neighborhoods with more disorder, uncleanness, and crime, those who perceive their neighborhood as safer have better sleep, based on child and parent ratings. The discussant then provides a broader framework on the roles of neighborhood, family, and personal attributes in promoting children’s resiliency over the life course, highlighting next steps for understanding underlying mechanisms, and suggests policy implications of the work. In sum, the symposium highlights different physiological outcomes (metabolic factors, inflammation, sleep), discusses predictors at different levels of analysis (individual attributes, interpersonal processes, neighborhood context), and emphasizes the potential for children and adolescents being resilient, despite adverse environments.

Individual Abstract Number: 198

CHILDREN’S PERCEPTION OF NEIGHBORHOOD SAFETY BUFFERS THE EFFECT OF NEIGHBORHOOD DISORDER ON SLEEP

Jennifer R. McGrath, PhD, Pediatric Public Health Psychology Laboratory, Concordia University, Montreal, QC, Canada, Denise C. Jarrin, PhD, École de psychologie; Centre de recherche Université Laval Robert-Giffard, Université Laval, Québec City, Québec, Canada

Similar to myriad health conditions, sleep disturbances evidence a socioeconomic gradient. Poorer sleep (latency, efficiency, awakenings) is more prevalent among adults with lower household income, less educational attainment, and unemployed. Neighborhoods with high socioeconomic status (SES) often live in neighborhoods with more crime, violence, and crowding. Yet, neighborhood disorder does not affect all people equally. In adults, perceived neighborhood safety is protective against the effect of neighborhood disorder on sleep. The present aim was to evaluate whether children’s perceived neighborhood safety moderated the association between neighborhood disorder and sleep, even after controlling for age, sex, family SES, and neighborhood SES. Children’s sleep was evaluated using the Sleep Hygiene Index and Psychological Daytime Sleepiness Scale. Regression analyses using latent factors indicated greater perceived neighborhood safety buffered the association between neighborhood disorder and sleep, as well as neighborhood cleanliness and dangerousness (litter, drinking in public, burglary). Children’s sleep was measured using the Children’s Sleep Habits Questionnaire. Regression analyses using latent factors indicated greater perceived neighborhood safety moderated the effect of neighborhood disorder on sleep, even after controlling for age, sex, family SES, and neighborhood SES (interaction: Fisher’s Z = .33, p < .05). Thus, children’s perceived neighborhood safety buffered the association between neighborhood disorder and sleep, suggesting perceived safety is protective and contributes to resiliency. Future research should examine objective sleep measures. These findings have potential public policy implications for housing and the concentration of disorder and poverty, which contribute to perceived safety and adversely impact children’s sleep.

Individual Abstract Number: 199

PSYCHOLOGICAL RESILIENCE AMONG LOW SOCIOECONOMIC STATUS YOUTH AND IMPLICATIONS FOR CARDIOVASCULAR RISK PROFILES

Edith Chen, PhD, Psychology, Northwestern University, Evanston, IL

Little is understood about why some youth from low socioeconomic status (SES) environments exhibit good health despite adversity. We discuss a program of research that describes psychological resilience characteristics that may buffer youth from adverse physiological profiles, and we also discuss how these characteristics emerge in a subset of low SES youth. Psychologically, we propose that low SES youth are also engaged in “shift-and-persist” strategies (reframing stressors more benignly while persisting with future optimism) will have lower cardiovascular risk profiles, and that the presence of positive role models in low SES youths’ lives will help promote shift-and-persist strategies. We describe an empirical study that tested whether role models and shift-and-persist strategies protected low SES youth from cardiovascular risk. 163 youth, ages 13-16, completed role model interviews and shift-and-persist questionnaires while total cholesterol and inflammatory markers including interleukin-6 (IL-6) and C-reactive protein (CRP) were assessed. Low SES youth with supportive role models had lower IL-6 (beta = -.18, p < .05). Low SES youth who were high in shift-and-persist strategies also had lower IL-6 (beta = .17, p = .05). Shift-and-persist strategies partially mediated the interaction between SES and role models on IL-6, suggesting that one reason why role models are associated with inflammatory markers in low SES youth is because these role models facilitate youths’ engagement in shift-and-persist strategies. No benefits of role models or shift-and-persist were found among high SES youth. Identifying naturally occurring psychological buffers among low SES youth represents an important approach in efforts to address health disparities.
studies has focused on the role of acute or chronic increases in sympathetic nervous system (SNS) activity paired to decreases in parasympathetic nervous system (PNS) activity in blood pressure regulation. In this symposium we present cumulative evidence that autonomic dysregulation may also play an important role in two other systems that could play a pivotal role in cardiovascular disease: inflammation and the metabolic syndrome. In a cross-sectional examination in the Twins Heart Study and Cardiovascular Health Study, Vaccarino et al. and Kop et al respectively showed HRV to be negatively related to metabolic risk factors across all frequency ranges, including the respiratory frequency where HRV can be regarded as a good proxy for PNS activity. HRV was also negatively associated with IL6, white blood cell count, and CRP, indicators of chronic low-grade inflammation. Expanding on these cross-sectional findings, Neijts et al. longitudinally tested whether cardiac sympathovagal balance has predictive value for chronic low-grade inflammation after 5 years. They found baseline ANS activity to be moderately but significantly associated with CRP and fibrinogen at 5 year follow-up. These associations disappeared, however, when including BMI as a covariate. In the Netherlands Study of Depression and Anxiety, Penninx et al. used measures of cardiac PNS and SNS activity at the baseline to predict increases in waist circumference, serum triglycerides, blood pressure, serum glucose, and low-density lipoprotein (HDL) cholesterol at 5-year follow-up. Increased sympathovagal balance was significantly predicted an increase in number of metabolic abnormally over time. A decrease in HDL cholesterol over time was predicted by increased sympathetic activity as well as by decreased parasympathetic activity. Taken together the data from all four large scale studies are compatible with a chain of events in which ANS dysfunction has an effect on the metabolic risk profile and inflammatory state, that in turn can influence each other in a detrimental way.

Individual Abstract Number: 440

**THE COMBINED EFFECT OF DEPRESSION AND PHYSICAL INACTIVITY ON INFLAMMATION AND AUTONOMIC NERVOUS SYSTEM MEASURES: LONGITUDINAL ANALYSIS OF THE CARDIOVASCULAR HEALTH STUDY**

Willem J. Kop, PhD, Medical Psychology and Neuropsychology, Center of Research on Psychology in Somatic diseases (CoRPS), Tilburg University, Tilburg, WB, Netherlands, Phyllis K. Stein, MD, Division of Cardiology, Washington University School of Medicine, St Louis, MO, Helma M. de Morree, PhD, Department of Medical Psychology and Neuropsychology Center of Research on Psychology in Somatic diseases (CoRPS), Tilburg University, Tilburg, NB, Netherlands, John S. Gottsdiener, MD, Echocardiography Labaratory, University of Maryland Hospital, Baltimore, MD

Background: The predictive value of depression for adverse cardiovascular disease (CVD) outcomes is mediated in part by physical inactivity. The neuroimmune pathways involved in the association between depression and physical inactivity as related to CVD are not well understood. This investigation addresses the unique and joint contributions of depression and physical activity levels on inflammation and autonomic nervous system activity. Methods: Participants (N=907 Cardiovascular Health Study subgroup, mean age 71.3±4.6 years, 59.1% women) were evaluated for inflammation markers (C-reactive protein (CRP), tissue factor (TF), interleukin-6 (IL-6), fibrinogen, and white blood cell count (WBC)) and ANS indices derived from heart rate variability (HRV) analysis (frequency domain and non-linear HRV). ANS contributions were calculated using power spectral methods and explained significance were assessed using the standard questionnaires (CES-D and MLTA; using continuous and categorical scales) studies are compatible with a chain of events in which ANS dysfunction has an effect on the metabolic risk profile and inflammatory state, that in turn can influence each other in a detrimental way.

Individual Abstract Number: 441

**INTERRELATIONSHIPS AMONG AUTONOMIC DYSFUNCTION, METABOLIC SYNDROME AND INFLAMMATION: A TWIN STUDY**

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Background: The physiological pathways linking metabolic risk factors to the development of coronary artery disease (CAD) are incompletely understood. We hypothesize that autonomic dysregulation represents a general pathway through which these risk factors increase inflammation which in turn lead to CAD: Methods: In a series of studies with middle-aged male twins enrolled in the Twins Heart Study (THS), we investigated the interrelationships between 24-hour heart rate variability (HRV), an established measure of autonomic function, with metabolic syndrome risk factors and C-reactive protein (CRP). All twins underwent ambulatory electrocardiogram monitoring and 24-hour ultra-low (ULF), very -low (VLF), low (LF), and high-frequency (HF) power spectral analysis. A middle-aged male twin with metabolic syndrome (MetS) definition was based on standard criteria of waist circumference, triglycerides, HDL-cholesterol, systolic blood pressure and fasting glucose. We genotyped 3 single-nucleotide polymorphisms (SNPs) in the CRP gene with minor allele frequency >5% in the HapMap Caucasian panel. Structural equation modeling was used to estimate the genetic and environmental correlations between CRP, HRV and MetS, and the explanatory effect of CRP SNPs. Analyses adjusted for behavioral risk factors (smoking, physical activity, depression) and medications (beta-blockers, statins, antidepressants). Results: HRV was negatively related to MetS across all frequency ranges, and each additional MetS risk factor was associated with lower HRV. HRV was also negatively associated with CRP. Associations with both MetS and CRP were most robust for ULF, VLF and LF; these associations persisted after adjusting for behavioral factors and medications, and were only mildly attenuated in pair-wise comparisons. A robust genetic correlation was found between CRP and ULF (rG=-0.3, p=0.001) and between CRP and MetS (rs=0.5, p=0.01); while a non-significant genetic correlation was also observed between MetS and ULF (rg=-0.3, p=0.10). One CRP SNP (rs1205) was associated with both CRP (r=0.003) and ULF (r=0.005) and explained 11% of the genetic covariance between them. Conclusions: Autonomic dysregulation may represent an underlying pathway for adverse metabolic risk profile (both pre- and post-inflammation). However, the correlations among autonomic function, inflammation and MetS are due, in part, to common genetic influences suggesting that these processes share common etiological pathways.

Individual Abstract Number: 442

**THE ASSOCIATION OF AUTONOMIC NERVOUS SYSTEM ACTIVITY WITH CHRONIC LOW-GRADE INFLAMMATION AT 5-YEAR FOLLOW-UP**

Melanie Neijts, MSc, Gonneke Willemsen, PhD, Rene van Lien, MSc, Dorret I. Boomsma, PhD, Biological Psychology, VU University, Amsterdam, NH, Netherlands, Eco J. de Geus, PhD, Biological Psychology, EMGO+ Institute, VU University & VU Medical Center, Amsterdam, NH, Netherlands

Background: A shift in the autonomic nervous system (ANS) activity towards sympathetic dominance and chronic low-grade inflammation
have both been implicated as risk factors for the development or progression of cardiac disease. Previous, mostly cross-sectional, studies showed ANS activity and inflammatory markers to be associated markers to be associated markers. We longitudinally tested whether cardiac sympathovagal balance has predictive value for chronic low-grade inflammation after 5 years. Methods: A sample of 334 healthy subjects from the Netherlands Twin Register participated in ambulatory ANS monitoring and in a later Biobank study. In the ANS study, 24-h recordings with the VU-AMS were performed and five measures of ANS activity were extracted: RMSSD, SDNN, RSA, PEP and HR. Average levels were determined for 3 conditions: sleeping, sitting activities and physical active periods based on continuous accelerometer signals and diary reports. As part of the Biobank study, fasting blood samples were collected, in which we determined the levels of two cytokines, TNF-a and IL-6, its receptor and two acute phase reactants, CRP and fibrinogen. Effects were analyzed with linear mixed-effect models accounting for family relatedness. Age, sex and subsequently BMI were included as covariates. Results: No associations were found for TNF-a and IL-6R. During sleep and sitting activities, HR was related to CRP, fibrinogen and IL-6 (r=0.18, p<0.05), and in physical active periods to fibrinogen (r=0.13, p<0.05). During sitting and physical activity, RSA was related to CRP and fibrinogen (r=0.12 to -1.0, p<0.05), while SDNN was related to fibrinogen (r=-0.12 to -1.9, p<0.05) and, during sitting, to CRP (r=0.18, p<0.05). HR was not associated with any of the DNA markers parameters. When BMI was also included as a covariate, the associations became weaker. Conclusion: ANS activity is moderately but significantly associated with inflammatory state at 5 year follow-up. These associations mostly disappear when including BMI as a covariate.

Individual Abstract Number: 444 DYSREGULATION OF THE AUTONOMIC NERVOUS SYSTEM PREDICTS DEVELOPMENT OF THE METABOLIC SYNDROME

Brenda W. Penninx, PhD, Psychiatry, VU University Medical Center, Amsterdam, NH, Netherlands, Carmilla M. Licht, PhD, Clinical Neuropsychology, VU University, Amsterdam, NH, Netherlands, E C. J. de Gru, PhD, Biobank Study, EMGO Institute, VU University & VU Medical Center, Amsterdam, NH, Netherlands

Background: Stress is suggested to lead to metabolic dysregulations as clustered in the metabolic syndrome. Although dysregulation of the autonomic nervous system is found to associate with metabolic dysregulations and the metabolic syndrome, no longitudinal study has been performed to date to examine the predictive value of this stress-system in the development of the metabolic syndrome. We examined whether autonomic nervous system (ANS) function predicts the 2-year development of one or more of the metabolic abnormalities that constitute the metabolic syndrome. Methods: Data were from 1933 participants aged 18-65 years participating in the baseline and 2-year follow-up of the Netherlands Study of Depression and Anxiety. ANS measures included heart rate (HR), respiratory sinus arrhythmia (RSA, high RSA reflecting high parasympathetic activity), pre-ejection period (PEP, high PEP reflecting low sympathetic activity), cardiac autonomic balance (CAB) and cardiac autonomic regulation (CAR). Metabolic syndrome was based on the updated Adult Treatment Panel III criteria and included high waist circumference, serum triglycerides, blood pressure, serum glucose, and high low-density lipoprotein (HDL) cholesterol. Results: Baseline short PEP, low CAB, high heart rate, and high CAR were predictors of an increase in number of metabolic syndrome components during follow-up. High short heart rate (CAB were predictors of a 2-year decrease in high-density lipoprotein (HDL) cholesterol, and a 2-year increase in diastolic and systolic blood pressure. Short PEP and high CAR also predicted a 2-year increase in systolic blood pressure, and short PEP additionally predicted a 2-year increase in diastolic blood pressure. Finally, a low baseline RSA was predictive for a subsequent decrease in HDL cholesterol. Conclusion: Increased sympathetic activity predicts an increase in number of metabolic abnormalities over time. A decrease in HDL cholesterol over time is predicted by increased sympathetic activity as well as by decreased parasympathetic activity. Systolic and diastolic blood pressure increases are mainly predicted by high sympathetic activity. These findings suggest that a dysregulation of the autonomic nervous system is an important predictor of cardiovascular diseases and diabetes through dysregulating lipid metabolism and blood pressure over time.

Symposium 140 ACCELERATED CELLULAR AGING: IMPACTED BY PSYCHOLOGICAL AND BEHAVIORAL FACTORS ACROSS THE LIFE SPAN?

Brenda W. Penninx, PhD, Psychiatry, VU University Medical Center Amsterdam, Amsterdam, nvt, Josine E. Verhoeven, MSc, Psychiatry, VU University Medical Center Amsterdam, Amsterdam, nvt, Anna C. Phillips, PhD, School of Sport and Exercise Sciences, University of Birmingham, Birmingham, na, Gonneke Willemsen, PhD, Biological Psychology, VU University, Amsterdam, nvt, Eli Puterman, PhD, Psychiatry, University of California, San Francisco, CA, Elissa S. Epel, PhD, Psychiatry, University of California, San Francisco, San Francisco, CA

Psychological stress and unfavorable health behaviors are common and have a huge public health impact. Their adverse health consequences are tremendous; they increase the risk of many aging-related conditions including obesity, functional and cognitive decline, cancer, diabetes, cardiovascular disease and overall mortality. These unfavourable health outcomes suggest a rather global underlying accelerated degenerative pathway. Telomere length (TL) emerged as a novel marker of cellular age, integrating the cumulative lifetime burden of genetic and environmental factors independent of chronological age. Telomeres are tandem repeat DNA sequences (TTAGGG)n that form protective caps at chromosome ends. The successful maintenance of telomeres is critical to human health, and indeed, shorter TL has shown to predict the onset of a range of morbidities and mortality. In this symposium we present data from four large-scale populations studies, covering different age groups, that examined the impact of psychological and behavioural factors on TL. In the Netherlands Study onDepression and Anxiety, Verhoeven et al. found evidence for a significantly shorter mean TL among 1897 patients with major depressive disorder compared to 528 controls, and confirmed a dose-response association as the shortest TLs were observed among the most chronic and severely depressed patients. In a longitudinal approach, Philips et al. used data from the West of Scotland-Twenty-07 study with three age cohorts and four waves of data collection. Depressive symptoms were associated with shorter telomere length 7 to 12 years later, but in the youngest cohort (mean age of 37) only suggesting that higher depressive symptoms in earlier age may contribute to more rapid biological aging. Willemsen et al. used data from the Netherlands Twin Registry among 7801 subjects and confirmed traditional sex and age effects on TL, as well as a high heritability for TL indicating strong underlying genetic factors. However, on the contrary to some other studies, they did not find much evidence for an impact of psychological or behavioral factors on cellular aging. Using longitudinal data in 213 postmenopausal women, Puterman et al. confirmed the impact of combined unhealthy lifestyle and major life stressors during a one year period on accelerated shortening of TL in this period. Finally, Elissa Epel will discuss potential reasons for inconsistencies across presented study findings, and provide some overall conclusions and study directions for the field of cellular aging in the realm of biobehavioral research.

Individual Abstract Number: 404 TELOMERE LENGTH AND MAJOR DEPRESSIVE DISORDER: DATA FROM A LARGE PSYCHIATRIC COHORT STUDY

Josine E. Verhoeven, MSc, Psychiatry, VU University Medical Center Amsterdam, Amsterdam, nvt, The Netherlands, Dorá Pócsz, MSc, Psychiatry, VU University Medical Center, Amsterdam, NH, The Netherlands, Elissa S. Epel, PhD, Psychiatry, University of California, San Francisco, CA, The Netherlands, Owen M. Wolkowitz, MD, PhD, Psychiatry, University of California, San Francisco, CA, Brenda W. Penninx, PhD, Psychiatry, VU University Medical Center, Amsterdam, NH, The Netherlands

Introduction - Patients with Major Depressive Disorder (MDD) have an increased risk of developing various aging-related somatic diseases, such as coronary heart disease, diabetes, obesity and cancer. This suggests mechanisms of accelerated aging within the depressed population. Accelerated aging can be examined at the level of telomeres in leukocytes since telomere length (TL) is a novel indicator of biological age. This study examines in a large cohort of pharmacologically depressed persons and controls whether depression is associated with accelerated biological aging, and whether depression
Introduction: Telomere length (TL) has been primarily associated with ageing and mortality. In addition, previous studies have included a range of other traits related to ageing and mortality, including SES, lifestyle, stress reactivity and psychological variables. The aim of this paper is two-fold: 1) to present TL and its association with health, lifestyle and personality as a function of age and sex and 2) to examine these associations monzygotic twins who are discordant for TL.

Methods: Within the Netherlands Twin Register Biobank, TL was obtained by a quantitative PCR-based technique in 7801 individuals, including 848 complete monzygotic (MZ) twin pairs and 694 complete dizygotic (DZ) twin pairs. Four subgroups of unrelated subjects were created: 1237 men < 50 yrs, 2045 women < 50 yrs, 1128 men ≥ 50 yrs and 1492 women ≥ 50 years (average age 32.4, 34.2, 61.6 and 60.0 yrs, respectively). Data were obtained at the time of blood sampling (e.g. fasting lipid, glucose and insulin levels, blood cell counts, liver enzyme levels, indicators of inflammatory state, smoking, subjective health, and BMI), or as part of longitudinal survey collection (e.g. alcohol consumption, sport participation, personality, ADHD, migraine, age at menarche).

Results: TL was assessed reliably as evidenced by the high MZ twin correlation (rMZ = 0.61) and clearly highly genetically determined (the correlation in DZ twins was 0.34). Sex and age were associated with TL as expected, with shortest telomeres in the older men. However, no other associations with TL were evident in the general population. The present study examined participants in the West of Scotland Twenty-07 Study

SYMPTOMS OF DEPRESSION PROSPECTIVELY PREDICT TELOMERE LENGTH YEARS LATER, BUT ONLY AMONG YOUNGER ADULTS: EVIDENCE FROM THE WEST OF SCOTLAND TWENTY-07 STUDY

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Psychological factors such as early adversity and the stress of caregiving are emerging as predictors of telomere length, an index of biological ageing. However, although lifetime major depressive disorder is associated with shorter telomeres, less is known about self-reported depression symptoms in the general population. The present study examined participants in the West of Scotland Twenty-07 Study across three age cohorts and four waves of data collection from 1992/93 to 2007/08. Participants were aged approximately 37, 57, and 76 years old at final data collection. Depressive symptoms were measured using the Hospital Anxiety and Depression Scale at each time point. Telomere length was assessed from 1063 blood samples collected at the final wave in 2007/08 for respondents who also had depression data. In regressions, depressive symptoms measured in 1995-97 and 2000-04, but not 1992/93 or 2007/08, were associated with shorter telomere length in 2007/08, but in the youngest cohort only (p = .05 and .01, respectively). The average depression score over time or the change in symptoms from wave 2 to wave 5 were not associated with telomere length. This suggests that the higher depressive symptoms in earlier age may contribute to more rapid biological ageing.

TELOMERE LENGTH IN A DUTCH TWIN FAMILY POPULATION: RELATIONSHIP WITH HEALTH, LIFESTYLE, AND PERSONALITY

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characteristics such as severity, duration and age-of-onset do further impact on biological aging.

Methods - Data were from the Netherlands Study of Depression and Anxiety including 1095 current MDD patients, 802 remitted MDD patients and 528 control subjects without any lifetime psychiatric disorder. MDD diagnoses and age-of-onset were established in DSM-IV based psychiatric interviews, severity and duration were measured with the Inventory of Depressive Symptoms and the Lifecirt Interview. TL was assessed as the mean telomere repeat sequence copy number (T) compared to a reference gene copy number (S; T/S ratio) using quantitative PCR. We used linear regression and ANCOVA analyses to associate depression characteristics to TL, after adjustment for sociodemographics, health and lifestyle variables.

Results - Compared to healthy control subjects (T/S ratio=1.140), adjusted mean of TL was shorter among current MDD patients (T/S ratio=1.106; p<.05) and remitted MDD patients (T/S ratio=1.107; p<.04). Within the 1095 current MDD patients, both higher depression severity (p<.01) and longer symptom duration (p=.01) were associated with shorter TL. Analyses revealed no associations between TL and age-of-onset, single versus recurrent episodes and antidepressant medication.

Conclusions - Our results confirm that MDD is associated with accelerated biological ageing: both current and remitted MDD patients had shorter telomere length than control subjects. In addition, we found evidence for a dose-response relationship since the most severe and chronically depressed patients had the shortest telomeres. Individual Abstract Number: 407

A RECIPE FOR TELOMERE SHORTENING: THE COMPOUNDING EFFECT OF AN UNHEALTHY LIFESTYLE AND MAJOR LIFE EVENTS

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Senescent cells are mechanistic precursors to the pathogenesis of diseases of aging. Several cellular markers indicate senescence of mitotic cells, with considerable attention paid to the telomeric ends of chromosomes. The dynamics of the telomere/telomerase maintenance system is the interaction between heredity, environmental factors including life events that occur to individuals and lifestyle behaviors.

Adulthood marks a life stage when major events significantly wear on telomere length, at least cross-sectionally. Yet, there is a dearth of evidence demonstrating prospective effects of major life events on telomere shortening over time. Our understanding of telomere biology is incomplete without considering lifestyle directly, and the extent to which a healthy lifestyle may dampen the effects of life events. Healthy lifestyle behaviors (i.e. physical activity, good sleep hygiene, healthy dietary practices, non-smoking status) are independently associated with longer immune cell telomeres. These behaviors typically cluster together, and are stronger predictors of telomere length when combined than when considered independently. Here, we examine the effects of life events on leukocyte telomere shortening over the course of one year, and importantly, examine whether these effects vary dependent on level of a healthy lifestyle.

Two hundred and thirteen postmenopausal women with mean age of 57 +/- 4.3 participated in a one year prospective study on life stress, behaviors, and cell aging. Regressions revealed that major events (b = .42.16, SE = 28.14, p = .14) and lifestyle over the year (b = 9.13, SE = 8.35, p = .28) were unrelated directly to leukocyte telomere length at one-year follow up, including baseline telomere length, age and BMI as covariates. The interaction between major events and lifestyle was significant however (p = .026). Simple slope analyses revealed that major events were significantly related to TL at follow up only at 1 SD below mean year-long healthy lifestyle (b = -104.02, SE = 39.12, p = .009).

Thus, an unhealthy lifestyle and the accumulation of major life stressors over time can burden the telomere maintenance system such that accelerated shortening is evidenced across a year.
CURRENT PERSPECTIVES ON MATERNAL-CHILD HEALTH IN THE PERINATAL PERIOD
Laura Glynn, PhD, Psychology, Chapman University, Orange, CA, Mary Coussons-Read, PhD, Psychology, University of Colorado, Denver, CO, Clayton Hilmert, PhD, Psychology, Wayne State University, Detroit, MI, Kimberly D’Anna-Hernandez, PhD, Psychology, California State University, San Marcos, CA, Mary Coussons-Read, PhD, Psychology, University of Colorado, Denver, CO

Rapidly accumulating evidence suggests that early life experience, beginning during the prenatal period, exerts broad influences that persist throughout the lifespan. Each developing organism plays an active role in its own construction. The human fetus has evolved mechanisms to acquire information about the environment and guide its development. The human placenta is both a sensory and effector organ that incorporates and transduces information from the maternal environment into the fetal developmental program. The fetal-placental unit’s detection of stress signals from the maternal environment “informs” the fetus about conditions necessary for survival in the postnatal environment. In response to this information, the fetus adjusts its developmental trajectory, with implications for birth outcome and postnatal health and development.

The purpose of this symposium is to highlight current findings in maternal-child health during the perinatal period. The themes include: 1) Providing insight into novel predictors of adverse birth and developmental outcomes (pregnancy anxiety, acculturated catastrophic events). 2) Examination of a range of consequences associated with prenatal stress exposure (shortened gestation, fetal growth, and infant hypothalamic-pituitary-adrenal (HPA) axis regulation). 3) Consideration of maternal stress hormones as potential mediators of the relation between prenatal maternal psychological distress and adverse birth and developmental outcomes. 4) Analysis of the adaptive significance of prenatal maternal stress signals. This set of talks represents a wide range of prospective longitudinal studies and considers contributing factors such as timing of exposure and critical biomarkers. The first speaker will present new data linking pregnancy anxiety, a potent predictor of adverse birth and developmental outcomes, to dysregulated prenatal maternal cortisol trajectories. The second speaker will present unique findings examining the link between exposure to a catastrophic stressor and shortened gestation and reduced fetal growth. The third speaker will evaluate the implications of maternal acculturated among Latina women for prenatal maternal stress hormone profiles and birth outcomes. The final speaker will present novel data describing the implications of prenatal stress hormone exposures (both naturally occurring and those resulting from therapeutic intervention) for infant HPA-axis regulation.

THE IMPACT OF CATASTROPHIC STRESS ON PREGNANCY OUTCOMES
Clayton Hilmert, PhD, Psychology, North Dakota State University, Fargo, North Dakota

Psychological stress in various forms, including self-reports of current stress and retrospective reports of past stress, has been associated with adverse birth outcomes. The present study examined the impact of a naturally occurring, pregnancy outcomes study in a cohort of 448 women. Participants were 73 women who were pregnant during a record-breaking flood in or near their communities and who had spontaneous labor and uncomplicated deliveries. Women were recruited during prenatal care visits within a trimester after the flood crest and were asked to report their general psychological stress, and physical and financial strain related to the flood. We tested a model predicting pregnancy outcomes (length of gestation and birth weight) with distance from flooding, gestational age at the time of the flood crest, and the interaction of these two variables. Results revealed that women who were relatively early in pregnancy when the crest occurred and who lived closer to flooding areas had smaller babies than other women (p<.01). This pattern remained significant after controlling for medical risk, length of gestation, physical and financial strain, and perceived stress. Further exploration of the impact of the flood crest was found with multi-level analyses of ultrasound measures. Models of fetal biparietal growth across the entire pregnancy showed that for women in the first trimester during the flood crest, the rate of growth decreased after the crest. In contrast, a decrease in rate of growth did not occur for women later in pregnancy during the flood crest. Distance from and timing of the flood crest were not significantly related to gestational age at birth. These results add to the growing body of literature showing that catastrophic stressors impact fetal growth. Physical strain and financial difficulties that could have impacted pregnancy did not explain our results. Future research needs to focus on additional biopsychosocial pathways by which disaster stress may affect fetal growth.

FETAL STRESS HORMONE EXPOSURE PROGRAMS INFANT HPA AXIS REGULATION
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The prenatal period is a time of enormous change during which organs and organ systems are forming and are susceptible to both organizing and disorganizing influences. These influences on the fetus have been described as programming. Compelling evidence supports the hypothesis that a wide range of adult health outcomes including heart disease and obesity are programmed in utero by processes that occur during the fetal period. The influence of maternal stress signals on the developing fetal hypothalamic–pituitary–adrenal (HPA) axis has been proposed as one mechanism underlying fetal programming of adult health outcomes. Few prospective studies have evaluated programming of the fetal HPA axis. We will present data suggesting that fetal stress hormone exposure is associated with neonatal and infant HPA axis functioning. Data will be presented from two prospective longitudinal cohorts. Cohort 1 comprises 116 women and their full term infants. Maternal plasma cortisol was assessed at 15, 19, 25, 31 and 36+ gestational weeks. Cohort 2 consists of full term infants who were exposed to synthetic glucocorticoids prenatally (n=30) and a no treatment comparison group (n=60). Infant salivary cortisol was evaluated in response to the painful stress of a heel-stick blood draw at 11 months of age and in response to inoculation with inactivated influenza vaccine at 6 and 12 months of age. Cohort 1, elevated levels of maternal cortisol during the second and third trimesters were associated with both a larger cortisol response and a slower recovery from the stress of the heel-stick (p’s < .05). Similarly, in Cohort 2, infants exposed to prenatal synthetic glucocorticoid treatment displayed a larger and more prolonged cortisol response to the heel-stick procedure (p<.05). These effects on the development of the HPA axis persist later into infancy. Prenatal exposure to elevated maternal cortisol also is associated with a larger infant cortisol response to the inoculation procedure at 6 and 12 months of age (p<.05). These data are among the first in humans to demonstrate that prenatal stress hormone exposures alter the functioning of stress regulatory systems in the offspring, independent of postpartum influences, and suggest a potential mechanism for fetal programming.

THE ASSOCIATION BETWEEN PREGNANCY ANXIETY AND MATERNAL CORTISOL DURING PREGNANCY
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Pregnancy anxiety is defined as anxiety about the mother’s own health, the baby’s health and delivery in the context of a specific pregnancy (Dunkel Schetter, 2011). Accumulating evidence suggests that independent of medical risk factors, pregnancy anxiety is a potent and consistent predictor of birth and infant outcomes and development. The maternal-fetal hypothalamic pituitary adrenal (HPA) axis is one mechanism thought to explain these effects. Therefore, the purpose of this study was to prospectively assess the association between pregnancy anxiety and HPA functioning during mid to late pregnancy. Specifically, we measured pregnancy anxiety and salivary cortisol in a cohort of 448 women on 4 occasions during pregnancy. Multilevel modeling techniques were utilized to simultaneously test the influence...
of changes in pregnancy anxiety over pregnancy (within-person changes) and mean levels of pregnancy anxiety (between-person differences) on cortisol trajectories and levels. Results revealed that women with higher mean levels of pregnancy anxiety had steeper increases in cortisol trajectories over pregnancy compared to women with lower mean levels of pregnancy anxiety. These steeper increases led to significant differences in cortisol levels between 29 and 30 weeks gestation. Changes in pregnancy anxiety over pregnancy (deviations from a woman’s mean level) did not predict cortisol levels or changes in trajectories. These results held up even after adjusting for general psychological distress. The implications of these findings will be discussed with respect to understanding the nature of pregnancy anxiety and how it affects infant outcomes such as fetal nervous system development and stress regulation. Furthermore, these findings may suggest specific targets for screening and clarify that in order to reduce pregnancy anxiety, intervention early in pregnancy or even before conception is likely necessary.

Individual Abstract Number: 763

CORTISOL, ACCULTURATION, STRESS, MOOD AND THE PROTECTIVE ROLE OF CULTURAL VALUES IN PREGNANT WOMEN OF MEXICAN DESCENT

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Mexican-Americans are the most rapidly growing group in the US. Mexican-American women is acculturation. Acculturation involves adapting to a new culture and is associated with poor mental health outcomes. Yet, whether levels of acculturation contribute to maternal stress and depression and the physiological mechanism by which this may occur is unclear. This study hypothesizes that a continuous measure of acculturation would be positively related to maternal stress, depression, and HPA axis activity during pregnancy. Salivary cortisol was compared to acculturation, pregnancy-specific distress, and salivary cortisol in pregnant women of Mexican descent. Saliva collection occurred 3 times/day (30 minutes after waking, before lunch and 4PM) over 3 days to obtain an average daily cortisol decline during early, mid and late pregnancy (16-19, 26-29 and 32+ weeks gestation, respectively). Overall measures of maternal depression and pregnancy-specific distress were positively correlated (r=0.387, p<0.01). In mid pregnancy, multiple linear regression determined a significant effect of cortisol on elevated pregnancy-specific distress that was moderated by acculturation (R^2=0.51, β=0.06, p=0.06). There were no effects of cortisol (p=0.12) or acculturation (p=0.57) on maternal depression. In addition, acculturated women were more likely to give birth to preterm (p=0.03) and low birth weight infants (p=0.005). In a current follow-up study, researchers aim to identify the underlying stressors of acculturation as well as potential protective factors. Pregnant women of Mexican descent self-reported on acculturation, discrimination stress and depression. These results held up even after adjusting for general psychological distress. The implications of these findings will be discussed with respect to understanding the nature of pregnancy anxiety and how it affects infant outcomes such as fetal nervous system development and stress regulation. Furthermore, these findings may suggest specific targets for screening and clarify that in order to reduce pregnancy anxiety, intervention early in pregnancy or even before conception is likely necessary.

Individual Abstract Number: 752

THE RELATIONSHIP BETWEEN VENTRAL HIPPOCAMPAL ACTIVITY AND AUTONOMIC BRAINSTEM NUCLEI IN HUMANS

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Hippocampus and amygdala receive information not only about the external world but also information regarding the internal state. Multi-synaptic pathways between autonomic brainstem nuclei and the hippocampus are likely to play an important role in integrating autonomic function with emotion and memory storage. We have developed a new method, masked independent component analysis (mICA), to detect intrinsic connectivity networks in the hippocampus, and to reveal connectivity of each network with subregions in the hypothalamus, midbrain, and brainstem. We analysed a resting fMRI dataset from 40 healthy subjects. Heart rate (HR) and dermoelectrical activity (EDA) were obtained. We observed ten independent hippocampal components: four ventral, three mid, two posterior, and one distributed bilateral component. Ventral components showed connectivity with hypothalamic regions, and relatively stronger connectivity with midbrain regions, such as locus coeruleus or raphe nuclei. Ventral components also showed connectivity with rostral caudal medulla. By contrast, dorsal, but not ventral, components showed connectivity with inferior and superior colliculus activation. With respect to autonomic activity, ventral components showed correlation with both HR and EDA, and two mid components were correlated with either HR or EDA. Components correlating with either HR or EDA showed connectivity with hypothalamic regions, and with the rostral and caudal medulla. Hippocampal components that correlated with HR increase showed connectivity with activation in the hypothalamus, rostral and caudal medulla. In addition, multiple networks showed connectivity to cortical regions such as the medial prefrontal cortex or the anterior cingulate cortex. Thus, our study reveals the close relation of networks within the hippocampus to autonomic function in healthy subjects. Preliminary data on patients with depression will be shown in contrast to healthy subjects.
Individual Abstract Number: 755

FUNCTIONAL IMAGING OF AUTONOMIC RESPONSES TO HYPOXIC CHALLENGE: REGIONAL CORRELATES OF PHYSIOLOGICAL CHANGES AND EFFECTS OF SLOW BREATHING

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Background Slow breathing (at 6/min, a rate evoked by mantra recitation) benefits mood and cardiovascular function including chemoreflex response to hypoxia.2 This motivated us to undertake a study to test neural mechanisms underlying effects of slow breathing. Methods 20 healthy volunteers took part in an fMRI study of controlled (paced by auditory cues) and spontaneous breathing in normoxia and hypoxia (13% inspired O2). Cardiovascular and respiratory measures were simultaneously acquired. Participants engaged in blocks of paced-slow breathing (at 5.5/min), paced-normal (10/min) and spontaneous breathing (mean 8.7/min: range 2.3-11.7). Results Hypoxic challenge reduced arterial oxygen saturation from 97% to 91%, increasing heart rate and reducing heart rate variability & end-tidal CO2. Physiological changes, spontaneous breathing rate and status as a ‘trained breather’ did not explain the magnitude of SaO2 drop (in this study). Brain data revealed (1) activation of insula and mammillary bodies to increasing end-tidal CO2; (2) activation in pontine, cerebellum, thalamus, striatum and lateral cortices to heart rate slowing, (3) increased medulla & decreased anterior insula / pregenual cingulate activity to heart rate variability, and (4) activation in pons, hypothalamus, thalamus, putamen and insular, cingulate & prefrontal cortices tracking ventilation. (5) Blocks of hypoxia activated mid pons, amygdala, anterior insular and rostrolateral prefrontal cortices. (6) Paced-slow breathing evoked stronger engagement of pontine nuclei, PAG, cerebellum, hypothalamus, thalamus and lateral & anterior insula cortices. (7) Slow breathing interacted with hypoxia through changes in putamen and frontal pole activity. Conclusions Our findings provide insight into slow breathing effects on responses to hypoxic challenge, highlighting recruitment of frontostralateral circuitry to regulatory interoceptive systems. The study did not replicate all recognized effects of slow breathing on resistance to hypoxia, yet it informs interpretation of studies evoking cardiorespiratory change.

1 Bernardi L et al 2001 Hypertens. 19::2221-9

Individual Abstract Number: 762

MACHINE LEARNING AND BRAIN-AUTONOMIC INTERACTIONS

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Autonomic responses are important indicators of normative emotional and energetic processes and health risks in several disorders. Autonomic responses to psychosocial events are driven by specific, emotionally and energetically based responses. Recent neural imaging reveals complex circuits that mediate these responses. However, distributed analyses of these circuits are challenging and require advanced machine learning methods. 3 Bernardi L et al 2001 Hypertens. 19::2221-9

1 Bernardi L et al 2001 Hypertens. 19::2221-9

Individual Abstract Number: 95

TELOMERE LENGTH PREDICTS THE INFLAMMATORY RESPONSE TO SLEEP DEPRIVATION IN OLDER ADULTS

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Sleep deprivation activates the inflammatory arm of the immune system in adults. No study has examined this response pattern in older adults who by virtue of their age are more likely to have sleep disturbance and increases in inflammation. In this study, we examined the effects of one night of partial sleep deprivation (PSD) on intracellular monocyte expression of inflammatory cytokines in older adults and determine whether variations in inflammatory responses to sleep loss correlate with a marker of cellular aging, namely peripheral blood mononuclear cell telomere length (TL). Thirty healthy male and female older adults (ages 60-84) from the Los Angeles area were evaluated in a NIH Clinical Translational Research Center. Following an uninterrupted night of sleep (11 PM to 7 AM) which served as baseline, sleep was restricted to 3 AM to 7 AM on the next night (PSD). Stimulated intracellular cytokine (ICC) expression in monocytes was measured in the morning after the baseline and PSD nights for IL-6 and TNF-alpha by flow cytometry. Prior to PSD, fasting blood samples were taken for the measurement of TL using real-time qPCR. Repeated measure ANCOVAs adjusting for chronological age revealed no significant main effect of PSD on IL-6 or TNF-alpha ICC in this older adult sample. However, distributional analyses revealed considerable variability in inflammatory responses to the PSD. Approximately half of the participants showed decreases in ICC with no change or declines post-PSD. To examine whether TL could explain...
the variability in ICC responses to PSD, we conducted linear regression analyses. Independent of chronological age, TL was a significant predictor of the magnitude of change in ICC IL-6 in response to PSD (R2 change = .21, p = .05, n = 19). TL was unrelated to change in ICC TNF-alpha. In this older adult sample, there was no overall effect of PSD on ICC, due to wide variability in responses. TL partially explained this variability, such that those older adults with shorter TL, an indicator of cellular aging, showed greater monocyte expression of IL-6 in response to sleep loss. Together, these data indicate that shorter TL is related to increases of cellular inflammation in response to sleep loss in older adults.

Individual Abstract Number: 653
SLEEP AND HOST PROTECTIVE MECHANISMS: HISTORICAL AND EMERGING EVIDENCE
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While the importance of sleep for health is self-evident to most individuals, there is much to be discovered about the ways in which sleep is involved in human host defense mechanisms. Quality sleep of sufficient duration and biological timing is a necessary condition for optimal health maintenance and disease prevention. Recent evidence suggests that sleep is also involved in recovery processes following surgery. The current variability in survival will allow communication on research in the area of sleep and host protective mechanisms, with a primary focus on human research. Current directions will be discussed, reviewing effects of different models of sleep loss, the response of metabolic, autonomic and inflammatory systems to these sleep alterations. We will then present data that has examined the effects of individual differences in age and adiposity on responsiveness to sleep loss. Findings to be presented are that inflammation will be increased flow mediated dilation of the brachial artery, baroreflex sensitivity, heart rate and other hemodynamic indices are altered by sleep loss. Increased blood pressure and reduced flow mediated dilation of the brachial artery have both been reported to predict future development of cardiovascular disease, and small increases in inflammatory mediators have been shown to be predictive of cardiovascular disease. During experimental sleep loss inflammatory processes are altered and blood pressure is increased, suggesting that possibility that common mechanism(s) may underlie these changes. Recent data from our group has found that baroreflex sensitivity in younger individuals looks similar to profiles of older individuals, during sleep deprivation, supporting the model of sleep deprivation as an intervention that that moves physiological responses towards an older profile. In addition, recent results from a pilot study will be presented that shows sleep extension in hypotension to reduce blood pressure. Inflammatory mediators from that study will also be presented. The presentation will conclude by pointing out future directions for research (some of which will be presented in this symposium).

Individual Abstract Number: 662
POOR SLEEP AND VISCERAL ADIPOSY POTENTIATE STRESS-INDUCED CYTOKINE REACTIVITY
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Sleep disturbance is a key behavioral risk factor for chronic medical conditions observed at high rates among overweight and obese individuals. Systemic inflammation, including in response to stress, may serve as a common biological mechanism linking sleep, adiposity, and disease risk. To investigate these relationships, 48 postmenopausal women (mean age=61.7, SD=6.2; 85.4% Caucasian; 43.8% caregivers) completed a standardized laboratory stress task during which timed blood was collected at baseline and 30+, 50+ and 90+ minutes after stressor onset to assess circulating levels of interleukin (IL)-6, IL-10, and IL-6/IL-10. Self-reported sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Sagittal diameter was obtained in the clinic and was used to estimate visceral adiposity. Multi-level growth curve models, adjusting for age and caregiver status, revealed that systemic levels of IL-6 and IL-6/IL-10, but not IL-10 alone, increased significantly in response to acute laboratory stress (p<0.001). Poorer self-reported sleep quality was associated with greater stress-induced increases in IL-6 and IL-6/IL-10 (B=0.07, SE=0.03, p=0.02). Higher sagittal diameter was also associated with greater IL-6 reactivity (B=0.06, SE=0.03, p=0.04). In three-way interactions, the association between sleep quality and cytokine reactivity varied as a function of sagittal diameter. Specifically, among poor sleepers (1 SD above mean of PSQI score), stress-induced increases in IL-6 and IL-6/10 were significantly steeper in those with greater visceral adiposity (1 SD above the mean of sagittal diameter; IL-6: B=1.86; SE=0.24, p<0.001; IL-6/IL-10: B=1.47, SE=0.22, p=0.001) compared to those with a less visceral adiposity (1 SD below the mean of sagittal diameter; IL-6: B=0.31, SE=0.22, p=0.12; IL-6/IL-10: B=0.63, SE=0.29, p=0.03). These findings were independent of age, caregiver status, and body mass index. Sagittal diameter failed to moderate cytokine reactivity among good sleepers. In sum, poorer sleep quality and greater visceral adiposity, separately and in combination, are associated with greater stress-related increases in systemic inflammation. This research may help elucidate the complex link between sleep, obesity and inflammatory disease risk.

Individual Abstract Number: 666
SLEEP VARIABILITY AND CYTOKINES IN PREGNANCY
Michele L. Okun, PhD, Martica Hall, PhD, Psychiatry, Frank Jenkins, PhD, Pathology, James M. Roberts, MD, Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh, Pittsburgh, PA

Extreme variability in sleep duration and/or fragmentation impacts behavior, affect, physiology, and disease risk. Pregnant women in early gestation are at an increased risk for sleep variability given the profound physiological changes that take place following conception. Extreme variability may act as a psychological as well as physiological stressor impacting risk for adverse outcomes. No investigations have examined the degree to which pregnant women experience sleep variability nor have any studies which assess variability in immunological changes important for a successful pregnancy. Sleep diary and actigraphy-assessed sleep data collected from 78 pregnant women at 10-12 weeks’ (T1), 14-16 weeks’ (T2), and 18-20 weeks’ (T3) gestation were assessed for intra-individual variability, estimated from each subject’s standard deviation on diary (D) and actigraphy (A)measures. Morning blood samples for assay of IL-6, TNF-a, and IL-10 were collected at each 2-week interval. Analyses indicated that pregnant women do indeed experience substantial variability in their sleep, and that greater variability in both D- and A-sleep variables are cross-sectionally associated with higher circulating cytokine concentrations. At T1 greater variability in D-assessed sleep efficiency (r = .29, p = .03) were associated with higher IL-6, while greater variability in TIB was associated with higher IL-6 (r = .26, p = .05) and TNF-a (r = .23, p = .04). At T2 greater variability in D-assessed sleep efficiency was associated with higher TNF-a (r = .23, p = .03), whereas greater variability in A-assessed sleep efficiency (r = .38, p = .03) and WASO (r = .41, p = .02), and percentage of time spent awake (r = .40, p = .02) were associated with higher IFN-γ. At T3 greater variability in D- and A-assessed sleep latency was associated with higher IL-6 (r = .30, p = .01; r = .32, p = .01), while D WASO was associated with lower TNF-a (r = .24, p = .03). Extreme sleep variability may be another form of stress experienced by pregnant women. Importantly, stress is a recognized correlate of an increase in circulating inflammatory markers and adverse pregnancy outcomes.

Symposium 122
BEYOND SALIVARY CORTISOL: SALIVARY BIOMARKERS OF IMMUNE FUNCTION AND STRESS AT THE CUTTING EDGE
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This symposium will present emerging evidence regarding the use of salivary biomarkers of immune function and stress, including but not limited to salivary alpha-amylase (sAA), secretory immunoglobulin A
Lessons Learned from the Bench: Relating Salivary Biomarkers to Post-Trauma Psychopathology: Challenges and Opportunities

Theodore Robles, PhD, Psychology, David A. Elashoff, PhD, Lauren Harrell, MS, Biostatistics, Vivek Shetty, DMD, DDS, Dentistry, University of California, Los Angeles, Los Angeles, CA

Psychiatric disorders following trauma are debilitating and costly to treat, yet remain understudied. The dynamic nature of psychological assessments stymies non-specialists attempting to differentiate between normative distress and prolonged trauma-related psychopathology, particularly post-traumatic stress disorder (PTSD). Thus, identifying salivary biomarkers that predict later risk has promise for the understanding, diagnosis, and management of trauma-related psychopathology. We highlight methodological challenges to using salivary diagnostics to predict later psychopathology. The first challenge is developing reliable and accurate measurement tools for point-of-care assessments. In our ongoing efforts to validate a portable biosensor platform for a candidate marker of sympathetic activation, namely salivary alpha-amylase, we found that biosensor accuracy is dependent on the method of sample collection (directly from the mouth vs. passive drool), but is robust across different phases of sample handling. The second challenge is developing optimal research designs to test the predictive validity of salivary biomarkers in a clinical population. In an initial project designed to examine changes in salivary biomarkers in 119 patients from an inner-city Level I trauma center, saliva was collected at three visits (shortly after traumatic injury, 2-3 weeks later, and 5-6 weeks later). PTSD symptoms were assessed at the final visit. Salivary cortisol and alpha-amylase levels across the three visits did not differ between patients with PTSD and without PTSD. Neither stress nor smoking were associated with cortisol or alpha-amylase levels. Close by describing how the challenges we have faced inform a new study in the field that combines innovative methods for assessing multiple salivary biomarkers with a prospective specimen collection, retrospective blinded evaluation design (PRoBE, Pepe et al., 2008, JNCI) to identify and validate panel of salivary markers that predict PTSD in a larger sample of trauma patients.

Lessons Learned from the Bench: Relating Salivary to Blood-Based Inflammatory Markers

Christopher Engeland, PhD, Center for Wound Healing and Tissue Regeneration, University of Illinois at Chicago, Chicago, IL, Joshua M. Smeltzer, PhD, Daniel Stavish, BA, Jennifer E. Graham, PhD, Biobehavioral Health, Penn State University, University Park, PA

Inflammatory processes are an important component of the relationships between stress, immune function, and health risk. Inflammation has been linked to a wide range of conditions, including post-traumatic stress disorder (PTSD). However, many fields of inquiry would benefit from having an extended range of novel salivary biomarkers, along with a review of both their limitations and promise. New data are presented on the diurnal rhythm of sAA and its relationship to both daily and chronic stress (Drs. Robles, Rohleder), as well as data suggesting that sAA has both parasympathetic and sympathetic nervous system influences (Dr. Bosch). We also focus on underutilized salivary biomarkers and how they relate to stress and immune function. Data and methodological issues in utilizing markers and sIgA - which are central to mucosal immunity - will be discussed (Dr. Bosch). A range of technical and methodological issues with salivary inflammatory measurement, including the validity of salivary-based inflammatory cytokines (compared to levels in blood; e.g., TNF-α, IL-10), are presented (Dr. Engeland). Finally, a novel test-case in a clinical field setting will be presented, exploring the ongoing development of a remote biosensor platform for sympathetic activation (Dr. Rohleder). The discussion (Dr. Mills) will comment on the potential impact of these methods, with an emphasis on how novel salivary diagnostics can be used to advance our ability to examine how stress and immunological responses function over time and in ecologically valid contexts.
Findings from several novel investigations in hematologic cancers speak to behavior-immune relationships following hematopoietic stem cell transplantation (HSCT), a rigorous therapy that carries significant morbidity and mortality risks. These studies indicate that the recovery following HSCT may be a sensitive period for biobehavioral influences. Cancer-related fatigue, the most common post-treatment problem among long-term cancer survivors, is thought to be related in part to overactivation of the inflammatory network. Two different approaches provide fresh information about fatigue in breast cancer survivors. One project linked fatigue and lifetime stress exposure using a structured interview; fatigued survivors reported more stressful experiences early in life as well as more chronic difficulties in adulthood. Furthermore, early life stress moderated the association between fatigue and a novel inflammatory marker, sTNF-RII. Work from another group was spurred by recent evidence that has implicated leptin and adiponectin as mediators of inflammatory responses; relationships between these adipocytokines and fatigue were addressed in a sample of recent breast cancer survivors. These studies suggest exciting new directions for studying social environmental influences in cancer. The discussant, from the Basic Biobehavioral and Psychological Services Branch at the National Cancer Institute, brings a broad knowledge of the biobehavioral cancer literature to her commentary.

Individual Abstract Number: 133

SOCIAL RELATIONSHIPS AND GENE REGULATION IN OVARIAN CANCER
Susan K. Lugtendorf, Ph.D., Psychology, University of Iowa, Iowa City, IA, Koen DeGeest, M.D., Obstetrics and Gynecology, University of Iowa, Iowa City, IA, Premal Thaker, M.D., Gynecologic Oncology, University of Iowa, Iowa City, IA, Erin S. Costanza, PhD, Psychiatry & Carbone Cancer Center, University of Wisconsin-Madison, Madison, WI, Premal Thaker, M.D., Gynecologic Oncology, University of Iowa, Iowa City, IA, Frank Penedo, Ph.D., Medical Social Services, Northwestern University School of Medicine, Chicago, IL.

In previous work we have reported that ovarian cancer patients with higher levels of social support have significantly longer survival times than patients with low levels of social support. Social support has also been positively associated with lower levels of the angiogenic cytokines vascular endothelial growth factor (VEGF) in serum and in tumor, interleukin-6 (IL-6) in plasma and ascites, and norepinephrine (NE) in tumor and ascites, and with enhanced NK cell activity in peripheral blood and tumor infiltrating lymphocytes. Our current analyses use microarray-based transcriptional profiling of 108 primary ovarian cancers to identify genes differentially expressed in tumors from patients with high vs. low social support (assessed by the Attachment subscale of the Social Provisions Scale). Analyses controlled for tumor grade, stage, age, BMI, income, and histology. Tumors from patients with low SPS-attachment scores showed 713 up-regulated genes (1.25-fold) including genes controlling components of the extracellular matrix (ECM), inflammation, and proliferation. These tumors also had 869 down regulated genes, including those controlling Type I interferon activities which are largely anti-metastatic. These findings suggest upregulation of genes involved in the Epithelial-Mesenchymal Transition (EMT), an important process in cancer metastasis. Bioinformatics indicate that the upregulated genes appear to be regulated by factors including activated nuclear factor kappa beta (NF-kappaB; p < 0.024), activator protein-1 (AP-1; p < 0.0001), and GATA-3 (p < 0.0001), consistent with inflammatory and beta-adrenergic signaling. The cellular sources involved in these transcriptional alterations include cells of the myeloid lineage: monocytes are particularly activated (p = 0.0039) and plasmacytoid dendritic cells are particularly inhibited (p = 0.0016). These findings suggest that social environmental influences are transduced via beta-adrenergic signaling and can alter gene expression at the tumor level, thus potentially affecting disease progression and survival.

Individual Abstract Number: 280

LEPTIN AND ADIPOGENIN IN BREAST CANCER SURVIVORS: RELATIONSHIPS WITH FATIGUE
Janice K. Kiecolt-Glaser, Ph.D., Institute for Behavioral Medicine Research, Ohio State University College of Medicine, Columbus, OH, Rebecca R. Andridge, PhD, Beam Seok Hwang, MS, Division of Psychological Services Branch at the National Cancer Institute, brings a broad knowledge of the biobehavioral cancer literature to her commentary.

Individual Abstract Number: 133

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Susan K. Lugtendorf, Ph.D., Psychology, University of Iowa, Iowa City, IA, Koen DeGeest, M.D., Obstetrics and Gynecology, University of Iowa, Iowa City, IA, Premal Thaker, M.D., Gynecologic Oncology, University of Iowa, Iowa City, IA, Erin S. Costanza, PhD, Psychiatry & Carbone Cancer Center, University of Wisconsin-Madison, Madison, WI, Premal Thaker, M.D., Gynecologic Oncology, University of Iowa, Iowa City, IA, Frank Penedo, Ph.D., Medical Social Services, Northwestern University School of Medicine, Chicago, IL.

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Fatigue is the most common post-treatment problem among cancer survivors, affecting a third or more of long-term survivors. Persistent fatigue in survivors is thought to be related in part to overactivation of the inflammatory network. Recent evidence has implicated leptin and adiponectin as mediators of inflammatory responses. Mainly produced by adipose tissue, these adipokines have counter-regulatory functions in inflammation; leptin plays a pro-inflammatory role, while adiponectin has anti-inflammatory properties, and thus their relationships with fatigue were of interest. Subjects were 162 stage 0-IIIC breast cancer survivors who had completed cancer treatment within the past three years (except for tamoxifen/aromatase inhibitors), and were at least two months post-surgery or adjuvant therapy or radiation, whichever occurred last. Fatigued status was defined as a score below 50 on the RAND vigor/vitality scale, reflecting the frequency of feelings of fatigue over the last month. Analyses controlled for age, BMI, and statin use. Leptin was ~50% higher among the fatigued compared to the nonfatigued, p=0.02. Adiponectin did not differ significantly between groups. Fatigued and nonfatigued women did not differ on key dimensions including age (mean±SD), stage at diagnosis (mean±SD), type of treatment (mean±SD), treatment duration (months), type of treatment (mean±SD), cancer stage (88% stage I or II), menopausal status, smoking status, statin use, race, or education; however, consistent with considerable past research on fatigue in breast cancer survivors, fatigued women had higher BMIs, more depressive symptoms, and reported poorer sleep than nonfatigued women. These data have implications beyond fatigue. Cancer survivors have a greater risk for secondary cancers as well as a number of chronic diseases, including cardiovascular disease, that are due to negative affect. Anxiety was also associated with lower numbers of B cells (z=-2.6, p=0.01), CD4+8+ T cells (z=-2.3, p=0.01), and CD4+25+ T cells (z=-2.1, p=0.04). Findings suggest that mood disturbance at the time of treatment may hinder immune reconstitution following autologous HSCT. A timely and systematic investigation of behavior-immune relationships in HSCT will be important.
SESSION: Social Rejection, Exclusion and Evaluation: Neuro-endocrine Approaches

Abstract 612
VARIATION IN THE MU-OPIOID RECEPTOR GENE (OPRM1) MODERATES THE EFFECTS OF TARGETED REJECTION ON DEPRESSION
George M. Slavich, PhD, Cousins Center for Psychoneuroimmunology, Molly A. Tartar, M.A., Constance Hammen, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA

Targeted rejection is a psychologically noxious form of life stress that involves the intentional social rejection of an individual by others. Events of this type have been found to precipitate major depressive disorder three times faster than other forms of severe life stress. In addition, there is some evidence that exposure to targeted rejection is associated with increased pro-inflammatory gene expression, which has been implicated in the pathophysiology of depression. Despite these findings, however, not everyone who experiences targeted rejection becomes depressed, and the factors that modify depressotypic responses to targeted rejection life events remain unknown. To address this issue, we examined whether a single nucleotide polymorphism in the μ-opioid receptor gene (OPRM1) moderates the impact of exposure to targeted rejection on depressive symptoms. We focused on OPRM1 because a functional polymorphism in this gene (118A/G) has been found to be related to potentiated neural responses to social rejection in the laboratory, as well as to greater experiences of social rejection in daily life. Participants were 387 adolescents sampled from a longitudinal community study of intergenerational transmission of risk for depression. Participants were genotyped for OPRM1 and were interviewed at age 20 to assess their exposure to different types of recent life stress. Severity of depression was assessed using the Beck Depression Inventory (BDI). Although there was no main effect of OPRM1 status on depression severity (p = .67), as predicted, OPRM1 status did moderate a significant association between exposure to recent targeted rejection life stress and depression severity, F(2, 386) = 3.32, p = .037. Specifically, whereas G allele carriers and A homozygotes had similar levels of depressive symptoms under conditions of no recent severe life stress (Mean BDI scores = 6.3 and 6.8, respectively), A homozygotes and G allele carriers who experienced a recent severe targeted rejection life event had average BDI scores of 7.9 and 15.8, respectively. Therefore, targeted rejection was approximately twice as depressogenic for G allele carriers than for A homozygotes. These data highlight a gene X environment interaction effect and suggest that differences in risk for depression following targeted rejection may be partly attributable to variation in the μ-opioid receptor gene.

Abstract 631
NEURAL MECHANISMS LINKING SOCIAL EVALUATION AND INFLAMMATION: AN FMRI STUDY
Keely A. Mascateall, MA, Katarina Dedovic, Ph.D., Psychology, UCLA, Los Angeles, CA, Michael R.Jarcho, Ph.D., Neuroscience, Loras College, Dubuque, IA, George M. Slavich, Ph.D., Psychiatry & Biobehavioral Sciences, Julienne E. Bower, Ph.D., Psychology, Psychiatry & Biobehavioral Sciences, Michael R. Irwin, MD, Psychiatry & Biobehavioral Sciences, Psychology, Naomi I. Eisenberger, Ph.D., Psychology, UCLA, Los Angeles, CA

Psychological stress has been associated with the onset and progression of many major health problems including cardiovascular disease, HIV/AIDS, and depression (Cohen et al., 2007). Accumulating evidence suggests that heightened inflammatory activity may be a key mediator of the stress-health link, given that stress upregulates systemic inflammation (Steptoe et al., 2007), which is known to play a role several chronic diseases (Tracy, 2003). Interestingly, stressors that involve social evaluation may be especially likely to lead to increases in inflammation (Kemeny, 2009). Although behavioral studies demonstrate that social evaluation is associated with increased inflammation (e.g., Dickerson et al., 2009), the precise neurocognitive mechanisms by which these experiences get represented by the brain and translated into increases in inflammation are largely unknown. Thus, the purpose of the present study was to investigate the neural mechanisms linking social evaluation and inflammation. To examine this issue, 30 female participants underwent a functional MRI scan while they experienced an episode of social evaluation in which they received both positive, negative, and neutral feedback from an evaluator. Blood samples were collected prior to and 90 minutes following the stressor, and were subsequently assayed for circulating levels of the pro-inflammatory cytokine interleukin-6 (IL-6). Consistent with prior research, exposure to social evaluation was associated with a significant increase in IL-6 over the session (t = -4.95, p < .0001). Furthermore, receiving negative feedback during the evaluation (compared to receiving neutral feedback) was associated with heightened neural activity in a number of brain regions including the medial prefrontal cortex (MPFC), a region implicated in thinking about the self, and the thoughts and feelings of others. Critically, MPFC activity during negative feedback was significantly related to increases in IL-6 (r = .43, p < .05), and activity in the amygdala, a region frequently activated in response to threatening stimuli, was a significant mediator of the relationship between MPFC activity and inflammation (p < .05). Together, these data suggest that, during social evaluation, activity in neural regions often implicated in thinking about the self and others is associated with increases in inflammation, possibly via corresponding activation of threat-related neural regions, such as the amygdala.

Abstract 595
SOCIAL EXCLUSION - WHY DOES IT HURT?
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Social exclusion is known to be related to disease. It is, however, not well understood which pathways are involved in this relationship. Experimental induction of social exclusion alone rarely results in psychoneuroimmunological alterations though psychologically significant effects can be seen even in response to mild exclusion. In a series of experiments we thus analyzed indirect effects of social exclusion by investigating its effects on a subsequent endocrine stress response to a standardized laboratory stressor (public speaking paradigm). To experimentally induce social exclusion we employed the Cyberball paradigm. This is a computer-based ball tossing game where the participant is made to believe he or she is playing with three other participants connected via the computer to him or her. During the game the participant is either excluded (i.e. the other participants do not pass the ball to him or her) or included (i.e. he or she remains involved in the game).

In a first study including n=34 men and n=31 women we found Cyberball exclusion to adversely affect psychological well-being both in men and in women (p<0.05). When participants were subjected to a public speaking paradigm immediately afterwards men showed a profound cortisol response to public speaking stress (p<0.05). This response did not differ between groups. Cortisol responses of women, however, were strongly affected by their Cyberball pre-experience. While previously included women showed a normal cortisol stress response excluded women didn’t respond at all. We replicated this finding in a second sample of n=12 women. When we analyzed other endocrine parameters (epinephrine, norepinephrine, ACTH, estradiol) no significant group differences were seen there while we replicated our finding with respect to cortisol differences a third time (n=43 women). In a fourth study (n=84 women) we found rumination after Cyberball to predict cortisol responsiveness to the subsequent stressor. Our data indicate social exclusion to possibly affect physiological integrity in women by altering endocrine responsiveness to subsequent stressors. Rumination seems to play an important role here.

Abstract 619
SALIVARY TESTOSTERONE RESPONSES TO A REPEATED SOCIAL-EVALUATIVE COMPETITIVE STRESSOR
Jana Strahl, PhD, Urs M. Nater, PhD, Psychology, University of Marburg, Marburg, Hesse, Germany, Reinhard Fuchs, PhD, Sandra Klaperski, MsC., Institute of Sport and Sport Science, University of Freiburg, Freiburg, Baden-Wuerttemberg, Germany

High levels of psychosocial stress significantly affect bodily function and behavior. However, only few studies examined the effect of acute psychosocial stress on the hypothalamic-pituitary–gonadal axis, producing inconsistent findings so far. One reason might be the lack of a well-standardized laboratory stressor that reliably evokes sex steroid changes. In this regard, interactions with competitive characteristics are well known to alter testosterone (T) levels which in turn are related to...
mood, motivation, and aggressive behavior in these situations. The Trier Social Stress Test for Groups (TSST-G) combines social evaluative threat, performance stress, uncontrollability, and an additional competitive component, and is therefore expected to increase T levels. Since endocrine habituation to repeated stress is an adaptive mechanism, we further set out to examine the T response to repeated psychosocial stress.

The present study examined 25 healthy men (mean age: 48.5±10.2 years) in two sessions of the TSST-G, with a 12 week interval in between. Salivary T was measured before, 10, 25, and 40 min after the stressor. Furthermore, emotional stress (feeling tense, wanting to escape, feeling anxious) was measured repeatedly (-20, -1, +1, +25 min). As expected, the TSST-G resulted in increases of T 25 min after the stressor on both days (all p<.027). Furthermore, the mean increase to the second TSST-G was more than twice as high as to the first (p=.078), indicating sensitization of the T response to the stressor. With regard to emotional stress, the TSST-G resulted in higher tension, intention to escape and anxiety scores (all p<.001), which was comparable between both time points (all p=.115). Interestingly, regression analyses revealed that feeling tense significantly predicted stress responses of salivary T to the first, but not the second, TSST-G (R²=.392, beta=-.873, p=.004).

Our results indicate that a psychosocial stressor that includes a competitive component has a strong effect on salivary T. Furthermore, salivary T response was predicted by emotional stress. After a second exposure to the same stressor, sensitization of the testosterone response was observed. These findings might suggest a potential significance of T in behavior related to psychosocial competitive stress, such as aggression, mood, and motivation.

SESSION: Sleep and Fatigue

Abstract 766

PSG-DERIVED SLEEP IS RELATED TO SUBSEQUENT DAY DIURNAL CORTISOL PROFILE IN ADOLESCENTS, BUT NOT CHILDREN

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Sleep is a key modulator of cortisol secretion. In children and adolescents, shorter sleep duration, lower sleep efficiency, and longer sleep latency are associated with higher cortisol levels. Existing findings are predominantly based on subjective report or actigraphy assessment of sleep, which omits parameters related to sleep architecture. The present study examined the relation between polysomnography-derived sleep with subsequent day cortisol in children and adolescents. Participants aged 8-18 (N=97, M=10.67 yrs, 48.5% female) took part in the Healthy Heart Project at Concordia University, Montreal. Ambulatory polysomnography (PSG) was used for a single night sleep study at home. PSG data were scored by a sleep technician to derive sleep efficiency, sleep latency, NREM and REM sleep, and total sleep duration. Six saliva samples were collected the day following ambulatory recording. Single sample (bedtime, maximum) and aggregate measures (AUCAG, AUCI, AUCTG, diurnal slope) of the diurnal cortisol profile were derived. Regression analyses, controlling for sex, puberty, weekday, bed time and rise time, were conducted separately for children and adolescents. In children, no relations were observed between sleep and cortisol. In adolescents, shorter sleep duration was related to elevated maximum cortisol (β=.36, p=.01), AUCAG (β=.32, p=.02), AUCI (β=.40, p<.001), AUCTG (β=.30, p=.03), and flatter diurnal slope (β=.37, p=.01). Shorter REM sleep duration was related to higher maximum cortisol (β=.34, p=.02), AUCAG (β=.35, p=.01), AUCI (β=.30, p=.03) and flatter diurnal slope (β=.31, p=.03). Sleep efficiency and sleep latency were not related to any cortisol levels. Consistent with previous findings, shorter sleep duration was related to adverse cortisol levels in adolescents. Null findings in children may be attributable to limited power or measurement issues. These findings provide new knowledge about the link between sleep architecture and cortisol in children and adolescents. It is plausible that the link between sleep and cortisol emerges more consistently later in the developmental life course.

Abstract 533

SHOR TER SLEEP DURATION IS ASSOCIATED WITH INCREASED INSULIN SENSITIVITY IN WHITE MALES

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Short sleep has been linked to increased risk for type 2 diabetes and incident cardiovascular disease, and acute sleep restriction impairs insulin-mediated glucose disposal (i.e., insulin sensitivity [SI]). Here, we examined the relationship of natural variation in sleep duration to indices of glucose metabolism derived from the 180 minute, intravenous glucose tolerance test. Subjects were middle, non-diabetic community volunteers (N=224; mean age 44.5 ± 6.7 yrs [range: 30-54]; 52% Female; 90% White). In hierarchical regression analyses, we found shorter sleep duration (SLD; in hours) to be associated with lower Si (β = .002). There was also a significant SLD x Race interaction (β=1.527, p = .006), which reflected a positive association between SLD and Si for Whites (β = .247, p < .001) but not for African Americans. Moreover, among Whites SLD interacted with gender (β=1.82, p = .044). In within-gender models, shorter SLD predicted lower Si in White males (β = .389, p < .001) but not in White females (p = .15). Parallel analyses were also conducted to examine the relationship between SLD and acute insulin response (AIRg), a measure of pancreatic beta-cell function. Mirroring results for Si, SLD predicted AIRg in interaction with gender, again reflecting a male specific effect. Finally, in White males, waist circumference only partially mediated these associations (44% for Si; 38% for AIRg). These findings suggest that short sleep duration has a direct effect on insulin sensitivity and beta-cell function in non-diabetic adults, possibly contributing to later type 2 diabetes and cardiovascular disease. The association may be specific to males, an observation consistent with epidemiological evidence.

Abstract 708

EFFECT OF PREVIOUS-DAY STRESS LEVELS ON COGNITIVE DIMENSIONS OF FATIGUE - MODERATING ROLE OF SLEEP QUALITY

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BACKGROUND: Fatigue is among the most prevalent and debilitating psychosomatic symptoms. A relatively novel aspect in the study of fatigue is that it may be conceptualized as a multidimensional construct (e.g. cognitive and physical dimensions). Stress has been shown to be a risk factor for fatigue. In this study, we investigated the impact of momentary stress levels on subsequent cognitive and physical fatigue. Additionally, the moderating role of sleep quality was examined.

METHODS: Fifty healthy students (31 females, 23.6±3.2 yrs) took part in the study. They provided momentary data (at awakening, 10am, 2pm, 6pm, and 9pm) during 5 days of preparation for their finals (stress period) and during 5 days of a regular semester week (control period). Data were collected with pre-programmed iPods. Five items assessed fatigue on 5 dimensions: general fatigue, reduced motivation, reduced activity, mental fatigue, and physical fatigue. Sleep quality was measured via self-reports as poor or good. Data were analyzed by hierarchical linear modeling accounting for the longitudinal design and nested data structure. RESULTS: Previous-day stress was associated with low sleep quality (p<.001). Sleep quality was a significant predictor of all fatigue dimensions (each p<.001). Previous-day stress predicted reduced mental motivation (p=.015) and mental fatigue (p=.022), negatively interacting with sleep quality (interaction effects p=.022 for mental motivation, p=.028 for reduced fatigue). There was no association between previous-day stress and any other fatigue dimension. Same-day stress turned out to be a predictor of all fatigue dimension (each p<.001). Mental fatigue was more affected by sleep quality during the stress period than during the control period (interaction effect p=.008). The other effects were independent of stress or control period. DISCUSSION: Our data suggest that previous-day stress is associated with a wide range of autonomic and cognitive fatigue, both of which are cognitive features of fatigue. This effect...
Abstract 115
IMPAIRED SELF-CARE IN CHRONIC HEART FAILURE: THE IMPACT OF FATIGUE
Dionne Kesing, MSc, Johan Denollet, PhD, Jos Widdershoven, MD, PhD, Nina Kupper, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Noord-Brabant, The Netherlands

Background: It has been proposed that poor sleep and daytime sleepiness may lead to impaired self-care in patients with chronic heart failure (HF). Yet, this potential relationship has not been tested empirically and therefore, our aim was to prospectively examine whether self-reported fatigue and sleep problems were associated with impaired HF self-care in a prospective design.

Methods: 545 chronic HF outpatients (mean age 66±9.6 years, 74.9% men) from 4 teaching hospitals in the Netherlands completed questionnaires at baseline, 12-, and 18-month follow-up. Assessment included (i) symptoms of fatigue using the Fatigue Assessment Scale and the Dutch Exertion Fatigue Scale, (ii) sleep problems using a validated subscale of the Health Complaints Scale, and (iii) HF self-care and consultation behavior using the 9-items European Heart Failure Self-care behavior scale. Data was analyzed using a novel statistical method that handles correlated data, time-varying covariates, and allows an unequal number of repetitions.

Results: Linear mixed modeling using maximum likelihood (ML) showed that both general and exertion fatigue were significantly associated with impaired self-care (p=.008 and p=.03, respectively) and consultation behavior (p=.05 and p=.01, respectively) over time, after adjustment for disease severity, comorbid diseases, depressive symptoms, and subjective sleep problems. Sleep problems were not associated with impaired self-care (p=.38), but there was a trend for inadequate consultation behavior (p=.08). Other predictors for impaired self-care were male gender, having no partner, low educational level, and high body mass index, while diabetes was associated with better self-care.

Conclusion: Both general and exertion fatigue were associated with impaired HF self-care and consultation behavior, and this could not be explained by subjective sleep problems, disease severity or psychological covariates. Tailored treatment of fatigue problems may have a positive impact on self-care in patients with HF.

SESSION: Socioeconomic Status and Health

Abstract 119
CHILDHOOD AND ADULTHOOD SOCIOECONOMIC STATUS IN RELATION TO ADULT SUBCLINICAL CARDIOVASCULAR DISEASE IN THE STUDY OF WOMEN’S HEALTH ACROSS THE NATION HEART STUDY
Rebecca C. Thurston, PhD, Psychiatry, Psychology, Epidemiology, and Clinical and Translational Science, Rachel H. Mackey, PhD, Epidemiology, Karen A. Matthews, PhD, Psychiatry, Psychology, Epidemiology, and Clinical and Translational Sciences, University of Pittsburgh, Pittsburgh, PA

Background: The relation between low adult socioeconomic status (SES) and cardiovascular disease (CVD) is well-known. However, life-course perspectives underscore the importance of childhood SES to the development of CVD disparities, and the relative importance of childhood and adult SES to CVD are not understood. Examining these relations using subclinical CVD indices capturing early disease development is useful to avoiding SES biases in event presentation and detection. The study aim was to examine the relative relations of childhood and adult SES to carotid intima media thickness (IMT), an index of atherosclerosis and brachial artery flow mediated dilation (FMD), an estimate of endothelial dysfunction.

Methods: Aims: Aims were tested among Pittsburgh participants of the Study of Women’s Health Across the Nation (SWAN), a prospective study of midlife women (N=245, 30% African American, 70% Caucasian). Relations between childhood SES (maternal and paternal education, home ownership, family being on public assistance) and adult SES (education, income, difficulty paying for basics) in relation to each subclinical CVD index were examined in linear regression models with one adult and one childhood SES measure (covariates: age, race, BMI, SBP, smoking, and for FMD, baseline lumen diameter).

Results: For IMT, lower childhood SES (maternal education: <= vs. => high school: b(SE)=0.03(0.01),p=0.04; being on public assistance: b(SE)=0.03(0.02),p=.04), but not adult SES, was related to higher IMT. For FMD, adult SES (current education < vs. >= college: b(SE)=.17(0.07),p=0.01), but not childhood SES, was related to poorer FMD. An interaction between race and current financial strain (p<.05) indicated that difficulty paying for basics was associated with somewhat poorer FMD among African Americans (b(SE)=.23(12.06) but not Caucasians (b(SE)=.04(0.09),p=.63). There were no interactions between childhood and adult SES.

Conclusions: Low childhood SES may be most important to processes that develop over a lifetime (e.g., atherosclerosis). Conversely, low adult SES may be most relevant to dynamic processes (e.g., acute endothelial dysfunction). These results point to the specificity of the timing of adverse exposures in relation to varying CVD processes.

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Abstract 696
OBJECTIVE NEIGHBORHOOD CRIME IS DIFFERENTIALLY ASSOCIATED WITH CARDIOVASCULAR RISK FACTORS AS A FUNCTION OF RACE AND SEX
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Aspects of neighborhood socioeconomic status (SES) may be associated with cardiovascular disease (CVD) risk independent of individual level SES. The present study investigated relations of objective neighborhood crime to CVD risk factors, with potential mediation by psychosocial vulnerability factors. Participants were 1,718 community-dwelling Black and White men and women (56% male; 42% White; mean age=47.5 years; mean education=12.6 years) who had participated in the Healthy Aging in Neighborhoods of Diversity Across the Life Span Study (HANDLS) and were free of diagnosed stroke, dementia, neurological disorders, psychiatric disorders, cancer, and dialysis treatment. At their baseline visit, participants underwent a medical history, physical examination, blood chemistries, clinical assessment of blood pressure, and completion of psychosocial measures. Objective crime rates were derived from reported criminal offenses and population by census tract. Outcome variables included systolic and diastolic blood pressure, waist circumference, body mass index (BMI), fasting glucose levels, triglycerides, and total, HDL, and LDL cholesterol. Multiple regression analyses for each outcome variable were stratified by sex and race and adjusted for age, education, SES, cardiovascular and metabolic comorbidities, antihypertensive and statin use, use of tobacco, alcohol, illicit drugs, and BMI (where relevant). Results showed significant associations of greater overall crime rate with higher fasting glucose (β=.131, t(420) = 2.59, p < .05, R2 = .014) and greater violent crime rate with higher systolic blood pressure (β=.170, t(420) = 2.41, p < .05, R2 = .013) but not childhood SES, was related to poorer FMD. An interaction between race and current financial strain (p<.05) indicated that difficulty paying for basics was associated with somewhat poorer FMD among African Americans (b(SE)=.23(12.06) but not Caucasians (b(SE)=.04(0.09),p=.63). There were no interactions between childhood and adult SES.

Conclusions: Low childhood SES may be most important to processes that develop over a lifetime (e.g., atherosclerosis). Conversely, low adult SES may be most relevant to dynamic processes (e.g., acute endothelial dysfunction). These results point to the specificity of the timing of adverse exposures in relation to varying CVD processes.

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Abstract 103
DOES THE INCOME-MORTALITY GRADIENT PERSIST AT HIGHER INCOME LEVELS? IT DEPENDS ON WHOM YOU STUDY
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Income is inversely associated with mortality and it is widely accepted that this survival advantage occurs across the full income spectrum.
Conversely, some research has found nonlinearity in this association, i.e., greater mortality differences at lower rather than higher income levels (Rehkopf et al., 2008). However, risk estimates at high income levels are imprecise because of a small number of observations in those categories. In addition, the shape of the association may be in part dependent upon initial mortality risk, i.e., may vary across age and initial health status. The purpose of the present study was to evaluate the form of the income-mortality gradient in the general US population and compare it to subsamples restricted to working-aged and initially healthy adults. To accrue sufficient frequencies in higher income categories we combined data from two nationally representative US surveys (N > 50,000) and merged them with mortality data (>5000 events) assessed 8-9 years following the baseline assessment of income and health status. Family income (from wages, social security, etc.) was classified in 11 categories ranging from <US$4,000 to > $75,000. In the full sample mortality showed a generally linear pattern of decreased mortality across 11 income categories with unadjusted rates from 95 (lowest income) to 18 (highest income) deaths per 100,000 people (95% CI’s 90-100 and 16-20). When analyses were restricted to working-aged adults (> 65 years old) the rates ranged from 44 to 11 (95% CI’s 39-50 and 9-13), leveling off above $35,000 per year. A similar threshold pattern was observed when limiting analyses to those free of baseline disease (cancer, heart disease, stroke) and any functional limitation. Thus, a linear association of mortality risk was observed across the income spectrum in the full sample but the mortality differences shrank and took a more threshold form when analyses were limited to initially healthy and/or working-aged adults. Assertions regarding the shape of the income-mortality gradient in the US should be qualified by initial mortality risk, age and initial health status.

Abstract 105
THE COMBINED ASSOCIATION OF PSYCHOLOGICAL DISTRESS AND SOCIO-ECONOMIC STATUS WITH MORTALITY FROM STROKE, CORONARY HEART DISEASE, AND ALL CAUSES: A NATIONALLY-REPRESENTATIVE COHORT STUDY
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Background: Both psychological distress and low socio-economic status are recognized risk factors for cardiovascular disease and mortality but their interaction has never been considered so far. The aim of this study was to test whether low socio-economic status amplifies the effect of psychological distress on mortality from stroke, coronary heart disease, and all causes and all causes.
Methods: We studied 66,500 participants from the Health Survey for England who were 35 or older, free from cancer and cardiovascular disease, living in private households in England from 1994 to 2004, and selected using stratified random sampling. Participants were linked prospectively to mortality records from the Office of National Statistics to measure the outcomes using WHO ICD codes (mean follow-up time = 8.2 years). Psychological distress was measured using the 12-item General Health Questionnaire and socio-economic status was indexed by occupational class.
Results: The crude incidence rates for fatal stroke, fatal coronary heart disease, and all-cause mortality were 1.02 (95%CI = 0.94-1.11), 1.85 (95%CI = 1.74-1.97), and 14.49 (95%CI = 14.17-14.81) per 1,000 person-years. After adjustment for age, gender, smoking, body mass index, diabetes, and hypertension, psychological distress and low socio-economic status were associated with increased mortality rates. In a stratified analysis, the association of psychological distress with all mortality outcomes differed with socio-economic status (Likelihood Ratio Test adjusted P values <0.001), with the strongest associations being observed in the lowest socio-economic status categories.
Conclusions: The adverse effect of psychological distress on cardiovascular and general health is amplified by low socio-economic status and vice versa. People in higher socio-economic status groups have lower mortality rates even when they experience high psychological distress.

SESSION: Cancer
Abstract 80
LOW EMOTIONAL SUPPORT FROM DIFFERENT SOURCES AND PRO-INFLAMMATORY AND PRO-METASTATIC LEUKOCYTE GENE EXPRESSION IN WOMEN AFTER SURGERY FOR BREAST CANCER
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Objective: Emotional support (ES) is associated with less adversity and better adaptation in women with breast cancer (BCa). Adversity and ES have been related to differential leukocyte inflammatory signaling in cancer patients. In this study, we relate ES to pro-inflammatory and pro-metastatic leukocyte gene expression in women under treatment for early BCa. Methods: Leukocyte gene expression was measured by microarray analysis of peripheral blood mononuclear cells, and ES was assessed with the Sources of Social Support Scale (SSSS) in 80 women with non-metastatic BCa 2-10 weeks after surgery, before adjuvant treatment. Relative gene expression between levels of ES Total and ES from health care providers and family were compared. Results: Analysis of covariance compared gene expression in women with low ES (≤1 SD below mean) vs. high ES (≥1 SD above mean) on each SSSS subscale. Women with low total ES had greater pro-inflammatory (IL-1A, PTGS2, CCL20) gene expression (all ps<0.05), and marginally greater pro-inflammatory (IL-1B, IL-6, CCL3L1) and pro-metastatic (MMP-9) gene expression than those with high ES (all ps<0.10). Women with low ES from health care providers had greater pro-inflammatory [IL-1B: F(1, 13)=5.839, p<0.05, partial eta-squared=0.310] and pro-metastatic [LMNA: F(1, 13)=4.889, p<0.05, partial eta-squared=0.310; MMP-9: F(1, 13)=5.282, p<0.05, partial eta-squared=0.289] gene expression than those with high ES. Women with low ES from health care providers had marginally greater pro-inflammatory (IL-1A, CCL20, CXCL2) gene expression than those with high ES (all ps<0.10). Women with low ES from family had marginally greater pro-metastatic (MMP-9) and pro-inflammatory (IL-6, CCL7) gene expression than those with high ES (all ps<0.10). All findings held after controlling for age, ethnic identification, disease stage, income, time since surgery, and estrogen and progesterone receptor status. Conclusions: Patients with early BCa who report low ES show greater pro-inflammatory and pro-metastatic gene expression than women who report high ES in the weeks after surgery.
inflammation may promote disease progression, these findings may be relevant for understanding the biological effects of adaptation processes during BCa treatment and future health outcomes.

Abstract 352
INSOMNIA AND CIRCADIAN DYSREGULATION PREDICT QUALITY OF LIFE FOLLOWING SURGERY FOR GYNECOLOGIC CANCER
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Women undergoing surgery for gynecologic cancer experience decrements in a number of dimensions of quality of life but little is known about their sleep quality. The present study investigated the extent to which insomnia and circadian dysregulation were associated with quality of life concerns. Women undergoing surgery for an endometrial or ovarian malignancy (N = 41) completed questionnaires assessing insomnia (SI), depression (IDAS), fatigue (FSI) and pain (BPI) and wore an actigraph wristwatch to assess indices of activity-rest patterns (amplitude, mesor) at 1 week, 1 month, and 4 months postsurgery. Mixed-effects linear regression fixed effects models were employed to examine relationships between sleep assessments and quality of life outcomes. Women with more insomnia symptoms reported higher levels of depression (z = 4.84, p < .001), fatigue (z = 3.36, p < .01), and pain (z = 3.77, p < .001) during the four months following surgery. This pattern of results was the same for patients with lower mesor and amplitude actigraphy scores (all p values < .05) among individual participants, changes in insomnia symptoms across the assessment points were associated with corresponding changes in depressive symptoms (t = 4.05, p < .001) and fatigue (t = 2.13, p < .05) after covarying for the effects of time since surgery, with depression and fatigue most severe when insomnia symptoms were greatest. Changes in mesor and amplitude were associated with corresponding changes in fatigue (t = -3.58, p < .01; t = -2.68, p < .05 for mesor and amplitude, respectively) and changes in pain (z = 2.38, p < .05 for mesor and amplitude, respectively), with fatigue and pain most pronounced when activity level was lowest and activity-rest rhythms were dampened. Findings suggest that insomnia and circadian dysregulation may exacerbate important quality of life concerns following recovery from surgery for gynecological cancer.

Abstract 298
PERSONALITY AND THE RISK OF CANCER: A 15-YEAR FOLLOW-UP STUDY OF THE GAZEL COHORT.
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Objective: Although well-designed large-scale prospective studies have dismissed the association of cancer incidence with neuroticism or extroversion, most studies that addressed other personality constructs had serious limitations. This study aimed to examine the associations between cancer incidence and four personality measures: Type 1 “cancer-prone”, Type 5 “rational/anti-emotional”, hostility and Type A behaviors. Methods: All personality measures were available for 14,522 members of the GAZEL cohort. These participants were followed-up for diagnoses of primary cancers from January 1, 1994 to December 31, 2009. Associations between personality and cancer incidence were measured by Hazard Ratios (HR) computed through Cox regression and adjusted for several potential confounders.
Results: During a median follow-up of 17.2 years, 1,139 participants received at least one diagnosis of primary cancer. The mean duration between baseline and cancer diagnosis was 9.3 years. Type 1 was associated with a decreased risk of breast cancer (HR for one standard deviation: 0.81, 95% confidence interval: 0.68-0.97, p = .02). Type 5 was not associated with prostate, breast, colorectal or smoking-related cancers, but was associated with other cancers (HR for one standard deviation: 1.17, 95% confidence interval: 1.04-1.31, p = .01). There was a dose-response relationship between Type 5 and other cancers, but not between Type 1 and breast cancer. Hostility was associated with an increased risk of smoking-related cancers, which was merely explained by smoking habits, and Type A was not associated with the risk of cancer, whatever the site. Conclusions: Some personality measures were associated with selected cancers. The links between rational/anti-emotional tendencies and cancer incidence may warrant further epidemiological studies. Should these results be replicated, further studies would be needed to explore the underlying mechanisms.

Abstract 636
DEPRESSION, TELOMERE SHORTENING, AND SURVIVAL IN BLADDER CANCER
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A number of studies have found that depression is associated with increased mortality in cancer. Telomere shortening is also involved in cancer development and survival and associated with depression and chronic stress. No study has evaluated depression and telomere length in modifying cancer outcomes. 464 newly diagnosed bladder cancer patients were followed prospectively. Depressive symptoms were assessed using the CES-D and depression history using the MHQ. Telomere length was measured from blood samples at baseline for each patient. Multivariate cox regression was used to assess the association between depressive symptoms, depression history, telomere length, and bladder cancer mortality, as well as the joint effects on bladder cancer mortality. Kaplan-Meier plots and log rank tests compared survival times across subgroups for each variable. Depressive symptoms were assessed using the CES-D and depression history using the MHQ. Median survival: CES-D scores <16 = 21.6 months, 88 deaths occurred. In multivariate analyses, patients with CES-D scores ≥16 had a 1.9-fold (P=0.018) increased risk of mortality (median survival: CES-D scores ≥16 = 58.0 months vs. CES-D scores <16 = 200 months, P=0.004). Although MHQ was not significantly associated with survival (1.5-fold increased risk of mortality), in joint analysis with the CES-D, patients with both CES-D scores ≥16 and a history of depression experienced a 4.6-fold (P=0.018) increased risk of mortality (median survival 44.0 months) compared to patients with CES-D scores <16 and no history of depression (>200 months). In univariate analysis, long telomere length was associated with significantly improved survival (HR=0.55, P=0.015), but was not significant in multivariate analysis. A joint effect of telomere length and depressive symptoms revealed that compared to patients with CES-D scores <16 and long telomeres exhibited an over 3.2-fold increased risk of mortality (P=0.004) and significantly shorter median survival time (31.3 months vs. 199.8 months, P<0.001). Our study suggests that shortened telomere length and depressive symptoms influence bladder cancer mortality indicating that interventions that address depressive symptoms may improve survival in bladder cancer patients.

Abstract 188
COGNITIVE-BEHAVIORAL STRESS MANAGEMENT FACILITATES ADAPTATION AND ALTERS PRO-INFLAMMATORY AND PRO-METASTATIC LEUKOCYTE GENE EXPRESSION IN WOMEN TREATED FOR BREAST CANCER
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Background: The psychosocial and neuroendocrine correlates of breast cancer adaptation and the underlying mechanisms.
Objective: To test whether participations in a cognitive-behavioral stress management intervention that reduces stress and alters inflammation is associated with improved breast cancer adaptation.
Methods: Women treated for breast cancer (n=127) participated in a randomized-controlled trial: 32% vs 44% receiving the intervention (p=0.38). Using repeated measures ANCOVA, we examined differences across time between intervention and control groups.
Results: Intervention participants showed greater decreases in depressive symptoms (F=14.43, p<0.001) and state anxiety (F=10.17, p<0.001) across assessment points compared to control participants. Intervention participants also showed less cortisol reactivity (F=6.01, p=0.016) and smaller increases in pro-inflammatory cytokines across time (F=4.02, p=0.047) compared to control participants. There were no differences in pro-metastatic cytokines across time between intervention and control groups. Conclusion: A cognitive-behavioral stress management intervention that reduces stress and alters inflammation is associated with improved breast cancer adaptation.
Background. Psychosocial interventions that decrease adversity and promote resiliency processes may facilitate adaptation and alter pro-inflammatory signaling in cancer patients. This study tested whether:

(1) adversity and resiliency factors are associated with differential expression of pro-inflammatory and pro-metastatic genes in circulating leukocytes in women who recently completed surgery for breast cancer; and

(2) a group-based Cognitive-Behavioral Stress Management (CBSM) intervention can facilitate adaptation and modulate adversity- and resiliency-related leukocyte gene expression in breast cancer patients as they move through treatment. Methods: Women (N = 79) with non-metastatic breast cancer who had undergone surgery 2-10 weeks prior were randomized to a 10-week CBSD (N = 45) or active control condition (N = 34) and completed the psychosocial questionnaires and provided peripheral blood samples for genome-wide transcriptional profiling and bioinformatic analyses at baseline, 6-, and 12-month follow-ups. Results: At study entry greater negative affect and less positive affect, less benefit finding and less emotional social support related to >50% greater expression of leukocyte pro-inflammatory and pro-metastatic genes, even after controlling for sociodemographic and medical covariates. Women in CBSM showed decreased negative affect, and increased positive affect and benefit finding, whereas controls showed negligible change over time in mixed model group x time analyses. Also 62 transcripts showed greater than 50% down-regulated genes associated with inflammation at the gene expression level in CBSM-treated patients relative to controls, including genes encoding pro-inflammatory cytokines (IL1a, IL1b, IL6), prostanoid-synthesis enzyme COX2, inflammatory chemokines and their receptors, and pro-metastatic genes (LMNA, MMP9). Gene Ontology analyses confirmed that CBSM down-regulated genes were those involved in pro-inflammatory cytokine activity (p < .0001) and wound healing (p < .0001). Promoter-based bioinformatic analyses implicated decreased activity of NF-kB/Rel and GATA family transcription factors and increased glucocorticoid receptor activity as potential mediators of CBSM-induced transcriptional alterations. Conclusion. A 10-week group-based CBSM intervention can reduce adversity, and increase resiliency factors in parallel with altering leukocyte gene expression in ways that may facilitate better recovery from treatment for breast cancer and could influence longer-term outcomes.

SESSION: Acute and Chronic Stress

Abstract 646

DEPRESSIVE MOOD PREDICTS CORTISOL RESPONSE TO ACUTE STRESS IN ASTHMA PATIENTS BUT IN NOT HEALTHY CONTROLS

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Research suggests that endogenous cortisol responses to acute stressors among asthmatics may be blunted. There is also evidence that depression can lead to an altered cortisol response to acute stressors. However, to our knowledge, studies have not examined the effect of depressive symptoms on cortisol response to stressors in the context of a chronic inflammatory disease such as asthma. In this study, 39 asthma patients (mostly intermittent to moderate severe asthma) and 41 healthy controls underwent a speech and mental arithmetic stressor (Trier Social Stress Test). During the course of the laboratory session, salivary cortisol was collected 6 times (0 min and 0 min before and at 0, 15, 30 and 45 min after the stressor). Depressive mood in the past week was assessed with the Hospital Anxiety and Depression Scale at the beginning of the session. Using mixed effects repeated measure ANOVA we modeled effects of HADS, group (asthma versus control), time, Time x Group, HADS-D x Time, HADS-D x Group, HADS-D x Group x Time, and gender as predictors of cortisol levels. Depressive mood moderated cortisol response to the acute stressor (p<.001), but only among asthmatic patients (p=.036). More specifically, higher depressive symptoms were associated with a significant increase in cortisol (p<.001) 15 minutes following the stressor, whereas low depressive symptoms were associated with no cortisol response (p=.878) among asthmatic patients. No effect of corticosteroid intake was found for asthma patients. In healthy participants, depressive symptoms did not have an effect on cortisol response to the acute stressor (p=.485). These findings suggest that depression may have a different impact on cortisol responses among individuals with chronic inflammatory diseases.

Abstract 114

PERSONALITY AND PHYSIOLOGICAL REACTIONS TO ACUTE PSYCHOLOGICAL STRESS IN A LARGE COHORT OF MIDDLE AGED MEN AND WOMEN

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Stable personality traits have long been presumed to have biological substrates, although the evidence relating personality to biological stress reactivity is inconclusive. The present study was novel through examining the association between key personality traits and both cortisol and cardiovascular reactions to acute psychological stress, in a large cohort (N = 329) of middle aged men and women. Salivary cortisol and cardiovascular activity, namely systolic blood pressure (mean arterial pressure), were measured at rest and in response to a battery of psychological stress tasks comprising 5-minutes each of a Stroop task, mirror tracing, and a speech task. Participants subsequently completed the Big Five Inventory to assess neuroticism, agreeableness, openness to experience, extraversion, and conscientiousness. Those with higher neuroticism scores exhibited smaller cortisol (p = .02) and cardiovascular stress reactivity (SBP; p = .02, DBP; p = .06), whereas participants who were more agreeable and more open and had larger cortisol (p = .01, p = .03, respectively) and HR reactions to stress (p = .04, p = .05, respectively). These associations survived adjustment for a range of potential confounding variables. In conclusion, a negative constellation of personality traits (high neuroticism, low agreeableness, and low openness) would appear to be linked to diminished stress reactivity. These results add to the contention that blunted stress reactivity may be maladaptive.

Abstract 665

PASSIONATE AND COMPANIONATE LOVE INTERACT TO PREDICT MEN’S CORTISOL RECOVERY—BUT NOT REACTIVITY—IN RESPONSE TO AN ACUTE STRESSOR

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We examined whether men’s and women’s feelings of passionate and companionate love interacted to predict their physiological reactivity and recovery from a social-evaluative stressor (specifically, the Trier Social Stress Task; Kirschbaum et al., 1993). Although feelings of passionate love appear to be tied to higher chronic levels of cortisol for both men and women (Marazziti & Canale, 2004), researchers have yet to examine how feelings of love are associated with cortisol levels following exposure to an acute stressor. Further, it is unclear how (or if) companionate love—or ‘friendship-based love’—is associated with cortisol production, although recent work indicates that feelings of intimacy (a key component of companionate love) are tied to lower levels of cortisol (Ditzen et al., 2008). Thus, we conducted a series of correlational analyses to examine how passionate and companionate love are tied to daters’ cortisol reactivity and recovery in response to a laboratory stressor. Participants were 117 individuals in newly formed romantic relationships (M=2.9 months). Prior to their laboratory visit, participants completed an online questionnaire, which included measures assessing feelings of passionate and companionate love for their partners. During the laboratory session, salivary cortisol samples were collected 15 minutes following initiation of the ‘TSST’ in order to assess participants’ physiological reactivity and recovery. Although love was unrelated to participants’ cortisol reactivity (p=.17–.87), a multiple regression analysis revealed a significant Passionate Love x Companionate Love x Sex interaction (p=.04) when predicting cortisol recovery. Specifically, companionate love more positively predicted the slope of cortisol recovery for men (but not women) who reported higher levels of passionate love (p=.001). These results suggest that feelings of closeness are tied to a
more pronounced physiological recovery in response to acute stressors among men who are more passionately in love. Our findings comport with recent work indicating that feelings of intimacy may have a stress-buffering effect against non-relationship stressors (Ditzen et al., 2008).

Abstract 558
JOB STRAIN AS A RISK FACTOR FOR THE ONSET OF TYPE 2 DIABETES: RESULTS FROM THE MONICA/KORA AUGSBURG COHORT STUDY
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Background – The prevalence of type 2 diabetes has been growing rapidly worldwide and risk factors have not yet been identified completely. Features of impaired mental health are attracting increasing attention and there is also some evidence that job strain may be associated with type 2 diabetes onset.

Methods – We investigated data from 5,337 working men and women aged 29–66 years without diabetes who participated in one of the three population-based MONICA/KORA Augsburg surveys between 1984 and 1995 and had full information in all analyzed variables. 291 incident cases of type 2 diabetes were assessed until 31 December 2002 using follow-up questionnaires. Information on job demands and decision latitude was obtained at baseline with self-administered questionnaires. Participants with high (low) job demands and low (high) job control, defined as above or below the median score on the respective scales at baseline, were classified to have high (low) job strain according to Karasek. For sensitivity analyses two alternative job strain definitions were used: the log10-transformed ratio of job demands divided by job control and a median-split variable of this ratio. Information on the other baseline risk factors was obtained in standardized examinations or personal interviews. Hazard ratios (HRs) were estimated from Cox proportional hazard models.

Results – The participants with high job strain had a 45% higher risk to develop type 2 diabetes than those with low job strain after multivariable adjustment for age, sex, survey, BMI, education, physical intensity of work, parental history of diabetes, physical inactivity, smoking, alcohol intake, and living alone (HR = 1.45 [95%CI: 1.00; 2.06]). The results were robust when using the two alternative job strain definitions. Interestingly, the strongest association between high job strain and type 2 diabetes development was detected in men who were living alone (p value of third-order interaction = 0.01).

Conclusions – Psychosocial job strain was an independent predictor of type 2 diabetes after a median follow-up of 12.7 years, confirming evidence from previous studies. The stronger effect in men who were living alone needs to be verified in future studies.

Abstract 369
INCREASED RISK OF CORONARY HEART DISEASE AMONG INDIVIDUALS REPORTING ADVERSE IMPACT OF STRESS ON THEIR HEALTH: THE WHITEHALL II PROSPECTIVE COHORT STUDY
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Background: Response to stress can vary greatly between individuals. However, it remains unknown if perceived impact of stress on health is associated with important health outcomes.

Objectives: To examine whether individuals reporting stress to adversely affect their health are at increased risk of coronary heart disease.

Methods: Analyses are based on 7268 men and women (mean age: 49.5 years, range 39-63 years) from the British Whitehall II cohort study. Over 18 years of follow-up, 352 coronary deaths or first non-fatal myocardial infarction (MI) and 668 first definite angina events occurred.

Results: After adjustment for sociodemographic characteristics, participants who reported that stress had affected their health “quite a bit or extremely” at baseline had 2.12 times higher (95% CI 1.52-2.98) risk of coronary death or incident non-fatal MI when compared to those who reported no effect of stress on their health. For incident definite angina, the corresponding hazard ratio was 2.27 (95% CI 1.76-2.93); note that this risk was markedly elevated (HR=4.11, 95% CI 1.81-9.37) within the first few years of follow-up. These associations were attenuated but remained statistically significant after adjustment for bio-behavioural and other psychological risk factors and perceived levels of stress.

Conclusions: In this prospective cohort study, perceived adverse health-effects of stress were associated with an increased risk of coronary heart disease. Clinical attention should be paid to those who complain that stress affects their health.

SESSION: Depression, Insulin Sensitivity and Diabetes

Abstract 346
SOMATIC-VEGETATIVE SYMPTOMS OF DEPRESSION PREDICT 6-YEAR INCREASES IN INSULIN RESISTANCE: DATA FROM THE PITTSBURGH HEALTHY HEART PROJECT
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Although prospective studies suggest a bidirectional association between depression and type 2 diabetes, few studies have examined depressive symptom clusters or concurrently evaluated both directions of this relationship. Consequently, our objective was to examine the longitudinal, bidirectional associations between the somatic-vegetative and cognitive-affective clusters of depressive symptoms and insulin resistance, which is implicated in the pathophysiology of type 2 diabetes. Participants were 269 adults (baseline age range: 50-70 years, 55% female, 14% non-white) without diabetes enrolled in the Pittsburgh Healthy Heart Project, a prospective cohort study. At baseline and the 6-year visits, participants completed the Beck Depression Inventory-II (BDI-II) to assess depressive symptoms and underwent a blood draw to quantify fasting serum insulin and glucose. We examined baseline BDI-II total and subscale scores as predictors of 6-year change in the homeostatic model assessment (HOMA) score, an index of insulin resistance computed from fasting insulin and glucose. We also examined baseline HOMA score as a predictor of 6-year change in BDI-II total and subscale scores. HOMA and BDI-II change were computed as follow-up score minus baseline score. Regression analyses, adjusted for baseline HOMA score and demographic factors, revealed that the baseline BDI-II somatic-vegetative score (beta=.14, p=.03), but not the total (beta=.10, p=.11) or cognitive-affective score (beta=.004, p=.95) scores, was a predictor of 6-year increases in the HOMA score. The pattern of results was similar after further adjustment for body mass index, except that the BDI-II total score became a predictor of HOMA change (beta=-.13, p=.03). In contrast, the baseline HOMA score did not predict 6-year increases in BDI-II total, somatic-vegetative, or cognitive-affective scores (all p's>.48). Our
findings indicate that older adults experiencing the somatic-vegetative symptoms of depression (e.g., fatigue, sleep disturbance, and appetite changes) may be at an increased risk of insulin resistance and subsequent type 2 diabetes.

Abstract 661

ARE THE SOMATIC-AFFECTIVE AND COGNITIVE SYMPTOMS OF DEPRESSION DIFFERENTIALLY ASSOCIATED WITH INSULIN RESISTANCE?

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Objective: A number of observational and cohort studies have examined whether a link between depression and insulin resistance exists, but results have been mixed. One possible explanation for equivocal findings is that certain symptoms of depression are more strongly associated with insulin resistance than other symptoms. Somatic-affective depressive symptoms (e.g., insomnia, crying) are more common than cognitive symptoms of depression in those with cardiovascular disease. Similarly, we hypothesized that insulin resistance would be more strongly associated with somatic-affective symptoms than with cognitive symptoms of depression.

Method: 306 cardiac outpatients (mean age = 60) referred for an exercise stress test were recruited. Participants completed a series of questionnaires, including the Beck Depression Inventory II (BDI-II), and a blood sample was drawn to determine participants’ homeostatic model assessment (HOMA), a measure of insulin resistance. In a principal components analysis (PCA), BDI-II items were forced to load onto two components. An item was said to load on a given component if the factor loading was 0.4 or greater. Adjusting for age, sex, body mass index, medication use, and the presence of cardiovascular disease, GLM analyses were conducted to examine associations between these two components and HOMA. Results: PCA analysis revealed nine items loading onto the first component, subsequently labeled the “cognitive” component and eleven items loading onto a “somatic-affective” component. Two items loading onto both components were removed from further analysis. When examined in separate GLM analyses, both components were significantly associated with HOMA (ps < .02). However, when including both components simultaneously in the model, only the somatic-affective component was significantly associated with HOMA (b(SEM) = 0.35(0.14), p = .01). Conclusion: The somatic-affective symptoms of depression appear to be more strongly associated with insulin resistance than the cognitive symptoms. Somatic-affective symptoms may need to be targeted in interventions among those who are depressed with high insulin resistance.

Abstract 443

SOMATIC, BUT NOT NONSOMATIC, SYMPTOMS OF DEPRESSION ARE ASSOCIATED WITH INSULIN RESISTANCE: NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) 2005-2010

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While there is a well-established link between depression and type 2 diabetes, depressive symptom clusters have received little attention in this literature. To begin to address this gap, we examined relationships among the somatic and nonsomatic clusters of depressive symptoms and insulin resistance, which is involved in the pathogenesis of type 2 diabetes. Participants were 4,834 adults (mean age = 44.3 years, 50% female, 19% African American, 20% Mexican American) who participated in the 2005-2010 waves of NHANES—a survey of a larger, probability sample representative of the U.S. population. Participants with the following conditions were excluded: diabetes, cardiovascular disease, liver condition, kidney condition, or current pregnant. Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ-9; converted to z-scores), and somatic and nonsomatic subscale scores were computed based on results of a confirmatory factor analysis. Our index of insulin resistance was the homeostatic model assessment (HOMA) score, which we computed from fasting plasma glucose and insulin levels. Separate regression analyses (adjusted for age, sex, race-ethnicity, education, and the NHANES sample design) demonstrated positive associations between PHQ-9 total (B=0.25, SE=0.04, p<.001), somatic (B=0.24, SE=0.04, p<.001), and nonsomatic (B=0.20, SE=0.05, p<.001) scores and HOMA score. When the subscales were entered simultaneously into a regression model, the somatic score (B=0.19, SE=0.05, p<.001), but not the nonsomatic score (B=-0.09, SE=0.06, p=14), remained associated with HOMA score. The same pattern of significant results was observed after adjusting for body-mass index; however, effect sizes were attenuated. Our cross-sectional findings suggest that the relationship between depression and insulin resistance may be driven primarily by the somatic symptoms (low energy, appetite changes, and sleep disturbance) and raise the possibility that adults with the somatic symptoms of depression may be at an elevated risk of type 2 diabetes.

Abstract 107

THE CO-OCCURRENCE OF DEPRESSION IN DIABETES: AN ANALYSIS OF 231,797 INDIVIDUALS FROM 47 COUNTRIES IN THE 2002 WORLD HEALTH SURVEY.

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Background: Depression is common in diabetes and increases the risk of adverse health outcomes, including poor glycemic control, incidence cardiovascular disease and premature mortality. Few studies, however, have explored the association of diabetes and depression in multi-national samples which included low and middle-income non-western countries.

Methods: Data from 47 countries of the 2002 WHO World Health Survey were used including a total of 231,797 adults aged 18 years or older (mean 41 years, 53% female). Diabetes was assessed by means of self-reported diagnosis or treatment. Presence of a major depressive episode (MDE) in the previous 12 months was assessed using an algorithm based on DSM-IV criteria. Odds ratios (ORs) and 95% confidence intervals (CI) were calculated to quantify associations between diabetes and MDE in the entire sample and for countries aggregated into four continents (Africa, South America, Asia and Europe). ORs were adjusted for age, sex, education, body mass index, smoking and physical activity. Results: The prevalence of diabetes (3.5%; range 0.2%-13%) and MDE (7.9%; range 0.4%-38%) differed widely across countries. Globally, people with diabetes had an increased odds of MDE (adjusted OR 2.36, 95%CI 1.91-2.92). This association was found in the continents of South America, Asia and Europe (ORs >1.97), but not in Africa (OR= 0.86, 95%CI = 0.54-1.37).

Conclusions: There is a global increase in adjusted odds of depression in people with diabetes. Given the global rise in diabetes in the following decades, and the increased health risk of depression in diabetes, studies examining mechanisms and interventions are needed.

Abstract 431

DEPRESSIVE SYMPTOMS ARE NEGATIVELY RELATED TO KIDNEY FUNCTION IN TYPE 2 DIABETES

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The relationship between depressive symptoms and markers of CKD in T2DM patients without overt renal dysfunction is not known. It is also unclear whether the association between depressive symptoms and kidney disease or function is independent of CM risk. We examined cross-sectional
SESSION: Relationship Quality and Health

Abstract 624

QUALITY OF DAILY SPOUSAL INTERACTIONS EXPLAIN THE ASSOCIATION BETWEEN MARITAL COHESION AND CAROTID Atherosclerosis

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Objective: A small, mixed literature suggests that better marital adjustment may be associated with less atherosclerosis in healthy samples. It is unclear whether this association is explained by quality of daily spousal interactions. This study examined the role of daily spousal interactions in explaining the association between marital cohesion and carotid intima-media thickness (CIMT), a subclinical marker of atherosclerosis. Methods: We examined 275 healthy, middle-aged adults (AHAB-II study) who were married or living with a partner in a marital-like relationship (mean age= 42.2 (SD=7.3), 53% female, 88% Caucasian). Marital cohesion was measured using the marital cohesion subscale (α = .83) of the Dyadic Adjustment Scale (DAS). Social interaction quality was assessed using Emotional Moment Assessment (EMA) methods. For 4 days, participants completed EMA interviews hourly, rating their most recent interactions on 4 characteristics (e.g., conflict, agreeableness). Negative items (e.g., conflict) were reverse scored so that higher scores reflected more positive interaction quality. Responses to the 4 items in reference to spousal interactions were averaged across observations and days and then summed (α = .93) to form the spousal interaction quality score. Participants were followed for 6 years and CIMT measured at 3 visits. Results: Adjusting for demographic and traditional CVD risk factors, greater marital cohesion was associated with lower CIMT, F(11, 263) = 4.09, p < .05. This association was consistent across age, race, gender, and education. When the EMA-based measure of spousal interaction quality was added to the model, the marital cohesion association was eliminated but more positive spousal interaction quality was significantly associated with lower CIMT (β = -.01, p < .01). Formal mediation analyses using the MacKinnon ACL approach confirmed that EMA spousal interaction quality explained the association between marital cohesion and CIMT. Conclusions: Cohesiveness of serious relationships has positive implications for cardiovascular health. Ecological momentary assessment of partner interactions may have utility for specifying the pathways by which cohesive relationships affect health. Supported by HL040962 and HL07560.

Abstract 777

INCREASED INTERPERSONAL CONFLICT AND INCREASED NUMBER OF ROLE TRANSITIONS PREDICT POOR ADHERENCE TO ASPIRIN AFTER ACUTE CORONARY SYNDROMES (ACS)

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Background: Depression is strongly associated with poor adherence to medications after acute coronary syndromes (ACS). Yet, significant gaps remain in our understanding of the association between specific depression vulnerabilities — cognitive, behavioral, interpersonal — and medication adherence.

Methods: A cohort of 172 patients with ACS completed measures of cognitive (Dysfunctional Attitudes Scale), behavioral (Pleasant Events Schedule), and interpersonal vulnerabilities (Dyadic Adjustment Scale and inventory of recent major role transitions such as divorce or loss of job) within 1 week of hospital admission. After discharge, aspirin adherence was electronically measured for 3 months using the Medication Event Monitoring System. Parametric and non-parametric statistics were used for bivariate analyses between adherence and depression vulnerabilities. Logistic regression was then used to determine whether depression vulnerabilities were significantly associated with adherence to aspirin after ACS after adjusting for age, gender, ethnicity, race, medical comorbidity, ACS severity, and depressive symptoms.

Results: The mean age was 59 years, 45% were women, and 87% were white. Twenty-three percent were non-adherent (took aspirin correctly on <80% of days). In bivariate analyses, there were no significant associations between cognitive and behavioral vulnerabilities with medication adherence. In contrast, there was an inverse graded association between number of role transitions and medication adherence Table; p=0.005). Increased interpersonal conflict was also inversely associated with medication adherence (p=0.005). In the adjusted model, both role transitions (p=0.007) and interpersonal conflict (p=0.02) remained associated with poor medication adherence, whereas depressive symptoms were no longer significantly associated with adherence in this model.

Conclusions: Increased interpersonal conflict and increased number of role transitions are associated with lower adherence to aspirin after ACS. Targeted interventions that focus on the resolution of interpersonal conflict and that promote positive adjustment to role transitions might improve adherence to medications in the post-ACS setting.
partnered, unhappily partnered, and unpartnered female chronic pain patients, and 2) affect and pain cognitions mediated the partner status effect on pain-related changes in physical functioning. 251 women with chronic pain due to osteoarthritis and/or fibromyalgia completed 30 daily electronic diaries assessing pain, affect, pain-related cognitions, and physical functioning. Patients living with a romantic partner also completed a modified version of the Locke-Wallace Marital Adjustment Scale (Locke & Wallace, 1959) to assess relationship satisfaction. Multilevel modeling revealed that patients in satisfying unions showed more adaptive daily pain-related changes in physical functioning, pain coping difficulty, and catastrophizing compared to those in unsatisfying unions and those who were unpartnered. Both partnered groups also showed more adaptive pain-related changes in positive affect compared to the unpartnered group. The impact of relationship status on pain-related changes in physical functioning was partly mediated by the pain cognitions catastrophizing and coping difficulty. These results indicate that happily partnered pain patients show less pain-related physical disability and more adaptive affective and cognitive responses to daily pain changes than do unhappily partnered and unpartnered patients. Living in a happy union may bolster the capacity of patients to sustain a sense of pain coping efficacy during pain episodes, which in turn, minimizes pain-related physical activity limitations.

Abstract 771

NATURALISTICALLY-OBSERVED INTERPERSONAL CONFLICT AND POSITIVE MATERNAL BEHAVIORS ARE ASSOCIATED WITH CHILDREN’S DIURNAL CORTISOL PATTERNS

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Early family life, including conflict and family warmth, is associated with physical health in adulthood. However, we still know very little about the biological pathways through which early family influences are detrimental to or protective of later health. The purpose of this study was to investigate the relationships between naturally-observed conflict and positive maternal behaviors in daily life and children’s diurnal cortisol patterns using a cutting-edge naturalistic observation sampling methodology called the Electronically Activated Recorder (EAR). Forty children and adolescents diagnosed with asthma aged 10-17 (17 boys and 23 girls) wore the EAR for 4 days. The EAR is a small digital audio recorder that unobtrusively tracks real-world behavior by periodically recording snippets of ambient sounds while participants go about their daily lives. In this study, the EAR recorded 50 seconds of sounds every 9 minutes, providing a total 8,457 valid sound files. Trained coders rated children’s ear files for the presence of interpersonal conflict behaviors such as yelling, arguing or fighting. Additionally, sound files in which the mother was heard talking to the child were rated for expressions of maternal warmth such as fighting. Additionally, sound files in which the mother was heard 50 seconds of sounds every 9 minutes, providing a total 8,457 valid sound files. Trained coders rated children’s ear files for the presence of interpersonal conflict behaviors such as yelling, arguing or fighting. Additionally, sound files in which the mother was heard talking to the child were rated for expressions of maternal warmth such as fighting. Additionally, sound files in which the mother was heard 50 seconds of sounds every 9 minutes, providing a total 8,457 valid sound files.

SESSION: Obesity and Overweight

Abstract 425

PSYCHOSOCIAL STRESSORS AND CHANGE IN VISCERAL FAT IN AFRICAN-AMERICAN AND CAUCASIAN WOMEN: STUDY OF WOMEN’S HEALTH ACROSS THE NATION (SWAN) HEART STUDY

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Visceral adipose tissue (VAT) is a marker of adiposity related to cardiovascular disease (CVD) risk. Prior studies show that psychosocial stressors are related across-sectionally with VAT among women transitioning through menopause. We examined longitudinal associations between five psychosocial stressors and VAT progression among African-American and Caucasian women, and differences in these associations by race/ethnicity. Participants included 338 women (37% African American; 63% Caucasian) from Chicago and Pittsburgh sites of the Study of Women’s Health Across the Nation who were part of the ancillary SWAN Heart Study. VAT was measured at the SWAN Heart baseline exam and 2.3 years later by electron beam computed tomography. VAT values were log-transformed for analyses. Depressive symptoms, anger, anxiety, hostility, and perceived discrimination were assessed by self-report questionnaires and modeled continuously. Multivariable linear regression models were used to examine the relation of the psychosocial stressors with change in visceral fat and interactions with race/ethnicity were tested. Mean VAT was 122.7 cm2 at baseline, and increased, on average, by 20.2 cm2, with greater increases in African-American than Caucasian women (p<.04). Follow-up VAT was 3.27% higher for each 1-SD higher score on depressive symptoms (p<.044), and 6.32% and 12.31% higher, respectively, for each 1-point higher anger (p<.019) or discrimination (p<.002) score, adjusting for baseline VAT, age, race, site, time between scans, and hormone use. Anxiety and hostility were unrelated to VAT. Adjustment for CVD risk factors attenuated the effects of depressive symptoms and anger, but discrimination remained significantly related to VAT (p<.012). Associations did not vary by race/ethnicity. Findings show that psychosocial stressors contribute to increased VAT over time in women. CVD risk factors partially accounted for some associations, though the effect of discrimination remained significant in adjusted analyses. Additional work is needed to understand pathways linking discrimination to visceral fat. [Supported by NIH/DHHS grants AG012505, AG012546, HL065581, HL065591, HL089862, 1UL1RR031833-01 and 8UL1TR000114-02.]

Abstract 155

THE RELATIONSHIP OF C-REACTIVE PROTEIN TO OBESITY-RELATED DEPRESSIVE SYMPTOMS: A LONGITUDINAL STUDY

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Obesity has been shown to produce a state of systemic low-grade inflammation that may have detrimental neuropsychiatric effects. This study examined longitudinal associations between obesity, inflammatory and depressive symptoms amongst a cohort of older English adults over 4 years of follow-up. Participants were 3891 obese and non-obese people drawn from the English Longitudinal Study of Ageing (ELSA) [aged 64.9 (SD = 8.8) years, 44.6% men]. Depressive symptoms were assessed at baseline and after 4 years of follow-up using the eight-item Centre for Epidemiological Studies – Depression Scale (CES-D). Approximately 26.3% (N = 1 025) of the sample were categorized as obese at baseline. Obesity at baseline was associated with elevated levels of depressive symptoms at follow-up (P < .001), in analyses that adjusted for depression levels at baseline and sociodemographic and background variables including the prevalence of permanent illness/disability, alcohol consumption, sedentary behavior, and smoking. In addition, C-reactive protein (CRP) concentrations at baseline were independently associated with CES-D depression scores at follow-up (P = .008) in fully adjusted analyses. Subsequent mediation analyses revealed that CRP levels explained
DEPRESSIVE SYMPTOM CLUSTERS AS PREDICTORS AND CONSEQUENCES OF ADIPOSY OVER A 9-YEAR PERIOD: THE AFRICAN AMERICAN HEALTH STUDY
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Although recent meta-analyses suggest that depression may be both a predictor and consequence of increased adiposity, no studies have evaluated the relative importance of the facets of depression for both directions of this relationship. Thus, our objectives were (a) to examine the utility of four depressive symptoms clusters (depressed affect, somatic symptoms, interpersonal distress, and positive affect) in predicting 9-year changes in adiposity and (b) to examine the utility of three adiposity indicators (body fat percent, BF%; measured and self-reported body mass index, BMI) in predicting 9-year changes in depressive symptom clusters. Participants were 579 community-dwelling African Americans (mean baseline age = 56 years, 63% female) recruited from the St. Louis metropolitan area. Depressive symptoms were assessed at baseline and 9-year follow-up by the 11-item Center for Epidemiological Studies-Depression Scale (CES-D). CES-D subscale variables were computed based on previous factor analyses. Adiposity variables assessed at baseline and follow-up were BMI, assessed by bioelectrical impedance analysis, and measured and self-reported BMI. Regression analyses adjusted for age, sex, and baseline adiposity revealed that lower baseline positive affect predicted greater 9-year increases in adiposity and (b) to examine the utility of three adiposity indicators (body fat percent, BF%; measured and self-reported body mass index, BMI) in predicting 9-year changes in depressive symptom clusters. Participants were 579 community-dwelling African Americans (mean baseline age = 56 years, 63% female) recruited from the St. Louis metropolitan area. Depressive symptoms were assessed at baseline and 9-year follow-up by the 11-item Center for Epidemiological Studies-Depression Scale (CES-D). CES-D subscale variables were computed based on previous factor analyses. Adiposity variables assessed at baseline and follow-up were BMI, assessed by bioelectrical impedance analysis, and measured and self-reported BMI. Regression analyses adjusted for age, sex, and baseline adiposity revealed that lower baseline positive affect predicted greater 9-year increases in self-reported BMI ($\beta = -0.09, p < .01$). None of the other CES-D subscales predicted self-reported BMI change, and no subscales predicted BF% or measured BMI change (all $p > .11$). In fully-adjusted models (baseline income, education, medical conditions, and functional abilities added as covariates), the relationship between positive affect and self-reported BMI change was no longer significant ($\beta = -.06, p = .10$). In contrast, higher baseline BF% ($\beta = .14, p = .01$), measured BMI ($\beta = .14, p < .01$), and self-reported BMI ($\beta = .09, p = .04$) each predicted 9-year increases in interpersonal distress after adjusting for age, sex, and baseline interpersonal distress, depressed affect, somatic symptoms, and positive affect. Baseline self-reported BMI also predicted 9-year increases in somatic symptoms ($\beta = .09, p = .03$). The relationship between each adiposity variable and interpersonal distress change persisted in the fully-adjusted models (all $p \leq .04$), but self-reported BMI was no longer associated with somatic symptoms ($\beta = .07, p = .12$). Our findings suggest that specific depressive symptoms - especially interpersonal distress - may be a consequence of increased adiposity in African Americans, perhaps due to the stigmatizing effects of obesity and its associated social discrimination. Research supported by the National Institute on Aging Grant AG010436.

DO WORK RELATED PSYCHOSOCIAL RESOURCES PROTECT YOU AGAINST BECOMING OBESE?
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Background: Recent studies have questioned the explanation of obesity being a sole consequence of poor nutritional habits. Experimental and epidemiological data have implicated chronic stress in the pathogenesis of obesity. Methods: We included participants from a prospective cohort study amongst German industrial employees ($n = 14,338$) with non-missing data on psychosocial characteristics ($n = 13,946$), objective medical measures ($n = 13,406$) and overnight heart rate variability (HRV, $n = 7,065$, mean age 41.9 years $\pm 10.9$, 81% males). Body mass index (BMI) was regressed on socio-demographic characteristics, health behavior, work-related stress, personal/ work-related resources and health-behavior age using previously validated questionnaires. Heart rate variability (RMSSD) was entered as day-time and night-time average.

Results: Mean BMI was 26.4 ± 4.4 (IQR 23.8 to 28.4) in men and 24.1 ± 6.2 (IQR 20.8 to 25.8) in women. The basic model comprising of age and gender explained 7.4% of the variance in BMI. Psychosocial variables explained additional 1.7%. The full model including BMI explained 13.4% of the variance (adj. R-square). The following variables were significantly associated with BMI: age (standardized beta (s.b.) = -0.20), gender (s.b. = -0.18), blue-collar work (s.b. = -0.10), health behavior including smoking, exercise and nutrition (s.b. = -0.07, large values indicate good health behavior), work related resources (s.b. = -0.05), personal resources (s.b. = 0.07), HRV at work (s.b. = -0.17), HRV during sleep (s.b. = -0.10). Sleep quality was no longer retained once heart rate variability was included. Restricting the analysis to male white-collar workers for eliminating potential confounding of HRV by different levels of manual labor retained the effect of HRV ($n = 3317$, day-time HRV, s.b. = -0.21).

Discussion: These data suggest a more differentiated view on the pattern of factors being related to increased BMI: higher psychosocial resources at work as well as higher daytime-HRV were associated with lower BMI, with equally or larger effect sizes than social status or health behavior. Participants with good personal resources (high quality of social network, satisfying personal relationships) showed a trend towards higher BMI as did subjects with higher night-time HRV.

LOW VITAMIN D AND DEPRESSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF PROSPECTIVE ASSOCIATIONS AND INTERVENTION EFFECTS
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Background: Low vitamin D has been implicated in the pathogenesis of depression, and vitamin D supplementation has been explored as an intervention for depression. However, the association between low vitamin D and depression varies, as does the efficacy of vitamin D supplementation for reducing depressive symptoms. We conducted a systematic review and meta-analysis of these two bodies of literature. Methods: Electronic databases were searched through May 2012 for prospective cohort studies reporting associations of low vitamin D with developing depression and randomized controlled trials (RCTs) examining vitamin D supplementation as a treatment for depression. Demographic, clinical, and methodologic variables, including definition of low vitamin D, type of depression assessment, and vitamin D dosage, were extracted from each publication. Risk of bias was assessed using the Downs & Black checklist and the Cochrane Risk of Bias Tool for prospective cohort studies and RCTs, respectively. Results: Of 2,394 references initially retrieved, 3 prospective cohort studies comprising 8,627 participants and 5 RCTs comprising 3,054 participants met inclusion criteria. Meta-analysis of the 3 prospective cohort studies showed a 2.3-fold increased risk of developing depression in individuals with low vitamin D versus those with sufficient vitamin D (hazard ratio [HR], 2.3; 95% CI, 1.6 – 3.2, p < 0.001). Effect size estimates varied, with HRs ranging from 0.45 to 2.70, but statistically significant heterogeneity was not observed (Q = 2.0, p = 0.36). The aggregate point estimate for the efficacy of vitamin D supplementation for depressive symptoms was small and non-significant (standardized mean difference, 0.06, 95% CI, -0.12 – 0.23, p = 0.52), but significant heterogeneity was observed (Q = 10.83, p = 0.07). Although our search yielded too few studies to explore this heterogeneity using meta-regression, we observed that greater vitamin D dosage was associated with increased depression treatment effects. Conclusions: Low vitamin D is associated with an increased risk of developing depression, but vitamin D supplementation at the doses tested thus far in 5 trials does not improve depressive symptoms.
30% of patients meet criteria for a mood and/or anxiety disorder. Results and Conclusion: 646 patients completed the follow-up (81%); age, sex, ICS dose, f-up time, baseline ACQ (ACQ analysis). Hospitalizations and ED visits for asthma in the last year, and socio-demographic and medical history interview, standard spirometry, and a brief, structured, psychiatric interview (Primary-Care Evaluation of Mental Disorders, PRIME-MD) to assess mood and anxiety disorders. A-30

Abstract 648  
CORTISOL MOBILIZATION PREDICTS EXPOSURE THERAPY OUTCOME AMONG PANIC PATIENTS  
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Cortisol administration during exposure can facilitate reduction in fear among anxiety patients. However, few studies have examined the predictive value of endogenous cortisol reactivity and levels in the morning prior to exposure as well as during exposure, on treatment outcome. In this study, 26 patients with panic disorder and agoraphobia underwent 89 in-vivo exposure sessions. This included 3 weekly exposure therapy sessions and a 2-month follow up assessment. Salivary cortisol was collected 7 times during the first exposure day (upon awaking, 30 min after awaking, 1 hour before exposure, right at the beginning of the exposure, 30 min into the exposure, at the end of the session, and 30 min after exposure). Morning cortisol was only measured before session 1, for sessions 2-4 cortisol was only sampled before, during, at the end, and after exposure. Additionally, cortisol was collected on a non-exposure control day matching the times of the exposure day. Results showed significantly elevated anxiety and cortisol levels on the day of exposure as compared to the time-matched control day values (p <.001), but there was no significant increase in cortisol during exposure (p =.800). Using multi-linear modeling, we found that greater cortisol levels during exposure predicted more clinical improvement in panic symptoms (catastrophic cognitions, agoraphobic avoidance, and perceived control; ps <.05). Specifically greater cortisol levels and reactivity during greater reductions in agoraphobic avoidance (p <.040) and catastrophic cognitions (p <.001). Higher cortisol levels during exposure were also associated with a greater increase in perceived control (p <.001). By contrast, lower morning cortisol reactivity and levels were related to a greater decrease in agoraphobic avoidance (p <.001), whereas higher morning cortisol levels and reactivity was related to less of a decrease (p =.075 and p <.055, respectively). The observed association of cortisol release during exposure with treatment outcome reflects previous findings of cortisol impacting memory consolidation and fear extinction. On the other hand, morning cortisol release seems to impact treatment outcome through a different mechanism.

Abstract 281  
The Prospective Impact of Mood and Anxiety Disorders on 5-Year Asthma Control and Health Service Use  
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Background: We have previously reported observing significant cross-sectional associations between mood, but not anxiety disorders, and poor asthma control among tertiary care adult asthmatics. However, cross-sectional associations do not provide information about the direction of this relationship, or on the impact of mood and anxiety disorders on long-term asthma outcomes. The present study assessed the prospective impact of mood and anxiety disorders on health service use, asthma control (including emergency department [ED] visits and hospitalizations) and asthma control levels among adult asthmatics.

Methods: 801 adults with confirmed asthma were recruited on the day of their clinic visit (06/03 - 12/06). At baseline, patients underwent a socio-demographic and medical history interview, standard spirometry, and a brief, structured, psychiatric interview (Primary-Care Evaluation of Mental Disorders, PRIME-MD) to assess mood and anxiety disorders. At follow-up, patients were re-contacted for a telephone interview an average of 5 years later to assess frequency of hospitalizations and ED visits for asthma in the last year, and completed the Asthma Control Questionnaire (ACQ). The impact of mood/anxiety disorders on risk for events and ACQ scores was assessed using logistic regression and GLM, respectively adjusting for age, sex, ICS dose, Fup time, baseline ACQ (ACQ analysis).

Results: Patients and Controls: 646 patients completed follow-up (81%); 30% of patients meet criteria for a mood and/or anxiety disorder (Anxiety: 8%; Mood: 11%; Both: 11%). Results indicated that anxiety, but not mood disorders, were predictive of worse ACQ scores at 5 years after adjustment for covariates. Though psychiatric disorders were not associated with an increased risk of health service use, there was a trend suggesting a 61% increased risk for ED visits associated with mood disorders. Findings suggest that identifying and treating mood and anxiety disorders may be important for optimizing asthma control.

Abstract 322  
Infection Load as a Predisposing Factor in Somatoform Disorders  
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Introduction Somatoform disorders are characterized by chronic and/or multiple functional (i.e. medically unexplained) somatic symptoms (FSS). It has been suggested that infections may be triggers for FSS to occur, pointing to the immune system as a pathogenetic factor in the development of FSS. Aim of the current study was to compare the prevalence of infections (i.e. infection load) in the history of patients with somatoform disorders and in matched controls.

Methods Samples were drawn from the Psychiatric Case Register Middle Netherlands (PCR) and the Julius General Practitioners Network (JGPN). Patients with a diagnosis of undifferentiated somatoform disorder, somatization disorder, or pain disorder in the PCR (SD patients; n = 185) were matched at the index-date of diagnosis to persons without somatoform complaints (Controls; n = 185). Infection load was defined as the number of infection registrations in the JGPN (all registrations or limited to registrations with anti-infectious medication prescription) before diagnosis of a somatoform disorder in the SD patients. For Controls, a matched time period was used. Groups were compared for the occurrence of infections at different time periods: a five-year period before diagnosis available (M = 10 years) and for a three-year period close to the psychiatric diagnosis. Mann-Whitney U test was used for all comparisons. If differences in infection load were found, groups were also compared on six sub categories of infection load.

Results SD patients had a significantly higher number of infection registrations in both time periods (p <.001). For the medication-only comparisons, a significant difference was found only within the total time period (p <.001). Between-group comparisons of sub categories of infection load indicated that differences were mainly found in the number of acute, localized infections that are commonly with fever.

Discussion Results show that SD patients with a somatoform disorder have a higher infection load preceding their diagnosis as compared to matched controls. These findings implicate that infection load may indeed predispose for developing FSS, and they emphasize the importance of further research on immunological mechanisms in SD patients.

SESSION: Autonomics and Blood Pressure  
Abstract 749  
CONCURRENT PARASYMPATHETIC ACTIVITY CAN ATTENUATE OR ENHANCE SYMPATHETIC INFLUENCES ON sAA  
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The Netherlands, Ennio C. Veerman, PhD, University Medical Center Utrecht, Utrecht, the Netherlands, Myriam M. Lipowsky, PhD, Altrecht Psychosomatic Medicine Elkenboom, Altrecht GGZ, Zeist, the Netherlands, Lorentz J. van Doornen, PhD, Clinical and Health Psychology, Utrecht University, Utrecht, the Netherlands.

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Discussion Results show that SD patients with a somatoform disorder have a higher infection load preceding their diagnosis as compared to matched controls. These findings implicate that infection load may indeed predispose for developing FSS, and they emphasize the importance of further research on immunological mechanisms in SD patients.

SESSION: Autonomics and Blood Pressure
METHODS: Experiment 1: 32 male undergraduates were exposed to a time-paced memory test (MT), an "passive coping" stressful surgical video (SV), and a control condition. Experiment 2: 34 university undergraduates (18 males) were exposed to 8 min of MT and 8 min of cold pressor (CP). Experiment 3: 29 university undergraduates (6 males) engaged in vigorous cycling at 100 Watts resistance. Saliva was collected before, during and immediately upon completion of each stressor, using unstimulated saliva collection (spitting method). Heart variability (rMSSD) and pre-ejection period (PEP) were respectively utilized as markers of cardiac vagal and sympathetic drive.

RESULTS: Experiment 1 and 2: The MT induced the expected cardiac sympathetic activation (PEP=-8ms; p<.001) in conjunction with a vagal withdrawal (p<.001); the SV induced a modest sympathetic activation (PEP=-2ms, p<.05) accompanied by a parasympathetic co-activation (p<.01); CP showed a prominent increase in blood pressure (p<.001) but no cardiac sympathetic drive (p=.20). Regarding sAA, MT induced a substantial increase in sAA immediately upon stressor completion (+85%, p<.001), at which time point there was a vagal rebound, but only modest increases during the stressor when vagal tone was decreased (p<.001). SV stress increased sAA similar to MT, despite its weaker sympathetic effects. During CP no changes in sAA were observed during or after the task. Experiment 3: Exercise caused potent sympathetic activation (PEP=-34ms, p<.001) and vagal withdrawal (p<.001), but only a moderate increase in sAA (+13%, p<.01). Analyses of individual differences showed that exercise sAA increases were largest in those showing the smallest decrease in vagal tone.

CONCLUSION: Changes in sAA during stress appear co-determined by stressor-specific parasympathetic drive. The largest sAA increases were seen during conditions of cardiac sympathetic-parasympathetic co-activation.

Abstract 175

AUTONOMIC IMBALANCE PREDICTS THE DEVELOPMENT OF METABOLIC SYNDROME IN THE FRAMINGHAM HEART STUDY

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Background: Obesity, diabetes, and heart disease—the three most costly epidemics of our time—share a common but rarely treated mechanism: sustained autonomic imbalance (sympathetic overactivity, parasympathetic underactivity). We hypothesized that autonomic imbalance at baseline would significantly increase the odds of developing metabolic syndrome within 12 years. Method: We identified a subgroup of the Offspring cohort of the Framingham Heart Study who did not have metabolic syndrome at baseline (1983-87) and whose metabolic syndrome status was either positive at the 4-, 8-, and/or 12-year follow-up ("ever") or was negative at all three follow-ups ("never"). We conducted a backward elimination variable selection procedure on a logistic regression model, using the dichotomous variable of metabolic syndrome status as the outcome variable. We used the independent baseline variables of autonomic imbalance (resting heart rate and heart rate variability) and the covariates of age, gender, and cigarette smoking, as well as their second-order interactions with autonomic imbalance, to predict the odds of developing metabolic syndrome within 12 years.

Results: Our sample consisted of 1143 participants (mean age 46.6 years, 57% female). As a result of the variable selection procedure, we settled on a simple model consisting of the predictors of heart rate variability (HRV) for age, gender, and cigarette smoking and for age and gender needed). The findings revealed that one standard deviation decrease in heart rate variability increased the odds of developing metabolic syndrome within 12 years by approximately 43% (95% CI 30%-57%, p<.0001). Contrary to our hypothesis, resting heart rate was not a significant predictor. In addition, for each increase in age by 1 year, and for each cigarette smoked, the odds of developing metabolic syndrome within 12 years increased by 2.2% and 1.8%, respectively (age: 95% CI 1.4%-2.9%, p<.0001; cigarettes: 95% CI 0.8%-3.0%, p<.0005).

Finally, the odds of developing metabolic syndrome within 12 years of baseline were 2.2 times higher for males than for females (95% CI 1.73-2.83, p<.0001). Conclusions: In a community sample of middle-aged men and women, low heart rate variability, increased age, cigarette smoking, and being male significantly increased the odds of developing metabolic syndrome within 12 years of baseline. This finding supports a possible role for autonomic imbalance in the development of metabolic risk and its consequences, such as obesity, diabetes, and heart disease.

Abstract 302

BLOOD PRESSURE 'NON-DIPPING' STATUS IS ASSOCIATED WITH GREATER OVERNIGHT EPINEPHRINE EXCRETION.

James D. Lane, Ph.D., Psychiatry and Behavioral Sciences, Cynthia M. Kuhn, Ph.D., Pharmacology & Cancer Biology, Richard S. Surwit, Ph.D., Ilene C. Siegler, Ph.D., M.P.H., Beverly H. Brunnett, Ph.D., Redford B. Williams, M.D., Psychiatry and Behavioral Sciences, Duke University School of Medicine, Durham, NC

A blunted decline in blood pressure from waking to sleep is recognized as a risk factor for cardiovascular disease. A systolic blood pressure (SBP) decline of < 10% defines an individual as a 'non-dipper,' who is at higher risk. The mechanisms responsible for this characteristic are not known, although evidence suggests a possible role for sympathetic nervous system activity in this phenomenon. This study examined the role of epinephrine (EPI) concentration for non-dipper status in a bi-racial sample of 292 women and 205 men aged 18 to 56 years. Assessments included 24-h ambulatory BP monitoring and workday, evening, and overnight urinary catecholamine measurements. Non-dipping status was categorized by a < 10% percent reduction in average SBP from waking to sleeping. Overnight EPI excretion rate (ng/min) (male: 0.21 mg/day; n=140) was the predictor of select of soluble concentration (ng/ml) and volume (ml) divided by the length of the overnight interval (min). In contrast to 'dippers' (N=240), non-dippers (N=257) had a 40% higher overnight EPI excretion rate (1.77 vs 1.25 ng/min, p<.005). Moderating effects of sex and race were examined. Race (N=171 Black, N=326 White) had no effect on EPI excretion and did not interact with dipping status. When race was removed from the model, the interaction of sex and dipping status remained significant (p=.08) and the main effect of dipping status remained (p<.003). The interaction trend suggests a larger effect of dipping status on EPI in men than in women. Male non-dippers had a 63% higher EPI excretion rate compared to dippers (2.26 vs 1.36 ng/min), while the comparable difference was only 20% in females (1.40 vs 1.17 ng/min).

Evidence of greater overnight EPI excretion in those individuals who showed a blunted decline in systolic blood pressure during sleep may be only a marker of elevated EPI concentrations during sleep. Given the widespread effects of EPI on cardiovascular and metabolic functions, such elevations could contribute to cardiovascular risk through multiple pathways that merit further investigation. (This research is supported by NHLBI grant P01HL36587.)

Abstract 268

SELF-REPORTED ENGAGEMENT IN ABSORBING SELF-SELECTED ACTIVITIES PREDICTS LOWER AMBULATORY BLOOD PRESSURE

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Non-medical interventions (e.g., meditation) have positive effects on blood pressure (BP), but often have poor adherence. These interventions may lower BP because they focus attention on positive activities and away from negative thoughts. If refocused attention is an active agent in behavioral BP-lowering interventions, then individuals could engage in a wide range of activities to lower BP, including reading a book, playing music, and any number of other self-selected activities (SSAs), so long as these SSAs absorb a person’s attention. The purpose of this study was to examine if self-rated absorption in SSAs is related to lower ambulatory BP (ABP) in daily life. Participants (n = 38) completed interviews about their SSAs that included reporting their engagement in absorbing SSAs, to which questionnaires (e.g., rumination, trait anxiety) that formed an index of absorption and positive disposition were asked. These measures may be only a marker of elevated EPI concentrations during sleep. Given the widespread effects of EPI on cardiovascular and metabolic functions, such elevations could contribute to cardiovascular risk through multiple pathways that merit further investigation. (This research is supported by NHLBI grant P01HL36587.)
absorption. For nighttime SBP and DBP, only the absorption main effect was significant ($b_2=-2.10$ & $-2.27$, $p<.05$, respectively), indicating that greater reported absorption predicted lower nighttime BP. These results suggest that engagement in absorbing SSAs is related to lower BP in daily life, and have implications for the development of non-pharmacological interventions. Existing interventions should capitalize on components that absorb attention. New interventions can be designed to promote engagement in absorbing SSAs, as they have fewer barriers to engagement than teaching a new skill (e.g., the activity is already enjoyable). Thus, we would expect high rates of persistence and compliance with SSAs-based interventions.

**SESSION: Physical Activity**

**Abstract 581**

**ASSOCIATIONS BETWEEN OMEGA-3 FATTY ACID CONSUMPTION, EXERCISE AND CARDIOMETABOLIC RISK**

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Both physical inactivity and low consumption of long-chain, omega-3 fatty acids (N3FA, found primarily in fish) have been associated with elevated risk for development of diabetes and cardiovascular disease. We previously observed that exposure to N3FA was associated with overall cardiometabolic risk in interaction with physical activity, such that N3FA intake was protective only in persons who also physically active. Here, these associations were re-examined in a separate, larger sample of 472 community volunteers, 30-55 year of age, not taking confounding supplements or prescription medications. Consumption of N3FA was indexed by content of these micronutrients in red blood cells (mole%), and physical activity estimated from the Paffenbarger questionnaire (kcal/week). Risk factors were waist circumference, blood pressure, fasting serum HDL-cholesterol and triglycerides, and insulin resistance estimated using the Homeostatic Model Assessment. Standardized distributions of these 5 variables were averaged to form a composite cardiometabolic risk (CMR) score. In linear regression analyses controlling for age, race and gender, results revealed that physical activity ($b_2=-.254$, $p<.001$) and N3FA exposure ($b_2=-.169$, $p<.001$) were both related inversely to CMR. No interaction between N3FA and physical activity was found ($P>.10$). N3FA exposure was associated, independently of physical activity, with the following individual risk factors: waist circumference ($b_2=-.11$, $p=.009$), triglycerides ($b_2=-.13$, $p=.003$), mean BP ($b_2=-.10$, $p=.02$), and insulin resistance ($b_2=-.127$, $p=.005$). The beneficial associations of N3FA consumption and physical activity were additive, such that persons in the high N3FA exposure and high physical activity tertile had substantially lower standardized CMR ($p<.01$), adjusted for age, gender and race, than persons low in both healthy behaviors (see Figure). In summary, although no statistical interaction was found, healthy habits of regular physical activity and frequent fish consumption appear to jointly reduce overall cardiometabolic risk.
Methods: Using an ambulatory assessment design, subjective stress and active (p<.001), and inversely related to physical and mental fatigue period (all p<.035). Physical activity was positively related to feeling general fatigue and stress, and reduced motivation during the exam period (adjusted beta (SE) = -3.38 (1.33)) than those without an anxiety disorder. When assessing the interaction between Mood and Anxiety disorders we found a non-significant trend for an effect (F=2.93, p=.088). This interaction suggested that those patients with both a mood and anxiety disorder, only an anxiety disorder, and no disorders tended to have less LTPA over time, whereas those participants with only a mood disorder tended to increase their LTPA over time. Conclusions: Having an anxiety disorder was associated with decreasing levels of LTPA over a 2-year period. In contrast, having a mood disorder was not associated with any deleterious effect on LTPA. It is possible that anxious patients at risk of cardiovascular events may decrease their levels of physical activity over time due to fear of having an exercise-induced event. Future research is needed to explore such explanations.

Abstract 522
DYADIC ADJUSTMENT TO CANCER: ILLNESS PERCEPTIONS AND POST-TRAUMATIC STRESS SYMPTOMS IN ADOLESCENT AND YOUNG ADULT PATIENTS AND THEIR CAREGIVERS
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As the understanding and treatment of cancer improves, the population of long-term adolescent and young adult (AYA) cancer patients grows. Alongside their caregivers, AYA cancer patients endure frequent waves of uncertainty and stress that may be perceived differently by each of them. However, because AYA patients and their caregivers share the protracted illness course as a dyad, or two interdependent individuals, their illness perceptions may “spill over” to each other’s psychological health. Using data collected from 112 dyads, this study compared AYA patients’ and caregivers’ illness perceptions and post-traumatic stress (PTS) symptoms, and examined the role illness perceptions played in each other’s PTS symptoms. AYA cancer patients (ages 12-24; 52% male) in active treatment (mean time since diagnosis: 2.5 yrs.) and their caregivers (86% parents; ages 24-68; 85% female) were recruited from an outpatient cancer clinic. Each member of the dyad reported their illness perceptions and completed the baseline and at least one of the follow-up assessments, and were included in the current analyses. A series of repeated measures mixed models were conducted, adjusting for age, sex, history of overt cardiovascular disease, and baseline fitness (total METS on the exercise stress test).

Results: Average LTPA significantly decreased over time (M (SD) baseline MET-hrs/week = 7.8 (12.6), year 1 = 6.9 (11.3), year 2 = 6.5 (11.4)). At baseline 13% of all participants had a mood disorder and 11% had an anxiety disorder. In a main effects model of Mood and Anxiety disorders, Anxiety (F=6.43, p=.012) but not Mood (F=0.40, p=.528) disorder predicted changes in LTPA over time. Those participants who had an anxiety disorder engaged in less physical activity (adjusted beta (SE) = -3.38 (1.33)) than those without an anxiety disorder. When assessing the interaction between Mood and Anxiety disorders we found a non-significant trend for an effect (F=2.93, p=.088). This interaction suggested that those patients with both a mood and anxiety disorder, only an anxiety disorder, and no disorders tended to have less LTPA over time, whereas those participants with only a mood disorder tended to increase their LTPA over time. Conclusions: Having an anxiety disorder was associated with decreasing levels of LTPA over a 2-year period. In contrast, having a mood disorder was not associated with any deleterious effect on LTPA. It is possible that anxious patients at risk of cardiovascular events may decrease their levels of physical activity over time due to fear of having an exercise-induced event. Future research is needed to explore such explanations.

SESSION: Dyadic Approaches
"WE OVEREAT, BUT "I" CAN STAY THIN: PRONOUN USE AND BMI IN COUPLES SHARING UNHEALTHY EATING HABITS.

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Purpose: The purpose of this study is to investigate the link between shared unhealthy eating, pronoun use (we- and I-talk), and body composition. We-talk in couples is usually associated with better coping and health, whereas I-talk is linked to decreased physical and psychological wellbeing. However, studies on health-detrimental habits suggest that pronoun use may also reflect couple’s mutual engagement in unhealthy behaviors.

Methods: Forty-three committed heterosexual couples (mean age = 32.3, SD = 13.0; mean relationship duration = 6.2 years, SD = 7.2) reported on their height, weight, and use of eating to regulate emotion (ERE). During a laboratory session, participants discussed health habits with their romantic partners. We transcribed these conversations, subjected them to Linguistic Inquiry Word Count, and used a multilevel model to test whether ERE and pronoun use were associated with BMI. Results: The interaction between couple’s average BMI, we-talk, and gender was significant, F(1,34) = 8.70, p = .006. Among women in couples with high average ERE, those who used more we-talk had significantly higher BMIs than those who did not use we-talk as frequently (b = .65, p = .0002). However, among women in couples with low average ERE, we-talk was not associated with BMI. The interaction between couple’s average ERE, I-talk, and gender was significant, F(1,34) = 6.04, p = .02. For all women, higher I-talk was associated with lower BMI. This relationship was stronger among women in couples with high average ERE (b = -.28, p = .001 vs. b = -.11, p = .04 for low average ERE). No significant relationships between ERE, pronoun use, and BMI were found in men.

We-talk in couples with high average ERE was associated with higher BMIs for women, but not for men. This suggests that for women the impact of a health-detrimental habit may be compounded by partners with low average ERE, we-talk was not associated with BMI. The interaction between couple’s average ERE, I-talk, and gender was significant, F(1,34) = 6.04, p = .02. For all women, higher I-talk was associated with lower BMI. This relationship was stronger among women in couples with high average ERE (b = -.28, p = .001 vs. b = -.11, p = .04 for low average ERE). No significant relationships between ERE, pronoun use, and BMI were found in men.

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Compared to control couples, PTSD couples reported greater psychological distress, couple conflict, and disaffection (low warmth), and larger increases in anxiety compared to control couples (all ps < .05; range η²: .34-.88). PTSD couples also displayed greater increases in systolic blood pressure and cardiac sympathetic activation in response to the stressor (all ps < .05; range η²: .066-.074). Partners in the PTSD group exhibited similar, if not greater, increases in negative affect and physiological responses as veterans with PTSD (all ps < .05; range η²: .03).

This is the first investigation to document emotional and cardiovascular risks of couple conflict in veterans with PTSD and their partners. Anger and physiological responses to couple discord might be pathways linking PTSD to health risks, for both veterans and their partners.

Abstract 613 EMOTIONAL AND CARDIOVASCULAR RESPONSES TO COUPLE CONFLICT IN POSTTRAUMATIC STRESS DISORDER: A STUDY OF IRAQ AND AFGHANISTAN WAR VETERANS AND PARTNERS

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Posttraumatic stress disorder (PTSD) is associated with increased risk for cardiovascular disease (Boscarino, 2008) and relationship difficulties (Taft et al., 2011). Greater exposure to couple conflict, and greater emotional and cardiovascular reactivity to such conflict, may help explain the link between PTSD and cardiovascular disease in veterans. Partners of veterans with PTSD also experience greater psychosocial difficulties (Lambert et al., 2011). Thus, compared to partners of veterans without PTSD, PTSD partners may experience greater emotional and cardiovascular reactivity to couple conflict.

Methods: One hundred and eighty-nine children aged 10 - 20 (M = 14.95, SD = 2.52) and their parents participated. SES was indexed by the number of bedrooms in the home and crowding (people per bedroom). Children and parents viewed videos depicting an ambiguous social scenario (e.g. teacher discussing a cheating incident in class), and were interviewed separately about their appraisals of the scenario. Responses were coded and parent-child discrepancy scores were computed. Families then engaged in a discussion task about a highly rated area of disagreement in their relationship (conflict task). Blood pressure (BP) and heart rate (HR) readings were taken at baseline and during the conflict task.

Lower average SES across a child’s lifetime marginally predicted greater parent-child discrepancy scores (β = -.156, t = -1.902, p = .059). Lower average SES across a parent’s lifetime marginally predicted greater directional parent-child discrepancy scores (β = -.129, t = -1.688, p = .093), such that lower SES was associated with children appraising relatively more threat than their parents from the same scenario. In addition, lower early-life SES in children (e.g. age 0 – 5) significantly predicted greater parent-child discrepancy (β = -.157, t = 1.941, p = .054), while lower early-life SES in parents marginally predicted greater directional parent-child discrepancy (β = -.128, t = 1.634, p = .104). In turn, greater parent-child discrepancy was associated with greater systolic blood pressure reactivity in parents during the conflict task (β = .116, t = 2.095, p = .047). Greater directional parent-child discrepancy was associated with greater diastolic blood pressure (β = .111, t = 1.912, p = .058) and greater heart rate (β = .105, t = 2.249, p = .026) reactivity in parents during the conflict task, such that the more negatively children appraised an ambiguous social situation from their parents, the greater the parents’ reactivity during the conflict task.

These findings contradict the hypothesis that the tendency to appraise threat develops over time and is influenced by both SES at crucial time points, such as early-life, and also by lifetime trajectory of SES. Furthermore, discrepancies between children and parents in terms of their appraisal of the same social scenario may play a role in shaping how parents in particular respond physiologically to family conflict.

Lower average SES across a child’s lifetime marginally predicted greater parent-child discrepancy scores (β = -.156, t = -1.902, p = .059). Lower average SES across a parent’s lifetime marginally predicted greater directional parent-child discrepancy scores (β = -.129, t = -1.688, p = .093), such that lower SES was associated with children appraising relatively more threat than their parents from the same scenario. In addition, lower early-life SES in children (e.g. age 0 – 5) significantly predicted greater parent-child discrepancy (β = -.157, t = 1.941, p = .054), while lower early-life SES in parents marginally predicted greater directional parent-child discrepancy (β = -.128, t = 1.634, p = .104). In turn, greater parent-child discrepancy was associated with greater systolic blood pressure reactivity in parents during the conflict task (β = .116, t = 2.095, p = .047). Greater directional parent-child discrepancy was associated with greater diastolic blood pressure (β = .111, t = 1.912, p = .058) and greater heart rate (β = .105, t = 2.249, p = .026) reactivity in parents during the conflict task, such that the more negatively children appraised an ambiguous social situation from their parents, the greater the parents’ reactivity during the conflict task.
SESSION: Emotion, Physiology and Health

Abstract 623

EATING BEHAVIORS AND MOOD IN WOMEN'S EVERYDAY LIVES

Kristin E. Heron, Ph.D., Survey Research Center, Stacey B. Scott, Ph.D., Center for Healthy Aging, Martin J. Sliwinski, Ph.D., Human Development and Family Studies, Joshua M. Smyth, Ph.D., Biobehavioral Health, The Pennsylvania State University, University Park, PA

A growing body of research seeks to understand the interplay between eating behaviors and mood. Most of this work, however, utilizes laboratory designs or retrospective self-report measures; Ecological Momentary Assessment (EMA) methods provide an alternative approach that facilitates ecological validity and characterization of temporal processes. We used EMA to examine the relationship between mood and eating behaviors in everyday life among women with sub-clinical disordered eating behaviors. Participants (N = 131, age M = 20, BMI M = 26) completed 5 daily EMA reports on palmtop computers for 1 week. Assessments included measures of negative (NA) and positive affect (PA) and eating-related behavior both during eating (binge eating, loss of control over eating, restricting food intake) and non-eating episodes (skip eating to control weight/shape). Time lagged multilevel random slope models were used in a 2-way interaction between eating behaviors and mood. Results showed higher NA after binge eating (p < .01), loss of control over eating (p < .01), and restricting food intake (p < .02), but not after skipping eating to control weight/shape (p = .31). PA was not associated with any eating behaviors (p > .10). Time lagged analyses support the view that mood effects may be consequences, rather than antecedents, of eating behavior (p < .05 for all antecedent and PA outcomes). Results show higher negative mood did not precede unhealthy eating and weight control behaviors, but was higher when women had recently engaged in these behaviors. This study provides "real-world" and "real-time" evidence for an association between unhealthy eating behaviors and negative mood in young women exhibiting sub-clinical disordered eating behavior. These findings elucidate processes in daily life that may influence the development and maintenance of unhealthy eating and weight control behaviors, which in turn can inform health behavior interventions (e.g., for obesity, diabetes, eating disorders, etc.).

Abstract 285

REVISITING THE LACK OF CORRESPONDENCE BETWEEN SELF-REPORTED AFFECT AND PHYSIOLOGY

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The relationship between self-reported emotions and physiology in the laboratory presents a conundrum: stressful experimental manipulations increase negative emotions and influence physiological responses, yet the relationship between the two often appears small or non-existent. We propose that the correspondence exists, but is often missed due to the use of between-persons statistics (e.g., correlation/regression); these approaches test whether those who are most affected by stress emotionally are also those most affected by stress physiologically. Correspondence, however, is better tested by examining whether emotional and physiological responses covary within individuals over time. We examined if multilevel modeling (MLM) can generate a more sensitive measure of the within-person correspondence between self-reported anger and blood pressure (BP) than between-person statistics. Participants (n = 60) engaged in an anger recall task while instrumented with a cuff (Ohmeda Finapres 2300) to continuously measure systolic BP (SBP) and diastolic BP (DBP). Anger was reported at baseline, immediately after the recall task, and at five points during a twelve-minute recovery period. As expected, anger, SBP, and DBP increased in response to the recall task, and then recovered over time. As is often observed, correlations between anger and SBP/DBP were non-significant (both for change scores from baseline to recall/recovery and for absolute values at recall/recovery; rs = .05 to .17, ps > .20). In contrast, results from MLM indicate a clear correspondence between emotional and physiological changes. Participants' anger scores from each measurement point were entered to predict SBP and DBP for each corresponding point (while controlling for baseline SBP or DBP, time, and average anger scores). The measurement specific anger scores predicted SBP (b = 1.25, p < .003) and DBP (b = 0.62, p < .007). These results suggest the necessity of using within-persons analyses (e.g., MLM) to test the correspondence between emotion and physiology. Moreover, MLM provides the opportunity both for reanalysis of existing data and the exploration of new theories and clinical associations between emotion and physiology.

Abstract 174

EMOTIONS, SYMPTOMS AND ACTIVITY PATTERNS IN CHRONIC FATIGUE SYNDROME: AN EXPERIENCE SAMPLING METHODOLOGY STUDY.

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Background: People with chronic fatigue syndrome frequently describe an uncertain course with fluctuations in symptoms. The cognitive behavioural model of chronic fatigue syndrome suggests that fatigue may be maintained in part by activity limitation or prolonged rest during symptomatic periods. Another activity pattern is higher activity levels ("all-or-nothing behaviour") when feeling relatively well, followed by extended rest. The present pilot study used experience sampling methods to test the hypothesised interrelations between emotional states, symptom levels and activity management.

Method: Twenty participants with a diagnosis of CFS (mean illness duration 7 years) were supplied with specially programmed mobile phones which beeped at ten unpredictable time points throughout the waking hours of each day, over six consecutive days. At the beeps, questions were delivered on the phone relating to mood, symptoms, and activity levels. Questions referred to affective mood, activity levels at the time the beep went off and to the time elapsed between the current and previous beep.

Results: Multilevel regression analyses were conducted using all available data (1198 data points). Symptom severity and negative affect were highly correlated at the same beep. Resting was associated with a higher symptom load at previous, current and subsequent beeps (all p < .001). Feeling well was associated with higher reported activity levels at current and subsequent time-points (p < .001), but higher activity levels predicted more reported symptoms at the subsequent beep (p = .033).

Conclusions: This study using experience sampling methods with CFS patients, provides insight into the interrelations between fluctuations in emotional states, symptoms and activity patterns and suggests that activity management patterns may to some extent be symptom driven. This information may be useful in designing cognitive-behavioural programmes to aid patient recovery.

Abstract 401

POSITIVE/NEGATIVE AFFECT (GLOBAL MOOD SCALE) AND THEIR ASSOCIATION WITH PERCEIVED HEALTH STATUS IN 622 PATIENTS FROM THE INTERNATIONAL HEARTQOL PROJECT

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Background: Positive affect and negative affect are equally important in determining a patient’s psychological well being, and may have an independent effect on cardiovascular outcome. These affective mood states can be assessed with the 20-item Global Mood Scale (GMS). However, little is known about cross-cultural differences in positive and negative affect in cardiac patients from different countries around the world. Moreover, a shortened version of the GMS could contribute to its increased use in cardiovascular research and enhanced response rates. The aim therefore was to examine the cross-cultural and construct validity of a 12-item version of the GMS.

Methods: 622 cardiac patients (fatigue 33%, myocardial infarction 38%, ischemic heart failure 29%) from the International HeartQoL
Project (22 countries) completed the 20-item GMS, the Hospital Anxiety and Depression Scale (HADS), and the Short Form (SF)-36 to assess health related quality of life (HRQL). Clinical variables were derived from medical records. Multi-group confirmatory factor analysis (CFA) in AMOS, and exploratory factor analysis (EFA), reliability analysis and ANOVA in SPSS were used.

Results: EFA and reliability analysis led to the reduction of the original 20-item GMS to a 12-item version (GMS12) with two 6-item scales both comprising an energy (vitality vs. exhaustion) and an emotion component (enjoyment vs. malaise). Positive and negative affect were reliably assessed with the GMS12 (negative=.79-.90, positive=.75-.89). In CFA, cross-cultural measurement equivalence was established at a configural, metric and scalar level, as the factor-item configuration, values of the factor loadings, factor correlation, and error structure were not significantly different across all participating countries (fit indices: CFI =.94; NFI=.91; RMSEA=.016). Specificity analysis showed that the combination of low positive and high negative affect reported the highest positive affect (p<.001; mean differences <2.7). Patients with low positive and high negative affect were at increased risk for a worse disease severity, as indicated by a higher angina symptom class (OR=1.6; 95%CI 1.04-2.35).

Disease severity, as indicated by a higher angina symptom class (OR=1.6; 95%CI 1.04-2.35) and poor mental health (p<.001; η²=.33; see figure), was associated with the combination of low positive and high negative affect reported the highest levels of anxiety (p<.001; η²=.19) and depression (p<.001; η²=.33; see figure), as compared to other patients. They also reported the lowest levels of HRQL (p<.001), particularly in terms of decreased vitality (η²=2-.35) and poor mental health (η²=.28). Finally, angina patients with low positive and high negative affect were at increased risk for a worse disease severity, as indicated by a higher angina symptom class (OR=1.6; 95%CI 1.04-2.35).

Conclusions: The GMS12 is a cross-culturally valid measure of positive and negative affect in cardiac patients. It is important to assess both positive and negative affect, as patients with low positive and high negative affect reported high levels of depression and anxiety, and low levels of HRQL.

Abstract 741

TRAIT MINDFULNESS IS ASSOCIATED WITH AFFECTIVE STABILITY, SELF-REPORTED EXECUTIVE FUNCTIONING, AND LOWER PRE-SLEEP AROUSAL IN DAILY LIFE

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Mindfulness has been associated with better self-regulation as indicated by measures of emotional stability and cognitive-executive functioning (Chambers, Guillone, & Allen, 2009). In prior studies, mindfulness has typically been assessed following mindfulness-training, and emotion regulation has often been assessed via retrospective self-report. Thus, little is known about the relationship between individual differences in mindfulness and self-regulatory processes that occur in daily life. The current study used experience sampling methods to examine the relationship between trait mindfulness, affective stability, subjective executive functioning (EF) and pre-sleep arousal (PSA). A sample of 38 participants (32% male; age 20-45, M=27) completed the Five Factor Mindfulness Questionnaire (Baer, 2006) before beginning two days of experience sampling. Affect ratings were obtained using 23 Likert-scale affect items via palm pilots; 48-hour response rates ranged from 8-22 (M=14; SD=3.5). Within-subjects standard deviations of affect ratings were averaged to create a measure of daily affective stability. EF and PSA were assessed both nights. EF ratings included difficulties with impulsivity, cognitive control, and emotional reactivity from the prior day using items from well-validated measures of EF (BRIEF, CAARS). PSA was assessed via the Pre-Sleep Arousal Scale (Nicassio, 1985). Higher trait mindfulness predicted greater affective stability (ß=.36 p=.02), better daily EF ratings (ß=.37, p=.02), and lower reported PSA (ß=.54, p=.001). Regression analyses indicated that the relationship between trait mindfulness and somatic PSA was no longer significant (ß=.24, p=.08) when controlling for both affective stability (ß=.34, p=.03) and self-reported EF (ß=.31, p=.04), suggesting that daily self-regulation may be an important mechanism by which mindfulness contributes to psychophysiological recovery. Findings are consistent with the hypothesis that mindfulness is associated with prefrontal cortex functioning and parasympathetic nervous system activation.

SESSION: Interventions

Abstract 345

CAN FINDING HEADSPACE REDUCE WORK STRESS? A RANDOMISED CONTROLLED WORKPLACE TRIAL OF A MINDFULNESS MEDITATION APP

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Background: Work stress is a risk factor for depression, hypertension and heart disease. Mindfulness therapies can improve mental health but traditional group courses are impractical for many employees. We investigated whether mindfulness training using a smartphone app influenced work stress, blood pressure and cardiac parasympathetic reactivity.

Methods: 120 healthy employees from a UK pharmacy company were recruited. At baseline participants completed a questionnaire assessing work stress (Karasek model), wellbeing (WEMWBS), anxiety and depression (HADS) and mindfulness (FMI). A hair sample was taken. BP was measured with a wrist monitor 5 times over a work day. Participants were randomised to Group 1 (n=65, app group) or Group 2 (n=55, waitlist control). The app consisted of a 45-day programme of 10-20 minute audio mindfulness exercises (www.getsomeheadspace.com). After 8 weeks all measures were repeated at interview. Group 2 then received the app. An online questionnaire was distributed 18 weeks post baseline.

Results: 8 weeks 115 participants (96%) completed follow-up. Group 1 spent an average 252min listening to meditation (range 0-725min). The intervention was associated with significant improvements in job control, reduced anxiety and depressive symptoms (Table). There was a dose-response relationship between time meditating and gains in mindfulness, well-being and job control (p<0.01) but not with job demands. Mean BP fell by 1.7/2.1mmHg (SBP/DBP) in Group 1 and by 0.7/0.1mmHg in Group 2. In a model adjusted for age, sex and BMI, the difference in DBP over time between groups was significant (Figure). Hair cortisol concentration did not differ between groups 18 weeks 75 (65%) completed a questionnaire. Psychological measures were stable for Group 1 respondents. Group 2 responded to the app similarly to Group 1.

Conclusions: Self-administered mindfulness training with an app is a feasible method for improving psychological wellbeing at work and may reduce blood pressure.

The employer in this trial is now using this app with other employees. Public downloads of the app exceed 150,000.
Abstract 560

CHANGES IN ILLNESS-RELATED COGNITIONS RATHER THAN DISTRESS MEDIATE IMPROVEMENTS IN IBS SYMPTOMS AND DISABILITY FOLLOWING A BRIEF COGNITIVE BEHAVIOURAL THERAPY INTERVENTION.

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Background. Irritable bowel syndrome (IBS) is a characterized by chronic abdominal pain and bowel disturbance in the absence of structural bowel abnormalities. A randomized controlled trial demonstrated that a brief cognitive behavioral therapy (CBT) intervention significantly improved IBS symptoms and related disability compared to treatment as usual (TAU) (Moss-Morris et al., 2010). The aims of the current study were to analyze additional trial data to 1) evaluate whether CBT altered cognitive, behavioral and mood factors hypothesized to perpetuate IBS symptoms and disability and 2) establish if proximal changes in these factors over the 2 month intervention period mediate the positive treatment effects of CBT 6 months later.

Method. Primary-care patients meeting Rome criteria for IBS were randomized into CBT self-management plus treatment as usual (TAU) (n=51) or TAU alone (n=53). The CBT included a structured self-administered 7-week manualized programme in conjunction with 3 hours of therapy. Potential mediators included Brief Illness Perception Questionnaire, Hospital Anxiety and Depression Scale, and the Cognitive and Behavioral Responses to Symptoms Questionnaire were measured at baseline and end of treatment. Mediation analysis with change in mediators across treatment (2 months) and change in outcome at follow-up (6 months) was conducted using bootstrapped path models with Maximum Likelihood Estimation.

Results. Compared to patients in TAU alone, CBT patients showed significant reductions in catastrophizing, fear avoidance, the beliefs that IBS is a biological disease and symptoms are a sign of internal damage, and negative illness perceptions at the end of treatment. Change in negative illness perceptions following intervention mediated the treatment effect on improved IBS symptom severity and disability at 6 months follow-up. Changes in symptom attribution and beliefs also mediated the treatment effect on disability at follow-up. Discussion. This is the first study to show that proximal changes in specified cognitive factors but not mood mediate the long term CBT benefits for IBS. Changing negative beliefs about IBS and the meaning of symptoms appear to be key treatment mechanisms and provide some support for a cognitive behavioral model for understanding IBS. Refining this CBT approach in accordance with these findings and examining longer-term outcomes is now required.

Abstract 206

BRIEF PSYCHOLOGICAL INTERVENTION AFTER SURGERY FOR BREAST CANCER IMPROVES AFFECT AND INCREASES BENEFIT FINDING

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Objective: Group-based psychological interventions lasting from 3-12 months for women with breast cancer (BCa) may improve affect and increase benefit finding (BF) during treatment, though the length of these interventions may not be feasible. A randomized controlled trial demonstrated that a brief (5-week) intervention predicted the positive treatment effects of CB/RT on BF 6 months later. Women's improved affect and BF-positivity at T3; and whether changes in T1-T2 ABS-balance mediated intervention effects on T1-T3 changes in BF-positivity.

Methods: Women (N = 150) with stage 0-III BCa who were 2-10 weeks after BCa surgery showed improved affect and BF, specifically adopting a more positive worldview (BF-positivity). ABS-balance was measured at baseline (T1) and immediately following the 5-week group-based Cognitive Behavioral (CB), Relaxation Training (RT), or attention-matched Enhanced Education (EE) condition. ABS-balance was measured at baseline (T1) and immediately following the 5-week intervention (T2), and BF-positivity was measured at baseline (T1) and 6 months post-baseline (T3). Multiple regression tested whether active intervention (CB/RT) vs control (EE) improved ABS-balance at T2; improved BF-positivity at T3; and whether changes in T1-T2 ABS-balance mediated intervention effects on BF-positivity. Results: Controlling for age and disease stage, we found (1) a group by time effect for ABS-balance (p = 0.030), such that CB/RT significantly improved (p = 0.002) while EE was unchanged from T1-T2; and (2) a group by time effect for BF-positivity (p = 0.014), such that CB/RT significantly increased (p < 0.001) while EE was unchanged from T1-T3. (3) T1-T2 change in ABS-balance accounted for a significant proportion of the variability in T1-T3 change in BF-positivity, R^2 = 0.25, p = 0.014. The Sobel test for mediation, z = -1.677, p = 0.093 indicated that 3) T1-T2 change in ABS-balance partially explained the effect of CB/RT on T1-T3 change in BF-positivity. Conclusions: Women who received a brief CB or RT intervention after BCa surgery showed improved affect right after intervention and, subsequently, showed increased positive worldview benefit finding 6 months later. Women’s improved affect and benefit finding after intervention may have implications for how they adapt to treatment.

Abstract 652

IMPACT OF TELEPHONE-BASED, HEALTH BEHAVIOR CHANGE PROGRAMS ON CORTISOL REGULATION AMONG OLDER ADULTS

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Biological markers of stress, such as abnormal cortisol patterns, have been associated with increased risk for chronic health problems among older adults. Yet, studies investigating the influence of changing one’s health behaviors on cortisol patterns are rare. The current study examined whether participation in one of four telephone-based health behavior change programs [i.e., exercise (EX), nutrition (NUT), stress management (SM)] was associated with reduced self-reported (Perceived Stress Scale) and physiological stress levels (salivary cortisol patterns) among older adult caregivers vs. non-caregivers (mean age=56±6 years; 54% caregivers). Our sample consisted of 54 chronically stressed older adults (mean BMI=30±5, 70% women) who provided salivary samples for cortisol testing at four different times during the day (upon awakening, 30 minutes after awakening, 4pm, and bedtime) at both baseline and 4 months (post-intervention). ANCOVA analyses (controlling for baseline cortisol levels and BMI) showed that older adults in: (1) EX showed greater 4-month decreases in self-reported stress levels compared to those in EX+NUT, especially among non-caregivers (F=14.7, p<0.001); (2) SM showed greater 4-month decreases in overall cortisol levels compared to those in NUT and EX+NUT, particularly among caregivers (F=2.2, p=0.06); and (3) NUT showed normal...
diurnal cortisol patterns at 4 months compared to those in SM, especially among non-caregivers (F=11.4, p<.001). These findings suggested that telephone-based health behavior change programs may have differential effects in regulating stress levels and may need to be tailored to address the unique stressors experienced by older adult caregivers and non-caregivers.

Abstract 205
THE EFFECTS OF A MINDFULNESS PROGRAM ON SUSTAINED BLOOD PRESSURE: THE HARMONY STUDY (HYPERTENSION ANALYSIS OF STRESS REDUCTION USING MINDFULNESS MEDITATION AND YOGA)
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The few studies finding a sustained effect of stress management on BP among hypertensives may be confounded by an enhancement of medication compliance. The HARMONY study was a prospective, wait-list randomized controlled trial designed to test whether mindfulness based stress reduction (MBSR), a standardized group stress-reduction therapy, could lower ambulatory BP (ABP) among those with stage-1 unmedicated hypertension. Final results are presented here.
Study eligibility included mean daytime systolic ABP ≥ 135/85 mm Hg and diastolic ABP ≥ 100 mm Hg. Subjects were randomly assigned to either Early (immediate treatment) or Delayed (wait-list control, after primary outcome period) groups. The primary outcome measure was mean awake and 24HR ABP at the 12 week primary outcome period (12 weeks post baseline for all subjects). In total, 101 adults aged 20–75 yrs were enrolled; 38 males, 63 females with a mean age of 55 + 11 years. Average 24HR ABP was 135/82 ± 7.9/5.8 mmHg and awake ABP was 140/78 ± 7.0/6.0 mmHg at baseline. RANOVA (Group X Time) revealed no significant difference between treatment and control on all ABP parameters, both at the 12 week primary outcome and other time points. The change in 24HR SBP/DBP at 12 weeks between treatment and control was only 0.0/0.4 mmHg (+/-7.2/4.7, both p>0.62). The study had 81% power to detect a 24 hour systolic BP difference of 6.0 mmHg with 37 participants per group. Secondary within-group analyses revealed no significant changes in ABP from baseline or post-MBSR to study close, but in the baseline to post-MBSR analyses there was a 1.8mmHg decrease in 24HR SBP (p=0.05) and of 2.1mmHg in awake SBP (p<0.01).
MBSR was ineffective in lowering ABP among stage-1 unmedicated hypertensives over 12 weeks. Within groups, there was a modest lowering of systolic ABP post-intervention but this was not sustained to the next follow-up measurement. Parameters such as MBSR compliance remain to be examined. It is still unclear whether stress management can have sustained effects on BP in unmedicated hypertensives.

SESSION: Psychoneuroimmunology
Abstract 317
CAREGIVING IS ASSOCIATED WITH CHANGES IN MONOCYTE SENSITIVITY TO GLUCOCORTICOIDS OVER TIME
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Objective. Chronic psychosocial stress has been shown to alter inflammatory processes implicated in the pathogenesis of numerous illnesses, however the mechanisms underlying this are still poorly understood. One possibility is that social difficulties that repeatedly activate the body’s stress systems can result in monocytes becoming desensitized to the anti-inflammatory effects of glucocorticoids over time, eventually giving rise to an ongoing inflammatory state that confers disease vulnerability. Methods. To examine this hypothesis, we enrolled 34 family caregivers of patients with brain cancer and 47 non-caregivers in a 4-visit 10-month longitudinal study. At each visit participants underwent a blood draw. To assess sensitivity to glucocorticoids, we cultured whole blood with lipopolysaccharide and various cortisol doses and measured intracellular expression of interleukin-6 (IL-6) in monocytes via FACS. To quantify peripheral inflammation, we used ELISA to measure serum IL-6. Analyses were done using multilevel modeling. Results. At study entry, caregivers were more sensitive to glucocorticoids than controls (b = .265, SE = .067, p<.001), however they became progressively less so over follow-up (b = -.006, SE = .002, p = .005). Likewise, caregivers had lower levels of serum IL-6 at baseline than controls (b = .337, SE = .163, p = .042), but showed a trend towards increasing IL-6 over follow-up (b = -.009, SE = .004, p = .057). To determine whether the declining sensitivity was due to stress-related changes in glucocorticoid receptor (GR) expression, we measured GR protein via FACS. Caregiving was unrelated to GR protein expression (b = -.007, SE = .005, p = .152). Conclusions. These data are consistent with the hypothesis that caregivers’ monocytes become less sensitive to the anti-inflammatory effects of glucocorticoids over time and that this shift has downstream inflammatory consequences insofar as caregivers showed increasing levels of serum IL-6 over time. This process appears to reflect functional changes in GR signal transduction, as caregiving was unrelated to GR availability. These findings highlight a possible mechanism through which chronic stress can affect processes related to health.

Abstract 368
PREMENSTRUAL CHANGES OF MOOD - A PSYCHO-IMMUNOLOGICAL PHENOMENON?
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Background: Immunopsychological relationships are a well described phenomenon both in animals and men. Especially proinflammatory cytokines have been shown to be involved in the development of sickness behavior and of depressive symptoms. The menstruation can be characterized as a profound local inflammatory response within the endometrium with tissue edema, influx of immune cells and cytokine synthesis. We thus investigated immunopsychological associations during the menstrual cycle. We measured both systemic (i.e., blood) and local cytokines, the last being assessed in uteral cervix secretions. Method: 45 healthy naturally cycling young women participated in this within-subjects study. Chronic stress was assessed in the beginning of the study, mood (Profile of Mood States) and cytokine concentrations (interleukins IL-1β, 2, 4, 6, 8, 10, 12 and 17) were assessed immediately after menstruation, around ovulation and in the early, mid, and late luteal phase. Results: Cervical cytokine concentrations changed throughout the menstrual cycle. This was most prominent for the proinflammatory cytokines IL-1β, IL-6 and IL-8 (all p<0.05) with high concentrations immediately after menstruation decreasing towards ovulation and increasing again in the luteal phase. No significant changes were observed in systemic cytokines. Chronic stress went ahead with higher local cytokine concentrations. Increases in cytokines were significantly associated with mood changes during the luteal phase. Conclusion: To the best of our knowledge this is the first study to demonstrate local cytokine alterations during the menstrual cycle in a within design. Our data indicate complex psychoinmunological interactions related to these alterations.

Abstract 738
CONSISTENT ASSOCIATIONS BETWEEN MEASURES OF DISTRESS AND CMV REACTIVATION IN A LARGE OCCUPATIONAL SAMPLE
Jerrald L. Rector, MSc, Victoria E. Burns, PhD, School of Sport and Exercise Sciences, University of Birmingham, Birmingham, West Midlands, United Kingdom, Marc N. Jarzczok, Diploma, Adrian Loerbroks, PhD, Mannheim Institute of Public Health, Social and Preventive Medicine, Mannheim Medical Faculty, Heidelberg University, Mannheim, Baden-Württemberg, Germany, Paul Moss, MD, Cancer Research UK Centre, University of Birmingham, Birmingham, West Midlands, United Kingdom, Joachim E. Fischer, MD, Cancer Research UK Centre, University of Birmingham, Birmingham, West Midlands, United Kingdom, Marc N. Jarczok, Diploma, Adrian Loerbroks, PhD, Mannheim Medical Faculty, Heidelberg University, Mannheim, Baden-Württemberg, Germany, Paul Moss, MD, Cancer Research UK Centre, University of Birmingham, Birmingham, West Midlands, United Kingdom, The few studies finding a sustained effect of stress management on BP among hypertensives may be confounded by an enhancement of medication compliance. The HARMONY study was a prospective, wait-list randomized controlled trial designed to test whether mindfulness based stress reduction (MBSR), a standardized group stress-reduction therapy, could lower ambulatory BP (ABP) among those with stage-1 unmedicated hypertension. Final results are presented here.
Study eligibility included mean daytime systolic ABP ≥ 135/85 mm Hg and diastolic ABP ≥ 100 mm Hg. Subjects were randomly assigned to either Early (immediate treatment) or Delayed (wait-list control, after primary outcome period) groups. The primary outcome measure was mean awake and 24HR ABP at the 12 week primary outcome period (12 weeks post baseline for all subjects). In total, 101 adults aged 20–75 yrs were enrolled; 38 males, 63 females with a mean age of 55 + 11 years. Average 24HR ABP was 135/82 ± 7.9/5.8 mmHg and awake ABP was 140/78 ± 7.0/6.0 mmHg at baseline. RANOVA (Group X Time) revealed no significant difference between treatment and control on all ABP parameters, both at the 12 week primary outcome and other time points. The change in 24HR SBP/DBP at 12 weeks between treatment and control was only 0.0/0.4 mmHg (+/-7.2/4.7, both p>0.62). The study had 81% power to detect a 24 hour systolic BP difference of 6.0 mmHg with 37 participants per group. Secondary within-group analyses revealed no significant changes in ABP from baseline or post-MBSR to study close, but in the baseline to post-MBSR analyses there was a 1.8mmHg decrease in 24HR SBP (p=0.05) and of 2.1mmHg in awake SBP (p<0.01).
MBSR was ineffective in lowering ABP among stage-1 unmedicated hypertensives over 12 weeks. Within groups, there was a modest lowering of systolic ABP post-intervention but this was not sustained to the next follow-up measurement. Parameters such as MBSR compliance remain to be examined. It is still unclear whether stress management can have sustained effects on BP in unmedicated hypertensives.
Background: A number of small-scale studies have shown that stress may drive reactivation of latent viruses. However, evidence from larger studies is related to acute HPA axis and inflammatory stress responses, and to adaptation of HPA axis and inflammatory responses to repeated stress. Sleep disturbances appeared to partially mediate the relationship between psychological factors and CMV IgG. Other suspected pathways, such as inflammation, were not significant.

Conclusion: In one of the largest studies to date, we found consistent associations with CMV reactivation across measures of distress. These associations appear partly mediated by sleep disturbances and were stronger in those with lower SES.

Abstract 769

**BASEL HPA AXIS ACTIVITY IS RELATED WITH ADAPTATION OF HPA AXIS AND INFLAMMATORY RESPONSES TO REPEATED ACUTE STRESS**

Xuejie Chen, M.Sc; Myriam V. Thoma, Ph.D; Danielle Gianferante, B.Sc; Christine M. McInnis, B.Sc; Nicolas Rohleder, Ph.D; Psychology Department, Brandeis University, Waltham, MA

Objective: Basal diurnal HPA axis activity has been shown to be altered in persons with chronic stress or psychiatric disease, and is considered predictive of negative health outcomes. What is unclear is the underlying mechanism of this relationship. In the present study, we tested one hypothetical pathway i.e. that altered basal HPA axis activity is related to acute HPA axis and inflammatory stress responses, and to adaptation of HPA axis and inflammatory responses to repeated stress.

Methods: We recruited n=68 healthy individuals from two age groups (44 young adults, 25 male and 19 female, mean age = 21.09 yrs., mean BMI = 24.53 kg/m2; 24 older middle-aged adults, 10 male and 14 female, mean age = 55.90 yrs., mean BMI = 25.11 kg/m2), who collected saliva at 6 points on two days: immediately and 0.5h, 1h, 4h, 9h, and 13h after wake up. Participants were further exposed to the Trier Social Stress Test (TSST) twice. Plasma interleukin-6 (IL-6) and salivary cortisol were measured repeatedly until 2 hours after the stress.

Results: First acute stress exposure activated HPA axis and increased plasma IL-6 (both p<0.001), during second exposure, habituation was found in HPA reactivity (time*day F=4.72; p=0.006), but not in the inflammatory response. Steeper diurnal cortisol slopes were related with stronger habituation of cortisol during secondary stress exposure in young adults, and older men, but not older women (interaction F=2.54; p=0.048). Steeper diurnal cortisol slopes were further related with lesser IL-6 sensitization upon secondary stress exposure across both genders and age groups (interaction: F=3.27; p=0.015).

rhythm was also related with several self-reports of psychological well-being.

Conclusion: Our results show that steeper diurnal cortisol daily curve was related with a more adaptive stress response pattern of the HPA axis and the inflammatory response to repeated stress. This is in line with previous findings that a steeper diurnal cortisol curve is related to better health outcomes. However, the relationship differs between age groups and genders, and it remains to be shown if less adaptation is prospectively related with disease.

Abstract 326

**PHYSIOLOGICAL STRESS SYSTEMS AND CELLULAR AGING: ANALYSES FROM A LARGE-SCALE COHORT STUDY**

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Introduction: Telomere length (TL) has emerged as a novel marker of cellular aging, and shorter TL has also been observed in individuals exposed to psychological stress such as those with major depressive and anxiety disorders. There is increasing evidence that psychological stressors exert their effect on cellular aging through the alteration of biological stress systems. This study examined whether the body’s main stress systems – inflammation, metabolic dysregulation, HPA-axis and autonomic nervous system - are associated with TL.

Methods: Data were from 2981 adults (18-65 years, 66% female) of the Netherlands Study of Depression and Anxiety. Inflammation markers included Interleukin-6 (IL-6), C-Reactive Protein (CRP) and Tumour Necrosis Factor-alpha (TNF-α), all five metabolic syndrome indicators were assessed, hypothalamic-pituitary adrenal (HPA) axis was determined by saliva cortisol measures capturing the awakening curve and evening levels, and the autonomic nervous system (ANS) measures included heart rate, respiratory sinus arrhythmia and pre-ejection period (PEP). TL was assessed as the mean telomere repeat sequence copy number (T) compared to a reference single gene copy number (S; T/S ratio) using quantitative PCR. Linear regression analyses were conducted with adjustments for demographic and lifestyle variables.

Results: Significant associations were found between TL and indicators of inflammation, metabolic syndrome and the ANS, but not for the HPA-axis. High CRP (beta= -0.041; p= 0.04), IL-6 (beta= -0.035; p=0.05), triglycerides (beta= -0.079; p<0.001), blood glucose (beta= -0.069; p=0.001), waist circumference (beta= -0.051; p=0.01) and PEP (beta= -0.060; p=0.001) were associated with shorter TL. Associations between TL and TNF-α and HDL cholesterol were borderline significant. A strong association is also seen between the number of stress system dysregulations and TL (beta= -0.086; p<0.001).

Conclusions: This large-scale study showed that telomere length was linked with inflammation, metabolic syndrome indicators and ANS function, but not to the HPA-axis. A dose-response relationship was suggested as a higher number of stress system dysregulations was associated with shorter telomeres.

**SESSION: Depression and Cardiovascular Disease**

Abstract 493

**DOUBLE DEPRESSION IS ASSOCIATED WITH GREATER RISK OF INCIDENT CARDIOVASCULAR DISEASE THAN MAJOR DEPRESSION: DATA FROM THE NATIONAL EPIDEMIOLOGIC SURVEY ON ALCOHOL AND RELATED CONDITIONS (NESARC)**

Stephanie M. Case, M.S., Jesse C. Stewart, Ph.D., Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN

Evidence suggests that depressive disorders and symptoms are risk factors for cardiovascular disease (CVD); however, little attention has been given to the concept of double depression, which is major depressive disorder (MDD) superimposed on dysthymia. We hypothesized that double depression is a stronger predictor of incident CVD due to greater duration of exposure to depression (versus MDD alone) and greater severity of depression (versus dysthymia alone). We analyzed data from 29,581 adults (mean age = 45 years, 58% female, 106x486 152x495 \beta =.14, p<.05), and decreased subjective mental health (β=-.15, p<.005), adjusting for age, gender, marital status, smoking, and SES. Exploratory analyses showed that the association of psychological factors and CMV IgG was stronger in low SES individuals (interaction p<.05). Diurnal cortisol was significantly higher in CMV-infected participants (p<.05), but was not associated with reactivation. Sleep disturbances appeared to partially mediate the relationship between psychological factors and CMV IgG. Other suspected pathways, such as inflammation, were not significant.

Conclusion: In one of the largest studies to date, we found consistent associations with CMV reactivation across measures of distress. These associations appear partly mediated by sleep disturbances and were stronger in those with lower SES.

Abstract 769

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Objective: Basal diurnal HPA axis activity has been shown to be altered in persons with chronic stress or psychiatric disease, and is considered predictive of negative health outcomes. What is unclear is the underlying mechanism of this relationship. In the present study, we tested one hypothetical pathway i.e. that altered basal HPA axis activity is related to acute HPA axis and inflammatory stress responses, and to adaptation of HPA axis and inflammatory responses to repeated stress.

Methods: We recruited n=68 healthy individuals from two age groups (44 young adults, 25 male and 19 female, mean age = 21.09 yrs., mean BMI = 24.53 kg/m2; 24 older middle-aged adults, 10 male and 14 female, mean age = 55.90 yrs., mean BMI = 25.11 kg/m2), who collected saliva at 6 points on two days: immediately and 0.5h, 1h, 4h, 9h, and 13h after wake up. Participants were further exposed to the Trier Social Stress Test (TSST) twice. Plasma interleukin-6 (IL-6) and salivary cortisol were measured repeatedly until 2 hours after the stress.

Results: First acute stress exposure activated HPA axis and increased plasma IL-6 (both p<0.001), during second exposure, habituation was found in HPA reactivity (time*day F=4.72; p=0.006), but not in the inflammatory response. Steeper diurnal cortisol slopes were related with stronger habituation of cortisol during secondary stress exposure in young adults, and older men, but not older women (interaction F=2.54; p=0.048). Steeper diurnal cortisol slopes were further related with lesser IL-6 sensitization upon secondary stress exposure across both genders and age groups (interaction: F=3.27; p=0.015).
42% non-white) who participated in Waves 1 (2001-2002) and 2 (2004-2005) of the NESARC study and who had no history of CVD at baseline. At Wave 1, the Alcohol Use Disorder and Associated Disabilities Interview Schedule was administered to assess lifetime history of DSM-IV major depressive disorder (MDD) and dysthymia. From these data, we computed a 4-level variable: no depression history (n=24,339), lifetime MDD only (n=4,028), lifetime dysthymia only (n=246), lifetime MDD and dysthymia (double depression; n=968). At Wave 2, participants who reported being diagnosed with myocardial infarction, stroke, angina, or arteriosclerosis in the past year by a physician were coded as having had a CVD event; those diagnosed with myocardial infarction or stroke were coded as having had a hard CVD event. There were 1,380 CVD events and 365 hard CVD events. Logistic regression models adjusted for demographics (age, sex, race-ethnicity, education) and CVD risk factors (hypertension, hypercholesterolemia, diabetes, tobacco use, body mass) revealed that lifetime double depression (OR=1.72, 95% CI: 1.31-2.25, p<.001) and MDD only (OR=1.26, 95% CI: 1.06-1.49, p<.01), but not dysthymia only (OR=1.45, 95% CI: 0.88-2.40, p=.15), predicted CVD events. Double depression was a stronger predictor than MDD only (p<.04). In models predicting hard CVD events, double depression remained a predictor (OR=1.86, 95% CI: 1.10-3.16, p=.02) but MDD and dysthymia only did not (both p>-.43). Our findings partially support our hypothesis that young adults with double depression may be a subgroup of depressed patients at particularly elevated CVD risk in which prevention efforts should be intensified.

Abstract 412
MAJOR DEPRESSIVE DISORDER IS ASSOCIATED WITH CARDIOVASCULAR RISK FACTORS IN ADOLESCENTS
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Purpose: Depression is associated with risk factors for cardiovascular disease (CVD) in adults. It is unclear when in the life course of depression this association begins. The purpose of the study was to compare the prevalence of CVD risk factors in adolescents with and without major depressive disorder (MDD). Methods: We compared CVD risk factors, including smoking, obesity, physical activity, sedentary behavior, and parental history of CVD, between adolescents with histories of childhood-onset MDD (N=210), never-depressed siblings of the depressed adolescents (N=195), and unrelated adolescents with no history of any major psychiatric disorder (controls; N=161). The participants were enrolled in a long-term study of juvenile-onset depression. Results: Eighty-five percent of the participants with histories of childhood-onset MDD were in remission when assessed for CVD risk factors during adolescence. Nevertheless, they had a higher prevalence of smoking and were more likely to be sedentary than their siblings and the controls, and they had a higher prevalence of obesity compared to the controls (all ps <.05). Although their average age was in the mid-30's, the parents of the adolescents who had lifetime histories of MDD were more likely to report clinical manifestations of CVD than parents of controls, including higher rates of myocardial infarction and CVD-related hospitalization (ORs, 1.36-4.63). The differences in CVD risk factors between the depressed cases and controls were independent of parental CVD. Conclusion: A history of juvenile onset MDD is associated with an unfavorable CVD phenotype in adolescents. The Aleixo study provided us with unprecedented data and for CVD risk factors, and demonstrated that they segregate in families. Trials are needed to determine whether treating depression in children can decrease cardiovascular risk.

Abstract 84
THE PHQ-2 DEPRESSION SCREEN PREDICTS MORTALITY FOR UP TO 2 YEARS FOLLOWING HOSPITALIZATION OF PATIENTS WITH SYSTOLIC HEART FAILURE
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Background: The American Heart Association recommends routine depression screening of cardiac patients with the 2-item Patient Health Questionnaire-2 (PHQ-2). Reports suggest a positive PHQ-2 is associated with mortality at 1-year following hospitalization with heart failure (HF) but the longer term predictive effect is unknown. (Rollman BL et al., J Cardiac Failure, 2012) Methods: 471 hospitalized HF patients with an ejection fraction (EF) < 40%, NYHA functional class II-IV symptoms, who were suspected of depression were screened with the PHQ-2 prior to discharge from 4 Pittsburgh-area hospitals (12/07-6/09). Sociodemographic, health-related quality of life (SF-12), and clinical information were collected at baseline. We used Kaplan-Meier analyses to calculate the annual incidence of all-cause mortality by PHQ-2 status with log-rank tests for statistical significance. Multivariate Cox models were used to generate hazard ratios (HR) by PHQ-2 status that adjusted for established predictors of HF mortality. Results: At baseline, PHQ-2 positive patients (PHQ-2 (+); n=371), compared with PHQ-2 negative patients (PHQ-2 (-); n=100) were younger (age 65 vs. 70) and more likely to report lower levels of function (NYHA Class: 67% III-IV vs. 61% II) and health-related quality of life (mean SF-12 MCS: 44 vs. 59) (all p<0.005). We confirmed vital status on 99% (467/471) of our study cohort as of 6/30/12 (mean follow up: 1,048 days± 528 days) and identified 198 deaths (42%). At both 1- and 2-years follow-up, more PHQ-2 (+) vs. PHQ-2 (-) patients had died (Table), and the risk associated with a positive PHQ-2 persisted even after adjustment for age, gender, EF, and other established predictors of HF mortality (1-year: HR: 3.19 (95% CI: 1.50-6.80); p=0.003; 2-year: HR: 2.00, (1.19-3.37); p=0.009). However, PHQ-2 status failed to predict mortality by 3 years follow-up (3-year: HR: 1.36 (0.90-2.06); p=0.14; 4-year: HR: 1.44 (0.98-2.12); p=0.07). Conclusion: Among hospitalized patients with systolic HF, a positive PHQ-2, depression was independently predictive of an elevated risk of mortality for up to 2 years. Our findings highlight the adverse impact of depression on HF mortality and inform the design of clinical trials examining the impact of treating depression as a means to reduce HF mortality.

Table: Cumulative Mortality Incidence by PHQ-2 Status

<table>
<thead>
<tr>
<th>Year</th>
<th>PHQ-2 (+) % (n)</th>
<th>PHQ-2 (-) % (n)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>20 (76)</td>
<td>8 (8)</td>
<td>0.005</td>
</tr>
<tr>
<td>2nd Year</td>
<td>31 (116)</td>
<td>19 (19)</td>
<td>0.02</td>
</tr>
<tr>
<td>3rd Year</td>
<td>37 (138)</td>
<td>33 (33)</td>
<td>0.28</td>
</tr>
<tr>
<td>4th Year</td>
<td>43 (161)</td>
<td>37 (37)</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Abstract 559
DEPRESSION AND POST-OPERATIVE RECOVERY IN CORONARY ARTERY BYPASS GRAFT SURGERY PATIENTS: THE ROLE OF INFLAMMATION
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Depression is highly prevalent among patients undergoing coronary artery bypass graft (CABG) surgery and these patients are known to be at greater risk of impaired adaptation and recovery; the reasons for this are not clear. We hypothesised that pre-CABG depressed participants would have a greater inflammatory response to surgery, and that this elevated inflammatory response would be predictive of a longer post-operative hospital stay. We tested this hypothesis in a sample of 154 male and female patients undergoing a first-time, elective CABG procedure. Participants were assessed prior to surgery, three to five days after surgery and two months post-surgery, completing...
psychosocial measures and providing blood samples for the analysis of the inflammatory markers interleukin (IL)-6, high sensitivity C-reactive protein (CRP) and tumor necrosis factor (TNF)-alpha. All analyses controlled for age, gender, socioeconomic status (total annual household income), euroSCORE and baseline depression scores (Beck Depression Inventory [BDI]); all significant findings were p < 0.05. In line with our hypothesis, results found that those participants experiencing greater pre-operative depression symptoms had increased odds of an extended post-operative hospital stay (>7 days). Moreover, compared to those who were not depressed, those participants who were depressed prior to surgery (BDI ≥15) had a significantly higher change in IL-6 from baseline to the days shortly following surgery. However, a greater CRP, but not IL-6, response to surgery was predictive of a longer hospital stay. Therefore, while inflammation is implicated in both depression and post-operative recovery, results were not consistent across inflammatory markers.

SESSION: Ruminating

Abstract 237
DIFFERENTIAL EFFECTS OF POST-STRESSOR RUMINATION AND DISTRACTION ON C-REACTIVE PROTEIN (CRP) IN MIDDLE-AGED WOMEN
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Psychological stressors can lead to acute physiological changes, such as inflammation (Steptoe et al., 2007). For those who ruminate, or mentally rehearse past stressors, these physiological changes may last longer. This is important because chronic inflammation has been implicated in numerous disorders (e.g., atherosclerosis, depression). Prior research suggests a link between the tendency to ruminate and immune system activity (e.g., Segerstrom et al., 2008; Thomsen et al., 2004). The current study tested whether experimentally-induced rumination (compared to distraction) prolongs stress-related inflammation. During a two-hour afternoon laboratory visit, 28 healthy women (mean age = 20.9 yrs) completed a five-minute evaluative speech stressor followed by a brief delay. Participants were randomly assigned to either ruminate on the stressor (n = 14) or engage in distraction (n = 14) for five minutes. Audio and visual prompts guided participants through each task. Circulating concentrations of plasma C-reactive protein (CRP; a protein that increases in response to inflammation) were assessed with enzyme-linked immunosorbent assays four times throughout the visit: 3 minutes pre-stressor and 22, 45, and 64 minutes post-stressor onset. We hypothesized that post-stressor CRP levels would be greater for those who ruminated compared to those who were distracted. Manipulation checks revealed that those in the rumination condition reported more overall thought about the speech task (M = 2.93, SD = 0.62) than those in the distraction condition (M = 1.71, SD = 1.44), t(17.62) = 2.91, p < .01. Furthermore, there were no group differences in attention to the task prompts, t(26) < 1.30. In line with our hypothesis, linear mixed model regressions revealed a differential CRP response pattern over time for rumination and distraction groups, condition x time: F(1,52) = 4.29, p < .05. Follow-up contrast tests and paired t-tests indicate that in the distraction condition, participants’ CRP concentrations increased 45-minutes post-stressor onset and then returned to pre-stressor levels by the end of the visit, distraction X time: t(52) = 2.68, p = .01; paired t(13) = 2.62, ns. In contrast, participants in the rumination condition demonstrated decreased levels in CRP the 45-minutes post-stressor levels by the end of the visit, rumination X time: t(22) = 2.66, p < .01; paired t(13) = 2.84, p < .01. In sum, results suggest that ruminating on stressors may sustain inflammatory responses, whereas distraction may diminish them. Findings have implications for understanding risk and protective factors for persistent inflammation.

Abstract 707
IS WORRYING BAD FOR YOUR INSULIN RESISTANCE?
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Background: Chronic stress has been implicated with the risk of cardiovascular disease and diabetes. Animal models suggest that exposure to chronic stress adversely affects insulin resistance. Elevated fasting insulin levels are one of the early biological markers of insulin resistance. In humans a heterogeneous array of potentially correlated psychosocial stressors exists, ranging from perceived stress related problems over work-related issues to rumination of worries. Little is known which of these potential stressors is related to insulin resistance.

Methods: Cross-sectional analysis at baseline recruitment to an industrial cohort study. 1192 middle aged white collar employees (mean age 52 years, range 45 to 63, ± 5.7 years, 20.1% females) completed the comprehensive work-health-check questionnaire including an extensive battery on subjective health, personal resources, work-related psychosocial resources, work-related demands and stress, health behavior and worry. The latter was operationalized using a five-item scale including items on chronic worry and rumination. Log-transformed morning fasting insulin levels were regressed onto other metabolic parameters, physiological measures and psychometric scales using generalized linear models.

Results: A linear regression model comprising of the biological measures glucose, HbA1c, BMI, LDL-cholesterol, HDL, age and gender explained 37.4% of the variance (F = 11.83). Adding psychosocial measures significantly improved the model (p = 0.0024, based Akaiake Information Criterion). Self-reported health behavior (std. beta = - 0.08, p = 0.005), the worry-scale (std. beta = 0.09, p = 0.018) and the self reported subjective stress level during the previous day (std. beta = 0.06, p = 0.04). While the tradeoff to rumination had a marginally significant association, but not work demands, general sleep quality, personal resources, overall perceived stress or work related resources.

Discussion: Out of a large array of potential psychosocial stressors evaluated in this study, worry and perceived stress during the previous day showed a small but statistically significant association with fasting morning insulin levels.

Abstract 629
POST-STRESS RUMINATION PREDICTS HEIGHTENED FUTURE CORTISOL RESPONSE TO STRESS
Danielle Gianferante, MA, Myriam V. Thoma, Ph.D, Aysha Malik, BA Candidate, Luke C. Hanlin, MA, Nicolas Rohleder, PhD, Psychology, Brandeis University, Waltham, MA

Objective: Rumination defined as past-centered negative thinking, has been linked to stress physiology and has been suggested to affect mental and physical health. Research has shown links between stress-related rumination and elevated cortisol levels. However, the relationship between past stressors and future stress responses had not yet been tested. We hypothesized that increased stress-related rumination will predict heightened cortisol responses to a future stressor.

Methods: Twenty-eight participants (14 male) of two age groups (18-22 yrs., n=11; 50-65 yrs., n=17) were exposed to the Trier Social Stress Test (TSST) twice on consecutive days. Salivary cortisol was measured 1 min before, and 1, 10, 30, 60 and 120 min post TSST on both days. Ten minutes after the initial stressor, participants provided self-reports of state rumination by indicating how often since the stressor they had experienced thoughts such as “I always do badly in this type of situation”. Participants also provided a trait-based rumination measure, as well as several state-based affect measures.

Results: The TSST induced significant changes in cortisol over time (F=7.726; p<.001). Habituation to second time stress exposure was found: cortisol increases were marginally lower on the second day of testing (F=3.457; p=0.074). There were no gender difference in state rumination scores (r=.243, p=.810). State rumination correlated with cortisol on day one return to pre-stressor levels (r=.376, p=.002). Ruminating on day one predicted cortisol responses on day two (r=.486, p=.009). State rumination was highly correlated with perceived stress and depressive symptoms (lowest r= .468, highest p=.012). However, neither of these variables were correlated with cortisol responses on either day (highest r=.274, lowest p=.175). Trait rumination scores were correlated with state rumination (r=.493, p=.009), however, trait rumination was not associated with cortisol responses on either day (highest r=.29, lowest p=.13).

Conclusions: Increased rumination in response to first-time stress exposure was predictive of higher cortisol responses to second-time stress exposure. We found that initial post-stress rumination is related to maladaptive cortisol response patterns over time. Broadly, these results suggest that interventions that focuses on reducing rumination as a response to stressful experiences might be effective in correcting maladaptive stress response patterns.
Abstract 347
WRITTEN EMOTIONAL DISCLOSURE BUFFERS AGAINST THE EFFECTS OF MALADAPTIVE RUMINATION ON AMBULATORY BLOOD PRESSURE: A MULTI-LEVEL APPROACH
Daryl B. O'Connor, PhD, Psychology, University of Leeds, Leeds, West Yorkshire, UK, Laura Ashley, PhD, Oncology, St James's Institute of Oncology, Leeds, West Yorkshire, UK, Fiona Jones, PhD, Psychology, University of Leeds, Leeds, West Yorkshire, UK, Eamonn Ferguson, PhD, Psychology, University of Nottingham, Nottingham, Nottinghamshire, UK
Background: Writing about distressing events and experiences has beneficial effects on psychological and physical health outcomes. Written emotional disclosure (WED) has also been found to buffer against depression symptoms among those with maladaptive rumination (i.e., brooding). This study, using a multi-level design, examined whether WED can buffer against the effects of brooding on daily cardiovascular outcomes.
Method: Seventy-two participants were randomised to write about their most stressful life experience(s) or non-emotive topics, for 20 minutes, on 3 consecutive days. Two weeks and 14 weeks later ambulatory blood pressure (ABP) levels were recorded every 30 minutes over a 12 hour working day (yielding 3130 observations). Levels of activity were also recorded at the time of each reading. Brooding and reflection and resting blood pressure were measured at baseline together with demographic variables (age, BMI, family history of hypertension).
Findings: Using hierarchical linear modelling (controlling for baseline ABP, activity levels and familial hypertension), a main effect of writing condition was found for systolic blood pressure (SBP) and diastolic blood pressure (DBP) at 2 weeks but not at 14 weeks follow-up, such that higher levels of ABP were observed following trauma writing compared to the non-emotional writing condition. Furthermore, as predicted, there was a significant condition x brooding interaction at 2 weeks (but again not at 14 weeks follow-up) for SBP and DBP indicating that higher levels of brooding were associated with lower ABP levels in the WED condition but not in the control condition.
Discussion: These findings suggest that WED can buffer against the effects of maladaptive rumination on daily cardiovascular outcomes. The effects on ABP appear to short-lived suggesting brooders may benefit from booster writing sessions.

SESSION: Maternal-Fetal Health
Abstract 65
SLEEP DURATION BUT NOT SLEEP DISRUPTION IS ASSOCIATED WITH DIURNAL CORTISOL IN PREGNANT WOMEN
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Background: Dysregulated cortisol profiles are associated with adverse pregnancy outcomes. Sleep disturbance in non-pregnant individuals dysregulates cortisol profiles. Sleep disturbance is common in pregnancy but the association between sleep disturbance and cortisol has not been prospectively examined in pregnant women.
Methods: Women's (n=82) self-reported sleep, negative affect and salivary cortisol were repeated in each trimester for 82 pregnant women. Samples were collected 5 times per day over the course of 2 days in each trimester for a total of 30 paired psychological distress and cortisol measurements. Women with shorter sleep duration were reliably associated with changes in the cortisol trajectory on the following day, and if these associations were altered by between-person differences in negative affect.
Results: Sleep duration, but not sleep quality or sleep disruption, was associated with changes in the cortisol trajectory. Shorter sleep duration was associated with lower waking levels (β=-.001, p<.05), but higher levels 30 min post waking (β=-.001, p<.01); a sharper decline over the course of the day (β=-.005, p<.01), and attenuation of this decline toward the evening (β=-.0003, p<.01) compared to longer sleep duration. After controlling for pre-pregnancy BMI and obstetric history, individual differences in negative affect altered the association between sleep duration and cortisol. Women with shorter sleep duration and lower negative affect had the highest cortisol levels 30 min post waking and the flattest daytime trajectories, whereas women with longer sleep duration and higher negative affect had a blunted awakening response and the steepest decline in daytime cortisol (see Figure 1).
Discussion: Sleep disruption and negative affect during pregnancy are recognized correlates of adverse obstetric outcomes. We found that short sleep duration was associated with a larger CAR and higher evening cortisol levels, and that negative affect moderated these associations. While these findings are consistent with those reported for non-pregnant individuals, we further contend that they may be particularly relevant in pregnancy. Sleep disturbance and negative affect in pregnancy may dynamically dysregulate cortisol thereby increasing risk for adverse pregnancy outcomes.

Abstract 51
BIOBEHAVIOURAL COHERENCE BETWEEN PSYCHOLOGICAL DISTRESS AND CORTISOL OVER THE COURSE OF PREGNANCY: IMPLICATIONS FOR FETAL PROGRAMMING BY MATERNAL STRESS
Gerald F. Giesbrecht, PhD, Paediatrics, Tavis Campbell, PhD, Psychology, University of Calgary, Calgary, Alberta, Canada, Nicole Letourneau, PhD, Nursing, Bonnie J. Kaplan, PhD, Paediatrics, University of Calgary, Calgary, AB, Canada
Background
Despite strong evidence that advancing gestation attenuates autonomic nervous system responses in pregnant women, there is little evidence to suggest that HPA axis responses to psychological provocation are also attenuated. Nevertheless, it is widely held that dampening of the HPA axis response to psychological distress serves a protective function for the mother and fetus.
Methods
Ambulatory assessment of ecologically relevant psychological distress and salivary cortisol were repeated in each trimester for 82 pregnant women. Samples were collected 5 times per day over the course of 2 days in each trimester for a total of 30 paired psychological distress and cortisol samples per woman.
Results
Psychological distress and cortisol were positively associated, β=.024, p<.01, indicating that increases in psychological distress within the day-to-day experiences of pregnant women were reliably associated with increases in cortisol (Table1, Model 1). Gestational age did not moderate the association between psychological distress and cortisol, β=.009, p=.13 , suggesting that negative psychological experiences remain potent stimuli for the HPA axis during pregnancy (Table 1, Model 2).
Conclusions
Biobehavioral coherence between ecologically relevant experiences of psychological distress and cortisol is not attenuated with advancing...
gestation. Psychological experiences remain potent stimuli for the HPA axis throughout pregnancy suggesting that changes in the psychobiology of cortisol during pregnancy do not confer a protective function for mother and fetus.

Table 1. Multilevel Models for Covariation between Psychological Distress and Cortisol (Model 1), Effects of Gestational Age on the Covariation between Psychological Distress and Cortisol (Model 2)

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td>Esti-</td>
</tr>
<tr>
<td></td>
<td>mate</td>
</tr>
<tr>
<td>Momentary (level 1) Effects</td>
<td></td>
</tr>
<tr>
<td>WAKING Levels ((\tau_{0j}))</td>
<td>-1.64</td>
</tr>
<tr>
<td>CAR ((\tau_{ij}))</td>
<td>0.32</td>
</tr>
<tr>
<td>TIME ((\tau_{ij}))</td>
<td>-1.12</td>
</tr>
<tr>
<td>TIME(^2) ((\tau_{ij}))</td>
<td>0.002</td>
</tr>
<tr>
<td>PSYCHOLOGICAL DISTRESS ((\tau_{ij}))</td>
<td>0.024</td>
</tr>
<tr>
<td>Gestation Age (level 2) Effects</td>
<td></td>
</tr>
<tr>
<td>For WAKING Levels ((b_{0ij}))</td>
<td>-0.27</td>
</tr>
<tr>
<td>For CAR ((b_{1ij}))</td>
<td>-0.006</td>
</tr>
<tr>
<td>For TIME ((b_{1ij}))</td>
<td>0.001</td>
</tr>
<tr>
<td>For TIME(^2) ((b_{1ij}))</td>
<td>-0.002</td>
</tr>
<tr>
<td>For PSYCHOLOGICAL DISTRESS ((b_{1ij}))</td>
<td>0.0009</td>
</tr>
</tbody>
</table>

Note: Estimates are presented for the final most parsimonious models. Words in capital letters indicate time-varying (Level 1) variables. CAR = cortisol awakening response; SE = standard error.

Abstract 202

**BIO-BEHAVIOURAL COHERENCE BETWEEN MOOD AND HEART RATE VARIABILITY DURING PREGNANCY**

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Background: Heart rate variability (HRV) is a valuable tool for measuring autonomic responses to stress and emotion. Pregnancy initiates dramatic changes in cardiac autonomic function, including reductions in 24-hour HRV within 6 weeks after conception. However, the extent to which HRV remains a valid index of short-term emotional changes in pregnant women is not known. The aim of this study was to assess bio-behavioral coherence between momentary mood and HRV in early pregnancy.

Methods: Ambulatory assessments of HRV and mood were completed by 41 women in early pregnancy (<13 weeks gestation). Continuous heart period was recorded for 2 days along with 6 mood samples collected 30 minutes post-waking, at 11:00, and at 21:00 on each day. Data analysis examined associations between mood and HRV in the 20 minutes prior to the mood sample. HRV segments were excluded if the participant reported exercising or napping during the 20-minute assessment period. Multilevel models evaluated time-varying covariations between HRV [high frequency (HF) and low frequency (LF)] and mood (positive and negative), adjusting for time of assessment and mean HRV for the time segment of interest. HF-HRV and LF-HRV represented the primary outcome variables. HRV measures were calculated using the Fast Fourier method and were log-transformed. Mood variables were person-centered to focus on within-person associations between mood and HRV.

Results: Increases in both positive (B = -0.482, p < .01) and negative (B = -0.489, p < .05) mood were associated with reduced HF-HRV, indicating that emotional arousal, regardless of valence, was associated with parasympathetic withdrawal. LF-HRV was negatively associated with only positive mood (B = -0.328, p < .01). Maternal age moderated each of these effects, such that a stronger association between mood and HRV was observed in younger than in older women. Specifically, there was an age × positive mood interaction effect on HF-HRV (B = 0.076, p < .01) and on LF-HRV (B = 0.054, p < .01) and an age × negative mood interaction effect on HF-HRV (B = 0.088, p < .05).

Conclusions: Despite changes in autonomic cardiac modulation in early pregnancy, these results suggest that HRV remains sensitive to changes in emotional arousal, but bio-behavioural coherence is not valence-specific for HF-HRV. Ongoing data collection and analyses will focus on the potential moderating influence of obstetric variables (e.g., parity) and salivary cortisol on bio-behavioural coherence of mood and HRV and on changes in mood-HRV associations from early to late pregnancy.

Abstract 403

**FETAL ORIGIN OF ALLERGIC ASTHMA: INSIGHTS ON MECHANISTIC CUES AND THERAPEUTIC TARGETS ARISING FROM A MOUSE MODEL OF PRENATAL STRESS CHALLENGE**

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Background: Prenatal stress challenge is a pivotal environmental factor that has been proposed to increase the vulnerability of offspring to develop chronic immune diseases in later life. We analyze the effect of prenatal exposure to stress. Methods: BALB/c mice were exposed to sound stress during late gestation. Allergic asthma was induced in the offspring. We analyzed immune cells in lungs, bronchoalveolar fluid (BAL) and lung-draining lymph nodes as well as cytokine concentrations in the BAL. Further, stress-challenged pregnant females were treated with a progesterone derivative. Results: Stress challenge resulted in decreased serum levels of maternal progesterone. Prenatally stressed female adult offspring revealed an increased susceptibility toward asthma, mirrored by an increased airway response, influx of inflammatory cells and increased T helper 2 cytokines in the BAL. Progesterone supplementation abrogated the impaired intrauterine development as well as the susceptibility of asthma. Conclusions: Our study revealed that prenatal stress severely interferes with the intrauterine development, resulting in offspring with an increased vulnerability toward asthma-like symptoms. Supplementation of progesterone during stress-challenged pregnancies abrogates gender-dependently the increased susceptibility.

**SESSION: Trauma and PTSD**

Abstract 733

**PATHWAYS FROM CHILDHOOD TRAUMA TO ELEVATED C-REACTIVE PROTEIN IN ADULTHOOD: THE ROLES OF ANXIETY, HEALTH BEHAVIORS AND DISRUPTED SLEEP**

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Many studies have linked a history of childhood trauma (CT) with the incidence of adult inflammatory diseases and elevated markers of inflammation, including C-reactive protein (CRP). It has been proposed that the association between CT and adult inflammatory profiles is governed by diverse behavioral and physiological processes.

We
hypothesized that CT impacts adult inflammation through sleep disruption, poorer health behaviors and emotion-based eating secondary to elevated trait anxiety and general distress. To model the impact of childhood trauma on circulating CRP, we used a structural equation modeling approach on a subsample of the Midlife in the United States (MIDUS) biomarker project. Participants were 672 adults without a history of cancer, diabetes, cardiovascular disease or stroke. They completed a physical examination, questionnaires, and provided blood for assay of CRP. We tested for gender differences by holding as many parameters invariant between genders as possible while still retaining good model fit. The measurement model fit the data well, as did the structural model. Tests of direct and indirect effects revealed that childhood trauma was significantly associated with elevated CRP, through pathways including disrupted sleep (p = 0.02), and elevated body mass index (BMI; p < 0.01) and marginally via poorer health behaviors (p = 0.06). Elevated distress, higher levels of trait anxiety, or both mediated these effects. Men and women differed in reported levels of physical abuse, sexual abuse, and physical neglect. Compared to men, women showed a stronger association between distress and the use of food as a coping mechanism. Both men and women showed disrupted sleep secondary to increased distress associated with childhood trauma, however, in the best fitting model men also had a direct path from childhood trauma to disrupted sleep independent of trait anxiety and distress. We contend that childhood trauma results in elevated C-reactive protein in adulthood via multiple behavioral pathways. Men and women experience trauma in qualitatively distinct patterns but share many vulnerabilities which can lead to elevated health risks.

Abstract 592

OBJECTIVE EVIDENCE OF CARDIOVASCULAR ISCHEMIA IN PATIENTS WITH POST-TRAUMATIC STRESS DISORDER: RESULTS FROM THE MIND YOUR HEART STUDY
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Background: Prior studies have demonstrated patients with post-traumatic stress disorder (PTSD) are at increased risk for cardiovascular disease (CVD), but few studies include objective measures of cardiovascular disease and none have evaluated subclinical disease. In addition, how PTSD causes CVD remains unknown. We evaluated the association between PTSD and an objective measure of cardiac ischemia (exercise treadmill testing) in a large cohort or outpatients, the majority of whom did not have known clinical CVD. We also evaluated the potential biological, behavioral, and psychosocial mediators of the association of PTSD and CVD.

Methods: The study included 663 outpatients from two Department of Veterans Affairs (VA) Medical Centers enrolled in the Mind Your Heart Study between 2008 and 2010. PTSD was assessed using the gold-standard Clinician Administered PTSD Scale (PCL-C), which yields both a PTSD diagnosis and a continuous symptom severity score. Exercise treadmill tests were performed with a standardized protocol and results were reviewed by physicians and a supervising cardiologist who were blinded to PTSD status. Logistic regression models were used to evaluate the association of PTSD and ischemic changes on exercise treadmill testing. Models were serially adjusted for potential confounders and mediators.

Results: Of the 663 participants, 230 patients (35%) had PTSD. Seventeen percent of patients with PTSD had ischemic changes on ETT as compared to 10% of patients without PTSD (P = 0.006). The association between PTSD and ischemia remained significant after adjusting for potential confounders (age, sex, prior cardiovascular disease) and mediators (traditional cardiac risk factors, C-reactive protein, health behaviors, sleep quality, social support and depression), adjusted OR 2.42, 95% CI 1.39-4.22, P = 0.002. Findings were also significant when those with prior cardiovascular disease were excluded (fully adjusted OR 2.24, 95% CI 1.20 – 4.18, P = 0.01) and when continuous PTSD symptom score rather than PTSD diagnosis was used as a mediator (fully adjusted OR 1.43, 95% CI 1.09-1.88, P = 0.01 per standard deviation in PTSD symptom score).

Conclusions: PTSD was associated with greater likelihood of ischemic changes on ETT independent of traditional cardiac risk factors, C-reactive protein, and several health behaviors and psychosocial risk factors, suggesting other mechanisms linking PTSD and ischemia should be explored. In the majority of patients in this study, ischemia on exercise treadmill testing represented subclinical CVD. This highlights the opportunity and need for early intervention in patients with PTSD to prevent progression to myocardial infarction and other CVD events.

Abstract 427

VETERANS WITH PTSD AFTER COMBAT-RELATED CONCUSSION EXHIBIT ALTERED POSTERIOR CINGULATE ACTIVITY WHILE APPRAISING FACIAL EMOTIONS
I-Wei Shu, MD PhD, Scott C. Matthews, MD, Psychiatry Service, Veterans Affairs San Diego Healthcare System, San Diego, CA, Julie A. Otton, PhD, Naval Health Research Center, San Diego, CA

Background. Over twenty-five percent of military personnel who experience mild traumatic brain injury (mTBI) during combat in Operations Enduring or Iraqi Freedom (OEF/OIF) develop posttraumatic stress disorder (PTSD). Comorbid PTSD exacerbates social impairment in veterans with mTBI. Social impairment in neuropsychiatric populations, e.g., major depression, schizophrenia, insomnia, and even in areas of potentially threatening stimuli, including the mental states of self or others. These areas include medial frontal, anterior cingulate and posterior cingulate cortices (MFC, ACC, PCC). However, whether such abnormalities occur in veterans with PTSD after mTBI during appraisal of socially-salient stimuli has not been directly examined.

Approach. We hypothesized that, compared to veterans with mTBI only, veterans who develop PTSD after mTBI exhibit altered brain activity in these areas during social appraisal. To test this hypothesis, we recorded electroencephalography (EEG) in 32 OEF/OIF veterans (16 mTBI only; 16 mTBI+PTSD) during the Reading the Mind in the Eyes Task (RMET), a validated social appraisal task that requires subjects to match words for higher-order mental states with images of eyes cropped from photographs of human faces. Results. Behaviorally, no group differences in accuracy were observed. Electrophysiologically, mTBI+PTSD veterans exhibited ERP changes, including greater N300/P300 amplitudes. Greater N300 negativity (at Cz) correlated with greater PTSD severity (r < 0.01). Independent brain components contributing maximally to N300/P300 source localized to 4 primary clusters: bilateral occipital, medial occipital, PCC and dorsal cingulate. Only the PCC cluster reproduced greater N300/P300 amplitudes in mTBI+PTSD versus mTBI only veterans. Furthermore, greater PCC N300/P300 amplitudes correlated with greater PTSD severity.

Conclusion. Consistent with our hypothesis, these results demonstrate that veterans with PTSD after mTBI exhibit altered brain activity in areas responsible for appraising the feelings of others. These changes may suggest veterans with mTBI+PTSD experience the expression of others as more threatening, which could contribute to social impairment in this population.

Abstract 330

CHILDHOOD TRAUMA IMPACTS CARDIOVASCULAR RECOVERY FROM ACUTE STRESS IN HEALTHY PREEMENOPAUSAL WOMEN
Carissa A. Low, PhD, Dana H. Bovbjerg, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Early life adversity is emerging as an important risk factor for cardiovascular disease, cancer, and other diseases of aging, particularly among women, but the mechanisms underlying these associations remain unclear. Exposure to traumatic stress in childhood may lead to lasting dysregulation of physiological responses to stress, such as exaggerated or prolonged cardiovascular reactivity resulting in cumulative biological wear-and-tear over the life course. We hypothesized that healthy women with a history of childhood trauma would exhibit exaggerated cardiovascular responses to an acute standardized laboratory challenge and impaired recovery after the stressor. Nonsmoking women aged 24 to 49 (n = 151, mean age = 34.5, 80% Caucasian) with no self-reported or nurse-identified health problems were recruited. Following informed consent, all completed a measure of childhood abuse and neglect (Childhood Trauma Questionnaire) and underwent the Trier Social Stress Test (TSST).

A-44
Blood pressure and heart rate were monitored at baseline, during stress, and for 75 minutes post-stress. Repeated-measures analyses, adjusting for body mass index and age, revealed a significant time x history of childhood trauma (HCT) association for diastolic blood pressure (DBP) and mean arterial pressure (MAP). There were no differences between women with HCT+ (n=75) and without (HCT−, n=76) histories of childhood trauma during the baseline or during the TSST, but HCT+ women exhibited delayed recovery in MAP and DBP following completion of the stressor (p’s < .05). For HCT- women, MAP and DBP returned to baseline levels 15 to 30 minutes after completing the speech and mental arithmetic task, whereas HCT+ women exhibited elevated MAP and DBP for up to 60 minutes post-stress. These findings suggest that exposure to childhood trauma may result in long-lasting impairment of stress recovery mechanisms. Over time, such prolonged physiological activation following stresses of daily life may lead to greater allostatic load and increased risk for negative health outcomes.

Abstract 306
POLY-VICTIMIZATION IN CHILDHOOD IS RELATED TO LOWER CORTISOL STRESS RESPONSE IN YOUNG ADULT WOMEN

Aimee J. Midei, M.S., Psychology, Karen A. Matthews, Ph.D., Psychiatry, Epidemiology, University of Pittsburgh, Pittsburgh, PA

Childhood victimization experiences often co-occur within individuals, such that an exposure to one type of violence increases the likelihood of being exposed to a second form of violence, and this is termed poly-victimization. The present study aimed to examine the relationship between poly-victimization and cortisol response to psychosocial stressors. Undergraduate women from the University of Pittsburgh responded to an online survey measuring history of six different victimization experiences occurring before the age of 18: physical abuse, sexual abuse, peer violence, intimate partner violence, community violence, and witnessing violence. Ninety-two healthy women with a mean age of 18.6 were recruited into 2 study groups (n = 48 controls with no history of childhood victimization, and n = 44 poly-victims). Participants engaged in the Trier Social Stress Test (public speech and mental arithmetic) in the mid-afternoon. Salivary cortisol was obtained at three points, immediately prior to the stressor, 30 minutes after stressor initiation, and 50 minutes after stressor initiation. The cortisol stress response was analyzed by calculating the area under the curve with respect to ground (AUCG) and with respect to increase (AUCI). After controlling for childhood socioeconomic status and oral contraceptive use, linear regressions showed that poly-victims had significantly lower total cortisol output, as measured by AUCG (B = -6.70, SE = 2.43, p < .01). Poly-victims tended to have a less sensitive cortisol response, as measured by AUCI (B = -3.40, SE = 2.01, p = .09). There were no differences between controls and poly-victims on subjective experiences during the stress tasks or cortisol values at baseline. The findings with AUCG remained when analyses adjusted for CES-Depression symptoms and body mass index. In sum, this study provides preliminary support for a link between childhood poly-victimization and dampened cortisol responses in young adult women. Supported by 2TL1RR024155-06 (University of Pittsburgh, Clinical and Translational Science Institute), R24 HL076852 and HL076858.

SESSION: Discrimination

Abstract 240
PERCEIVED DISCRIMINATION AND HYPERTENSION: A COMPREHENSIVE SYSTEMATIC REVIEW

Cynthia M. Dolezsar, MA, Behavioral Medicine Laboratory, Jennifer J. McGrath, PhD, Pediatric Public Health Psychology Laboratory, Alysia J.M. Herzig, MA, Sydney B. Miller, PhD, Behavioral Medicine Laboratory, Concordia University, Montreal, Qc, Canada

Discrimination is posited to underlie racial disparities in hypertension. Extant literature suggests a possible association between perceived racial discrimination and blood pressure, although inconsistent findings have been reported. The aim of this comprehensive systematic review was to quantitatively evaluate the association between perceived racial discrimination with hypertensive status and blood pressure. An electronic database search of PubMed and PsychNFO [keywords: (blood pressure or hypertension or diabetic or systolic or systolic) and (racism or discrimination or prejudice or unfair treatment)] was combined with descending and ascendency approaches. Forty-four articles met inclusion criteria (N = 32,651; 104 effect sizes). Articles were coded for demographics, lifestyle behaviors, hypertensive diagnosis, blood pressure measurement, discrimination measure and constructs, study quality, and effect sizes. Random effects meta-analytic models were tested based on Fisher’s Z, the derived common effect size metric. Perceived racial discrimination was associated with hypertensive status [Fisher’s Z=0.048, 95% CI (.013, .087)], but not with overall resting blood pressure [Zystolic=-0.011, (-0.06, .031); Zdiastolic=-0.016, (-.006, .034)]. Moderators that strengthened the relation included sex (male), race (Black), age (older), education (lower), and hypertensive status. For resting blood pressure, the relation was significant only for institutional-setting type discrimination measures [Zystolic=-0.046, (-.040, .060); Zdiastolic=0.060, (.045,077)]. Perceived discrimination was most strongly associated with nighttime ambulatory blood pressure, especially among Blacks (Zystolic=-0.17, -.070, .245); Zdiastolic=-0.227, (.179, .255)]. Despite methodological limitations in the existing literature, there was a small, significant association between perceived discrimination and hypertension. Future studies should examine contextual-level indicators of discrimination (e.g., neighborhood segregation), racial minority status, and acculturation, which may more accurately capture daily variation attributable to experienced racial discrimination. Perceived discrimination may partly explain racial health disparities.

Abstract 688
RACIAL DISCRIMINATION AND DISEASE DAMAGE AMONG AFRICAN AMERICAN WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Systemic lupus erythematosus (SLE) is an autoimmune disease that disproportionately impacts African American women. Although SLE has wide variation in severity, and disease activity waxes and wanes often unpredictably, African American women with SLE have been found to experience faster progression and worse consequences of disease compared to their White counterparts. Identifying factors that are associated with disease progression and severity among African American women with SLE may improve our understanding of the causes of these racial disparities. This cross-sectional study investigated whether discrimination, a qualitatively unique source of racial minority stress that African American women are susceptible to, is associated with SLE-related disease damage. Participants were 559 African American women in the Georgians Organized Against Lupus (GOAL) study, a population-based cohort of SLE patients in Atlanta, GA. Disease damage was assessed using the Brief Index of Lupus Damage (BILD), a validated, patient reported measure of major irreversible organ damage and treatment toxicity since the onset of SLE. Discrimination was assessed using the Everyday Discrimination Scale, a widely used measure of routine experiences of unfair treatment. OLS regressions revealed that after controlling for age (b=0.03, SE=0.01), race (Black), and time since diagnosis (b=0.02, SE=0.01) discrimination was significantly associated with BILD score (b=0.21, SE=0.11, p<0.05). This relationship persisted even after controlling for socioeconomic and other health-related characteristics, with greater reports of racial discrimination being associated with higher BILD score. This is the first study to our knowledge demonstrating that discrimination is associated with disease damage among African American women with SLE. Consonant with findings on the negative implications of discrimination for other health outcomes, our results suggest that experiencing discrimination is a source of psychosocial stress that contributes to SLE disease damage. Our study also has implications for understanding and reducing racial disparities in SLE. Societal efforts aimed at addressing pervasive discrimination may help to improve SLE outcomes among African American women.
**SESSION: Pain**

**Abstract 616**

**CONDITIONING AND EXTINCTION LEARNING OF VISCERAL PAIN IN HEALTHY SUBJECTS - A FMRI STUDY**

Michiko Kano, MD, PhD, Behavioral Medicine, Tohoku University Graduate School of Medicine, Sendai, Miyagi, Japan; Steven J. Coen, PhD, Adam D. Farmer, MD, PhD, The Wingate Institute of Neurogastroenterology, Queen Mary University of London, London, London, UK; Vincent Giampietro, Ph.D, Department of Neuroimaging, Kings College London, Institute of Psychiatry, London, London, UK; Michael J. Brammer, PhD, Department of Neuroimaging, Kings College London, Institute of Psychiatry, London, London, UK; Shin Fukudo, MD, PhD, Behavioral Medicine, Tohoku University Graduate School of Medicine, Sendai, Miyagi, UK; Qasim Aziz, MD, PhD, The Wingate Institute of Neurogastroenterology, Queen Mary University of London, London, London, UK.

**Background:** Learning and memory process of internal bodily sensations may be relevant for the pathophysiology of psychosomatic diseases. Classical conditioning with somatic stimulation has been widely used. However little is known on the processing of visceral sensation. We investigated brain processing during associative learning and modification of the learned response of visceral pain using classical conditioning paradigm.

**Methods:** Twenty two healthy subjects (11 males and mean age ± SD = 30 ± 10) participated in a fMRI study. During acquisition, half of visual conditioning stimuli (CS+); coloured square was paired with painful oesophageal distension as unconditioned stimuli (US) and different coloured square were presented as non-conditioned stimuli (CS-). First extinction phase immediately followed acquisition and CS+ and CS- were presented without US. Second extinction phase was conducted after 20 minutes of fist extinction phase to see spontaneous recovery of conditioning response (CR).

**Results:** During acquisition phase, CS+ compared to CS- induced greater activation in the visceral pain matrix including the thalamus, insula, caudate, midbrain, anterior cingulate cortex (ACC), supplementary motor area (SMA), inferior parietal lobule (IPL) and cerebellum. During first extinction phase, CS+ compared to CS- showed greater brain activity in the medial prefrontal cortex (mPFC) and dorsolateral prefrontal cortex (dLPFC) in addition to the visceral pain matrix. During second extinction phase, CS+ compared to CS- demonstrated greater activation in the hippocampus, mPFC, dLPFC, insula, ACC, IPL, SMA and cerebellum. All brain data was significant at least level p ≤ 0.05 corrected.

**Conclusions:** CR using visceral pain produced a neural response in the absence of physical visceral pain similar to that occurs during actual visceral pain. Frontal cortex activity including mPFC and dLPFC may play an important role in extinction learning to regulate acquired CR. The activation in the hippocampus may be associated with memory retrieval of CR after extinction. These findings elucidate the brain mechanism underlying how aversive memory of visceral pain is modified depending on contextual change.

**Abstract 609**

**PARENTAL CATASTROPHIZING MEDIATES THE ASSOCIATION BETWEEN CHILD PAIN BEHAVIOR AND PARENTAL SOLICITOUSNESS**

Shelby Langer, PhD, School of Social Work, Joan Romano, PhD, Psychiatry and Behavioral Sciences, Lloyd Mancil, PhD, Oral Health Sciences, Rona L. Levy, PhD, School of Social Work, University of Washington, Seattle, WA

Catastrophizing (CAT), a negative appraisal in which pain is seen as signifying a high degree of threat or harm, is known to amplify the experience and expression of pain. CAT among significant others may also adversely affect pain outcomes by influencing how they respond to their loved one’s pain behavior. Parents’ CAT about their child’s pain may lead them to interpret pain behaviors exhibited by their child as indicative of harm, and thus may increase the likelihood that they intervene to aly pain behaviors which exacerbate the child’s pain, thereby encouraging illness behavior. This study sought to examine the potential mediating role of parental CAT in the association between child pain behavior and parental solicitousness in families of children with Inflammatory Bowel Disease (IBD). Parents of children with IBD (n = 174) completed measures designed to assess responses to and cognitions about their child’s gastrointestinal symptoms, and parental solicitousness. Demographic characteristics of parents were: M (SD) age = 44.3 (6.6), 90% female, 2% Hispanic, 93% Caucasian, and 48% college-educated. Their children were, on average, 13.8 years old (SD = 2.7), 49% female, 4% Hispanic, and 89% Caucasian. Mediation was tested using Hayes’ PROCESS macro for SPSS, a regression-based path analytic technique. Bootstrap methods were employed to estimate the indirect effect of CAT. Results for the various pathways were as follows. Child pain behavior predicted solicitousness (c = 0.23, SE = 0.08; p = 0.03); it also predicted CAT (a = 0.51, SE = 1.16; p = 0.001). When both CAT and child pain behavior were entered in the model, CAT predicted solicitousness (b = 0.02, SE = 0.01, p < 0.001); the association between child pain behavior and solicitousness was no longer significant (direct effect or c’ = 0.08, SE = 0.08, p = 0.297). CAT had a significant indirect effect (ab = 0.15, SE = 0.04, bias-correct 95% CI = 0.07, 0.24), explaining 65% of the effect of child pain behavior on solicitousness. These findings highlight the importance of parental cognitions in influencing responses to child pain and as a potential target for intervention.

**Abstract 600**

**POST-OPERATIVE PAIN: DOES TRAUMA HISTORY EXACERBATE OR MODIFY THE EXPERIENCE?**

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The mutual maintenance model proposes that post-traumatic stress (PTS) and chronic pain are characterized by shared cognitive, behavioral, and affective components which serve to reinforce each condition. However, this model fails to consider that previous traumatic experiences may function as a shared risk factor. While
trauma history has repeatedly been shown to confer risk for PTS, its role in painful conditions is less clear. The current study examined the relationship of trauma history to pain following orthopedic surgery. In support of the mutual maintenance model, we hypothesized that trauma history would function as a risk factor for prolonged, post-operative pain. Participants were 110 patients (35 males, 75 females) between the ages of 49 and 90 (M=69.2) undergoing unilateral total knee replacement surgery (TKR; Summa Health System, Akron, OH). The majority of the sample was Caucasian (92.8%) and undergoing TKR for the first time (75.5%). Patients completed questionnaires at baseline (2-3 weeks prior to surgery), as well as one month and three months following surgery. Pain severity prior to and following surgery was assessed using the Arthritis Impact Measurement Scale-2 (AIMS-2). Trauma history was assessed using the Traumatic Stress Schedule (TSS). Participants were classified into high or low trauma groups based on their number of lifetime traumas in comparison to the median. Independent t tests revealed a significant difference in pain severity three months following surgery between traumatic stress groups (t(92)=2.013, p=.047). Hierarchical multiple regression was used to further examine the study hypothesis. After controlling for relevant demographic variables and baseline pain severity, patients’ experience of traumatic events explained a significant proportion of pain severity three months following surgery (change R²=.028 by -.05). Unexpectedly, no sex by trauma history interaction was found, showing that trauma history was negatively related to pain (β=-.37, p=.01). These results indicate that pain severity following TKR was not moderated by sex or race. In contrast, the presence of prior traumatic events was associated with poorer pain outcomes for both males and females.

Abstract 195
AUTONOMIC AND HEMODYNAMIC RESPONSES TO COLD PRESSOR CHALLENGE AS RELATED TO TYPE D PERSONALITY
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Objective: Autonomic nervous system dysfunction plays a role in the association between psychological factors and adverse cardiovascular health outcomes. The Type D (Distressed) personality is associated with poor cardiovascular health outcomes but the biobehavioral mechanisms are largely unknown. The current study examined the cardiovascular and autonomic response to a passive physiologic cold challenge task. Methods: In total, 100 undergraduate students (84% female; mean age 19.8 years) underwent a cold pressor test involving a 1-minute immersion of hand and wrist in ice water as part of a larger stress test battery that also contained a modified Trier Social Stress Test. ECG, ICG and blood pressure were measured during rest, stress and recovery periods. Participants completed the DS14 questionnaire to assess Type D personality. GLM for repeated measures analysis was used to examine the response patterns. Results: Individuals with a Type D personality demonstrated an increased systolic (Δ=7.2 mmHg in non-Type Ds vs. 11.8 mmHg in Type Ds) and diastolic (Δ=9.7 in non-Type Ds vs. 13.2 mmHg in Type Ds) blood pressure reactivity, with a significant quadratic effect (SBP: F(82,2)=7.0, p=.01; n²=.08; DBP: F(82,2)=4.9, p=.03, n²=.06), while adjusting for the effects of sex and smoking status. Type D individuals also demonstrated an increased parasympathetic cardiac drive in adjusted analysis. RSA increased with 1.3% in non-Type Ds vs. 3.0% in Type Ds; while vagal withdrawal was observed in non-Type Ds (Δ=-3.0 ms; F(82,2)=6.3, p=.01, n²=.06). For sympathetic activation (i.e., decrease in pre-ejection period), a significant interaction with sex was found (p=.03), with the strongest effects for Type D personality in males, showing a significant quadratic effect in adjusted analysis (F(90,2)=7.1, p=.02, n²=.37), with male Type Ds responding with a decrease in PEP of 12 ms, whereas non-Type Ds and Type D women responded with a smaller decrease in PEP (4-6 ms). There were no significant group differences in physiologic response to the social stressor. Conclusion: Type D personality was associated with an exaggerated hemodynamic and autonomic response to a passive physiologic cold challenge task. This response pattern may account for the increased risk of blood pressure-related cardiovascular diseases associated with Type D.
craving and predictors of risk for smoking relapse. Our findings point to the importance of examining the links of these hormones with changes in withdrawal severity and mood, appetite, and weight post-cessation.

Abstract 406

THE CORTISOL AWAKENING RESPONSE: WHY TOLERABLE ERRORS IN TIMING MAY NOT BE SO TOLERABLE AND WHY LINEARITY OF CORTISOL RISE SHOULD NOT BE ASSUMED.

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Research linking the Cortisol Awakening Response (CAR) to psychosocial and health domains needs CAR measures to be based on accurately timed saliva samples. How accurate? Typically a CAR is big and brief, and even quite modest delays between awakening and initial saliva sample might theoretically be expected to compromise accuracy; but delays up to 15 min reportedly do not do so. This paradox is explored and predictions examined in new data for effects of moderate delays (5-15 min) on several different CAR magnitude measures, and on timing of the CAR peak. Both self-reported awakening and sampling times were objectively checked by actigraphy and track caps. 50 healthy females (21±4 years) were told to collect saliva on 4 days at 0, 15, 30 and 45 min post-awakening. Self-reports were significantly later by 8 (±11) min than objective estimates of awakening. Self-reported sampling time intervals were accurate (< 2 min mean error). Minimally delayed data (< 5 min) were compared with moderately delayed (5-15 min). CAR magnitude was significantly greater for delayed data and peaked earlier. Plots of cortisol values in real time suggested effects were due to a time lag between awakening and start of cortisol rise; cortisol rise was not linear. Further evidence for this was sought and found in an intensive investigation of 10 participants who collected saliva every 5 min from 0-30 min post-awakening. We conclude that moderate delays in saliva sampling previously thought tolerable lead to errors in estimating CAR magnitude and peak-timing, due to an approximate 10 min lag between awakening and cortisol rise. Ignoring this lag in calculations leads to overestimation of CAR magnitude, even if sampling is only moderately delayed. These findings, if generalizable, clarify how the physiology of the CAR unfolds, but are methodologically challenging for researchers since self-reported awakening times are not accurate enough to override concerns raised. Objective measurement of sampling time would, however, permit known delays to be taken into account when computing CAR estimates.

Abstract 483

ARE HIGH LEVELS OF DEHYDROEPIANDROSTERONE (DHEA) NECESSARY FOR OLD PEOPLE TO MAINTAIN COGNITIVE AND MENTAL HEALTH? FINDINGS FROM THE KORA-AGE STUDY.

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Background: Dehydroepiandrosterone (DHEA) is secreted by the zona reticularis of the adrenal cortex and is converted into potent sex steroids in peripheral target cells. However, randomized trials in elderly subjects with an age-dependent decrease in DHEA have provided no evidence for enhanced mental and physical performance after long-term administration of DHEA. Thus, the widely perceived performance-enhancing activity of DHEA is still more myth than reality. However, there is evidence that low DHEA serum levels - mainly in relation to insulin-like growth factor 1 (IGF-1) - may be associated with impairments in mental health and cognitive functioning. Study aim: We sought to correlate dehydroepiandrosterone-sulfate (DHEA-s) and insulin-like growth factor 1 (IGF-1) serum levels with cognitive and mental health conditions in older subjects from a population-based setting. Data were derived from the KORA-AGE Study conducted in approximately 5,000 older people (≥ 65 years) in Augsburg, southern Germany. A clinical investigation was performed in a random subsample of > 1,000 participants. Study design: Cross-sectional analyses of dehydro-epiandrosterone-sulfate (DHEA-s) and insulin-like growth factor 1 (IGF-1) serum levels were performed in participants of the medical examination of KORA Age (n=1,079 age 64-94) and associations with cognitive and mental health status were examined. Results: Both IGF-1 and DHEAs levels diminish with age. Significant sex differences were observed in both DHEAs (levels were higher in men compared to women in participants 85 and under, p<0.0001) and IGF-1 (levels were higher in men age 64-69, p<0.01, and age 70-79, p<0.005). Low DHEAs (1st quartile) were associated with impaired cognition (p=0.0043). Parkinson’s symptoms (p=0.0001) and depression (p=0.012). Physical activity in older participants was significantly associated with increased levels of both IGF-1 (p=0.0034) and DHEAs (p=0.0006). Conclusion: Age related decreases in the anabolic hormones DHEAs and IGF-1 are related to diminished cognitive and mental health in the elderly population.
1) Abstract 377

**BENEFIT FINDING IN BEREAVED CANCER CAREGIVERS**

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In the wake of a loss, personal growth and searching meaning (aka, benefit finding) can emerge along with psychological distress. Little is known however about the extent to which bereaved family members find any sort of benefit in the loss. This study aimed to confirm domains of benefit findings in bereaved caregivers, identify psychosocial predictors of benefit finding in bereavement, and determine the impact of benefit finding on psychological adjustment. A total of 121 family caregivers (age M=56.3) who initially participated in a nationwide survey (T1) were identified as bereaved 5 years post-diagnosis (T2: average 2.9 years since the death) and provided valid data for the study variables. Initial caregiving stress (Pearlin Stress Scale) at T1, benefit finding in bereavement (Benefit Finding Scale) and social support (ISEL) at T2 were measured. Three psychological adjustment outcomes-life satisfaction (SWLS), depressive symptoms (CES-D), and prolonged grief (Inventory of Complicated Grief)-were measured at T2. General linear models revealed that older age and being spousal caregivers were related to greater benefit finding (ps<.05). Greater initial caregiving stress was associated with lower benefit finding in non-spousal caregivers, whereas greater current social support related to greater benefit finding in spousal caregivers (ps<.05). In addition, the accommodation subdomain of benefit finding was positively associated with life satisfaction (β=.208, p<.05). Greater initial caregiver esteem was associated with lower life satisfaction and greater complicated grief symptoms among non-spousal caregivers (ps<.05). Overall, findings suggest that caregivers can find benefit across different domains in the challenges associated with bereavement. However, results reveal that the caregiving role might carry a particular meaning for non-spousal caregivers, whose initial benefit finding is supported by poorer adjustment to the loss. They might benefit from interventions designed to help them manage early caregiving stress, and later find benefit in the loss.

2) Abstract 231

**NEGATIVE AFFECT IN DAILY LIFE IS CORRELATED WITH CAROTID ARTERY Atherosclerosis**

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Objective: Although trait negative affect is associated with cardiovascular risk, this association may be underestimated when based on standard rating scales. Ecological Momentary Assessment (EMA) provides an alternative measure of negative affect that may reflect daily affective experiences more accurately. Here, we compared trait and EMA measures of negative affect as correlates of carotid artery intima-media thickness (IMT), a marker of atherosclerosis, in a community sample.

Methods: Healthy employed adults (N=481, 30-55 years of age, 53% females and 16% African Americans) completed an electronic diary on an hourly basis throughout a 4-day period. The diary interview included a 7-item, Likert-scaled rating of momentary negative affect. Scores were averaged across items, observations (mean of 53 per person), and days. The Positive and Negative Affect Schedule (PANAS) questionnaire was administered as a standard measure of trait negative affect. IMT (far wall of common carotid, internal carotid, and bulb) was measured by carotid ultrasonography using automated software. IMT measures were averaged across sites and were log transformed to reduce skewness.

Results: After adjusting for sex, race, age, and education, higher mean momentary negative affect (EMA) was associated significantly with greater IMT (β=.026, p=.01), whereas the PANAS measure of negative affect was not (β=.001 p=.368). These associations were significantly different from each other (t=2.896, p=.005 – Hotelling Williams Test). When adjusted for standard risk factors (BMI, systolic blood pressure, LDL, HDL, and glucose), the association with EMA measures remained significant (β=.019, p=.049). These associations were not moderated by sex or race.

Conclusions: EMA measures of negative affect were associated more strongly with carotid atherosclerosis, as indexed by IMT, when compared with standard trait affect assessments. These findings suggest that EMA measures may provide superior estimates of cumulative daily exposures to psychosocial risk. Supported by HL040962.

3) Abstract 625

**INFLUENCE OF OXYTOCIN ON SYSTEMIC INFLAMMATION IN HUMAN AND MOUSE MACROPHAGES**

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Oxytocin (OT) is a neurohypophyseal peptide associated with female reproductive functioning, nursing, and affiliative behavior. OT and its receptor are also expressed in the heart and vascular tissue and play a role in cardiovascular homeostasis. Previously, we demonstrated chronic exogenous OT administration decreased inflammation and atherosclerosis in animals. To further test this hypothesis, we used the Watanabe Heritable Hyperlipidemic rabbit and the apoE−/− mouse. We also demonstrated OT to have anti-atherogenic properties in vitro by reducing oxidative stress and inflammation, processes involved in atherosclerosis. The present study further assessed the anti-inflammatory effects of oxytocin by examining IL-6 secretion and OT receptor expression in response to lipopolysaccharide (LPS) treatment in culture. In addition, THP-1 macrophages were cultured with IL-6 and oxytocin, and results were also observed in vivo, mice were injected with LPS. Various tissues were collected and OT receptor and cytokine protein and mRNA expression were analyzed. Cultured THP-1 macrophages were incubated with LPS or LPS with OT. Mice were injected with 50 µg LPS and tissues were collected after 6 hours. Relative mRNA expression was evaluated by qRT-PCR. Secretion of the inflammatory cytokine IL-6 from cell culture medium or in plasma was measured by ELISA. It was found that LPS induced IL-6 gene expression and protein secretion and increased OT receptor expression in human macrophages. The addition of exogenous OT to these cells decreased IL-6 secretion suggesting an attenuation of inflammatory processes induced by LPS. For the in vivo murine studies, there was a significant increase in IL-6 mRNA expression in peritoneal macrophages, epididymal fat, heart, and aorta but was unaffected in peritoneal macrophages. Mouse plasma IL-6 levels were significantly elevated by LPS. Thus, LPS-treatment caused an upregulation in OT receptor mRNA expression in human macrophages but not in mouse tissues in vivo. This species difference can be accounted for by the presence of an IL-6 response element in the human OT receptor gene promoter region, not present in the murine gene, that increases receptor expression in response to inflammation. These data suggest that in humans, OT receptors are increased during the inflammatory response and this may provide one mechanism by which oxytocin attenuates inflammation.
surveys. Methods: Healthy, nonsmoking, premenopausal women working full time outside the home, were recruited by advertisement. All underwent physical exams and blood tests to confirm health status. For the assessment of urinary 8-OHdG, participants (n=50) collected timed samples of urine over the course of a weekend day and over the course of a weekend day. 8-OHdG levels were determined blind using a commercially available enzyme-linked immunosorbent (ELISA) assay. For assessment of acute stress effects on DNA damage, participants (n=28) were challenged with a speech task and mental arithmetic in the follicular phase of their menstrual cycles at a consistent time of day (late afternoon) under controlled laboratory conditions. Blood samples were collected from an iv line: 1) after a 30’ rest period (baseline); 2) immediately after the challenges (15’); and 3) after a 75’ recovery period. DNA damage was assessed blind in the alkaline comet assay, with tails quantified with commercial software. Results: As anticipated for times of work stress, adjusted urinary levels of 8-OHdG were found to be significantly (p<0.05) higher on workdays than on weekend days. Also as hypothesized, we found significantly elevated DNA damage in white blood cells collected immediately after the experimental challenges compared to baseline levels (p<0.01); following a 75 min rest period, the damage was no longer significantly different from baseline. Conclusion: The results provide evidence consistent with the view that daily life stressors can cause increases in DNA damage. The clinical significance of such increases remains to be determined, as do the mechanisms responsible for these stress effects, although in vitro studies suggest that both catecholamines and cortisol may play a role.

5) Abstract 400
IMPROVED PSYCHOLOGICAL WELL-BEING AND PHYSICAL FUNCTIONING IN RHEUMATOID ARTHRITIS: A COHORT STUDY COVERING THE LAST TWO DECADES
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Background: Only a few decades ago, the common recommendation given to patients with rheumatoid arthritis (RA) was to rest. Nowadays, physical activity and other means to improve well-being and functioning are commonly encouraged. Moreover, pharmacological treatment of RA has improved tremendously. This study examined if psychological well-being and physical functioning in patients with RA improved over the last two decades.
Methods: From 1990 to 2011, consecutive cohorts of RA patients (N = 1151, age 17-86 years, 64% female, 58% rheumatoid factor [RF] positive) were monitored. Measurements at diagnosis (baseline) and after 3-5 years of treatment (follow-up) were analyzed. Functional status was assessed with the Health Assessment Questionnaire, mood and anxiety with the Impact of Rheumatic diseases on General health and Lifestyle questionnaire. In hierarchical multiple regression analyses, well-being and functional status at baseline and (baseline adjusted) follow-up were first predicted by year of assessment, subsequently adding disease activity (erythrocyte sedimentation rate, joint count), gender, age, education, marital status, work status, expressed the magnitude of change: 0.2 = small, 0.5 = medium, 0.8 = large.
Results: Baseline psychological well-being and physical functioning did not significantly differ across the years (p ≥ .06), but an improvement (p ≤ .03) in follow-up anxiety (d = -0.4) and (baseline adjusted) follow-up cheerful mood (d = 0.3) and physical functioning (d = -0.6) was observed. After entering disease activity, the improvement remained significant for physical functioning (p = .01) but not for well-being (p ≥ .07). Of the other entered variables, only educational level took away the significance of the improvement in physical functioning (p ≥ .29). Post hoc analyses revealed that this only reflected an increase in educational level over the cohorts.
Discussion: Over the last two decades psychological well-being and especially physical functioning showed a significant upward trend, partly explained by a decrease in disease activity over the years. The results support the impression that improved pharmacological and educational interventions contributed to an improved quality of life in RA.

6) Abstract 48
THE ASSOCIATION BETWEEN PSYCHOLOGICAL WELL-BEING AND INCIDENT HYPERTENSION: THE WHITEHALL II COHORT
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Healthy British civil servants (n = 4,472) from the Whitehall II cohort self-reported their psychological well-being (emotional vitality, optimism) and relevant hypertension-related risk factors (demographic characteristics, health status, health behaviors, and psychological ill-being) between 1991 and 1994. Incident hypertension was defined by the clinical measures of diastolic and systolic blood pressure, self-reported physician-diagnosed hypertension, or self-reported treatment for hypertension. Follow-up assessments were conducted every three years through 2002-2004. Cox proportional hazards regression models were used to estimate hazard ratios (HR) of incident hypertension and included adjustment for potential confounders. There were 1,651 cases of incident hypertension. Only vitality was significantly associated with reduced risk of developing hypertension; the age-adjusted HR was 0.94 (p = 0.01; CI: 0.90-0.99) and did not change substantially after controlling for risk factors. Emotional vitality but not optimism was associated with significantly reduced risk of incident hypertension with a 6% risk reduction per 1-standard deviation increase in vitality. Effective interventions should not only aim to decrease psychological ill-being, but also increase well-being to protect against hypertension.

7) Abstract 295
HEMODYNAMIC EFFECTS OF COGNITIVE BEHAVIORAL STRESS MANAGEMENT IN RECIPIENTS OF IMPLANTABLE CARDEVERTER DEFIBRILLATORS: A RANDOMIZED CONTROLLED TRIAL
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Background: Recipients of implantable cardioverter-defibrillators (ICD) are at increased risk of serious cardiac arrhythmias, which may be triggered by mental stress. There is increasing evidence that Cognitive Behavioral Stress Management (CBSM) therapy may have beneficial psychosocial effects in ICD patients, but information is limited on its effect on potentially arrhythmogenic physiological responses to mental stress. The aim of this study was to assess the effects of CBSM versus "Patient Education" (ED) on mental stress induced changes in Rate Pressure Product (RPP = Heart Rate (HR) x Systolic Blood Pressure (SBP)). Methods: 129 recipients of ICDs were randomly assigned to 10-week programs of either CBSM or ED. HR and SBP responses to serial subtraction Math and Anger-Recall mental stress tests were measured immediately and 3 and 6 months after interventions. Psychological stress responses to Math mental stress testing were significantly diminished following CBSM at 3 months (p = 0.04), but not at 6 months follow-up. No differences were found following ED, or for RPP responses to Anger-Recall. Significantly lower scores were found immediately following CBSM than following ED for state and trait anger (p =0.02, p =0.03), anger/hostility (p=0.004), tension/anxiety (p=0.003), total mood disturbance (p=0.006), and perceived stress (p=0.02). At 3 months follow-up significantly lower scores were shown in the CBSM group for anger/hostility (p =0.017), tension/anxiety (p=0.01), and perceived stress(p=0.03) scores. At 6 months follow-up, significant differences were found for only perceived stress scores (p=0.04). Between group differences up to
3 months following intervention were associated with higher scores following ED and/or lower scores following CBBSM. Linear regression modelling revealed Total Mood Disturbance as the best predictor of reduced RPP response following CBBSM (p = 0.005). Conclusion: Study findings indicate that CBBSM reduces mental stress induced hemodynamic responses in subjects with ICD’s and confirm beneficial effects of CBBSM, compared with a control ED strategy, on a wide range of psychosocial measures. Effects persist for at least 3 months following treatment, but largely dissipate by 6 months following treatment.

8) Abstract 772
IMPLICIT AGONISTIC MOTIVES MODERATE THE STRENGTH OF THE LONGITUDINAL RELATIONSHIP BETWEEN DIASTOLIC Reactivity IN YOUTH AND ADULTHOOD
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We have shown that implicit (nonconscious) motives predict cardiovascular stress reactivity (CVR) in the laboratory and ambulatory blood pressure (ABP) levels during normal activities. Adolescents with an “agonistic striving” motive profile (AS: seeking to control others) exhibited greater CVR and higher ABP compared to “transcendence striving” profile (TS: seeking to control self) or “dissipative striving” profile (DS: inability to assert control). The present study tested the hypotheses that the longitudinal association between socially-induced CVR in adolescence and later in adulthood would be stronger in persons with the AS profile relative to those with the TS/DS profiles. Participants were 82 adults (age, 34±2; 72% Female, 60% Black, 35% White) who originally participated in Project Heart studies while in high school; motive profiles and CVR were assessed with the Social Competence Interview (SCI) when participants were aged 14 years, and again in their early thirties. AS, TS, and DS profiles were identified with cluster analysis; systolic and diastolic blood pressure (SBP, DBP), DBP were measured before and during the SCI at two-minute intervals. Reactivity was computed as the amount of change from baseline to SCI. Hypothesis testing with a linear model approach to regression in which Adolescent-CVR was predicted by Motive Profile, Adolescent-CVR (baseline) and their interaction, after controlling for gender, age, and body size. Results for Adult-DBP reactivity indicated significant main effects for Adolescent-DBP reactivity, F(1, 75)=6.41, p < .05, Motive Profile, F(1, 75)=7.59, p < .01, and interaction, F(1, 75)=4.50, p < .05. Analyses of simple slopes revealed that DBP reactivity measured in adolescence predicted adult DBP reactivity in adults with the AS profile, b=80 (SE=25), p < .01, but not in adults with TS/DS profiles, b=0.07 (SE=24), p = .77. Results for SBP were in the predicted direction but were not statistically significant (all values of p > .11).
Results suggest that the association between diastolic reactivity to social challenge in youth and adulthood is stronger in persons who persistently seek to influence or control others.

9) Abstract 528
BLOOD PRESSURE VARIABILITY IS RELATED TO COGNITIVE PERFORMANCE: THE MAINE-SYRACUSE STUDY
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Previous studies have shown increased blood pressure (BP) variability, in addition to average BP levels, to be related to increased risk of cerebrovascular events and damage. The majority of studies examining variability in BP have used ambulatory BP measures with measurement throughout the day and/or night. In the present study we ask about variability in BP during a single set of automated BP measurements. Clinic measurement practice often involves termination of measurement once one or two measurements are normal and repeated measurement if initial BP is high. With few measurements, the important information on BP variability may be discarded. We related BP variability to performance on multiple cognitive domains, indexed by 22 cognitive measures. BP was measured with 18 consecutive automated BP measurements taken 5 minutes apart, and the SD of these measurements was used as the BP variability measure for each participant. After exclusion for stroke, dementia, and dialysis, the sample included 979 individuals from wave 6 of the Maine-Syracuse Longitudinal Study [58.5% women; 81.5% of hypertensives treated; mean(SD) age = 62.0(12.8)]. Results of regression analyses indicated that SBP and DBP variability were inversely related to cognitive function. With adjustment for age, education, sex, diabetes, waist circumference, and mean heart rate, higher SBP variability was related to performance on the Global and Verbal Memory composites, and the Similarities test. Higher DBP variability was related to performance on the Global, Visual-Spatial Organization and Memory, and Executive Function composites, and Similarities. With additional adjustment for mean BP, results were attenuated, however significant associations remained. This study shows that BP variability, is an important predictor of cognitive function, and underscores the importance of obtaining multiple blood pressure measurements in studies of BP and cognitive function.

10) Abstract 660
COGNITIVE CONTROL BRAIN SYSTEMS UNDERLYING THE ASSOCIATION BETWEEN REAPPRAISAL AND THE METABOLIC SYNDROME
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Negative emotionality has been associated in prior epidemiological studies with an increased risk for developing the metabolic syndrome (MetS). Presumably, negative emotionality confers such risk via alterations in peripheral autonomic and neuroendocrine effector pathways that promote metabolic pathophysiology. Conversely, an individual’s habitual tendency to use cognitive reappraisal to regulate their negative emotions appears to protect against the development of the MetS (Kinnunen et al., 2005). However, the neural systems by which cognitive emotion regulation relates to the MetS remain entirely unknown. Here, we examine whether prefrontal and cingulate brain regions that jointly support cognitive emotion regulation and control peripheral physiological responses to negative emotional states correspond to a neural pathway linking emotion regulation to the MetS. Middle-aged adults (N=139; 74 men, mean age, 40.39 ± 6.2 years) underwent an fMRI scan while performing a Stroop color-word task that requires cognitive control in the presence of a negative emotional state and engages prefrontal brain areas (Sheu et al., 2012). Emotion regulation was assessed with the Emotion Regulation Questionnaire (ERQ), which assesses the tendency to use cognitive emotion regulation strategies, including cognitive reappraisal. The presence of the MetS was determined using the criteria outlined by the National Cholesterol Education Program, Adult Treatment Panel III. After adjusting for age and sex, frequent cognitive reappraisal usage was associated with reduced likelihood of having the MetS (β = -0.72, odds ratio [OR] = 0.49, p = 0.004), and meeting fewer MetS criteria (β = -0.16, p = 0.037). Moreover, fMRI psychophysiological interaction analyses revealed a positive relationship between frequent cognitive reappraisal usage and functional connectivity between dorsal anterior cingulate (dACC) and dorsolateral prefrontal cortex (DLPFC) during incongruent trials of the Stroop color-word task, net the influence of age and sex (β = 0.21, t = 2.45, p = 0.016). This positive dACC-DLPFC connectivity mediated the association between cognitive reappraisal and the MetS (ab indirect effect = -0.2163, 95% confidence interval = 0.5368 to -0.0203). Individuals who frequently use cognitive reappraisal may be at lower risk for developing MetS by recruiting prefrontal brain circuits when negative affective states engender cognitive control. Taken together, these results highlight a cognitive control network that may link habitual use of cognitive emotion regulation strategies to cardiovascular health.

11) Abstract 126
PREDICTORS OF LONG-TERM OUTCOMES IN CHRONIC WIDESPREAD PAIN IN THE GENERAL POPULATION: AN 11 YEARS PROSPECTIVE EPIDEMIOLOGIC STUDY
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Background: The objective of this study was to investigate predictors of continuous chronic widespread pain (CWP) in an 11 years prospective study of the general population. CWP refers to different musculoskeletal pain.

Methods: Chronic widespread pain was defined as “pain lasting more than three months during the last year at three or more predefined sites involving trunk and upper and lower limbs” from the Standardized Nordic Questionnaire. This study is based upon a representative Norwegian cohort of 28,367 individuals responding to both the second (1995-1997) and the third (2006-2008) wave of the Nord-Trøndelag Health Study (HUNT 2 and HUNT 3, respectively). The main independent variables in the regression analysis were separate anxiety and depression measures from the Hospital Anxiety and Depression Scale, age, gender, insomnia, body mass index, general health, education, exercise and the use of alcohol.

Results: The prevalence of chronic widespread pain in HUNT 2 was 17.4% (n = 4,927) and of these one-third were men (n = 1,555). Of those reporting CWP in HUNT 2, 51.3% (1,905 women and 622 men) still reported CWP in HUNT 3. This study found that neither depression, anxiety nor alcohol consumption affected the 11 years outcomes of CWP. However, general health, body mass index and insomnia were significant predictors for continuous CWP for women at all ages and for men aged 50 years and older. High education was negatively associated with CWP for women below 50 years, and physical exercise was negatively associated with CWP among men below 50.

Conclusions: This study indicates a high long-term stability of CWP in the general population, and in contrary to previous studies risk factors of chronic pain, neither depression nor anxiety was significant predictors on this outcome.

12) Abstract 331
A SELF-AFFIRMATION INTERVENTION ATTENUATES ENDOTHELIAL INJURY IN RESPONSE TO SOCIAL THREAT
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The induction of psychosocial stress is associated with endothelial cell (EC) injury and endothelial dysfunction, an early cardiovascular disease (CVD) biomarker. We tested whether self-affirmation, a well-established psychosocial threat intervention, could reduce EC injury elicited by social evaluative threat (SET). To our knowledge, no previous research has tested whether a psychosocial intervention can attenuate stress-induced EC injury. Thirty-two participants (23 male, mean age (SD) = 22.6 (3.77)) were randomized to one of three conditions. In the SET condition, participants completed the Trier Social Stress Test (TSST), a common induction of social evaluative threat; in the intervention condition, participants completed a self-affirmation writing exercise before completing the TSST; and in the Control condition, participants completed a control writing exercise task. Blood was drawn immediately prior to and after the TSST/control tasks as well as in a recovery period approximately 30 minutes later. EC injury was assessed by measuring circulating levels of EC-derived microparticles (EMPs), phenotype for EC activation (CD62E+), apoptosis (CD31+), or both (CD51+) using flow cytometry. Repeated measures ANOVAs with a within-subjects factor of TIME and a between-subjects factor of GROUP (SET, Intervention-SET, Control) revealed a significant interaction of time and group on all three EMP measures (CD62E+, p =.008; CD31+, p =.002; CD51+, p =.019). Additionally, repeated measures ANOVAs with a within-subjects factor of TIME and a between-subjects factor of GROUP (SET, Intervention-SET) revealed an interaction of time and group (CD62E+, p =.034; CD31+, p =.012; CD51+, p =.037) – there was an increase across time for measures from the Intervention-SET group. These findings confirm prior work demonstrating the negative effects of psychosocial stress on endothelial function, a biomarker of vascular health. The findings also demonstrate a stress mitigating effect on EC injury for the self-affirmation intervention. These findings suggest that a psychosocial intervention targeted to reduce social threat may be beneficial in reducing stress-induced increases in CVD risk.

13) Abstract 779
SECONDHAND TOBACCO SMOKE EXPOSURE IS RELATED TO POORER SLEEP AMONG NEVER-SMOKING ADOLESCENTS
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Tobacco exposure is associated with myriad health complaints including respiratory problems, asthma, and sleep complaints. Adult and adolescent smokers exhibit altered sleep architecture, including longer sleep latency, shorter sleep duration, and daytime sleepiness. Tobacco exposure may exert its influence as an upper airway irritant, disrupting breathing while sleeping, or through increased pharmacological exposure to nicotine. Interestingly, adult non-smokers exposed to secondhand smoke report greater sleep problems, more difficulty falling asleep, and shorter sleep duration. The aim of this project was to examine whether recent daily stressors (i.e., the stress induced increases in circulatory inflammatory markers associated with chronic caregiving stress) may have a similar relationship with sleep among adolescents. Adolescent youth in 6-7th grades (N = 377, M = 12.7 yrs, 54.3% female) participated in the AdoQuest Study in Montréal, Canada. Tobacco smoke exposure was assessed using self-report questionnaires of parent and sibling smoking. Biomarkers of secondhand smoke exposure included salivary cotinine and carbon monoxide readings. Subjective reports of sleep included the Pediatric Daytime Sleepiness Scale and insomnia assessed from the Child Behavior Habits Questionnaire (hypersomnia, sleep disturbance, quality, disturbances). Partial correlations, controlling for age and sex, were conducted on never-smokers only (n = 304; “never tried smoking a cigarette, not even a few puffs”). Exposure to greater number of smokers in the household or situations in which a parent smoked was related to greater daytime sleepiness (r = .22), shorter school-night sleep duration (r = .12), longer weekend sleep duration (r = .14), more sleep disturbances (r = .14), more nighttime awakenings (r = .11), and poorer sleep quality (r = .11). Higher cotinine was related to greater daytime sleepiness (r = .10), more sleep disturbances (r = .12), and increased sleep fragmentation (r = .12). These findings suggest increased tobacco smoke exposure is related to poorer sleep, which is consistent with previous findings. Similar to recent bans restricting smoking in cars with children, these results may have important public health policy implications for extending smoking bans into the home.

14) Abstract 348
DAILY STRESSORS AND CRP PRODUCTION AMONG PARENTS OF CHILDREN WITH AN AUTISM SPECTRUM DISORDER
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Background: Chronic caregiving stress is associated with elevations in circulating inflammatory markers, such as C-Reactive Protein (CRP). In prior studies, greater daily stressors in the past 24 hours partially accounted for the relationship between caregiving stress and elevated CRP level. In the current pilot study, we evaluated whether recent daily stressors (indicators of inflammatory problems) contributed to increased inflammatory markers associated with chronic caregiving stress. Method: Twenty-three parents of children with an autism spectrum disorder completed a retrospective measure of child behavior problems over the past month and daily diaries for 4 consecutive days. At the end of the last diary day, participants provided a few drops of blood using a standard finger prick procedure. The Behavior Problems subscale of the Scales of Independent Behavior-Child version rating was completed by the child’s primary caregivers in the morning, as were reports of child behavior problems. The Daily Inventory of Stressful Events assessed non-child-related daily stressors. The scores were summed across the diary days to create a cumulative index of exposure to recent child behavior problems and daily stressors. CRP levels were assessed via ELISA performed on the dried blood spots. Results: Associations between the cumulative number of non-child-related daily stressors, r = .43, p = .05, child behavior problems, r = .30, p = .04, and the combination of general daily stressors and child behavior problems, r = .59, p = .01, and circulating CRP levels were all
significant. The retrospective measure of child behavior problems was less strongly associated with CRP, r = -0.20, p = .05. Conclusion: These results suggest that the recurrent daily stressors experienced by these parental caregivers might lead to sustained elevations in circulating inflammatory markers. Furthermore, these data highlight the relevance of daily diary methodologies in relating the daily experiences of individuals undergoing chronic caregiving challenges to their immune functioning.

15) Abstract 215
CEREBRAL BLOOD FLOW LINKS INSULIN RESISTANCE AND BAROREFLEX SENSITIVITY
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Insulin resistance confers risk for diabetes mellitus and associates with a reduced capacity of the arterial baroreflex to regulate blood pressure. Importantly, several brain regions that comprise the central autonomic network, which controls the baroreflex, are also sensitive to the neurmodulatory effects of insulin. However, it is unknown whether peripheral insulin resistance relates to altered functionality within central autonomic network regions or whether such altered functionality relates to reduced baroreflex regulation. Accordingly, we tested whether non-functional activity within central autonomic regions statistically mediated the relationship between insulin resistance and an indirect indicator of baroreflex regulation; namely, baroreflex sensitivity. Subjects were 92 community-dwelling adults free of confounding medical illnesses (48 men, 30-50 years old) who completed protocols to assess fasting insulin and glucose levels, resting baroreflex sensitivity, and resting cerebral blood flow. Baroreflex sensitivity was mediated by cerebral blood flow. Functional activity within central autonomic regions statistically mediated the relationship between insulin resistance and baroreflex sensitivity. These novel observations may help to characterize the neural pathways by which insulin resistance and possibly diabetes mellitus relate to adverse cardiovascular outcomes.

16) Abstract 308
LINEAR AND QUADRATIC EFFECTS OF PLASMA OXYTOCIN ON DEPRESSION IN ETHNIC MINORITY WOMEN LIVING WITH HIV
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Background: Endogenous oxytocin (OT) moderates the effects of stress on immune functioning in ethnic minority women living with HIV (WLWH), and may also influence depression in this population. Interestingly, while some previous work found high levels of OT to be associated with greater depression, other research demonstrated that clinically depressed women exhibit lower levels of OT than others. Moreover, the relationship between insulin resistance and baroreflex sensitivity was mediated by cerebral blood flow. Functional activity within central autonomic regions statistically mediated the relationship between insulin resistance and baroreflex sensitivity. These novel observations may help to characterize the neural pathways by which insulin resistance and possibly diabetes mellitus relate to adverse cardiovascular outcomes.

17) Abstract 515
DEPRESSIVE SYMPTOMS ASSOCIATED WITH GREATER PRO-INFLAMMATORY AND PRO-METASTATIC GENE EXPRESSION AFTER SURGERY FOR NON-METASTATIC BREAST CANCER
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Objective: Women who are post-surgery for non-metastatic early stage breast cancer (BCA) often report elevated levels of depression related to diagnosis and treatment. Greater depression has been associated with poorer health outcomes and overall mortality. Less is known about whether elevated depression is associated with pro-inflammatory and pro-metastatic processes in women who are post-surgery for early stage BCA. Methods: Gene expression was measured in women undergoing surgery for non-metastatic early stage BCa who were 2-10 weeks post-surgery to assess expression of pro-metastatic and pro-inflammatory genes. Self-reported depressive symptoms on the Hamilton Rating Scale for Depression (Ham-D), relevant sociodemographic and treatment-related variables were collected concurrently. Women were further classified as above vs. below the clinical cut-off for the Ham-D (cutoff = 7). Results: Higher scores on the Ham-D were associated with greater expression of pro-inflammatory and pro-metastatic genes: PTGS2, LMNA, IL1A, CCL20 (all p<0.05). ANCOVA revealed that women whose Ham-D scores fell above the clinical cut-off had greater LMNA expression than those whose Ham-D scores fell below the cutoff for time elapsed from surgery to baseline assessments and stage of disease [F(1,71) = 5.87, p = 0.018, partial eta-squared = 0.08]. Conclusions: Upregulation of pro-metastatic and pro-inflammatory genes was observed in women who reported greater levels of depression and who were above the clinical cut-off for depression in the weeks after early stage BCA surgery. Expression of such genes may influence health outcomes and overall survival, and future research should examine whether leukocyte gene expression can explain the association between depression and clinical health outcomes in this population. Once such associations are established, psychosocial interventions that target post-surgical depression may be important in influencing biological processes related to disease progression and survival.
20) Abstract 513

AUTONOMIC NERVOUS SYSTEM (ANS) RESPONSE DIFFERS BETWEEN POSITIVE AND NEGATIVE EMOTIONAL EVENTS: FIRST RESULTS FROM A FIELD STUDY DURING THE WORLD SOCCER CUP 2010

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Background: There is a lack of studies investigating the influence of strong emotional events in real life situations. With soccer being the most popular sport worldwide, the World Soccer Cup (WSC) 2010 provided the opportunity to investigate the autonomic nervous system (ANS) response to real-life emotion, experienced simultaneously in a public, public viewing event.

Methods: In this field study questionnaire and heart rate (HR) recordings were collected during 9 public viewing events from 144 subjects. Only observations from matches involving the German team (n=7) were included. Goals for/against Germany were defined as positive/negative emotions, respectively.

Average HR, HR recovery, HR variability (HRV), and HRV recovery were calculated 1 minute before a goal, at goal, and 1 & 2 minutes after a goal and served as outcomes in random effects models. We fitted models assuming both a linear and a quadratic within-subject effect over time. To investigate whether there is a significant effect over time and to compare the time effect between positive and negative emotions we used hypothesis tests based on the linear part of the model. We conducted stratified analysis to investigate potential effect modification by sex and the individuals’ subjective importance of WSC (none, neutral, high).

Results: For three of four outcomes, we found significant slopes for both positive and negative emotions: HR (β=1.6, P=0.015, βN=2.3, P<0.001), HRV (β=0.5, P<0.001, βN=3.3, P<0.001), HRV recovery (β=0.5, P<0.001, βN=3.9, P<0.001). By contrast, both emotions showed no effect on HR recovery (β=0.2, P=0.727, βN=0.2, P=0.685).

Further, in these outcomes we found significantly different slopes between situations with positive and negative emotions: HR (P<0.001), HRV recovery (P<0.006). Stratification by sex did not alter our conclusion but individuals’ subjective importance of WSC showed to be an important effect modifier.

Conclusion: Our results indicate that both positive and negative emotions have an effect on ANS responses and that the effect differs between positive and negative emotional situations. Further we found that this effect does not depend on sex but on the individuals’ relevance of WSC.
The effects of emotional suppression on subjective and physiological arousal are unclear, in part because different study methods and outcomes can yield contradictory findings. Different methods of studying suppression, including personality trait, experimental manipulation, and self-reports during provocation, should be tested concurrently for their effects on both subjective and physiological arousal. We studied all three approaches in a sample of 197 adults (age M = 48; 55% female) with chronic low back pain. Participants reported their trait suppression on the White Bear Suppression Inventory. Next, they were instructed to perform a 5-minute computer maze task following the instructions of a confederate posing as a patient, who angered participants by being unjustly rude or critical of their performance. Prior to the task, participants were randomized to 1 of 2 suppression conditions and instructed to either suppress all feelings and thoughts during the task, or experience and express them normally. Participants rated their experience of anger and irritation (0 = none, 10 = extremely), both before and after the maze task. Blood pressure (BP) was measured repeatedly both at rest before the maze task as well as during the task itself.

Self-reported trait suppression was greater in patients who increased in anger, compared to those unchanged (t = 2.84, p = .005). The experimental suppression condition led to greater increases in systolic BP (ΔM = 4.53, SD = 6.83) than non-suppression (ΔM = 2.12, SD = 6.98, t = 2.38, p = .018). Finally, those who denied an increase in post-maze irritation had a greater increase in systolic BP (ΔM = 11.34, SD = 9.52) than those who increased in irritation (ΔM = 7.5, SD = 10.3, t = 5.88, p = .039). We conclude that suppression, particularly of anger, whether assessed via trait questionnaire, manipulated experimentally, or manipulated during provocation, should be tested studying suppression, including personality trait, experimental manipulation, and self-reports during provocation, should be tested.
Distraction showed higher HRV than those in Forgiveness and Ruminati
on (RMSSD and HF HRV all p’s < 0.5). The results suggest that: a) forgiveness may influence somatic health through mechanisms of cardiac autonomic control, b) lower HRV during unforgiveness is analogous to perseverative states such as worry and rumination, and c) among women, distraction from thoughts about a transgressor may be a beneficial coping strategy in the short term. Overall, the findings support the perseverative cognition hypothesis and suggest a link between forgiving responses and cardiovascular health.

25) Abstract 314
POSITIVE AFFECT IS ASSOCIATED WITH LOWER INFLAMMATORY MARKERS IN BREAST CANCER SURVIVORS
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There is growing evidence that positive affect predicts improvements in physical health, including morbidity and mortality, and is also associated with lower levels of inflammation. However, there has been very limited examination of links between positive affect and inflammation in cancer populations, despite the importance of inflammatory processes for cancer development and progression. The current study examined the association between positive affect and plasma markers of inflammation (CRP, sTNF-R-II, IL-1RA, and IL-6) in a sample of 166 women who had completed treatment for early-stage breast cancer within the past three months (mean = 1.1 months post-treatment). Positive and negative affect were assessed with the Positive and Negative Affect Scale (PANAS) and depressive symptoms were assessed with the BDI-II. Controlling for negative affect as well as age, BMI, and treatment with chemotherapy and radiation therapy, higher levels of positive affect during the past month predicted lower levels of sTNF-R-II (β = -.188, p = .018) as well as marginally lower levels of CRP (β = -.139, p = .070). The relationships between positive affect and both IL-1RA and IL-6 were in the same direction, but did not reach significance. Analyses controlling for depressive symptoms yielded a similar pattern of results. In contrast, negative affect during the past month and depressive symptoms during the past week were not significantly associated with inflammatory markers. Results suggest that positive affect may be uniquely associated with lower inflammation in the cancer context, which may have implications for cancer-related symptoms as well as cancer progression. Funding sources: Research supported by the National Cancer Institute (R01 CA 109650) and the Breast Cancer Research Foundation. P.M. is supported through a National Institute of General Medical Sciences Training Grant (S32GM084963).

26) Abstract 314
HEART RATE RECOVERY FROM EXERCISE STRESS IS NOT ASSOCIATED WITH HEART RATE RECOVERY FROM PSYCHOLOGICAL STRESS
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Substantial evidence from cardiology shows that heart rate recovery (HRR) from exercise challenge predicts mortality in cardiac patients and healthy community populations. In psychophiology, the weak association between psychological stress reactivity with cardiac outcomes has led to increased interest in the prognostic value of recovery from psychological stressors. There are no studies of the relationship between these two recovery indices; however, the cross-stressor adaptation hypothesis suggests that HRR from psychological and exercise stress should be related. This study tests this association using the cardiology literature’s preferred method for measuring HRR.. Participants were 71 healthy adults (ages 20 to 45, mean=31.5, SD=5.9 years; 52.1% female) enrolled in a clinical trial of the effect of exercise training on inflammation. Heart rate was measured during an exercise stress test for determination of aerobic fitness – VO2max) and during a laboratory psychological stress condition (mental arithmetic and Stroop tasks). In both protocols, a recovery period immediately followed each stressor. The continuous electrocardiogram measured during stressor and recovery periods was used to generate a beat-to-beat R-wave interval (RRI) time series used to compute HR. HRR was computed using the cardiology approach: the change in HR between peak HR during the stressor and HR at 60 sec and 120 sec into recovery. Math and Stroop were averaged to represent HRR to psychological stress. Graphical plots and Pearson’s correlations were used to examine the relationship between exercise stress HRR with psychological stress HRR, using a criterion alpha < 0.05. Contrary to the cross-stressor adaptation hypothesis, we found near-zero correlations between these two indices of HRR at both 60 sec and 120 sec into the recovery period (Fig. 1). These results: 1) suggest that exercise and psychological stress recovery invoke different neurophysiological mechanisms and; 2) provide no support for the cross-stressor adaptation hypothesis. Although null results may be difficult to interpret, these findings raise doubts about the capacity of psychological stress HRR to predict cardiac and mortality outcomes that have been predicted by exercise stress HRR.
Results: In a logistic model, mutually adjusted for depression, anxiety and inflammation, and for sociodemographics, socioeconomic status, lifestyle factors, those in the lowest OJ tertile (versus those in the highest) had a higher odds of depression (OR = 4.56, 95% CI, 2.90-7.18) or anxiety (OR = 3.49, 95% CI, 2.39-5.09). With regard to inflammatory markers, the odds ratios were 1.50 (95% CI, 1.03-2.21) for CRP, 1.09 (95% CI, 0.74-1.60) for fibrinogen, 1.64 (95% CI, 1.11-2.43) for WBC, and 1.65 (95% CI, 1.11-2.44) for NEUT. Using linear regressions these associations were replicated for depression and anxiety, but not for inflammatory markers.

Conclusion: OJ appeared to be strong determinant of anxiety and depression and is an independent determinant of inflammation. The fact that the latter association was found in logistic regressions but not in linear regressions is indicative of a threshold effect. Generalizing, this data suggests that in healthy populations, such as occupational cohorts, associations between inflammation and psychosocial risk factors like OJ may not be linear, and may become apparent only at high exposure levels.

29) Abstract 301
SELF-ESTEEM AND DIURNAL CORTISOL IN OLDER ADULTS: A LONGITUDINAL ANALYSIS
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Objective: Research has shown that self-esteem can be associated with psychological benefits (e.g., reduced negative affect and stress). However, negative affect and stress represents risk factors for disturbances in individuals’ endocrine systems. Self-esteem has also been shown to buffer increased levels of cortisol among individuals who perceive stress. However, self-esteem significantly declines in old age, and it is a risk factor for older adults’ health. Here we explore the associations between self-esteem changes and diurnal cortisol secretion in a 4 year longitudinal analysis of older adults. We expected that self-esteem declines would predict subsequent increases in cortisol if older adults experience high levels of stress or depressive symptoms. Methods: 147 older adults (aged 60+) completed 3 two-year assessments in the Montreal Aging and Health Study. The participants represented a range of self-esteem levels. We predicted associations between self-esteem changes and diurnal cortisol secretion in a 4 year longitudinal analysis of older adults. We expected that self-esteem declines would predict subsequent increases in cortisol if older adults experience high levels of stress or depressive symptoms. Methods: 147 older adults (aged 60+) completed 3 two-year assessments in the Montreal Aging and Health Study. The participants represented a range of self-esteem levels. We predicted associations between self-esteem changes and diurnal cortisol secretion in a 4 year longitudinal analysis of older adults.

28) Abstract 324
ASSOCIATION OF ORGANIZATIONAL JUSTICE WITH DEPRESSION, ANXIETY, AND MARKERS OF INFLAMMATION: A CROSS-SECTIONAL STUDY
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Objective: Organizational justice (OJ) refers to the perceived justice at the workplace and is associated with impaired health. The objective of this study was to determine the association of OJ with depression, anxiety and markers of inflammation, as these may act as potential pathways of the OJ-health relationship.

Methods: Cross-sectional data from the MIPH Industrial Cohort Studies (MICS) from 957 factory workers (88% male, mean age = 39 years, SD = 12) was used. OJ was assessed with the recently validated German Organizational Justice Questionnaire (G-OJQ). Depression and anxiety were assessed using the Hospital Anxiety and Depression Scale and inflammatory markers (C-reactive protein (CRP), fibrinogen, white blood cell count (WBC), and neutrophil count (NEUT)) were determined using fasting blood. Associations were explored by multiple adjusted logistic and linear regression analyses. For logistic regression, depression and anxiety were defined as scores of 8 or higher on each subscale. Elevated inflammatory levels were defined as marker values in the highest quartile (> 75% percentile). For linear regressions, CRP, fibrinogen, WBC, and NEUT were log transformed to assure normal distribution.
who begin opioid analgesic use are at greater risk of incident MI as compared to those who only have depression or only have opioid use.

Methods: In a cohort of 227,102 patients with no evidence of MI and who used the VA in 1999 and 2000, we identified depression using ICD-9 codes and opioid use (at any dose). An incident opioid prescription was defined as first use after 2 years without any prescription. We computed the age adjusted risk of MI before and after adjusting for Charlson comorbidity index. Patients were followed until MI or censorship (2007 or lost to follow-up).

Results: After accounting for comorbidity, as compared to nondepressed patients who did not use opioids, those who had both opioid use and depression were 2.2 (95% CI: 1.9-2.6) times more likely to develop MI, those with only opioid use 1.8 (95% CI: 1.7-1.9) times, or only MDD 1.4 (95% CI:1.2-1.7) times more likely to develop MI. Conclusions: The rapid increase (10 fold increase since 1990) in opioid analgesic use sets the stage for a parallel increase in risk of MI, especially in depressed patients. Results will inform health care providers of the MI risks associated with opioid use in depressed patients which may lead to screening and monitoring of depression and MI risk factors as part of prescribing opioids.

31) Abstract 350

ADVERSE HEART FAILURE PROGNOSIS IS ASSOCIATED WITH DEPRESSIVE SYMPTOMS: INDEPENDENT OF FUNCTIONAL STATUS, AND QUALITY OF LIFE

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FUNCTIONAL STATUS, AND QUALITY OF LIFE

ADVERSE HEART FAILURE PROGNOSIS IS ASSOCIATED WITH DEPRESSIVE SYMPTOMS: INDEPENDENT OF FUNCTIONAL STATUS, AND QUALITY OF LIFE

ADVERSE HEART FAILURE PROGNOSIS IS ASSOCIATED WITH DEPRESSIVE SYMPTOMS: INDEPENDENT OF FUNCTIONAL STATUS, AND QUALITY OF LIFE

32) Abstract 584

SOCIOECONOMIC STATUS OVER 12 YEARS IN RELATION TO SUBCLINICAL CARDIOVASCULAR DISEASE AMONG AN ETHNICALLY DIVERSE SAMPLE OF MIDLIFE WOMEN: THE STUDY OF WOMEN'S HEALTH ACROSS THE NATION

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Background The relation between socioeconomic status (SES) and cardiovascular disease (CVD) is well-established. However, the relation between SES and subclinical CVD, as well as SES assessed prospectively over time in relation to CVD is less clear. Use of subclinical CVD capturing early development of disease is useful to avoid SES biases in event presentation and detection. Considering SES over time is important given the dynamic nature of SES (e.g., income, financial strain). We aimed to examine the relation between SES assessed over 12 years in relation to subclinical CVD.

Methods The Study of Women’s Health Across the Nation (SWAN) is a prospective study of women who were ages 42-52, not taking hormones, and had their uterus and at least one ovary. 1403 women (30% African American, 51% Caucasian, 13% Chinese, 6% Hispanic) free of clinical CVD were included here. SES assessed yearly for 12 years, was categorized as <=high school, some college, >college education (baseline only); consistently low, medium, consistently high income; and consistent financial strain, no strain, and mixed. A carotid ultrasound at year 12 measured intima media thickness (IMT), adventitial diameter (AD), and plaque. Relations between SES and subclinical CVD were examined in linear and logistic regression (covariates: age, race, sex, education, BMI, smoking, alcohol use, HOMA, and anticoagulant, antihypertensive, lipid-lowering medication use). Psychological factors (depressive symptoms, anxiety, life events, positive/negative affect) were also considered.

Results In multivariable models, low education (<=high school: OR(95%CI): 1.46(1.05-2.04), p=.03; some college: OR(95%CI): 1.42(1.07-1.88), p=.01; vs. >college), consistently low income (OR(95%CI): 1.54(1.05-2.26), p=.03; medium: OR(95%CI): 1.18(90.90-1.56), p=.2; vs. high), and consistent financial strain (OR(95%CI): 1.67(1.22-2.30), p=.001; mixed: OR(95%CI): 1.28(96.170), p=.09; vs. none) were associated with greater likelihood of plaque. SES was not associated with IMT or AD; controlling for psychological factors had little impact on results. Findings were consistent across racial groups.

Conclusion Low education, low income, and financial strain, persisted consistently across the age, were associated with a greater plaque accumulation in the carotid artery among women free of clinical CVD. These findings support the value of considering SES over time.

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33) Abstract 478

NATURALLY-OBSERVED CONFLICT, PARENTAL STRESS, AND PEDIATRIC ASTHMA

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Formulating a clear picture of everyday family interactions is essential for understanding how family stress adversely affects children’s health, particularly in the context of chronic illness. Using a novel naturalistic observation sampling method called the EAR-assessment (EAR), we sought to investigate the effects of daily interpersonal conflicts and parental stress on pediatric asthma outcomes. We collected data from 74 children, aged 10 to 17 (M age = 12.89; 55% male), and their primary caregiver as part of the Asthma in the Lives of Families Today (ALOFT) study. Each child completed a pulmonary function test and a self-report questionnaire of asthma-related medical information was abstracted from their medical records. The Adult and Parent UCLA Life Stress Interview (LSI) assessed acute parental stress (the number of acutely stressful events in the past 6 months). Of these 74 participants, 40 children wore the EAR for 4 days. Trained research assistants coded the children’s EAR files for all instances of interpersonal conflict (e.g., arguing, fighting, yelling) and asthma symptoms (e.g., coughing, wheezing). EAR-assessed conflict was positively associated with child-reported shortness of breath (r = 0.36; p = 0.02) and wheezing (r = 0.37; p
with wheezing coded from the EAR ($r = 0.47$, $p < .002$), and with a greater number of emergency room visits in the past 6 months ($r = 0.47$, $p < .02$). Further, we found positive associations between LSI-assessed acute parental stress and child-reported coughing ($r = 0.27$; $p = 0.02$) and wheezing ($r = 0.38$; $p < 0.01$). We also found parental stress to negatively associate with FEV1/FVC, an indicator of pulmonary functioning ($r = -0.29$; $p = 0.02$), and with asthma clinic visits ($r = -0.36$; $p < 0.01$). Taken together, these findings show that greater interpersonal conflict in everyday life and parental stress are broadly associated with markers of asthma morbidity. This research has important implications for asthma interventions tailored to the individual and their larger family system.

34) Abstract 445

THE IMPACT OF STEREOTYPE THREAT ON HEART RATE VARIABILITY RECOVERY
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Health disparities exist in cardiovascular disease (CVD) such that minorities – especially African Americans – often have elevated risk for mortality and morbidity; however, the causes of such disparities are still largely unknown. Stereotype threat (ST) occurs when negative stereotypes associated with a particular group are made salient by cues in the environment. Previous studies present strong evidence that, when compared to their majority-group counterparts, ethnic minority-groups and women are the most affected by this phenomenon. Little research has been conducted to demonstrate the impact ST may have on the physiological systems of the body (i.e., cardiovascular system). Recently, research suggests that implicit ST conditions may present more deleterious psychological effects than a low ST or explicit ST condition. In the present study, we examined the differences in heart rate variability (HRV; an index of cardiovascular health) following a no, implicit, and explicit ST manipulation. Continuous heart rate data was recorded as 65 (32 minorities) participants completed a baseline period, a computerized target detection task, and a recovery period. Participants were randomly given the control, implicit ST, or explicit ST manipulation prior to the cognitive task. Results revealed that minority participants that underwent either ST manipulation had significantly lower HRV than the control group ($p< .05$). Additionally, minorities had significantly lower HRV recovery in the implicit ST manipulation when compared to majority participants ($p< .05$). Interestingly, between ethnicities, HRV recovery differences were not significant in the control or explicit ST groups. This supports recent research proposing that ST may not only prolong cardiovascular recovery, but implicit ST may present more harmful psychological and physiological effects than low or explicit ST manipulations.
35) Abstract 241
RELATIONSHIPS BETWEEN PERCEIVED STRESS MANAGEMENT SKILLS (PSMS) AND SLEEP QUALITY AND FUNCTIONAL WELL-BEING OUTCOMES MEDIATED BY DEPRESSIVE SYMPTOMS IN HIV+ WOMEN WITH HPV
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Purpose: Cognitive Behavioral Stress Management interventions (CBSM) are associated with improved psychosocial and health outcomes in a variety of health populations, including individuals with HIV and cancer. These improvements are partially due to improved perceived stress management skills (PSMS) and subsequent reductions in depressive symptoms. HIV+ racial/ethnic minority women deal with chronic, severe life and health-related stressors that tax coping resources on a daily basis. However, little is known about how differences in PSMS relate to quality of life in this population. The current study examined the relationships between PSMS and (a) sleep quality and (b) functional well-being mediated by depressive symptoms in HIV+ minority women with cervical cancer risk. Methods: 71 women (PS+ age = 31.3, SD = 8.4) with HIV and HPV completed measures of functional well-being (Functional Assessment of HIV Infection). Results: After controlling for demographic variables associated with sleep quality, greater PSMS was significantly associated with less sleep disturbance (β = -0.24, p < .03) and less daytime dysfunction due to sleepiness (β = -0.19, p < .03). These relationships were significantly mediated by lower depressive symptoms (Sleep disturbance Sobel test = -2.36, p < .02) and Daytime dysfunction Sobel test = -2.40, p = .02). While PSMS (β = 0.24, p ≤ .01) and lower depressive symptoms (β = -0.67, p ≤ .001) were significantly and independently associated with functional well-being, depressive symptoms did not mediate the relationship between PSMS and functional well-being. Discussion: PSMS is related to better sleep quality via lower depressive symptoms in HIV+ women with cervical cancer risk. These results also indicate that both PSMS and depressive symptoms are strong predictors of functional well-being. Women living with HIV and cervical cancer risk may experience mood, sleep, and functional well-being benefits from CBSM interventions that enhance PSMS.

36) Abstract 197
ILLNESS PERCEPTIONS PREDICT HEALTH PRACTICES AND MENTAL HEALTH FOLLOWING HEMATOPOIETIC STEM CELL TRANSPLANTATION
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Beliefs about illness are thought to shape health practices and coping efforts. The present study investigated illness perceptions among hematologic cancer patients undergoing hematopoietic stem cell transplant (HSCT). We also examined the extent to which perceptions predicted health practices and mental health following transplant. Participants (N = 311) completed measures of illness perceptions (belief about control, severity, timeline, personal control, consequences), personal and treatment control over cancer, and understanding of one’s cancer prior to HSCT. Assessments of health practices (diet, physical activity, alcohol use) and mental health (depression, anxiety, psychological well-being) were assessed pre-transplant and 1, 3, 6, and 12 months post-transplant. On average, HSCT recipients viewed their cancer to be more of an acute than chronic condition, perceived their cancer to have severe consequences, and believed they had moderate personal control over their cancer but that treatment had more control. Mixed effects linear regression models adjusting for graft type, age, and gender revealed that HSCT recipients who perceived the consequences of their cancer to be more serious experienced greater depression (z = 5.11, p < .001) and anxiety (z = 2.52, p < .05) and less psychological well-being (z = -3.60, p < .001) during the year following transplant. Those with a greater sense of personal and treatment control ate a healthier diet (z = 2.24, p < .05) and reported greater well-being (z = 3.47, p < .01; z = 5.60, p < .001). Patients who had a better understanding of their cancer also ate a healthier diet (z = 3.66, p < .001) and reported less depression (z = 4.61, p < .001), less anxiety (z = -3.26, p < .01), and greater well-being (z = 4.86, p < .001). Finally, HSCT recipients who believed their cancer was a chronic condition maintained high levels of physical activity throughout the year, while those who perceived their cancer to be an acute condition showed a more pronounced decline in physical activity during the initial months after transplant (z = 2.34, p < .05). Results indicate that HSCT recipients’ perceptions of their cancer may shape health practices and psychological well being during the critical recovery period after transplant.

37) Abstract 219
FACTOR STRUCTURE OF THE PHQ-9 DEPRESSION QUESTIONNAIRE AMONG HOSPITALIZED PATIENTS WITH SYSTOLIC HEART FAILURE
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Background: There is a significant body of work exploring the factor structure of various depressive screening measures in patients with cardiac disease. The American Heart Association (AHA) endorsed the nine-item PHQ-9 as a depression screening tool. However, its underlying factor structure in hospitalized systolic heart failure patients has not been explored.
Methods: 471 hospitalized heart failure patients who had an left ventricular ejection fraction (LVEF) < 40%, NYHA functional class II-IV symptoms, and were suspected of depression completed the PHQ-9 prior to discharge from 4 Pittsburgh-area hospitals. Sociodemographic and clinical data were collected at baseline. Confirmatory factor analysis (CFA) was performed using the MPlus statistical software described in outpatient cardiac patients and corresponding with item face validity: somatic dimension (fatigue, appetite problems, psychomotor agitation/retardation, sleeping difficulties) and cognitive dimension (depressed mood, lack of interest, worthlessness, concentration problems, suicidal ideation). The Chi2 test, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) goodness of fit indices were assessed. An exploratory factor analysis (EFA) was also conducted and further confirmed using the minimum average partial correlation selection technique.
Results: The sample was predominantly Caucasian (85%) and male (65%), with a mean age of 66±13 years. The average PHQ-9 score was 9.6±5.2 (Range: 0-25). CFA did not support a two-factor solution, with all indices indicating a poor fit (Chi2 p value<0.0001, CFI 0.796, RMSEA 0.089 (90% CI 0.073-0.105), SRMR 0.082). EFA yielded a 1-factor structure (one factor with an eigenvalue ≥ 1.280). All 9 items loaded positively on the factor, with each of the factor pattern coefficients > 0.35, with the exception of the suicidal ideation item (0.31). The one-factor solution was further confirmed by the minimum average partial correlation selection procedure.
Conclusion: Both CFA and EFA of the PHQ-9 in hospitalized systolic heart failure patients supports a 1-factor solution, suggesting that the questionnaire may be unidimensional when assessing depression in this population.

38) Abstract 722
RELATIONS OF FASTING GLUCOSE TO NEUROCOGNITIVE FUNCTION AMONG NON-DIABETIC OLDER ADULTS
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Type 2 diabetes shows well-established relations to lowered levels of cognitive performance. However, little is known about relations
between fasting glucose levels and glucose metabolism to neurocognition among non-diabetic older adults. The aims of the present study were to examine relations of fasting glucose and glucose metabolism to cognitive function, and to examine age, sex, and education as potential moderators of these associations. The participants were 172 non-diabetic, stroke- and dementia-free adults with a mean age of 66.5 years. The sample was 58% male with a mean level of education of 16.3 years. Participants completed neurocognitive tests that assessed attention, memory, executive functions, visuospatial skills, and psychomotor abilities. An oral glucose tolerance test was administered. Multiple regression analyses, adjusted for age, education, sex, depression, systolic blood pressure, body mass index, and anti-hypertensives were computed to examine relations of fasting glucose, 2 hour glucose, and 2 hour area-under-the-curve measures to cognitive performance also examined were interactions of glucose measures with age (≤70 vs. >70 y), sex, and education (<12 y vs. ≥12 y). Results showed the most robust associations between fasting glucose and the poor outcomes, although all were subject to effect modification. Age moderated the relation of fasting glucose to visuospatial abilities and mental flexibility; sex modified the relation of fasting glucose to learning and memory and mental flexibility; and education moderated relations of fasting glucose to working memory and psychomotor ability (p's < .05). In general, those most vulnerable to higher glucose levels were older adults, and had less education. Thus, results support the notion that higher levels of non-diabetic fasting glucose levels may contribute to lower levels of domain-specific neurocognition among vulnerable subgroups of non-diabetic older adults. Older adults may benefit from careful control and maintenance of glucose levels prior to the onset of Type 2 diabetes to help maintain optimal cognitive functioning.

39) Abstract 725

OBESITY IS ASSOCIATED WITH POORER NEUROCOGNITIVE PERFORMANCE AMONG ADULTS WITH HIGH BLOOD PRESSURE

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Obesity has been associated with poorer neurocognition among adults and increased risk of late-life dementia. Existing evidence suggests that the impact of obesity on neurocognition may be multifactorial and influenced by related comorbidities associated with metabolic syndrome, including hypertension. Recent evidence also suggests that behavioral interventions that modify cardiovascular risk factors, such as diet and exercise, may be associated with improved neurocognition. The present review will cover the existing literature linking obesity to poorer neurocognitive function, as well as discussing the impact of behavioral interventions, including exercise and dietary modification, on neurocognitive function. The review will also describe the ENLIGHTEN randomized trial of aerobic exercise and the Dietary Approaches to Stop Hypertension (DASH) diet currently being conducted among adults with vascular cognitive impairment, no dementia (CIND). Finally, we will present analyses from the recently completed ENCORE study examining the relationship between obesity and neurocognitive function among overweight and obese adults with high blood pressure. Participants in the ENCORE trial included 144 overweight or obese (body mass index 25-40) men and women with high blood pressure (130-159 / 85-99 mm Hg) participating in the ENCORE trial. Overweight, 109 obese participants underwent tests of Executive Function (Trail Making Test, Stroop Test, Controlled Oral Word Association Test, Digit Span, Animal Naming) and Memory (Verbal Paired Associates), and Psychomotor Speed (Digit Symbol Substitution Test and Ruff 2&7 Test). Participants also underwent assessments of cerebrovascular risk factors, including the Framingham Stroke Risk Profile (FSRP) including systolic blood pressure, diabetes, atrial fibrillation, history of cardiac disease, and left ventricular hypertrophy). For the purposes of the present analyses, the FSRP did not include age, because this was controlled for as a separate covariate. Thirty five participants were overweight (BMI 25-30) and 109 participants were obese (BMI 30-40). After controlling for the effects of age, years of education, gender, ethnicity, and the FSRP, obese participants had poorer Psychomotor Speed compared with overweight participants (t = -2.29, P = .024). Within this model, older age (P < .001) and lower education (P = .013) were also predictive of poorer Psychomotor Speed. Obesity was not associated with poorer Executive Function (P = .910). Obesity is associated with poorer Psychomotor Speed among adults with high blood pressure. These effects appear to be independent of cerebrovascular risk factors.

40) Abstract 214

TRAIT MINDFULNESS AND DEPRESSIVE SYMPTOMATOLOGY RELATIONS AMONG AFRICAN AMERICANS

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Trait mindfulness is a predisposition or tendency towards non-judgmental awareness of the present moment. Previous research has demonstrated a positive association between trait mindfulness and psychological well-being. An inverse association between trait mindfulness and depressive symptoms has also been established in the literature; however, this relationship has been documented primarily in Caucasian samples. To our knowledge, there have been no studies that have examined the relation between trait mindfulness and depressive symptoms in an African-American community sample. Previous empirical findings have shown that African Americans have significantly higher levels of depression than Caucasians suggesting a need for unique diagnostic and intervention options. The current study sought to examine the association between trait mindfulness and depressive symptomatology in African Americans. In addition, we examined whether the relationship varied as a function of age, gender, or education. Participants included 195 community-based African-American adults from the Washington, DC metropolitan area. This study was part of a larger study entitled the HealthPARC Study of Cognitive Aging (S.O.C.A). The mean age was 58.9 and the sample had a mean of 13 years of educational attainment. Hierarchical regression analysis was used to examine the relation between trait mindfulness and depressive symptomatology. After adjustment for age, gender, and years of education, trait mindfulness was negatively associated with depression in this group. This association did not vary as a function of age, gender, or education. This result was consistent with prior evidence that suggests trait mindfulness is associated with psychological well-being. Moreover, results support prior evidence suggesting that innovative interventions are needed to effectively engage and retain African Americans in psychotherapeutic treatment, and suggests that mindfulness-based interventions may be appropriate for this population. Because depressive symptoms are often associated with other health-related outcomes, future studies should explore other possible health benefits associated with mindfulness in this population.

41) Abstract 171

EFFECTS OF WRITTEN EMOTIONAL DISCLOSURE ON PSYCHOLOGICAL AND PHYSICAL HEALTH OUTCOMES IN CANCER PATIENTS AND SURVIVORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aim: Emotional non-expression has been associated with impaired adjustment to serious diseases such as cancer. Written emotional disclosure (WED) of thoughts and emotions related to traumatic events has previously been shown to provide positive effects in psychological and physical health problems in healthy and mixed clinical samples. The aim was to conduct a systematic review and meta-analysis of studies of WED, a potentially cost-effective intervention, with cancer patients and survivors.

Methods: Searches were conducted in electronic databases with the search terms: (Expressive OR emotional OR disclosure) AND (writing OR written OR written description) AND cancer. Inclusion criteria were: RCT of 3-4 sessions of written emotional disclosure with cancer patients or survivors providing results for effects on QoL, psychological or physical health outcomes. Effect sizes (ES; Hedges’ g) were calculated and pooled for combinations of QoL, psychological and physical health outcomes. Results: Twelve independent studies (total N=1194), all investigating effects of 3-4 20-min lab- or home-based writing sessions, fulfilled the inclusion criteria. Eight studies had investigated 355 cancer patients. No effects were found for either psychological health (ES (K=10, A-61
N=960): 0.09 (CI95%: -0.04 to 0.21); fixed model, p=0.18), physical health (ES (K=8, N=990): 0.12 (CI95%: -0.02 to 0.26); random model, p=0.39) or mental health (ES (K=4, N=418): 0.02 (CI95%: -0.20 to 0.16)). There were no indications of publication bias, and when exploring various potential moderators, including time to follow-up and fact-writing vs. no writing control groups, no differences in ES reached statistical significance.

Conclusions: In contrast to previous meta-analyses of studies with healthy and mixed clinical samples, no effects of WED were found for cancer patients and survivors for any of the combined outcomes. While WED may not be effective for the group of cancer patients and survivors as a whole; individual studies have reported statistical significant effects for various sub-groups, including participants with high social constraints and low alexithymia scores – potential moderators to be further studied.

42) Abstract 152
EFFECTS OF AEROBIC CONDITIONING ON CARDIOVASCULAR SYMPATHETIC RESPONSE TO AND RECOVERY FROM CHALLENGE
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Objective To test the hypothesis that aerobic but not strength training would lead to attenuated cardiovascular sympathetic reactivity to and more rapid recovery from cognitive and orthostatic challenge and that deconditioning would reverse this effect.

Methods We conducted a randomized controlled trial (RCT) contrasting the effects of aerobic vs. strength training on cardiac (pre-ejection period, PEP) and vascular (low-frequency blood pressure variability, LF-BPV) sympathetic reactivity to and recovery from psychological and orthostatic challenge in 149 healthy, young, sedentary adults. Subjects were randomized to 12-week aerobic or strength training programs and studied before and after training and again after 4 weeks of sedentary deconditioning. The data were analyzed by performing a Group (aerobic vs. strength) by Session (study entry, post-training, and deconditioning), by Period (baseline, 4-weeks, 8-weeks), and by 3-way ANOVA with prespecified contrasts of the effect of group assignment on reactivity and recovery. Results Aerobic capacity increased in response to conditioning and decreased after deconditioning in the aerobic but not the strength-training group. However, the two groups did not differ on PEP or LF-BPV reactivity to or recovery from laboratory challenge.

Conclusions These findings, from the largest RCT to address this matter to date, raise doubts about attenuation of sympathetic reactivity or enhancement of recovery as a putative mechanism underlying the cardioprotective effects of aerobic exercise.

43) Abstract 496
A POTENTIAL MOLECULAR MECHANISM LINKING AEROBIC EXERCISE TO IMPROVEMENT IN DENTATE GYRUS-RELATED COGNITIVE FUNCTION
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Background: Cognitive function deteriorates with age, in part because of a decline in neurogenesis within the dentate gyrus (DG) of the hippocampus. Recently, the chemokine CCL11 was implicated in the molecular mechanism of impaired neurogenesis. Interestingly, increases in age were associated with increased CCL11 levels in serum in mice and serum and CSF in humans. Because recent evidence suggests that exercise slows aging-related cognitive decline and because we have shown that aerobic exercise increases cerebral blood

volume, a correlate of neurogenesis, in the DG, we hypothesized that CCL11 mediates the effect of aerobic exercise training on cognitive function. We tested this hypothesis in healthy sedentary adults.

Method: Participants (n=35, age range 20-45 yrs) from a randomized trial of the effect of 12-weeks of aerobic training (vs. wait list) on inflammatory markers were assessed for aerobic capacity (VO2max) and CCL11. Data were collected before randomization and after training and change scores for each variable were computed. We analyzed the relationship between change in VO2max and change in CCL11 in a regression model that included group assignment.

Results: As predicted, increases in VO2max were significantly associated with decreases in CCL11 (β = -.35, p = .02)

Conclusions: These data provide preliminary evidence of a molecular pathway by which aerobic exercise, through its effects on a systemic chemokine, reduces the susceptibility of the aging brain to cognitive impairment.

44) Abstract 523
ARE YOUR FEELINGS ABOUT YOUR BODY AND SOCIAL SUPPORT STRESSING YOU OUT?
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We recently established low body esteem as a source of chronic stress. In a current study, we wanted to investigate if alexithymia-affected healthy persons differ from healthy persons with normal body esteem in the perceived stress levels as well as in their physiological response to stress. To answer these questions we studied a group of 100 healthy participants (71 females; age: 20±2) completed measures of perceived chronic stress (PSS), body esteem (BESAA), and social support (ISEL).

As expected, we found that both low body esteem as well as low social support were associated with high perceived chronic stress ratings for both genders (both: beta=-.43, p<.01). When controlling for social support, the association between body esteem and stress vanished (beta=-.17, p>.10). Interestingly, the above was true for the association between social support and stress when controlling for body esteem (beta=-.23, p<.17). This pattern was particularly evident for the two subdomains of body esteem measuring how one feels about one’s weight and appearance. When looking at how one thinks one’s body is judged by others, social support did not affect the gender-dependent link with perceived stress (beta=-.35, p=.03; controlling for social support: beta=-.32, p=.03).

These results suggest that social support may be one mechanism underlying the relationship between body esteem and perceived chronic stress. More specifically, individuals who feel negatively about their weight and appearance not only seem to have difficulties reaping the potential benefits of social support, but our findings further suggest a dangerous cyclical relationship in which low social support may help sustain low body esteem. A noteworthy exception from this pattern are men who, independent of social support, seem to be able to turn positive judgments about their bodies by others into a stress buffer.
Body esteem was assessed with the Body Esteem Scale (BES), and perceived chronic stress with the Perceived Stress Scale (PSS).

Overall, the TSST was successful in eliciting cortisol stress responses ($F=3.52$, $p<.031$). Hierarchical regression analysis revealed that while body esteem was negatively associated with perceived stress ($\beta=-.52$, $p<.001$), this was particularly true for males, such that males with low body esteem reported more perceived stress than females with low body esteem, while males with high body esteem reported less chronic stress than females with high body esteem ($\beta=-.35$ $p=.038$). With regard to cortisol stress responses, attribution subscale scores of the BES predicted strength of cortisol responses independent of gender ($\beta=-.27$, $p=.04$). These findings suggest that negative feelings about one’s physical appearance may indeed constitute a chronic stressor, particularly for men.

Furthermore, in support of the allostatic load approach, feelings of being viewed negatively by others seems to be the aspect of body esteem that is linked to HPA axis dysfunction, i.e., a blunted HPA activation during an acute psychosocial stressor. In summary, our findings support the notion of low body esteem being a chronic stressor and suggest negative health effects through stress-related mechanisms.

46) Abstract 594

**LINKS BETWEEN BODY ESTEEM, CHRONIC STRESS, AND CORTISOL REACTIVITY IN EATING DISORDER PATIENTS**

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**Abstract 597**

**ARE US WOMEN MORE STRESSED BY THEIR BODY PERCEPTIONS THAN GERMAN WOMEN?**

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Body esteem affects many areas of women’s lives, including health and well-being. For the current study, we propose that these negative effects may be due to negative perceptions of the body being an important source of chronic stress. Since significant variations in body esteem have been described among women in different cultural groups, we further propose that associations between body esteem, perceived stress, and stress appraisal may vary among German and US women.

To test these hypotheses, 30 US and 26 German women completed questionnaires assessing their levels of body esteem (BESAA), chronic stress (PSS), and appraisal of a stressful event (PASA).

Overall, US women reported significantly lower levels of body esteem than German women (appearance, weight, attributions: $p<.01$). Interestingly, while feelings that others make negative judgments about one’s body were also associated with higher levels of perceived stress for US women ($r=-.42$, $p<.03$), for German women, body esteem was independent of perceived stress ($r=-.05$, $p=.82$). Addressing the role of appraisal, we found that feeling better about one’s appearance was linked to perceiving more control and less threat in a stressful situation among German women ($r=.50$, $p<.01$; $r=-.51$, $p=.01$, respectively). For US women, however, assumptions about others’ judgments were associated with perceiving less control over a stressful situation ($r=-.58$, $p<.001$).

Overall, our current findings support a conceptualization of low body esteem as a chronic stressor and as such, suggest a pathway underlying the pathogenically observed link between body esteem and health. Our findings further suggest that this mechanism may vary significantly by culture and cognitive appraisal of stressful situations.

For example, while in German women, being satisfied with one’s appearance seems to be stress protective through feeling less threatened and more in control in stressful situations, US women appear to respond particularly strongly to what they think others might think about their body. These assumptions may then lead to perceiving social-evaluative situations as less controllable and, eventually, to chronic stress and health detriments in US women with low body esteem.

48) Abstract 293

**MARKERS OF HPA AXIS FUNCTIONING: IS THERE A RELATIONSHIP BETWEEN THE CAR AND THE TSST**

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The cortisol awakening response (CAR) and the Trier Social Stress Test (TSST) are both markers of HPA axis stress reactivity (Kudielka & Wust, 2010). The CAR involves a 50-160% increase in cortisol secretion post-wakening (Clow et al., 2004). The CAR is both a response to the stress of wakening and a way of marshaling resources to deal with the stresses of the day (Wust et al., 2000). It is also considered distinct from the regular diurnal rhythm of cortisol secretion (Wilhelm et al., 2007). The TSST is a psychosocial laboratory stressor involving social evaluative threat that reliably elicits an increase in cortisol secretion (Kirschbaum et al., 1993). The CAR and TSST are thought to measure two distinct types of cortisol secretory activity (Kudielka & Wust, 2010). However, there is little research comparing the CAR and TSST, although some studies have looked at differences in both markers in relation to individual factors such as parenting style (Ellenberg & Hodgins, 2009) and pregnancy stage (Entringer et al., 2010). This study compares the CAR and cortisol secretion across the TSST. We hypothesize that, because the CAR is considered by some to be a response to the stress of wakening, it would be correlated with cortisol secretion in response to a stressor such as the TSST.

Salivary cortisol was collected from 57 female participants (15 depressed, 42 non-depressed) over 5 days as a part of a separate study (Dienes et al., 2012). Samples were collected at waking and 30 minutes past waking. Salivary cortisol was collected at baseline, and at 0, 10, 25, and 40 minutes following the TSST. There was a significant correlation between mean CAR (across 5 days) and the rise immediately after the task to 10 minutes after the task on the TSST ($r=-.62$, $p=.003$). The CAR was also significantly correlated with the recovery in cortisol secretion from 10 to 40 minutes post task ($r=-.69$, $p<.001$).
0.36, p = 0.02). Similar correlations between the CAR and rise and recovery in the TSST were seen using estimates of each drawn from hierarchical linear models controlling for a range of biobehavioral factors.

Cortisol secretion across the TSST was significantly associated with the CAR, indicating that there may be a relationship between these two markers of HPA axis activity. It seems that a “healthy” increase in cortisol secretion across the CAR (50-160%) is associated with a “healthy” pattern of responding to the TSST (2-3-fold increase). Both the CAR and TSST may be markers of cortisol reactivity to either the stress of waking or a laboratory stressor. Further research is needed to determine if similar mechanisms are involved in these two forms of cortisol reactivity.

49) Abstract 292

RACIAL DISPARITIES IN CORTISOL SECRETION ACROSS THE TSST AND THE ROLE OF DISCRIMINATION

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Prevalence rates for many types of morbidity and mortality have been reported as disproportionate across racial groups in the US (U. Department of Public Health, 2011). Biological responses to environmental stress have been proposed as a partial explanation for such disparities. Many studies have focused on the relationship between racial disparities in stress and reduced functions of the HPA axis to a variety of negative health outcomes (Tsigos & Chrousos, 2002). Differences among racial groups’ diurnal cortisol patterns have repeatedly been found (DeSantis et al., 2007; Hajat et al., 2010).

Comparatively few investigations have focused on the differences among racial groups’ cortisol secretion in response to a standardized psychosocial stressor. Chong and colleagues (2008) reported that African American (AfAms) and Asian Americans (AAs) had lower cortisol secretion in response to, and during recovery from, the Trier Social Stress Test (TSST) when compared to Caucasians (Cs). We found that Hispanic Americans had a significantly steeper rise and steeper recovery in cortisol secretion across the TSST compared to Asian Americans in a previous study (Garber et al., in preparation). Additionally, the differences in cortisol secretion among racial groups have not been fully explained by socioeconomic status (SES) differences. Racial discrimination, a particular type of stress, is encountered more frequently and acutely by non-white individuals/persons of color, than by Caucasians (Contrada et al., 2001). Researchers have proposed biopsychosocial pathways by which discrimination initiates mechanisms that can have harmful effects on health (Harrell et al., 2011). It is predicted that Cs and AfAms will differ in cortisol secretion in response to the TSST, but that experience of discrimination may mediate these differences.

Eight AfAms and 6 Cs individuals (a pilot sample) completed the TSST and the General Ethnic Discrimination Scale. Although there was no significant difference between the two groups on rise and recovery in response to the TSST, differences in Area Under the Curve (AUC) approached significance (t(12) = -1.67, p = 0.08; Cs: Mean = 878.6, AfAms: Mean = 554.74). The difference between Cs and AfAms in lifetime experience of discrimination also approached significance (t(5) = 2.41, p = 0.06). Lifetime discrimination did not predict cortisol secretion. We predict that further data collection by the time of this symposium will solidify these preliminary findings and will allow for further mediational analyses involving discrimination. The current findings seem to indicate that differences in cortisol secretion exist not only in diurnal patterns, but also in response to an acute laboratory stressor, supporting the findings by Chong et al.

50) Abstract 681

POPULATION DIFFERENCES IN ASSOCIATIONS OF SEROTONIN TRANSPORTER PROMOTER POLYMORPHISM (5HTTLPR) DI- AND TRIALLELIC GENOTYPES WITH BLOOD PRESSURE AND HYPERTENSION PREVALENCE

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Based on prior research finding the 5HTTLPR L allele associated with increased cardiovascular reactivity to laboratory stressors and increased risk of myocardial infarction in healthy cohorts, we hypothesized that the 5HTTLPR L allele will be associated with increased blood pressure and increased hypertension prevalence in a large, nationally representative samples in the U.S. and Singapore. Weighted linear mixed model analyses tested associations between diallelic (LS) and triallelic (LS’, based on rs25531) 5HTTLPR genotypes and mean SBP and DBP collected during the Wave IV survey of the National Longitudinal Study of Adolescent Health (Add Health, N=14,299) in 2008-09 and during 2004-07 in 4,218 Singaporeans. The proportion of L alleles with the low activity rs25531 G allele ranged from 10-12% in Caucasians and Native Americans to 29% in African Americans, to 48-49% in Singaporean Malays, Indians and Chinese. In U.S. Caucasians L and L’ allele carriers had higher SBP (P=0.002-0.001) and a 26% higher hypertension prevalence (P=0.0002-0.0001) than those with SS and S’S’ genotypes. In contrast, among African Americans, L’ carriers had lower mean SBP (P=0.03) and a 21-31% lower hypertension prevalence (P=0.003) than those with the S’S’ genotype, and those with LS, L’L’ and S’S’ genotypes had significantly lower SBP (P=0.005-0.001) and hypertension prevalence (P=0.004-0.001) than those with SS and S’S’ genotypes. In the Singapore sample S’ carriers had higher SBP (P=0.02) and DBP (P=0.001) than those with the L’L’ genotype. These findings suggest that Caucasians carrying the L or L’ alleles, African Americans and Native Americans with the low activity rs25531 G allele, and those with the S’S’ genotype will be at higher risk of developing cardiovascular disease and may benefit from preventive measures. Supported by NICHD grant P01HD31921, NHLBI grant P01HL36587, and grants R-581-000-117-101, R-581-000-099-101, R-581-000-090-101, R-581-000-083-101 and R-581-000-062-112 from the National University of Singapore.

51) Abstract 131

CHARACTERIZATION OF COGNITION AND PSYCHO-PATHOLOGY ASSOCIATED WITH RECREATIONAL KETAMINE USE

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Ketamine has received increasing attention as a potential pharmacotherapeutic agent for affective disorders and in pharmacological models of psychosis, and is also a popular drug of abuse. While effects of acute, chronic, and medicinal ketamine exposure have received empirical focus, less is known about its recreational use. To this end, we explored general cognition, past psychiatric pathology and current psychiatric symptomatology, with a focus on recreational ketamine users. Given our earlier findings of particularly high cannabis consumption among ketamine users, we also recruited drug-naïve participants (n=20; no ketamine use) and drug-naïve participants (n=20) for comparison.

The mean age of the total sample was 22.4 (range: 17-55) years; 43% male. There were no significant differences among groups on age, sex, education, or cognitive abilities, and all ketamine users also reported cannabis use. Sixty percent of the ketamine sample met for a past Axis I diagnosis, 92% of whom had a history of major depression, but none met for current depression. In contrast, only 30% of the cannabis and 5% of the drug-naive groups had a past diagnosis. Ketamine users scored significantly higher than the drug-naive group across scales probing schizotypy, delusional ideation, and perceptual anomalies experienced outside acute drug exposure; cannabis users scored intermediate, but closer to the drug-naive group. While groups did not
differ on a measure of dissociative experiences, ketamine users endorsed significantly higher rates of out-of-body experiences (74%) and illusory vestibular sensations (80%), compared to 32% and 25% of cannabis users, respectively. These results suggest that links between ketamine and psychopathology extend to recreational use and anomalous experiences beyond its acute effects. The strong association with past, but not current, depression is noteworthy in light of ketamine’s recent use as an antidepressant. The mechanisms underlying these results are worthy of further investigation. With respect to the severity of pain, anxiety, depression or somatization no differences emerged. However, the severity of NLS and depersonalization was significant higher for the CRPS patients (NLS 12.4 ± 6.1 vs 9.1 ± 6.8, p = 0.042; CDS 33.0 ± 33.0 vs 17.2 ± 23.1, p=0.039). Any NLS was endorsed by 72% of the CRPS patients versus 28.6% of the controls (p<0.001). The recommended cut-off for NLS was yielded by 32% of the CRPS patients versus 13.6% (p<0.01). Clinically significant NLS were predicted by depersonalization, depression and somatization, but not by duration or severity of pain. Conclusions: Findings suggest that mental distress may play a more important role for the complex picture of CRPS than previously assumed.

52) Abstract 477
NATURALISTIC STRESSORS ARE ASSOCIATED WITH REDUCED 24-HOUR HRV IN ACUTE POST-MI PATIENTS
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Depression is associated with increased risk of mortality in acute post-MI patients, and reduced heart rate variability (HRV) has been suggested as a potential mediator of depression-related risk. Depression has also been associated with stressful life events, and stressful life events are known to reduce HRV. This study investigated whether depression is related to reduced HRV independently of stress reported during daily life. Structured interviews were administered to 323 men and women in-hospital two days following MI and again two weeks following MI after hospital discharge. Stress was measured using a modified version of the Hospital Stress Scale, and using the Daily Hassles Scale. 24-hour Holter recordings were obtained at baseline and two weeks later, on the same day as the interviews. Major depression was associated with significantly elevated scores on the Hospital Stress Scale (p<.001) and on the Daily Hassles Scale (p<.001), but was unrelated to 24-hour HRV during either the initial baseline assessment or during the assessment 2-weeks post-MI onset. However, stress experienced during hospitalization was related to lower SDNN during the baseline assessments (p=.03) and number of daily hassles was related to lower SDNN two weeks following MI (p=.03). The daily hassles score was also related to a slower recovery of HRV (p=0.052). These findings suggest that stress during daily life is an important modulator of autonomic cardiac control during the acute post-MI period.

53) Abstract 647
COMPLEX REGIONAL PAIN SYNDROME (CRPS) AND BODY PERCEPTION DISTURBANCES: ASSOCIATIONS OF NEGLECT-LIKE-SYMPTOMS WITH ANXIETY, DEPERSONALIZATION, DEPRESSION AND SOMATIZATION
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Objective: The Complex regional pain syndrome (CRPS) is a chronic pain disease characterized by severe pain, swelling, changes in the skin and motor dysfunction. The large majority of CRPS patients reports so-called “Neglect-Like-Symptoms” resp. disturbances of the body perception (Galer and Jensen, 1999). “Neglect-Like-Symptoms” (NLS) are much more prevalent in CRPS than in non-CRPS limb pain, which suggests that NLS is specific for CRPS. It is assumed that cortical reorganisation in the clinical stages of “Neglect-Like-Symptoms” (Reinersmann et al., 2012). Despite reports of increased mental distress in CRPS and similarities of the “Neglect-Like-Symptom” narratives with depersonalization (feeling of estrangement from one’s sense of self), no study has examined such associations. Against this background the aim of this cross-sectional study was to examine associations of mental distress with NLS in patients with CRPS as compared to other pain syndromes.
Methods: The sample consists of n = 50 patients with CRPS and n = 30 with other pain syndromes from a pain clinic (F.B.). Pain was classified according to the current IASP criteria. NLS were assessed with the original questionnaire (Frettloh et al. 2006). Anxiety, depression and somatization were assessed with the PHQ, depersonalization with the Cambridge Depersonalization Scale (CDS).
Results: 43.6% of the CRPS patients had at least one clinically significant mental disorder versus 43.3% of the controls (p=0.009). With respect to the severity of pain, anxiety, depression or somatization no differences emerged. However, the severity of NLS and depersonalization was significant higher for the CRPS patients (NLS 12.4 ± 6.1 vs 9.1 ± 6.8, p = 0.042; CDS 33.0 ± 33.0 vs 17.2 ± 23.1, p=0.039). Any NLS was endorsed by 72% of the CRPS patients versus 28.6% of the controls (p<0.001). The recommended cut-off for NLS was yielded by 32% of the CRPS patients versus 13.6% (p<0.01). Clinically significant NLS were predicted by depersonalization, depression and somatization, but not by duration or severity of pain. Conclusions: Findings suggest that mental distress may play a more important role for the complex picture of CRPS than previously assumed.

54) Abstract 632
AUTONOMIC RESPONSE TO AUDITORY EMOTIONAL STIMULI IN DEPERSONALIZATION DISORDER AS COMPARED TO PATIENTS CONTROLS
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Objective: Depersonalization disorder (DPD) is characterized by marked experiences of unreality, detachment, or being an outside observer with respect to one’s thoughts, feelings, sensations, body, or actions and deregulation. Recent neuroimaging and psychophysiological studies have shown diminished activation in limbic areas, and marked autonomic attenuation in response to negative affective stimuli. On the other hand, mindfulness interventions seem to be helpful to increase emotional awareness in DPD patients. Against this background the aim of this study was, to examine autonomic responsiveness to affective stimuli in DPD patients as compared to patient controls in two conditions (with or without mindful breathing meditation during affective stimulation).
Methods: The sample consists of n = 22 DPD patients and n = 15 patient controls. Both groups were matched regarding sex, education, severity of depression (BDI, 31 ± 12, 28 ± 12) and anxiety (STAI, 60 ± 9, 50 ± 10). Skin conductance responses were measured in reaction to emotional sounds (International Affective Digitized Sounds, IADS) of different valence (neutral, pleasant, unpleasant) and arousal (medium, high). Subjective ratings of valence and arousal were obtained using the Self-Assessment Manikin in a separate session.
Results: With respect to the subjective ratings of the sounds only differences for sounds with negative valence were found. DPD patients rated negative sounds as less unpleasant than patient controls (3.2 versus 2.5, d=0.76, p=0.025). With respect to arousal these sounds were rated as more arousing (3.2 versus 2.5, d = 0.76, p = 0.036). With regard to skin conductance responses DPD patients showed stronger autonomic responses to emotional stimuli (p=0.006), especially stronger responses to unpleasant stimuli (p=0.017) and stimuli with high arousal (p=0.032). No significant differences were found between the conditions with or without mindful breathing.
Conclusions: In summary, contrary to our expectation DPD patients showed stronger autonomic responses, especially to stimuli with unpleasant valence and high arousal. Despite their stronger autonomic responses, DPD patients rated the respective emotional stimuli as less unpleasant compared to patient controls. According to these findings, early emotional processing might be not attenuated in DPD. However, later phases of emotional processing (evaluation, awareness) might be affected by the disorder.

55) Abstract 165
ADVANCED MATERNAL AGE AT FIRST BIRTH IS NOT ASSOCIATED WITH INCREASED PSYCHOLOGICAL DISTRESS DURING PREGNANCY
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The average age at which women are having a first birth has been steadily increasing over the past three decades across many industrialized countries. Advanced maternal age (35 years of age and over) is associated with an increased risk of certain maternal and fetal medical complications. While the medical risks have been well documented, fewer studies have examined the psychosocial experience of older women during pregnancy. The aims of this study were to...
characterize and compare the psychosocial experience of pregnancy in first-time expectant older (age ≥ 35) and younger (age <35) women and to identify determinants of depressed mood during pregnancy in each age group to better inform tailored interventions. One hundred and eighty seven (n = 187) married or co-habiting nulliparous women completed questionnaires measuring: social support, life events, parental self-efficacy, pregnancy-related anxiety, and childbirth fear in the third trimester of pregnancy. Depressed mood was assessed with the Edinburgh Postnatal Depression Scale (EPDS). Demographic variables were computed for each age group to identify determinants of depressed mood. Both age (age ≥ 35, n = 75 vs. age <35, n=112) reported similar levels of social support, life events, parental self-efficacy, pregnancy-related anxiety, childbirth fear and depressed mood in the third trimester of pregnancy. Twenty percent of the women in the advanced age group (n = 16) and 30.5% (n = 35) in the younger age group obtained a score of ≥10 on the EPDS. In the multivariate analysis, the only variable independently associated with higher depressed mood scores in women of advanced maternal age was lower social support (β = -.25, p=0.039). In the younger age group, fewer years with partner (β = -.21, p=.01), higher pregnancy specific anxiety (β = -.36, p=0.001), and more stressful life events (β = .21, p=.015) were independently related to elevated depressed mood during pregnancy. Our findings suggest that psychosocial adjustment during pregnancy for older first-time mothers is generally comparable to their younger counterparts. Despite the similar experiences, depressed mood during pregnancy is common across age groups and necessitates early screening and intervention in primary and antenatal care settings in order to prevent more serious consequences for mothers and their infants. Age-specific determinants of depressed mood emerging in our results, highlighting the importance of tailoring strategies to increase the effectiveness of interventions designed to optimize maternal mental health during pregnancy.

56) Abstract 169
DEPRESSED MOOD AND BODY MASS INDEX ARE ASSOCIATED WITH POOR SLEEP QUALITY IN MEN EXPECTING THEIR FIRST CHILD
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Sleep disturbances including insomnia, sleep fragmentation and daytime sleepiness are common for women during pregnancy. Disturbed sleep has been shown to adversely impact quality of life and daily functioning in various populations. Studies addressing the prevalence and factors associated to sleep disturbances in men during the transition to parenthood are lacking. The aim of this study was to determine the prevalence of sleep disturbances in men expecting their first child and to identify factors associated with poor sleep quality. Couples expecting their first child were recruited from local prenatal classes and university affiliated obstetric/gynecology and ultrasound clinics. One hundred and forty-two men (mean age = 34.1, SD = 5.8) completed an on-line survey during their partner’s third trimester of pregnancy. The battery included the Pittsburgh Sleep Quality Index (PSQI), measures assessing depression, trait anxiety, social support, marital satisfaction, physical activity, and questions about smoking and alcohol consumption. Logistic regression examined correlates of poor sleep. The mean global PSQI score was 3.4 (SD = 1.7) and self-reported sleep duration was 7.7 hours (SD=1.1). The prevalence of sleep problems defined as PSQI ≥ 5 was 24.6% (n=35). Men who reported more depressive symptoms (odds ratio (OR) = 1.21, 95% confidence interval (CI) = 1.02-1.42) and with a higher BMI (OR = 1.11, 95% CI = 1.01 – 1.25) had greater odds of reporting poor sleep quality. Physical activity level, smoking and alcohol consumption were not associated to poor sleep quality. Depressive symptoms and elevated BMI are associated with sleep disturbances in men expecting their first child. Given that sleep quality is likely to worsen following the birth of a child, men who are already experiencing sleep difficulties in their partner’s pregnancy may benefit from strategies aimed at alleviating depressed mood and sleep hygiene counseling to improve sleep. Future studies to address the temporality of depressed mood and sleep disturbances in men during the transition to parenthood are needed.

57) Abstract 187
TELEPHONE-DELIVERED COGNITIVE BEHAVIORAL STRESS MANAGEMENT INTERVENTION FOR CHRONIC FATIGUE SYNDROME: EFFECTS ON STRESS, SYMPTOMS, AND NEUROIMMUNE PROCESSES
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Background. Stress has been associated with CFS symptoms and illness burden and related neuroimmune processes, and cognitive-behavioral moderators (e.g., optimism, coping, social support) mitigate the effects of stressors on CFS symptoms/illness burden. Interventions designed to reduce perceived stress through cognitive/behavioral and interpersonal skills training may decrease CFS symptoms and improve neuroimmune regulation. Previously we demonstrated that group-based cognitive behavioral stress management (CBSM) intervention decreases stress and improves mood scores in young women. However, CBSM is not feasible for the most impaired CFS patients cannot travel to and attend clinic-based groups we tested a telephone-delivered group-based CBSM (T-CBSM) program. Methods. We recruited 114 men and women diagnosed with CFS according to the Fukuda criteria and randomized them to either a 10-wk T-CBSM group or a 10-wk Telephone Health Information control (T-HI). Those in T-CBSM were provided a specifically designed phoneline and dialed in to a once weekly, CBSM conference call with a clinically trained group leader. Those in T-HI received a time-matched once weekly, health education phone session for 10 weeks. Patients completed questionnaires and provided saliva (4x daily for 2 consecutive days) and mid-day blood samples at baseline and 5-month follow-up. Results. Those assigned to T-CBSM reported reduced CDC-based symptom frequency and Perceived Stress Scale (PSS) scores at 5-month follow-up, with no changes in controls. CBSM participants also showed reductions in IL-1β and TNF-a compared to no changes in T-HI. Within T-CBSM greater improvements in perceived stress management skills associated with greater decreases in PSS, CFS symptom severity, fatigue interference, disruption in recreations and pastimes, and sleep disruption. Conclusions. Telephone-delivered group-based CBSM decreases CFS symptoms and alters neuroimmune processes by improving stress management skills. This work provides preliminary support for the efficacy of telephone-delivered group-based CBSM in CFS, and provides support for a biobehavioral model where changes in stress processes parallel improvements in symptom reports and neuroimmune regulation.

58) Abstract 390
POST-EXERTIONAL MALAISE SYMPTOMS, SALIVARY CORTISOL, AND COPING SELF-EFFICACY IN PATIENTS WITH ME/CFS
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Objective: Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is characterized by debilitating fatigue typically exacerbated by cognitive and/or physical exertion, leading to reformulated diagnostic criteria for this condition involving the presence of post-exertional malaise (PEM) symptoms. Cortisol dysregulation is frequently seen in individuals with ME/CFS, but the relationship between symptoms and frequency and severity of PEM has not been established. Since distress has been linked with cortisol dysregulation and CFS symptom exacerbation, it follows that one’s ability to manage distressing situations may relate to better cortisol regulation and less PEM in CFS patients. Methods: We examined relations between reports of PEM, salivary cortisol, and coping self-efficacy in 114 men (N = 20) and women (N = 94) with ME/CFS. The average age of the sample was 50.7 years (SD=11.5), and the majority (79.5%) were non-Hispanic White.
Participants provided saliva samples (4 per day for 2 days) and completed self-reports of CDC-based CFS symptomatology over the prior 30 days and their perceived ability to cope with stressful situations. Mean cortisol values from the two collection days were used for analysis. Results: Greater severity and frequency of PEM was related to lower post-awakening salivary cortisol (ρ = .035), less average cortisol output over the course of the day (ρ = .023), and a flatter diurnal cortisol slope (ρ = .11). Coping self-efficacy was positively related to greater post-awakening salivary cortisol (ρ = .19, p = .046) and was negatively related to diurnal cortisol slope (ρ = - .219, p = .020). Coping self-efficacy had an indirect effect on lower PEM via its effect on post-awakening salivary cortisol (95% confidence interval = -.193 to -.002).

Conclusion: Individuals who perceive themselves as more capable of coping with stressful situations reported less PEM, which may be due to less cortisol dysregulation with greater coping self-efficacy. Future research should examine whether methods to improve coping self-efficacy result in improved cortisol regulation and less post-exertional malaise in individuals with ME/CFS.

59) Abstract 118
CO-MORBID INTERNET AND ALCOHOL DEPENDENCY IS ASSOCIATED WITH BLUNTED CARDIAC AND CORTISOL REACTIONS TO ACUTE PSYCHOLOGICAL STRESS
Adam Bibby, BSc, Annie T. Girty, PhD, Doug Carroll, PhD, Anna C. Phillips, PhD, School of Sport and Exercise Sciences, University of Birmingham, Edgbaston, Birmingham, United Kingdom
Recent research suggests those with maladaptive dependencies, namely tobacco, alcohol, or exercise, may be characterised by low or blunted cardiovascular and cortisol reactions to acute psychological stress. Hence, previous health research has been focused on dependencies as opposed to single disorders may relate to poorer health outcomes. The present study was innovative through testing the hypothesis that co-morbid dependence, specifically to the Internet and alcohol, would be associated with blunted physiological stress reactivity. 581 undergraduate students (419 female) were screened using validated Internet and alcohol dependence questionnaires. Ten individuals with comorbidity, 16 non-dependent, and 12 dependent controls were selected for laboratory stress testing. Heart rate, blood pressure, and salivary cortisol were measured in response to 20 minutes of mental arithmetic and speech stress tasks. Compared to non-dependent individuals, the co-morbid group demonstrated blunted heart rate reactivity to the stress tasks (ρ = .02). There was also a trend for a blunted cortisol stress response in co-morbid individuals compared to the non-dependent group (ρ = .09). There were no group differences in blood pressure responses. There were also no group differences in stress task performance, baseline heart rate/cortisol, subjective task stressfulness/engagement, age, gender, body mass index, depression, or a range of health behaviours. This novel study shows that blunted heart rate, and to some extent cortisol, reactivity may be a characteristic of co-morbid behavioural and substance dependence. These results challenge the current hegemony regarding reactivity to stress and support the new and innovative theory that blunted stress reactivity may be a peripheral marker of central motivational dysregulation in the brain, and also detrimental for health. Given the health implications of Internet and alcohol dependence, blunted stress reactivity may have sustained impact as a potential prognostic marker of addiction and relapse risk, and to identify those most at risk of ill health in later life.

60) Abstract 680
PSYCHOPHYSIOLOGICAL DECOUPLING IN ALEXITHYMIC PAIN DISORDER PATIENTS
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The term alexithymia describes a multidimensional personality trait primarily characterized by a deficit in emotion processing and regulation. Individuals with alexithymia have difficulties in identifying and describing their own emotions and communicating one's own and others' emotional states. The link between alexithymia and psychopathology has been extensively investigated with a considerable emphasis on psychosomatic disorders. Highly alexithymic individuals might be more prone to attribute those unemotionalised emotions to somatic sensations and even perpetuate them. Although studies confirmed higher prevalence of alexithymia in pain disorder patients, it is not clear how alexithymia contributes to pain psychophysiology. 21 pain disorder patients with high alexithymia scores and 21 age-matched pain disorder patients with low alexithymia scores were exposed to three categories of stress-inductive stimuli: (I) cognitive arithmetic task without affective involvement, (II) watching a video with low affective involvement and (III) giving an oral presentation arousing high affective involvement. The Differential Affect Scale (DAS) was used to document subjective appraisal of the induced emotional stress. To investigate physiological reactivity we measured heart rate (HR), muscle tension (EMG) and skin conductance (SCR) throughout the whole experiment. Fisher's Z-transformations were applied to allow comparison of variables with different levels of measurement. Performing ANOVA's we aimed to assess the effect of the between factor group and the experimental factors time, task and measure on physiological activity as well as a possible interactions between them. Comparing SCR activity to DAS scores, a mixed design ANOVA revealed a significant three-way interaction Time x Measure x Group (F(1,40)=10.556; p<.002). Here, while giving an oral presentation, high alexithymia patients showed significantly lower SCR activity in combination with higher DAS scores. Thus, a weaker physiological reactivity could be shown in combination with comparatively increased subjective emotional appraisal in high alexithymia patients representing a decoupling between physiological and emotional processing during a stressful affect-inductive situation. Therefore, especially in pain patients with alexithymia the ability to differentiate affect from somatic sensations needs to be further investigated and may explain why coping self-efficacy result in improved cortisol regulation and less post-exertional malaise in individuals with ME/CFS.

61) Abstract 410
AUTOMATED VERSUS MANUAL WHITE MATTER HYPERINTENSITY RATINGS OF MR IMAGES IN A HEALTHY MIDDLE AGED SAMPLE
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White matter hyperintensities (WMH) are commonly found in older adults. In middle aged adults WMHs are common among adults with disease pathologies and cardiovascular risk factors, though in healthy middle aged adults, the prevalence of WMHs is limited. Various fully- and semi- automated WMH ratings systems have been used to detect WMHs in older and disease middle aged adults and whether results from this process correlate with lifestyle factors such as sleep, exercise, smoking, as well as food and alcohol intake in the same way as manual ratings. The automated WMH rating system as described by Wu and colleagues (2006) uses a fuzzy-connected algorithm to segment the WMHs, and the Automated Labeling Pathways to localize the WMHs into the anatomical space. This results in two global measures of WMHs, the first: WMT, the sum of the WMH volumes within the white matter anatomical space. This results in two global measures of WMHs, the second, ALL, a sum of WMH volumes from all of the white mattertracts defined by the Johns Hopkins University White Matter Atlas, and the second, ALL, a sum of WMH volumes from all of the white matter in the brain. Participants were recruited from a larger study. A sample of 74 participants, mean age 47.3 (SD=7.4) had automated rating data and a semi-overlapping sample of 67 participants, mean age 46.4 (SD=7.4) had manual rating data. There was no difference between groups on age, race or gender. A correlation (N=52) compared WMT and ALL with the manual WMH severity score (CHS 10-point rating scale). WMT and ALL were significantly correlated to the manual ratings, (WMT/Manual, r=.32, p=.020, ALL/Manual, r=.28, p=.045). Partial correlations controlling for age were run for all WMH rating types with various lifestyle factors. Manual WMH ratings were inversely correlated with days of exercise (N=67, r=-.18), and directly correlated with total kilocalories consumed (N=67, r=.29).
poverty, age, sex, alcohol, tobacco, and drug use, history of major
diseases, BMI, and depressive symptoms. In blacks, results showed
that the odds of HTN for those who reported monthly food insecurity
doubled compared to those who responded never (CI = 1.14–6.11, p = .024), and those who reported experiencing food insecurity some months had almost double the
odds of HTN compared to those who responded never (OR = 1.94, CI
= 1.01–3.76, p = .048). For whites, those who reported monthly food
insecurity had a 2.64-fold increase in odds of HTN compared to those
who responded never (CI = 1.02–6.08, p = .046). These results
support a relationship between food insecurity and HTN, such that
monthly food insecurity is associated with increased odds of HTN in
blacks and whites, while occasional food insecurity is associated with
HTN only in blacks.

### Table 1. Item response frequencies, by race, for the following question: “In the last 12 months, how often did you or your household cut the size of your meals or skip meals because there wasn’t enough money for food?”

<table>
<thead>
<tr>
<th></th>
<th>Blacks (N = 743)</th>
<th>Whites (N = 661)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>73.6%</td>
<td>76.1%</td>
</tr>
<tr>
<td>Only 1 or 2 months</td>
<td>5.2%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Some months, not every month</td>
<td>11.0%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Almost every month</td>
<td>7.3%</td>
<td>6.2%</td>
</tr>
</tbody>
</table>

Note: There were no statistically significant differences between groups (p’s > .05).
64) Abstract 699

EFFECT OF CENTRAL NERVOUS SYSTEM SEROTONIN FUNCTION ON INFLAMMATION, ADIPOSITY AND INSULIN SENSITIVITY

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Background: Studies have shown that inflammatory markers are increased in the insulin resistant state as well as in depressed individuals, raising questions about a potential common mechanism underlying inflammation in these conditions. Central nervous system (CNS) serotonin (5-HT) activity is implicated both in metabolic processes and psychological functioning. The purpose of the present study was to examine the association of the major 5HT metabolite 5-hydroxyindoleacetic acid (5HIAA) in cerebrospinal fluid (CSF) with depressive symptoms, C-reactive protein (CRP) levels, adiposity (BMI) and insulin sensitivity (HOMA-IR) in women. Method: We assessed the association of CSF 5HIAA with Beck Depression Inventory (BDI) score, plasma CRP level, HOMA-IR and BMI in a population of healthy women (N=65). Results: Depressive symptoms were not associated with 5HIAA, CRP, BMI or insulin sensitivity. However, there was a significant association between 5HIAA and HOMA-IR (p’s ranging between .02 and .001). A principal component analyses showed that CRP, HOMA, BMI and 5HIAA loaded strongly together. Controlling for BMI did not affect the association of 5HIAA to CRP but did reduce the 5HIAA to HOMA-IR association. Conclusion: It has been hypothesized that inflammation may precede insulin resistance, but the mechanisms are not known. The present results suggest that CNS 5HT function may be driving part of that association. Supported by NHLBI grant P01HL36587.

65) Abstract 166

THE ROLE OF VALUED LIFE ACTIVITIES IN DEPRESSED MOOD AND SMOKING CESSATION AMONG POST-ACUTE CORONARY SYNDROME PATIENTS

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Quitting smoking following an Acute Coronary Syndrome (ACS) greatly reduces mortality, but up to 50% of ACS patients relapse to smoking. Depression symptoms are common post-ACS and interfere with smoking cessation. Continued engagement in valued life activities is an established protective factor for depression and has recently been linked to greater readiness to quit smoking in medical patients, but has never been explored in ACS patients. The current cross-sectional study explores the relevance of valued activity engagement, valued activity restriction, and the replacement of restricted valued life activities to depression and smoking cessation in post-ACS patients. METHOD: 54 patients who were hospitalized for ACS in the past 1-12 months and were smoking at the time of their hospitalization were interviewed. Patients were asked to list activities currently engaged in that bring them meaning, pleasure, or a sense of accomplishment (count of activities listed = valued activity engagement) and any meaningful activities that they had to give up or severely restrict due to their heart condition (count of activities listed = valued activity restriction). Participants were also asked if they had found a satisfactory replacement for their most important restricted activity (i.e., rating as ≥5 on a 0-10 scale). Depression (Center for Epidemiological Studies Depression Scale-10), smoking status (self-reported 7-day point prevalence abstinence), and functional capacity (Duke Activity Status Index) were also collected. RESULTS: Greater depressed mood was associated with lower valued activity engagement (r = -.43, p < .0001) and greater valued activity restriction (r = -.42, p < .01), even after controlling for functional capacity (partial rs = -.33 and .30 respectively). Having problem solved a satisfactory replacement for one’s most important restricted valued activity was associated with lower levels of depressed mood (p < .01) and a greater likelihood of smoking cessation (p = .03). CONCLUSION: Treatments targeting engagement in valued life activities and replacement of restricted activities (e.g., Behavioral Activation), may facilitate both smoking cessation and amelioration of depressed mood in ACS patients. Supported by K23 HL107391.

66) Abstract 121

NEW ONSET DEPRESSION FOLLOWING HIP FRACTURE IS ASSOCIATED WITH INCREASED PHYSICAL FRAILTY IN OLDER ADULTS: THE ROLE OF CORTISOL:DHEAS

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Reduced regional gray matter volume (rGMV) in several brain regions including hippocampus, insula, anterior cingulate cortex (ACC) and the orbitofrontal cortex (OFC) were reported in subjects with posttraumatic stress disorder (PTSD) (Gilbertson 2002, Hakamata 2007, Woodward 2009, Chan 2009) or stressful life events (Papagni 2011). Our previous...
study revealed that the reduced ACC volumes and the decreased OFC volumes are the vulnerability factors and the acquired signs of PTSD symptoms by using Pre and Post earthquake MR images of 42 healthy survivors of the Great East Japan Earthquake, respectively (Sekiguchi) symptoms by using Pre and Post earthquake MR images of 42 healthy survivors of the Great East Japan Earthquake, respectively (Sekiguchi in press). Here, we examined the prognosis of the PTSD symptoms and brain structural changes in the brain regions previously implemented in the subjects with PTSD or stressful events. Of the 42 survivors, we could re-recruit 37 subjects (M/F = 28/9, Age = 21.0 ± 1.6 yr) and measured their structural MRI one year after the earthquake (Follow). We also assessed their PTSD symptoms by using the clinician-administered PTSD scale (CAPS) structural interview in 3 to 4 months (Post) and one year (Follow) after the earthquake. We applied the optimized voxel-based morphometry (VBM) method for brain structural dataset and compared rGMV between Post and Follow. As for PTSD symptoms, the CAPS total scores in one year after the earthquake were mostly recovered from 5.2 ± 9.6 (Post) to 1.6 ± 2.9 (Follow), suggesting no subject have developed into PTSD. As for rGMV, we found bilateral hippocampal volumes were significantly decreased (p < 0.001, uc) from Post to Follow, suggesting that highly stressful periods still existed even one year passed from the earthquake. On the other hand, rGMVs in bilateral insula, ventral ACC, bilateral and ventro-medial OFC were significantly increased (p < 0.001, uc) from Post to Follow. The increased volumes in these brain regions, which are involved in pain processing, emotional regulation, respectively, indicated that these cognitive functions play important roles in the resilience from the highly stressful event.

68) Abstract 754
ASSESSING SENSITIVITY OF COMMON PHYSIOLOGICAL STRESS MARKERS AND EVALUATING THEIR UTILITY FOR DIFFERENT TYPES OF STRESSORS IN HEALTHY ADULTS
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Objective: Using sensitive and reliable objective measures of stress is critical for research on stress and stress-related disorders as well as for evaluating interventions aimed at affecting stress responses and coping. Different types of stressors might activate different brain and body responses depending on the type of threat (physical or psychological), and this study aimed at comparing sensitivity of several common stress markers to a combined stressor and at assessing whether these stress markers differ in their sensitivity to specific stressor types.

Methods: Ninety-two healthy adults (Mean age = 58.0, 79 % females) were evaluated at baseline, during the stress battery consisting of physical, emotional, and mental stressors, and at post-stress assessment. The outcome stress markers included measures of respiration rate (RR), heart rate variability (HRV), EEG frontal asymmetry (EEG FA), galvanic skin response (GSR), and salivary alpha amylase (sAA) level at 5 assessment points (baseline, physical, emotional, mental stressor, and post-stress). Additionally, participants rated their stress level using subjective stress ratings at each time point.

Results: Repeated measures ANOVAs indicated significant increase in subjective stress ratings after stress battery on average and after each stressor type, p’s < .01, compared to baseline. Analyses completed to date demonstrated significant stress-related change after the stress battery for sAA levels and RR, p’s < .05, but not for EEG FA. With respect to specific stressor types, most significant changes in sAA and RR appeared following the mental stressor. Further analyses will be conducted evaluating stress-related changes in GSR and HRV, as well as assessing relationships among the measures used in the study. Furthermore, effect sizes for each of the tested marker will be compared.

Conclusions: Preliminary data showed different sensitivity of physiological markers to stress in general and to different types of stressors in particular. Most promising stress markers for the stressor types tested in our study will be discussed.

69) Abstract 712
BASELINE AND DYNAMIC PREDICTORS OF ENERGY IN ADVANCED KNOWLEDGE WORKERS
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Background: “Low-energy syndrome” is a major occupational health challenge in service and knowledge workers. Little is known about the interrelationship between baseline lifestyle and stress characteristics in advanced knowledge workers and how such variables might interact overtime in predicting changes in energy.

Methods: Advanced knowledge workers (total 303; 115 females and 184 males, with no gender information), representing information and technology companies and news media were asked to participate in the research study. Work sites were approached following endorsement by national management and labor unions. Participants responded to an extensive baseline survey, including questions in the domains of: sociodemographics, lifestyle, professional duties, skills and skills requirements, stress, recovery, physician-diagnosed diseases and self-rated health. In addition, a validated 3-item VAS type scale was used to determine self-rated energy. Participants responded to the survey at baseline, after 6 and 12 months, respectively. Loss-to-follow-up was less than 10 percent. Data were analyzed using regression and structural equation modeling. We tested two different latent growth models. The study had been approved by the appropriate IRB.

Results: Models assessing static relationships between predictor variables and the outcome variable energy at the three different time points explained approximately 50 percent of the overall variance in energy. There were significant changes over time in some (eating habits, worry), but not all (work effectiveness, stress) predictor variables over the one year period. The outcome variable energy changed significantly over time. Baseline stress was not predictive of baseline energy. Baseline eating habits, worry, and work effectiveness were predictive of baseline energy. The only significant predictor of changes in energy over time, was changes in work effectiveness.

Conclusion: This prospective study of the impact of workplace and personal factors on energy in knowledge workers highlights the importance of carrying out longitudinal studies in order to identify likely causative factors impacting adversely on employee health and energy. The study suggests that work efficiency, an organizational and malleable factor, play a key role to understand contributors to stress-induced “low-energy states”.

Acknowledgement: Supported by a Alecta and the the Swedish Council for Worklife and Social Research.

70) Abstract 273
BIOBEHAVIORAL MEDIATORS OF SES EFFECTS ON CRP IN A NATIONALLY REPRESENTATIVE U.S. SAMPLE
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C-Reactive protein (CRP), a marker of inflammation, is an established risk factor for cardiovascular disease. It has been suggested that elevated CRP may be at least one mechanism underlying the established relation between socioeconomic status (SES) and CVD. Understanding the association between SES and CRP helps to better understand how SES leads to CVD. Prior work has shown that the SES-CRP relation is complex, varying by race and gender and possibly mediated by behavioral risk factors. In addition, different measures of SES may have independent and varying associations with CRP. In the present study we used path models that to examine direct and indirect associations of four indices of SES (objective early life built environment ratings, parental education, participant education, and income level during early adulthood) with CRP during early adulthood using data on 14,656 participants from the nationally representative multi-ethnic sample-the Add Health Study. We examined potential mediation of the association of SES with CRP by way of CVD biobehavioral risk factors (body mass index (BMI), smoking, and alcohol consumption) within 8 groups categorized by race and gender. BMI mediated SES-CRP relations (p’s 0.048-0.001), while smoking mediated relations for...
certain groups (p’s, 0.046-0.001) and alcohol was not a mediator among any group. Indices of SES measured contemporaneously (income or respondent education level) with CRP and risk factors were more likely to be indirectly related to CRP via biobehavioral mediators for White, Hispanic, and Asian females, and Black males; whereas indices of earlier life SES (parental education or built environment) were more likely to be related to CRP through these mediators for Whites and Black females. These findings strengthen the case for reducing BMI and smoking among low SES groups. Supported by NICHD grant P01HD31921, NHLBI grant P01HL36587.

71) Abstract 703
PRELIMINARY RESULTS: HIGH-DENSITY LIPOPROTEIN IS PREDICTIVE OF SUPERIOR COGNITIVE FUNCTION IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT
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Background: There is evidence that high levels of high-density lipoprotein cholesterol (HDL) can increase hippocampal volume, accelerate synaptic maturation, and promote synaptic plasticity.1 Therefore, high levels of HDL may have a protective effect against Alzheimer’s disease, vascular dementia, and other neurodegenerative disorders. Procedure: Participants were older adults with MCI (n= 9) and their care partners (n= 10). In addition to the neurocognitive test battery (RBANS: Repeatable Battery for the Assessment of Neuropsychological status) and some standard physiological measurements (e.g. blood pressure), blood samples were collected from participants at 2 different time points. Insulin, glucose, triglycerides, cholesterol (total, LDL, and HDL), D Dimer, and CRP levels were measured. Results: For individuals with MCI, high HDL levels predicted high scores on specific neurocognitive tests measuring executive functioning (B= .515; p = .002), language processing (B= .371; p = .04), and attention (B= .554; p = .047) after adjusting for age and sex. These results were not found for the care partner group. Conclusion: While other studies have found relationships between HDL and measures of general cognition (e.g. the MMSE), this study used a neurocognitive battery that informs us about specific cognitive impairments. These results are consistent with previous research and suggest that strategies for boosting HDL may benefit specific neurocognitive functions as well as cardiovascular health.


72) Abstract 739
DATING VIOLENCE AND CARDIOVASCULAR RISK IN ADULTHOOD
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Adverse childhood experiences have been associated with cardiovascular disease (CVD) in adulthood. Examination of other highly prevalent upstream factors, such as dating violence, is warranted to highlight strategies that may prevent CVD. We test whether dating violence victimization and perpetration are associated with CVD risk in adulthood and whether risk differs by sex and history of maltreatment as a child. 9534 participants from waves 3 (2001-02) and 4 (2007-08) of the National Longitudinal Study of Adolescent Health were included [baseline age, mean (range), 21(18-27), 51% female]. Rasch modeling was used to create victimization and perpetration scores from frequency of 4 items (threat, physical violence, sexual violence, and injury) in relationships occurring between 1995 and 2001 when participants were 12 to 21 years old. Scores were modeled as no violence and tertiles among those reporting violence exposure. A composite CVD risk score was calculated from data collected at wave 4 representing the modifiable components of the Framingham 30-Year Risk Score including: systolic blood pressure, antihypertensive treatment, smoking, diabetes, and body mass index. Components were weighted according to the hazard ratio of their relationship to hard CVD in the Framingham cohort. Continuous components were log transformed. Linear regression models accounting for complex survey design were used to test models first including potential confounders (age, sex, race/ethnicity, educational attainment, and financial distress) then including potential mediators (depressive symptoms, physical activity, and diet). Multiplicative terms with sex and child maltreatment were tested. Overall, 32% reported victimization; 30% perpetration. Compared to no victimization, in models controlling for confounders victimization was associated with increased CVD risk in a dose response manner [estimates and 95% confidence intervals: 1st tertile 0.08 (0.02,0.18), 2nd tertile 0.11 (0.01,0.21), 3rd tertile 0.18 (0.10,0.26)]. Full adjustment for covariates did not attenuate the findings. Perpetration results were similar. No sex interaction was detected. History of maltreatment in childhood modified the results (p-values <=0.02), and the effect was restricted to those not exposed. Dating violence may have implications for cardiovascular health, especially among those without a history of maltreatment as a child. Greater attention to upstream psychosocial stress is warranted for its potential contribution to downstream cardiovascular disease risk.

73) Abstract 469
SLEEP, DEPRESSION, AND SOCIAL SUPPORT PREDICT TREATMENT-RELATED SYMPTOMS AND MOOD DURING CHEMOTHERAPY FOR BREAST CANCER: AN ECOLOGICAL MOMENTARY ASSESSMENT (EMA) STUDY
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Patients undergoing chemotherapy (CT) experience a range of physical and psychological symptoms. Understanding the association between psychosocial resources and symptoms during treatment will help identify patients at risk for severe symptoms during and following CT where additional resources may be needed. This study examines sleep, depression, and social support, using PSQI, CES-D, MOS-SS respectively, assessed 1 week prior to the start of a CT cycle as predictors of symptom (nausea, fatigue, pain, numbness, and difficulty thinking) and mood trajectories and responses to cancer-related stressors during the 3 weeks following administration of CT in 21 breast cancer patients. Symptom and mood ratings and number of...
cancer-related stressors were assessed 6 times daily for 3 weeks following CT via EMA using handheld computers. Data were analyzed using multilevel modeling PROC MIXED in SAS. Results revealed that women who reported greater baseline sleep problems reported greater nausea, numbness and anxious and negative mood throughout the 3 weeks after CT (p’s < .05). Baseline sleep problems and time interacted to predict nausea and mood, indicating that being below the PSQI median buffered nausea (β = .018, p = .016) and negative (β = -.015, p = .017) and anxious (β = -.018, p = .003) mood ratings following CT. Similarly, women who reported clinically significant depressive symptoms (CES-D ≥ 16) at baseline tended to report greater nausea, pain and fatigue throughout the 3 weeks after CT (p’s < .02). Baseline CES-D interacted with time to predict nausea, such that being < 16 at baseline buffered nausea ratings (β = .018, p = .036) following CT. Additionally, women who reported less SS at baseline experienced greater numbness, pain, fatigue, difficulty thinking, and greater anxious and negative mood throughout the 3 weeks following CT (p’s < .02). Separately, patients with poor baseline sleep and those with low SS reported high symptom severity regardless of the number of cancer-related stressors they reported experiencing at that moment (p’s < .01). These findings suggest psychosocial resources prior to CT are important predictors of the course symptoms experienced throughout cancer treatment.

74) Abstract 421
VAGAL HYPOREACTIVITY IN WOMEN WITH POSTTRAUMATIC STRESS DISORDER
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Autonomic hyperarousal is a core symptom of posttraumatic stress disorder (PTSD), which is explained by prefrontal disinhibition with resulting exaggerated stress responses. However, research has paid little attention to vagal components of stress regulation and thereby possibly missed the complexity of the problem. We performed mental stress tests in 37 healthy women, 25 women with PTSD but no putative stressors (PTSD-) and 27 women with PTSD and cardiac event (PTSD+). Stresses included mental arithmetic (MA; 5 min.) and a standardized audio recording of a crying baby (CB). Stressors were presented for 5 min. each and separated by 5 min. of rest. Among other parameters, heart rate (HR) and baroreceptor sensitivity (BRS; a marker of vagal regulation) were continuously recorded by a validated non-invasive monitor and compared between baseline rest (BR) and each of the stressors as well as between the two stressors. Mean age was 40 ± 10 y, with no significant group difference. In repeated measures ANOVA, highly significant time and time*group effects were observed for both HR and BRS (p’s<.001). While there were no significant group differences at baseline on HR or BRS, healthy controls (C) showed a significant increase in HR and decrease in BRS from BR to MA (see table). During CB, HR decreased below baseline, while BRS increased above baseline (all p’s<.005). When comparing PTSD- and PTSD+ to C, increases in HR from BR to MA were significantly smaller in both patient groups (both p’s<.01). Changes in BRS from BR to CB were significantly smaller in PTSD- (p=.009) and PTSD+ (p=.003) than in C, while change in HR was marginally smaller in PTSD+ vs. C (p=.056). In conclusion, healthy women react to MA with vagal withdrawal, while reaction to CB is characterized by vagal activation. Independently of cardiovascular medication, patients with PTSD show significantly less vagal activation than controls during CB.

75) Abstract 305
TRAITS FEAR AND AVOIDANCE AS PREDICTORS OF PAIN TOLERANCE
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Background: Most trait pain research has focused on chronic pain populations. However, trait measures of pain may also be a useful tool for determining acute pain outcomes in healthy groups. Method: Healthy participants initially completed a battery of questionnaires, including measuring pain-related fear (Pain Catastrophizing Scale and Pain Anxiety Symptoms Scale, with subscales of fear and avoidance) and vigilance (Pain Vigilance Awareness Questionnaire). Following the questionnaires, participants performed a cold pressor (CP) task in which their hand was submerged up to the wrist in an ice slurry maintained at 2°C until pain became intolerable. The maximum duration for the CP protocol was 5 min and participants were not informed of a priori of this limit. Interestingly, 23 out of the 128 participants immersed their hand for the maximum time limit, which allowed for comparisons between participants who terminated the CP under 5 min (low tolerant; LT) and those who kept their hand in for the entire duration (high tolerant; HT). Results: Higher trait pain-related fear responses in the LT group were observed when compared to the HT group (p < .05). Reported trait avoidance was also higher in the LT group compared to the HT group (p < .05). Overall pain vigilance/awareness was higher in the LT group compared to the HT group (p < .01). Conclusion: These results support the argument of trait averence to pain being associated with observed state pain tolerance. Compared to individuals low in pain-related fear/avoidance, individuals high in pain fear/avoidance display a shorter duration during the CP task. These findings may result from highly fearful participants’ difficulty in successfully managing the attentional demands of the pain experience. Specifically, the interference of pain is exaggerated by pain-related fear and catastrophic thinking. The findings suggest that patients show hypervigilance and bias toward pain-relevant stimuli. Additional research should be conducted to determine why certain individuals are more tolerant to pain.

76) Abstract 452
ANTICIPATORY MEAL RISE IN DIURNAL CORTISOL - WHAT IS IT AND WHAT CAN IT TELL US? EVIDENCE FROM THE PITTSBURGH COLD STUDIES
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When one thinks of diurnal cortisol, one tends to picture the standard curve, where you get a rise at wake-up, followed by a steep morning decline, leading to a leveling off in the afternoon and evening hours. However, many events can occur throughout the day that lead to alterations to this curve, including spikes related to anticipation of food-related meal anticipations. Here we report on anticipatory meal rise as a biomarker for HPA-axis activity. Method: Healthy participants were seated in a hotel room and given meals at approximately the same time each day, allowing for a unique opportunity to explore these anticipatory meal rises in a large group of extremely healthy subjects. A total of 402 subjects (54% male, 62% white, mean age 33.57 years, SD = 10.52) collected saliva samples at 10:00 am, 11:55 am (immediately prior to lunch), 3:00 pm, 5:00 pm (immediately prior to dinner) and 10:00 pm. Means across the sample show significant increases in cortisol levels at both the 11:55 am collection time and 5:00 pm collection time. Extent of anticipatory meal rise differed across the study sample, with lunch anticipatory rise being more variable than dinner. Younger participants, those who reported never being married, and those reporting lowered perceived stress based on the 10-item Perceived Stress Scale (PSS) showed the greatest anticipatory rise in saliva cortisol prior to lunchtime. Lower body mass index (BMI) was also related to higher anticipatory lunch rise. Additional psychosocial correlates of anticipatory meal rise will be discussed, as well as the implications of these findings in terms of using meal anticipatory rise as a biomarker for HPA-axis activity.
IT IS REALLY DISGUSTING: I MEAN IT, DO I FEEL IT?
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It has been theorized that the adaptive function of disgust extended from protecting the body from the incorporation of harmful elements to preserving social order and rules. The fact that people subjectively label both rotten food and crimes as “disgust” does not necessarily indicate that the same physiological mechanisms mediate these reactions. Is it just a linguistic or also a biological homology? To examine this issue, 20 men and 20 women were pseudo-randomly assigned to a physical or moral disgust induction by the use of audio scripts while the electrocardiogram was continuously recorded. Heart rate (HR) and variability (HRV) were derived. Affect ratings were obtained before and after the induction. Disgust sensitivity (DS-R) and obsessive-compulsive (OCI-R) tendencies were assessed. As suggested by the significant Script X Time interactions, partially overlapping subjective (F=4.31, p<.001; η²=.29) but distinct physiological response patterns emerged (F=8.20, p=.001; η²=.17 for HR; F=17.5, p<.0001; η²=.29 for HRV). Both scripts elicited disgust but whereas the physical script elicited feelings of fearfulness (F=3.48, p=.002), the moral script evoked more indignation (F=5.11, p<.0001) and contempt (F=4.10, p=.001). The disgust-induced subjective indicators were mimicked by opposite patterns of autonomic reactivity: enhanced activity of the parasympathetic nervous system (t=-2.46, p=.02) without concurrent changes in HR during physical disgust and decreased HRV (t=-3.40, p=.003) and increased HR (t=3.68, p=.002) during moral disgust. Disgust sensitivity correlated with the feeling of disgust during both conditions (r=.56 for moral and r=.45 for physical) and with dizziness for physical disgust (r=.47). Scores for DS and OCI correlated with HRV during the moral disgust induction (r=.49 and r=.67, respectively). Results suggest that the ‘bad taste’ of moral disgust does not rely on the same biological root of physical disgust and may only be considered a linguistic metaphor. The autonomic pattern that emerged for moral disgust seems to resemble more the physiological signature of anger. Indirect support for the notion that OCD is a disorder of morality was also obtained.

THE Efficacy OF Written EMOTIONAL EXPRESSION AT Reducing BACK AND HEADACHE Pain IN UNDERGRADUATES
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Little is known about pain symptoms and effective health interventions in undergraduates, perhaps due to the notion that they are a healthy, happy, and stress-free population. The current study investigated the efficacy of written emotional expression (WEE) at improving back pain and headaches in 94 undergraduates. Participants reporting elevated pain were randomized to either the WEE (n = 48) or time management writing condition (n = 46). Repeated measures ANOVAs revealed that both groups decreased in reported pain frequency over time (F (2, 87) = 4.92, p = .009); however, a significant group x time interaction with respect to pain medication use emerged (F (2, 92) = 3.22, p = .04). Medication use remained stable in the WEE group while participants in the time management group increased their pain medication over time. Avoidant coping moderated this relationship such that for those in the time management group, greater avoidance coping was related to more pain medication use (β = .33, p = .02). The present results suggest the preliminary efficacy of WEE at reducing reliance on pain medications and the impact of avoidance coping in pain medication usage. Further implications and future directions will be discussed.

RACIAL DIFFERENCES IN THE EFFECTS OF EARLY-LIFE STRESS ON THE DEVELOPMENT OF DEPRESSIVE SYMPTOMS IN YOUNG ADULTS
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Background: Early-life stress (ELS) is a well-established risk factor for the development of depressive symptoms. However, the exact mechanism for this relationship and the causes of the variable responses to ELS are not fully understood. Additionally, little consideration has been given to racial differences in the consequences of ELS.

Methods: This study examines whether different patterns exist between African-American (AA, n=197, 42.6% male, 28.6±3.02 years old) and European-American (EA, n=174, 53.5% male, 27.8±2.99 years old) young adults in the development of depressive symptoms following varying degrees of ELS. The severity of participants’ ELS and depressive symptoms was assessed by using the Advertising Childhood Events (ACE) and Beck Depression Inventory (BDI) questionnaires.

Results. Linear regression analysis found that exposure to ELS was a significant predictor for the development of depressive symptoms (p<0.001). The AA participants reported a higher rate of exposure to moderate (ACE score=3) or severe (ACE score>4) ELS than the EA participants (35.9% vs. 24.4%, p=0.015). However, there was no significant difference of the severity of depressive symptoms between two ethnic groups after adjusting for age and gender. A significant interaction effect was found between race and exposure to ELS (p<.001). In the EA group, there was a dose-effect relationship between increased exposure to ELS and the severity of depressive symptoms. On the contrary, the AA young adults who were exposed to minimum to moderate ELS developed similar depressive symptoms compared to those with no exposure. Only the AA young adults exposed to severe ELS exhibited significantly more depressive symptoms. Further adjustment for family socioeconomic status (SES) did not change the results.

Conclusions. Our study emphasizes the importance of ELS in the development of depressive symptoms in young adults. Although the AA participants had a higher rate of exposure to adverse ELS compared to the EA participants, they showed a different consequence of ELS in developing depressive symptoms.
about, and read a health vignette about that patient. They rated their motivation for self-care behaviors both prior and subsequent to selecting and reading the vignette. After reading, participants also reported how much they focused on similarities between themselves and the selected patient. As predicted, the extent of focus on similarities moderated the effect of reading selection on change in motivation (p=0.03). Participants reported higher motivation if they focused on their similarities with patients “doing better” (high coping effectiveness/low symptom severity). Patients reported lower motivation for self-care if focused on similarities with patients “doing worse” (low coping effectiveness/high symptom severity). Additional analyses showed that effects were not driven by pre-existing illness severity or individual difference characteristics. These findings confirm that social comparison can influence patient motivation for disease self-care, and that this response is moderated by perceived similarity to the comparison target. Further, these effects are specific to the comparison process, and not artifacts of existing differences between patients. These results have important implications for the management of T2DM (and perhaps other chronic diseases), as social comparisons are relevant to cognitive treatment, educational materials that include patient testimonials, and the composition of support groups.

81) Abstract 376
TRANS DiAGNOSTIC INTERN ET-BASED MAINTEN ANCE TREATMENT AFTER INPATIENT PSYCHOTHERAPY: SUITABLE FOR ALL PATIENTS? MODERATORS OF OUTCOME FROM A RANDOMIZED CONTROLLED TRIAL
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Background: Despite strong evidence for the efficacy of psychotherapy for mood disorders in its long-term outcome, it has not been enhanced. Recent studies have provided evidence for the efficacy of internet-based continuation treatments. However, to date, data that can help clarify which patients are likely to profit from this particular kind of treatment delivery are scarce. Objective: The study aimed to identify moderators of transdiagnostic, internet-based maintenance treatment (TIMT) outcomes following inpatient psychotherapy for mood disorders. Methods: Using data from a randomized controlled trial (N=400) designed to test the effectiveness of TIMT, we performed secondary analyses to identify factors moderating the effects of TIMT when compared with those of a treatment-as-usual group (TAU). TIMT involved a self-management module, asynchronous patient-therapist communication, a patient support group, and an online-based progress monitoring. Self-reports of psychopathological symptoms and potential moderators were assessed at the start of inpatient treatment (t1), at discharge from inpatient treatment/start of TIMT (t2), and at 3-month (t3) and 12-month follow-up (t4). Interactions between moderators, treatment condition, and occasions of measurement were probing via multilevel analyses. Moderators included demographic variables (sex, age, education level, internet literacy), clinical characteristics (diagnoses, comorbid personality disorder, years since first disorder onset, remission status at t2, relative change from t1 to t2), and motivational variables (self-efficacy, positive outcome expectancies). Results: Education level, positive outcome expectations, and diagnoses significantly moderated TIMT vs. TAU differences regarding changes in outcomes between t2 and t3. Only education level moderated change differences between t2 and t4. The effectiveness of TIMT (vs. TAU) was more pronounced among participants with a low (vs. high) education level (t2 to t3: B = -0.32, SE = 0.16, P < .001, t2 to t4: B = -0.32, SE = 0.10, P < .001). Participants with a high vs. low positive outcome expectations (t2 to t3: B = -0.12, SE = 0.05, P = .02) and participants with anxiety disorder (vs. mood disorder) (B = -0.43, SE = .21, P = .04). Simple slope analyses revealed that despite some subgroups benefiting less from the intervention than others, all subgroups still benefited significantly. Conclusions: Overall, findings suggest that this TIMT is suitable for a wide range of patients differing in various clinical, motivational, and demographic characteristics.

82) Abstract 607
PHYSICIAN BARRIERS TO END-OF-LIFE PLANNING IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE: THE ROLE OF FEARS OF IATROGENIC HARM AND AMBIG UITY
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Effective planning for end-of-life (EOL) care, including discussions of prognosis and the use of palliative care services, has been demonstrated to improve quality of life and reduce the costs of health care for patients with life limiting illness. However, for patients with chronic obstructive pulmonary disease (COPD), in contrast to other life-limiting illness, both patients and providers delay EOL communication. The aim of this study was to identify physician barriers to end-of-life communication in COPD. Participants included 110 physicians and trainees from departments of family and general internal medicine at two urban medical centers. They completed a survey containing three case vignettes depicting patients with mild, moderate or severe COPD. Participants rated the degree to which they would place a priority on communication about prognosis and end-of-life planning, including palliative care for the patients depicted in the vignettes as well as their own patients with similar symptoms. Items also inquired about distress during EOL communication with these their COPD patients. Independent variables included the Health Care Provider Communication (HCPC) scale. Two subscales of the HCPC measure concerns about causing iatrogenic harm, i.e., fears that discussing prognosis would cause patients to lose hope or fail to adhere to physician advice) and concerns about ambiguity (i.e., providers’ anxiety about EOL communication when it is unclear if patients understand the severity of their condition). The results indicated that concerns about causing iatrogenic harm (b = 0.23, p < .01, partial R2 = 0.04) and concerns about communicating in ambiguous situations (beta = 0.44, p < .001, partial R2 = 0.16) were significant independent predictors of physician distress about communicating prognosis. The scales assessing physician concerns about iatrogenic harm and ambiguity were significant predictors of treatment planning with the physician’s own patients (p < .05), but were not predictors of the physician’s ideas about communication with hypothetical patients (p > .15). Efforts to improve end-of-life planning may need to address physicians anxiety as well as knowledge.

83) Abstract 243
PERCEIVED PURPOSE IN LIFE IS RELATED WITH REDUCED INFLAMMATORY RESPONSES TO REPEATED ACUTE PSYCHOSOCIAL STRESS
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Rationale: Perceived purpose in life is linked with lower inflammation and better health in the elderly. While inflammation increases throughout life, inter-individual differences in its regulation may account for the variability of this increase. In this study, we set out to test whether higher perceived purpose in life acts as a protective factor by being associated with less pronounced responses of peripheral inflammation to repeated stress exposure. Methods: A sample of n=22 healthy, young adults (mean age 21.8 yrs, mean BMI 24.2 kg/m2) of both genders (n=12 male, n=10 female) were exposed to repeated acute stress (Trier Social Stress Test) a day apart. We determined purpose in life (PIL) by a subscale from Ryff’s Psychological Well-Being Inventory. Inflammatory stress responses were assessed by measuring IL-6 in plasma, at baseline, 30 minutes, and two hours after stress. Results: Participants showed significant increases in plasma IL-6 in response to stress (time effect: F=9.12; p<0.01), and a trend toward larger responses to repeated stress exposure (day by time interaction: F=3.52; p=0.07). While PIL was not related with IL-6 response to the first TSST (r=-0.11; n.s.), those scoring higher in PIL had lower IL-6 responses to the second TSST (r=-0.55; p=0.012). Furthermore, in participants with higher PIL, there was a marginally significant lessening of IL-6 sensitization to repeated stress (r=-0.40; p=0.09). Conclusions: These findings allow the cautious conclusion that individuals with a stronger sense of purpose in life have better regulation of inflammation following the experience of stressful events. Future studies will have to test whether these results generalize to the elderly population, and thereby show whether this is a relevant mechanism protecting elderly individuals’ health.
Willingness to seek care is a critical factor in medical help-seeking models, but the extent to which attitudinal differences are associated with perceived affordability of health care is unknown. Attitude differences and perceived adequacy and affordability of health care insurance were assessed in a community survey. The 35-item scale, together with a health and health insurance questionnaire, and a demographic information form were mailed to 1500 community residents. Participants were asked to rate the degree to which “The cost of medical and pharmacy care (separate items) nowadays is more than I or my family can afford.” Received were 380 (25.3%) usable forms. The attitude scale had already been pretested in college student samples - it was internally consistent and had strong test-retest reliability and predictive validity as determined by significant correlation with reported medical appointments and contacts assessed approximately two months later. The attitude scale had been previously factor analyzed and produced four factors (action/intention, fatalism, trust and avoidance/procrastination) as well as an overall total attitude score. Help-seeking attitudes sharply differentiated between people with and without health insurance with the least favorable attitudes associated with lack of health care coverage (p<.001). Respondents who agreed that the “cost of medical care nowadays is more than I can afford” expressed the least favorable help-seeking attitudes. The strongest correlations with perceived costs were for attitude scores, education, ethnicity, and adequacy of insurance coverage significant at .0001 level. In a series of partial correlations the partials rs showed that the attitude/medical cost and attitude/pharmacy cost relationships were strongly significant when controlling for the demographic and insurance adequacy variables. Results indicate that perceptions of adequacy of health insurance coverage are associated with attitudes about seeking medical help. Future research should examine whether perceptions of improved health insurance coverage are related to more favorable attitudes about seeking medical help.

| Percent Agreement with items: “The cost of medical care (medicine/pharmacy) nowadays is more than I or my family can afford.” |
|-----------------------------------------------|-----------------|---------|---------|
| Agree Medical (%) | 63 | 72 |
| 18-59 | 72 | 53 |
| Some college | 53 | 74 |
| Age (years) | 4.78 | .029 |
| Hispanic minority | 15.46 | .000 |
| Yes | 91 | 87 |
| No | 89 | 84 |
| 60-95 | 58 | 53 |
| Caucasian | 20.79 | .000 |
| 65-74 | 81 | 77 |
| White/non-Hispanic | 91 | 87 |
| 75+ | 42.60 | .000 |
| Education | 39.38 | .000 |
| Agree Pharmacy (%) | 72 | 72 |
| 18-59 | 72 | 53 |
| Some college | 53 | 74 |
| Age (years) | 4.78 | .029 |
| Hispanic minority | 15.46 | .000 |
| Yes | 91 | 87 |
| No | 89 | 84 |
| 60-95 | 58 | 53 |
| Caucasian | 20.79 | .000 |
| 65-74 | 81 | 77 |
| White/non-Hispanic | 91 | 87 |
| 75+ | 42.60 | .000 |
| Education | 39.38 | .000 |

* With the Bonferroni correction for multiple tests (12, in this instance), p values < .004 should be considered not-significant.
86) Abstract 430
CAN HUMANS COGNITIVELY CONQUER THE BRAIN EFFECTS OF INFLAMMATORY BOWEL DISEASE?
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Depression is common, costly, and has complex etiology, particularly in the context of chronic physical disease. Inflammatory bowel disease (IBD) is a life-long autoimmune disorder which provides a model to study the brain-gut axis. Using a translational approach, we investigated specific brain regions underlying emotional and cognitive processing in humans with and without active inflammation and also in a rodent model of colitis-induced depression. We also examined the effects of psychotherapy on depression (IBD), systemic inflammation, and brain morphology and metabolism. Two distinct depressive endophenotypes arose as predominant drivers of depression. The somatic subtype was comprised of neurovegetative symptoms and was associated with inflammatory cytokines, IBD activity, and somatic anxiety. The cognitive subtype was comprised of cognitive depressive symptoms, which were associated with more pessimistic illness perceptions and anxiety. Using fMRI to assess brain circuitry consistent with a greater cognitive ability to tolerate negative IBD-related words without emotional dysregulation. The IBD-depressed cohort had unique patterns of brain activity when presented with illness-related emotional cues compared to controls, suggesting that depression in the context of IBD is marked by elaborate cognitive processing of illness-related memories. In a rodent model of colitis, we demonstrated that somatic depressive symptoms were linked to changes in gene expression of immune regulatory proteins in specific limbic and cortical regions. These results further support the hypothesis that systemic inflammation can induce changes in brain functioning. Human treatment with cognitive behavioral therapy (CBT) was associated with changes in limbic and cortical brain circuitry consistent with a greater cognitive ability to tolerate negative IBD-related words without emotional dysregulation. While CBT probably reduced both depressive symptoms, the reduction in somatic symptoms was partially mediated by reducing systemic inflammation. We have identified somatic and cognitive phenotypes of depression, which may become future targets for personalized treatment impacting not only psychiatric symptomology, but systemic inflammation as well.

87) Abstract 386
EMG STARTLE RESPONSE IN ACUTE COMPARED TO CHRONIC AND RECOVERED ANOREXIA NERVOSA PATIENTS CONFRONTED WITH FOOD AND BODY SHAPE STIMULI
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Objective: There is an ongoing discussion about pathological emotional responses in patients with acute Anorexia nervosa (AN). The aim of this study was to examine the startle response of patients confronted with affective stimuli. Hypothesis: In line with earlier studies (Friederich et al 2011) there is difference in EMG startle reactivity in AN compared to controls looking on pleasant, but not on unpleasant or neutral pictures (a). AN patients (but also recovered and chronic AN) have higher EMG reactivity looking on food and body pictures compared to controls (b).
Methods: 80 female, 20 acute AN, 20 chronically ill AN, 20 healthy former AN (years of recovery M= 14.0, SD= 5.4) and 20 healthy controls (BMI: aAN17 sd 1.8; cAN15.6 sd 2.1; rAN 20.4 sd 1.7 and C 22.0 sd 1.4) were examined with the startle stimulus paradigm, examining EMG during looking on the International Affective Picture System (IAPS), and eating disorder specific food and body shape pictures.
Results: We found differences between recovered AN and controls in the EMG- startle reactivity looking on positive (p< 0.05) and negative pictures (p< 0.03) as well as body pictures (p< 0.04) and food pictures (p< 0.03). It was possible to differentiate also chronic AN vs. control looking on body and neutral pictures (p<0.05). Recovered AN show the same startle reactivity as acute AN according food (p< 0.05 and body (p<0.03) as well as positive and negative pictures.
Conclusion: The kind of an affective response seems an additional problem in AN. These aspects could be demonstrated also in the chronic course of disease and in former AN compared to healthy controls. Psychophysiological alterations as consequence of the AN are very interesting tools to understand better the symptoms in the long term run of AN. They have to integrate in further studies

88) Abstract 168
DIRECT COMMUNICATION WITH CONSULTEES AS A FACTOR IN ADHERENCE TO TREATMENT ADVICE IN PSYCHIATRIC CONSULTATIONS
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Background: In a recent systematic review, multiple factors that can affect adherence to treatment recommendations were identified (Leontjens, 2010). No findings pertaining to the level of communication as one of the factors for adherence to treatment advices were reported. Our hypothesis is that in the era of electronic medical records many de facto ways of communication can look appealing to consult liaison psychiatrists, but resulting in non-adherence to treatment recommendations. Method: In phase one of the study, psychopharmacological treatment recommendations were provided in the Electronic Medical Records (EMR) without any direct communication with the consultee. The rates of adherence were calculated per each individual recommendation (not per case). Adherence was assessed in the period of 17-24 hours after the initial consult note was placed in the EMR. In phase two, an intervention of delivering treatment recommendations directly via a phone call to every consultee was applied. Results: In phase one, psychiatric treatment recommendations examined were 27 (n=27). Rate of adherence was (55.6%). Consultees provided one reason (91.7%) or two reasons (8.3%) for non-adherence. In 83.3% of the non-adherent cases, the reason provided was: recommendations were not communicated directly to consultee; “communicative reason”. In 25% of the non-adherent cases the reason was “non-communicative”. In phase two post-intervention (n=20), rate of adherence increased to (100%). Conclusion: In our sample, direct communication of psychopharmacological treatment advices to the consultee was found to be a factor in adherence to treatment advice. The use of EMR as the main level of communication has reduced adherence rates in our sample. Limitations: Low sample size and lack of randomization has effects on the validity and generalizability of the outcomes. We looked in this study at only one kind of treatment recommendation ignoring the other kinds. Psychiatric consultation cases usually result in multiple recommendations, but in this study we looked at adherence to individual recommendations ignoring the outcome of other recommendation in the same case. We are also aware that the time frame we used in this study can be considered small. This might be one contributor to the high non-adherence rate in phase one. However, the same time-window was used in phase two. More research and larger studies are needed on this subject.
Methods: The sleep of 70 African American adults (mean age 58 ± 6 years; 57% female) was examined as part of the SleepSCORE. Two nights of in-home polysomnography (PSG) were used to assess average sleep duration and efficiency; morning self-reports was used to assess sleep quality. Sixteen hundred ancestry informative genetic markers were tested whether sleep quality, duration and efficiency in African Americans vary as a function of individual African genetic ancestry. Specifically, if sleep characteristics differ between races as a function of genetic differences between the races, then these phenotypes might covary with individual admixture. We tested whether sleep quality, duration and efficiency in African Americans vary as a function of individual African genetic ancestry. Specifically, if sleep characteristics differ between races as a function of genetic differences between the races, then these phenotypes might covary with individual admixture. We tested whether sleep quality, duration and efficiency in African Americans vary as a function of individual African genetic ancestry. Specifically, if sleep characteristics differ between races as a function of genetic differences between the races, then these phenotypes might covary with individual admixture.

Results: IAA ranged from 10%-88% with a mean of 56% (median of 42%). Patients with depressive disorders usually show decreased self-esteem and biased cognitive schemas. Both concepts are thus regarded to play an important role in the development and maintenance of depression. In the present study we tested if changes in early maladaptive schemas predict increases in self-esteem during a psychodynamic treatment. 45 patients with major depression received an integrative psychodynamic in-patient treatment in the Psychosomatic University Hospital Bonn, Germany. Early maladaptive schemas were measured by the Young Schema Questionnaire, self-esteem was assessed explicitly using the Rosenberg Self-Esteem Scale and implicitly by the Implicit Association Task and the Name Letter Effect. The results revealed strong changes during the eight weeks of treatment: Explicit self-esteem significantly increased, explicit self-esteem raised, and implicit self-esteem decreased. The changes in early maladaptive schemas predicted changes in explicit and implicit self-esteem and give suggestions which schemas are most relevant in the treatment of depression. Moreover the role of implicit self-esteem is discussed. Both implicit measures of self-esteem proved to be reliable in the present study, but in contrast to explicit self-esteem they were decreasing during the course of treatment.

The objective of this study was to investigate the relationship between psychological well-being and metabolic syndrome in a national sample of adults. Prior research implies negative psychosocial factors, such as depression, anxiety, and anger, as increasing risk for metabolic syndrome, a clustering of central adiposity, insulin resistance, hypertension, and dysregulated lipid profile associated with increased risk of cardiovascular disease and diabetes. However, little attention has addressed the role of positive psychosocial resources. Participants (N = 1,255; 56.8% female; Mage=SD = 57.0±11.6) were from the Survey of Midlife in the U.S. (MIDUS). Self-reported psychological well-being (multiple dimensions) was obtained via survey assessments, and metabolic syndrome components (waist circumference, systolic and diastolic blood pressure, triglycerides, HDL cholesterol, and fasting glucose) were measured during an overnight clinic visit. Controls included age, gender, race, education, current smoking, alcohol consumption, physical activity, history of coronary heart disease and diabetes, and usage of cholesterol or blood pressure medication. Unadjusted prevalence of metabolic syndrome (by the National Cholesterol Education Program ATP III definition) was 36.8%. As predicted, psychological well-being predicted reduced risk of metabolic syndrome. This effect remained significant after adjustments for sociodemographic and health covariates, OR (95% C.I.) = 0.81 (0.67, 0.98), Wald = 4.63, p = .03. Results were not moderated by age, gender, race, or socioeconomic status. Individual components of well-being with the strongest relationship to metabolic syndrome were personal growth and self-acceptance. Results highlight that positive psychosocial resources predict reduced risk for metabolic syndrome. Further work is needed to explicate the pathways and mechanisms through which these effects occur.

92) Abstract 791
SLEEP, STRESS, AND THE NEIGHBORHOODS IN WHICH WE SLEEP
Neighborhoods have important influence on health outcomes. Disadvantaged neighborhoods are associated with lower socioeconomic status (SES) and more stressful life events. Higher prevalence of sleep disorders have been reported in neighborhoods with higher poverty and worse psychosocial resources. Participants (N = 45, 80% female) registered in an undergraduate advanced research methods course, voluntarily agreed to take part in the class project. Participants completed the Perceived Stress Scale, Pittsburgh Sleep Quality Index, Sleep Hygiene Index, Perceived Neighborhood Disorder Scale, Collective Efficacy-Social Cohesion and Trust Scale, and Perceived Neighborhood Safety Scale. Participants wore an accelerometer (Actiwatch) to measure sleep-wake activity over 24 hours. Objective neighborhood disorder was derived using census-tract data from the
Methods: Participants were factor y workers (n=887, Mean age=44, (SES). nature and potential importance of these findings warrant replication, as infection, as well as exploration of potential pathways/confounders, such as elevated neuroticism, and openness to new experiences were assessed using a range 19-71; 88% male) who participated in a company health check. Regression showed that scores above the median on neuroticism and alcohol), and socioeconomic status. To illustrate, logistic measured as CRP, fibrinogen, and white blood cell counts. Health behaviors and (56%) increased perceived stress.  Taken together, these findings suggest that individuals with atypical depression may be driving the overall depression-inflammation relationship and may be a subgroup at particularly elevated cardiovascular risk.

93) Abstract 761
PERSONALITY AS A PREDICTOR OF CYTOMEGALOVIRUS INFECTION Jerrald L. Rector, MSc, Victoria E. Burns, PhD, School of Sport and Exercise Sciences, University of Birmingham, Birmingham, West Midlands, United Kingdom, Marc N. Jaraczok, Diploma, Adrian Loerbroks, PhD, Mannheim Institute of Public Health, Social and Preventive Medicine, Mannheim Medical Faculty, Heidelberg University, Mannheim, Baden-Württemberg, Germany, Paul Moss, MD, Cancer Research UK Centre, University of Birmingham, West Midlands, United Kingdom, Joachim E. Fischer, MD, Mannheim Institute of Public Health, Social and Preventive Medicine at the Mannheim Medical Faculty, Kristina Hoffman, PhD, Mannheim Institute of Public Health, Social and Preventive Medicine, Heidelberg University, Mannheim, Baden-Württemberg, Germany, Jos A. Bosch, PhD, Department of Clinical Psychology, Faculty of Social and Behavioral Sciences, University of Amsterdam, Amsterdam, Noord-Holland, The Netherlands
Background: Cytomegalovirus (CMV) is a common herpes virus that underlies accelerated aging of the immune system and predicts all-cause mortality. Data from experimental animal studies and human epidemiology additionally suggest that this neurotropic virus may affect personality, i.e., reducing novelty seeking. The preliminary nature and potential importance of these findings warrant replication, as well as exploration of potential pathways/confounders, such as elevated inflammatory activity, health behaviors, and socioeconomic status (SES).

Methods: Participants: Five patients presenting with medically unexplained skin sensations that characteristically evoked a subjective sense of infestation. The consequent psychological and behavioural impacts of these experiences are considerable and difficult to manage therapeutically. Underlying neurobiological mechanisms are unclear. We therefore undertook the first functional MRI study to test the hypothesis that such patients will differ from controls in central neural processing of affective and infestation-related stimuli.

Methods: Participants: Five patients presenting with medically unexplained skin sensations were recruited from the specialist psychodermatology service at The Royal London Hospital, mean age 52.8 years, 4 female, 1 male. Five healthy controls were matched for age and gender. Image acquisition: Whole brain MRI data was acquired on a 1.5 T scanner. Task: In a randomized event- related design participants were shown 6 classes of images – insects on skin; other objects on skin (three way interaction) revealed differences in the engagement of neural processing of affective and infestation-related stimuli.

94) Abstract 494
C-REACTIVE PROTEIN IS ELEVATED IN ATYPICAL BUT NOT NONATYPICAL DEPRESSION: NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) 1999-2004
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Although it is well established that depression is associated with augmented systemic inflammation, it is not known whether particular depression subtypes are more strongly related to inflammatory markers than others or whether the link between depression and inflammation is independent of anxiety. Our objective was to examine differences in C-reactive protein (CRP) – an inflammatory marker predictive of incident cardiovascular disease – among individuals with atypical major depressive disorder (MDD; n = 16), nonatypical MDD (n = 93), and no MDD (n = 1,682) both before and after adjustment for comorbid anxiety disorders. To achieve this objective, we analyzed cross-sectional data from a sample of younger adults (age range: 20-39 years, 53% female, 53% non-white) representative of the U.S. population who participated in NHANES between 1999-2004. We excluded adults with medical conditions associated with inflammation or CRP levels ≥ 10 mg/L. Depressive and anxiety disorders were assessed by the WHO Composite International Diagnostic Interview 2.1, and depressed persons with both hypersonmia and hyperphagia were coded as having atypical MDD. Serum CRP was quantified by latex-enhanced nephelometry. Regression analyses adjusted for demographics and the NHANES sample design revealed that the serum CRP of adults with atypical MDD was 68% higher (mean difference = 1.63 mg/L; B=1.75, SEB=0.59, p=.01) and 49% higher (mean difference = 1.31 mg/L; B=1.69, SEB=0.76, p=.03) than that of adults with no MDD or nonatypical MDD, respectively. CRP levels of adults with nonatypical MDD or no MDD did not differ (p=.85). Nearly twice as many adults with atypical MDD (56%) increased perceived stress.  Taken together, these findings suggest that individuals with atypical depression may be driving the overall depression-inflammation relationship and may be a subgroup at particularly elevated cardiovascular risk.

95) Abstract 270
CENTRAL EXPRESSION OF ABNORMAL AND UNEXPLAINED SKIN SENSATIONS
Jessica A. Eccles, BM ChB, Department of Psychiatry, Brighton and Sussex Medical School, Brighton, East Sussex, UK, Rachel J. Hargreaves, BS, Department of Dermatology, Barts and The Royal London NHS Trust, London, UK, Hugo D. Critchley, PhD, Department of Psychiatry, Brighton and Sussex Medical School, Brighton, East Sussex, UK
Background: A sub-group of patients present to dermatological services with unexplained skin sensations that characteristically evoked a subjective sense of infestation. The consequent psychological and behavioural impacts of these experiences are considerable and difficult to manage therapeutically. Underlying neurobiological mechanisms are unclear. We therefore undertook the first functional MRI study to test the hypothesis that such patients will differ from controls in central neural processing of affective and infestation-related stimuli.

Methods: Participants: Five patients presenting with medically unexplained skin sensations were recruited from the specialist psychodermatology service at The Royal London Hospital, mean age 52.8 years, 4 female, 1 male. Five healthy controls were matched for age and gender. Image acquisition: Whole brain MRI data was acquired on a 1.5 T scanner. Task: In a randomized event- related design participants were shown 6 classes of images – insects on skin; other objects on skin; other objects on leaf; neutral images; disgusting and fearful images. Analysis: Functional images were analyzed using SPM8. A full factorial model was used to analyze the results with two factors – group and stimulus type.

Results: Results are reported at voxel-wise significance analysis p<0.001. Across all conditions patients showed greater activity in the right parahippocampus. Insect versus non insect images evoked greater activation within occipital regions. The main effect of presentation of skin rather than leaf stimuli was to activate inferior parietal lobule and the patients showed enhanced activity within this area. Formal testing of differential responses of patients v. controls to images of insects on skin (three way interaction) revealed differences in the engagement of dorsal anterior cingulate and right lateral prefrontal cortices. Patients also showed greater activity in bilateral temporal lobes when viewing disgusting/fearful images compared to neutral images.
Discussion: We confirm that regional neural activity differs between patients with abnormal skin sensations and controls to condition-relevant and affective visual stimuli. These data provide insight into central mechanisms that potentially represent novel treatment targets.

ASSOCIATION OF ACUTE CORONARY SYMPTOM-INDUCED POSTTRAUMATIC STRESS DISORDER SYMPTOMS AND SELF-REPORTED SLEEP

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Background: Symptoms of posttraumatic stress disorder (PTSD) due to acute coronary syndrome (ACS) and poor sleep increase risk for recurrent ACS. Although PTSD has been associated with poor sleep in some populations, the association among ACS patients is unknown. We sought to estimate the association between ACS-induced post PTSD symptoms and self-reported sleep.

Methods: ACS-induced PTSD symptoms were assessed 1-month post-ACS in 188 adults using the Impact of Events Scale-Revised. Pre-ACS history of PTSD was assessed using questions from the Structured Clinical Interview for DSM-IV. Sleep was assessed using the Pittsburgh Sleep Quality Index. Multivariable linear and logistic regression models were used to determine whether ACS-induced PTSD symptoms and/or pre-ACS history of PTSD were associated with poor sleep, independent of sociodemographic and clinical covariates.

Results: ACS-induced PTSD symptoms, but not pre-ACS history of PTSD, were associated with worse self-reported sleep (ß = 0.20, p = 0.008) and increased odds of having elevated sleep disturbances (OR = 1.07, p = 0.008). PTSD, were associated with worse self-reported sleep (ß = 0.20, p = 0.008) and increased odds of having elevated sleep disturbances (OR = 1.07, p = 0.008).

Conclusions: ACS-induced PTSD symptoms are associated with poor sleep, which may explain some of the risk of recurrent ACS events with which they are associated.

Table: Multivariable adjusted associations of ACS-induced PTSD symptoms and pre-ACS history of PTSD with self-reported sleep

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Total score</th>
<th>PSQI total score</th>
<th>PSQI sleep disturbance score ≥ 10</th>
<th>Probability of sleep disorder</th>
<th>Poor sleep quality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>OR</td>
<td>OR</td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td>Total ACS-induced PTSD symptoms</td>
<td>0.20</td>
<td>0.0000</td>
<td>1.07</td>
<td>3.0000</td>
<td>1.02</td>
</tr>
<tr>
<td>Pre-ACS history of PTSD</td>
<td>0.03</td>
<td>0.67</td>
<td>1.39</td>
<td>0.74</td>
<td>0.46</td>
</tr>
</tbody>
</table>


ANTIBODIES TO THE HEAT SHOCK PROTEIN 60 (ANTI-Hsp60) AS MARKERS OF PSYCHOSOCIAL STRESS IN DIFFERENT DISEASES

Jose R. Peña, MD PhD, Medicine, Universidad de Carabobo, Valencia, Carabobo, Venezuela, Babette B. Weskler, MD, Paul Szabo, PhD, Medicine, Weill Cornell Medical College, New York, NY, Maria A. Lopez, PhD, Psychology, Universidad de Carabobo, Valencia, Carabobo, Venezuela, Jose M. Poveda, MD PhD, Psychiatry, Universidad Autonoma de Madrid, Madrid, Spain

Method: this is a case-control observational study matched by gender, age and social class in which quantitative variables: serum antibodies to Heat Shock Protein 60 (Anti-Hsp60) and a psychosocial stress test, the life events scale (Holmes and Rahe), were measured in 118 patients and 118 healthy controls. The patient group comprised 45 subjects with chronic CAD (28 men and 17 women; 19 patients (10 men and 9 women) who underwent major surgical procedures after bone trauma [blood was drawn from a peripheral vein 48 to 72 hours after the surgery]; 7 patients with ischemic CVD studied in the first month after the event; 20 women with Chronic PTSD and 20 patients with psychological stress: 17 who were grieving in the first year following divorce or (12 woman, 5 men) 10 women grieving after loss of a loved one in the previous year. Results: women with CAD showed increased mean Anti-Hsp60 (P<0.01) and increased mean of Psychosocial Stress scores (P<0.05). The distribution curve showed a trend that women with CAD who have higher Psychosocial Stress have increased Anti-Hsp60 (Pearson 0.30 moderately positive correlation); men with CAD also showed increased mean Anti-Hsp60 (P<0.01) and increased mean Psychosocial Stress scores as compared to controls (P<0.05), and similar trend between the two measures (Pearson 0.31 moderately positive correlation). Patients following major surgical procedures after bone trauma showed increased mean Anti-Hsp60 (P<0.01) and increased mean Psychosocial Stress scores as compared to controls (P<0.01); patients after CVD events showed increased mean Anti-Hsp60 (P<0.01), also with a correlative trend between these values (Pearson 0.18 low/moderate correlation); women with Chronic PTSD showed increased mean value Anti-Hsp60 (P<0.01) and Psychosocial Stress scores as compared to controls (P<0.01); women and men grieving after divorce or separation showed an increased mean value of Anti-Hsp60 (P<01 and P<0.05 respectively); women grieving after loss of a loved person showed increased Anti-Hsp60 (P<0.01). Conclusions: an increase of circulating Anti-Hsp60 in Patients suffering CAD, CVD, surgery after bone trauma, chronic post traumatic stress disorder(PTSD), bereavement after divorce or separation and grief after loss of a loved person could signify severe psychosocial stress suffered by these patients. Confirmation of these observations in a larger study would suggest an immunological response to stress mediated by Anti-Hsp60 that could serve as a future clinical marker of psychologic reactivity to illness or bereavement.

THE PROSPECTIVE ASSOCIATION BETWEEN PSYCHOLOGICAL WELL-BEING AND DIABETES: THE WHITEHALL II COHORT

Julia K. Boehm, PhD, Laura D. Kubzansky, PhD, Society, Human Development, and Health, Harvard School of Public Health, Boston, MA

Depression is associated with increased risk of diabetes, but less work has examined whether positive indicators of psychological functioning are associated with diabetes. We investigated the association between life events, diabetes, physical activity and diabetes. Incident diabetes was defined by combining physician diagnosed and screen detected cases, as well as by investigating each separately. Logistic regression models estimated odds of developing diabetes according to levels of life satisfaction, controlling for demographics, health behaviors, blood pressure, body mass index, and ill-being. Participants were followed approximately 10.96 person-years, during which time there were 52
SOCIAL SUPPORT ALTERS BIOBEHAVIORAL COHERENCE BETWEEN AFFECT AND CORTISOL DURING PREGNANCY

Julia C. Poole, BA (Hons) Psychology, Gerald F. Giesbrecht, PhD, Department of Paediatrics, Nicole Letourneau, PhD, Faculty of Nursing, Tavis S. Campbell, PhD, Department of Psychology, University of Calgary, Calgary, AB, Canada

Background: Women’s affective experience during pregnancy influences fetal development, and social support (SS) from a partner can buffer these effects. The underlying biological mechanisms responsible for the protective role of SS, however, are poorly understood.

Methods: Women’s (n=82) affective experience and cortisol were prospectively assessed in all 3 trimesters. Self-reports of affect were collected via Profile of Mood States, and cortisol was collected via saliva samples 5 times each day over 2 days within each trimester. Women’s appraisal of partner SS was assessed in each trimester via the Social Support Effectiveness-Questionnaire.

Data Analysis: 3-level multilevel models were used to determine if within-person changes in positive and negative affect independently predicted changes in cortisol and if the associations between affect and cortisol were moderated by SS.

Results: See Table 1 for a description of final models. Model 1 shows that changes in cortisol were independently predicted by positive (β= -0.04, p <0.05) and negative affect (β=.02, p <.05). Model 2 shows that SS did not moderate the association between negative affect and cortisol. Model 3 shows that SS did moderate the association between positive affect and cortisol (β=.00, p <.01). Figure 1 shows that the association between positive affect and cortisol is significantly stronger in women with low SS. In Model 4, we probe this moderating effect and show that it appears to be driven primarily by the degree to which SS is perceived as ineffective (β=.01, p <.05).

Conclusions: SS did not buffer the effects of negative affect on cortisol. In contrast, SS did alter the association between positive affect and cortisol, such that cortisol was relatively unchanged by positive affect among women with high SS but much more labile among women with low levels of SS. A woman’s perception of whether received support reflects negatively on her own efficacy appears to be the primary means by which SS alters biobehavioral coherence between positive affect and cortisol. Women who lack access to effective SS appear to have increased biological sensitivity to context, making them more vulnerable to the detrimental effects of cortisol.

99) Abstract 117

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td>Coefficient (SE)</td>
<td>t ratio</td>
<td>Coefficient (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.71 (0.04)</td>
<td>-</td>
<td>3.05*</td>
</tr>
<tr>
<td>Time Sq</td>
<td>-0.54 (0.03)</td>
<td>-</td>
<td>-0.54 (0.03)</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>0.02 (0.01)</td>
<td>1.98*</td>
<td>0.02 (0.01)</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>0.02 (0.01)</td>
<td>1.98*</td>
<td>0.02 (0.01)</td>
</tr>
<tr>
<td>Total Support</td>
<td>-0.0002 (.0004)</td>
<td>-</td>
<td>-0.0002 (.0004)</td>
</tr>
<tr>
<td>Emotional Support</td>
<td>0.004 (.001)</td>
<td>3.05*</td>
<td>0.004 (.001)</td>
</tr>
<tr>
<td>Ineffective Support</td>
<td>0.003 (.004)</td>
<td>73</td>
<td>0.003 (.004)</td>
</tr>
</tbody>
</table>

Notes: Low SS is the mean of the lower quartile; high SS is the mean of the upper quartile. Positive affect is person centered to show the effects of within-person changes in affect and cortisol.
They also completed questionnaires assessing perceived stress (CRP), and soluble vascular cell adhesion molecule (sVCAM). soluble tumor necrosis factor receptor-II (sTNFRII), C-reactive protein (CRP), and soluble tumor necrosis factor receptor-II (sTNFRII) concentrations of interleukin-6 (IL-6), soluble IL-6 receptor (sIL-6R), and IL-10. Patients with major depressive disorder (MDD) have elevated serum levels of inflammatory cytokines, which are known to alter basal ganglia activity. Additionally, from numerous clinical observations it has been well documented that type I interferons (IFNs) administered to patients for the treatment of hepatitis frequently cause severe depressive symptoms, which are usually resolved after withdrawal of the drug. Inflammatory cytokines, such as interferons, signal predominantly through members of the family of STAT (signal transducer and activator of transcription) transcription factors. Upon stimulation of cells with IFNs, STAT1 becomes phosphorylated on a single tyrosine residue, enters the nucleus as dimeric STAT1 complexes and binds sequence-specifically to GAS (gamma-activated sites) elements in the promoter regions of cytokine-driven genes. In this study, we introduced point mutations into the STAT1 DNA-binding domain by substituting alanine or lysine for two glutamyl residues, which are located adjacent to the phosphodiester backbone of DNA. The resulting mutants, termed STAT1-E411 and -E421, showed substantially elevated levels of tyrosine phosphorylation and a prolonged nuclear accumulation upon stimulation of cells with IFNs. We found that exchange of only one single glutamic acid residue significantly reduces the dissociation rate from GAS sites and, furthermore, broadens the repertoire of putative binding sites on DNA. However, despite high-affinity DNA binding and a prolonged residence time in the nucleus, the two mutants displayed a significantly reduced transcriptional activity on several IFN-driven endogenous target genes. These findings demonstrate that two negatively charged amino acid residues in the DNA-binding domain are engaged in the liberation of STAT1 from DNA. We showed that a high dissociation rate from GAS sites is a key feature of STAT1 signal transduction. In summary, we characterized two mutants in the STAT1 DNA-binding domain with increased affinity to DNA, which were defective in the activation of cytokine-driven target genes. These DNA-binding mutants appear to be valuable tools for the study of interferon-induced depression and may allow us to decipher the contribution of interferon signal pathways in pharmacologically induced depression.

101) Abstract 387

PSYCHOLOGICAL DISTRESS AND INFLAMMATORY MARKERS IN FEMALE PARTNERS OF MEN WITH PROSTATE CANCER

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Prostate cancer (PC) is the most common cancer diagnosed in men affecting 1 in 6 men in the US. Spouses and partners typically serve as caregivers for PC patients, helping them to manage symptoms, as well as providing instrumental and emotional support. Although other types of caregiving are known to influence immune processes, no studies have examined whether the stress of caregiving for a mate with PC is associated with changes in immune activity. To extend the literature in this area, we examined differences in inflammatory markers between 19 female partners of men with PC and a control group of 26 demographically matched women in relationships with men with no cancer history. Women provided a blood sample to measure plasma concentrations of interleukin-6 (IL-6), soluble IL-6 receptor (sIL-6R), soluble tumor necrosis factor receptor-II (sTNFRII), C-reactive protein (CRP), and soluble vascular cellular adhesion molecule (sVCAM). They also completed questionnaires assessing perceived stress (PSS) and Stress-related Dysphoria Scale (PDSS-SS) post and negative affect (PANAS) and mood (Profile of Mood States-POMS). After controlling for BMI, hypertension status, and tobacco usage, partners of men with PC had higher circulating levels of IL-6, sTNFRII, and sVCAM than controls (t(44) > 3.85, p’s < .05). There were no differences in CRP and sIL-6R. Partners of men with PC reported more anxiety, negative affect, and confusion than controls (t’s > 1.99, p’s > .05). As a follow-up, a series of hierarchical regression analyses were conducted to determine whether psychological distress mediated differences in inflammation between partners of men with PC and controls. The only significant association was between negative affect and sTNFRII (DR2 = .24, p = .04). However, there was no evidence that negative affect mediated the relationship between caregiver status and inflammation. Although based on a small sample, these preliminary findings reveal reduced psychological well-being and elevated markers of inflammation in partners of men with PC. Given the role of inflammatory processes in various illnesses, longitudinal studies should examine whether these changes impact risk for disease over time.

102) Abstract 535

EXERCISE AS AN ADJUVANT FOR INFLUENZA VACCINATION IN OLDER ADULTS

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Purpose: Protection from infectious disease through vaccination is a valuable medical tool, but can be limited by poor responses, either through low vaccine immunogenicity or poor responses in immunocompromised populations. A behavioural adjuvant such as acute exercise could therefore potentially improve vaccine responses in at-risk groups. Exercise has been shown to enhance vaccine responses in young adults, its effect in older adults is unknown. We therefore investigated the effects of exercise immediately prior to influenza vaccination on immune responses.

Methods: Forty-six older adults (mean age=73±7years, BMI=27.2±5kg/m2, male N=23) were randomly assigned to complete a maintenance of humoral response and cell-mediated immunity following influenza vaccination, changes in antibody titre from baseline to 1 month post vaccination (95% vs 91%, p=.78). Control participants suffered a higher rate of systemic adverse events in the 48 hours following vaccination (eg headache, runny nose, p=.036).

Conclusion: This is the first randomised controlled trial investigating the effects of resistance exercise on vaccine response in older adults. Further analysis of maintenance of humoral response and cell-mediated responses will be evaluated. Future studies should include efficacy of post-exercise vaccination for influenza prevention or severity of infection and effects of different doses of resistive or other exercise modalities in older adults as potential immune adjuvants.

103) Abstract 728

PRE-SLEEP WORRY, ANXIETY & PSG-DERIVED SLEEP IN YOUTH

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Adults with insomnia commonly report pre-sleep worry, or excessive negative cognitions. Longer pre-sleep latency has been observed in individuals with pathological worry, including generalized anxiety disorder (Harvey, 2003). Anxiety-disordered youth experience greater
pre-sleep worry and more subjective sleep problems (Alfano et al., 2016). The present study aimed to examine the relation between pre-sleep worry, anxiety, and sleep in young using PSG-derived cortisol measures. Youth aged 8-18 years (N = 245, 53.9% boys) and their parents participated in the Healthy Heart Project at Concordia University, Montreal. Parents completed the Pediatric Daytime Sleepiness Scale and adapted items on the Child Sleep Habits Questionnaire. Youth completed the affective disorder (n = 147; Mn age = 17 yrs) who collected saliva 6 times a day for 2 days at 4 visits over a year. Four variables were A-82

104) Abstract 389
ARE CORTISOL MEASURES STATE- OR TRAIT-LIKE?: A MULTILEVEL MODEL ASSESSMENT OF CORTISOL INDICES STABILITY
Kharaah M. Ross, MA, Psychology, Emma Adam, PhD, Institute for Policy Research, Michael Murphy, MA, Gregory E. Miller, PhD, Psychology, Northwestern University, Evanston, IL
Researchers have long viewed cortisol as a potential mechanism linking stress and health, but surprisingly little is known about normative cortisol secretion patterns. Are they stable day-to-day or from year-to-year? Does stability vary across the different cortisol-release indices typically used in psychosomatic research, i.e. daily rhythm vs. waking response? The answers to these questions have important implications for theory and research on cortisol. To address them, we re-analyzed data from 2 studies. Study 1 (S1) involved adolescent women at risk for affective disorder (n = 147; Mn age = 17 yrs) who collected saliva 6 times a day for 2 days at 3 visits spaced a year apart. Study 2 (S2) involved healthy adults (n = 81; Mn age = 51 yrs) who collected saliva 6 times a day for 2 days at 4 visits over a year. Four variables were calculated from log-transformed cortisol values: area-under-the-curve (AUC) total or total cortisol output across the day; and diurnal rhythm or the linear slope across the day. A 3-level intercept-only multilevel model provided reliability estimates for cortisol day-to-day and visit-to-visit through calculation of interclass correlation coefficients (ICCs) at each level. Higher ICCs denote greater stability. Across studies, stability was higher day-to-day (from ICC S2 AUCT = .63 to ICC S1 slope = .23) than visit-to-visit (from ICC S2 AUGC = .29 to < .1 for all ICC S1’s), suggesting that secretion patterns are more similar over short- rather than long-term periods. Visit-to-visit stability was lower in youth than adults across indices, perhaps reflecting an ongoing maturational process in adolescent women. Of the cortisol indices, total daily output was the most stable (ICC S1 = .47; ICC S2 = .63), and diurnal rhythm (ICC S1 = .23) and the awakening response (ICC S1 = .27; ICC S2 = .24) were the least. These analyses help shed light on the relative state- or trait-like behaviour of various cortisol indices, and how this may vary across development. Our results have both conceptual and methodological implications for psychosomatic cortisol research.

105) Abstract 571
IMPACT OF DEPRESSION ON PREMATURE ACUTE CORONARY SYNDROME: IS DEPRESSION ASSOCIATED WITH A HIGHER RISK PROFILE AMONG WOMEN?
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Background: Depression has been identified as a risk factor for both the development and progression of cardiovascular disease (CVD) and has been shown to be more common among women compared to men. Research on linking depression to increased CVD risk in initially disease-free individuals suggests that it may play a role in the premature onset of acute coronary syndrome (ACS), making these patients a relevant population in which to examine the extent to which depression is associated with a higher-risk phenotype for CVD. Thus, this study examined whether higher depression levels were associated with an increased risk of having a medical CVD risk marker, worse health behaviors, and worse endothelial function, and the extent of any sex differences, among young (d 55 yrs) patients with ACS.
Methods: This was a sub-analysis of the ongoing GENESIS-PRAXY Study, a prospective cohort study of young ACS patients recruited from 26 centres in Canada, the US, and Switzerland. 1015 patients (305 women, 30% aged 18-55 yrs (median 49 yrs) presenting with ACS to a participating hospital completed a sociodemographic and medical history questionnaire, a battery of psychological questionnaires including the Hospital Anxiety and Depression Scale (HADS); a blood sample and anthropometric measurements were also obtained. Chart reviews were conducted to verify self-report data. Associations of clinical and behavioral risk factors for CVD and worse endothelial function with HADS scores, and sex interactions, were analyzed using logistic or general linear models for dichotomous and continuous risk factors, respectively, adjusting for age, education, and anxiety (HADS-A).
Results and Conclusions: Results showed that every 1 point increase on the HADS-D subscale was associated with a 12% increase in the risk of having diabetes, a 7% increase in the risk of being obese, an 8% increase in the risk of having hypertension, a 6% increase in the risk of having dyslipidemia, and a 5% increase in the risk of being current smokers (all p<.05). Interestingly, we observed statistically significant depression-sex interactions for measures of obesity (i.e., body mass index and waist circumference) and von Willebrand factor (vWF), with women demonstrating higher rates of obesity, more total and central adiposity, and higher levels of vWF with increasing depression, compared to men whose rates/levels did not differ across depression levels. Results indicate that depression is associated with a higher-risk phenotype among young ACS patients, and may confer additional risk for cardiovascular disease development and progression. Further research in larger samples is needed to examine these findings in young ACS patients.
are not fully understood. Dysregulation of the autonomic nervous system (ANS) is a possible underlying mechanism of both cancer-related fatigue and sleep disturbance. Given these relationships, the potential association between fatigue and HRV is compelling. The current study examined the relationship between fatigue, sleep, and resting HRV in a sample of young breast cancer survivors enrolled in a mindfulness intervention trial. Women (n=71) who had been diagnosed with early stage breast cancer before the age of 50 completed psychological questionnaires, including measures of fatigue (FSI) and sleep quality (PSQI), as well as a physiological assessment including 10 minutes of resting EKG at the pre-treatment assessment. Participants were 47.12 years old (range = 28-60) and were an average of 4.05 (SD=2.36) years post-treatment. Fatigue was negatively associated with HRV, B=-.08, p=.02 for RMSSD (root of the mean squared difference of successive normal to normal waves) and B=-.15, p=.02 for HF Power ms2 (high frequency power of heart rate variability), controlling for age and body mass index (BMI). Poor sleep quality was also negatively associated with HRV, B=-.08, p=.01 for RMSSD and B=.05, p=.05 for HF Power ms2. Thus, low HRV was associated with increased fatigue and worse sleep quality in this sample. ANS dysregulation may contribute to cancer-related fatigue, possibly by driving increased inflammation, given that low HRV has been associated with increased inflammation and fatigue and cancer survivors show heightened inflammation.

107) Abstract 358
ELEVATED DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH ALTERED LEUKOCYTE BETA-ADRENERGIC SENSITIVITY IN HYPERTENSIVE AND PRE-HYPERTENSIVE PATIENTS
Laura S. Redwine, Ph.D., Suzi Hong, Ph.D., Kathleen S. Wilson, M.S., Paul J. Mills, Ph.D., Psychiatry, University of California, San Diego, CA.

The World Health Organization rates hypertension as one of the most important causes of premature death worldwide, predominantly through cardiovascular and cerebrovascular mechanisms. Moreover, depression increases risk for vascular diseases in hypertensive patients (Carney et al, 2002). The mechanisms are unknown; however, sympathetically modulated immune dysregulation associated with depression may be one pathway leading to worse prognosis in this group. In hypertensive patients, increased β-adrenergic receptor sensitivity significantly predicts cardiovascular mortality and myocardial infarction (Peng et al, 2006). Consequently, patients are prescribed β-blocking medications to forestall cardiovascular and cerebrovascular disease. Meanwhile, there is little research on depression and leukocyte β-adrenergic agonists in hypertensive and prehypertensive subjects by measuring in vitro peripheral blood mononuclear cells (PBMC) to β-adrenergic agonists in the current study. Acute sympathetic activation unmasked findings that no significant relationships among SBP, depression scores and CTX to ISO in subjects with low depression scores (suggesting reduced β-AR sensitivity); however, SBP was positively associated with CTX to ISO in subjects with high depression scores (suggesting increased β-AR sensitivity) (F = 4.65, p = .036, partial eta squared = .087).

Conclusions: Acute sympathetic activation unmasked findings that suggest higher depressive symptoms may lead to a dysregulation of PBMC β-adrenergic sensitivity which may correspondingly elevate the risk of hypertensive patients for cardiac structural and functional remodelling by increasing immune cell mobility in response to catecholamines.

108) Abstract 275
STRESS, COPING, VEGF AND MORTALITY IN WOMEN WITH ENDOMETRIAL CANCER
Laura C. Telepak, MS, Clinical & Health Psychology, Linda S. Morgan, MD, Obstetrics and Gynecology, Deidre B. Pereira, PhD, Clinical & Health Psychology, Edward K. Chan, PhD, Oral Biology and Anatomy and Cell Biology, University of Florida, Gainesville, FL. Purpose: Vascular endothelial growth factor (VEGF) is a cytokine known to stimulate tumor angiogenesis and is a poor prognostic factor in many cancers, including ovarian cancer. Research suggests that in women with ovarian cancer, psychosocial factors such as stress and coping in the pre-surgical period are related to levels of circulating VEGF. Few investigators have focused on these relationships in other gynecologic cancers. Therefore, the purpose of these analyses was to examine whether pre-surgical stress/coping were associated with lower 5-year survival in endometrial cancer via elevated pre-surgical VEGF levels.

Sample and Methods: Participants were 66 women (M=60.9 yrs, SD=8.8 yrs) diagnosed with Stage I-II endometrial cancer who subsequently underwent surgery. Patients completed psychological assessment and blood draw on the day prior to surgery. Life stress was assessed using a modified Life Experiences Survey; coping was assessed using the BriefCOPE; serum VEGF was assessed using ELISA.

Results: Analyses revealed that greater pre-surgical negative impact of stressful life events (r=.25, p<.05), self-distraction coping (r=.31, p<.05), and religious coping (r=.33, p<.05) were associated with higher pre-surgical VEGF levels. Cox survival analysis, controlling for tumor stage, age at diagnosis, and medical comorbidities revealed that higher pre-surgical VEGF levels were associated with greater all-cause mortality 4-5 years post-surgery (HR=2.07, p<.01). However, VEGF and coping variables were not significantly associated with mortality. In summary, among women with endometrial cancer, pre-surgical stress and coping were related to pre-surgical VEGF levels, which in turn were related to poorer survival. Future research should use an experimental design to (a) effect changes in perisurgical stress/coping and (b) examine subsequent effects on both VEGF and clinically significant health outcomes in this population.

109) Abstract 303
OCcupational status moderates the association between perceived stress and high blood pressure: Evidence from the IPC cohort study

Although lay beliefs commonly relate high blood pressure (BP) to stress exposure, research findings are conflicting. This study aimed to examine the association between perceived stress and high BP, and to explore the potential impact of occupational status on this association. Resting BP was measured in 121,816 adults (84,994 men), aged ≥30 years (mean age ± standard deviation: 46.8±9.9 years), without history of cardiovascular and renal disease and not on either psychotropic or antihypertensive drugs. High BP was defined as systolic BP>140 mmHg or diastolic BP>90 mmHg. Perceived stress in the past month was measured with the 4-item perceived stress scale (PSS-4). A total of 33,154 participants (27.0%) had high BP (151±14/90±9 mmHg). After adjustment for all variables except occupational status, perceived stress was associated with high BP [odds ratio (OR) for a 5-point increase in PSS-4: 1.06, 95% confidence interval (CI): 1.03-1.09]. This association was no longer significant after additional adjustment for occupational status (OR: 1.01, 95% CI: 0.99-1.04). There was a significant
perceived availability of social support and performed a peak exercise test. HRR was calculated as peak heart rate (HR) minus HR at 1 min post-exercise.

Results: Bivariate correlations showed a direct relationship between social support and HRR (r = 0.25, p < 0.05). Linear regression revealed that social support was directly associated with HRR after controlling for resting SBP, resting DBP, resting HR, gender, age, and total percent body fat (B = 0.42, SE = 0.15, t = 2.74, p < 0.01, change R2 = 0.07), such that higher levels of social support were associated with greater HRR following exercise. Moreover, higher levels of social support were predictive of greater HRR even after measures of depression and perceived stress were additionally included in the model (B = 0.39, SE = 0.18, t = 2.18, p = 0.03, change R2 = 0.05).

Conclusions: Higher levels of perceived availability of social support were associated with greater HRR from exercise in a sample of prehypertensive adults, even after controlling for a host of demographic, clinical and psychological factors. This investigation lends support to the polyvagal theory in a clinical population.

110) Abstract 527

HEART RATE RECOVERY AFTER EXERCISE IN PREHYPERTENSIVE ADULTS: THE ROLE OF SOCIAL SUPPORT

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Purpose: The polyvagal theory suggests that social functioning is associated with cardiac vagal tone. The clinical role of vagal tone in cardiovascular disease has been increasingly acknowledged. The polyvagal theory has been traditionally investigated in infants and children and less so in adults, especially those with preclinical markers of disease. Thus, we investigated if social support was associated with heart rate recovery (HRR) from exercise (an index of vagal tone) in a group of prehypertensive adults. We hypothesized that higher perceived availability of social support would be associated with increased HRR (better vagal tone) from exercise.

Methods: Data were collected as part of a larger study investigating mechanisms linking exercise and hypertension. Participants included 77 sedentary adults (mean age = 45 years) men and women with elevated blood pressure (BP: mean SBP/DBP = 138/84 mmHg). Participants provided information about demographic information and perceived availability of social support and performed a peak exercise test. HRR was calculated as peak heart rate (HR) minus HR at 1 min post-exercise.

Results: Bivariate correlations showed a direct relationship between social support and HRR (r = 0.25, p < 0.05). Linear regression revealed that social support was directly associated with HRR after controlling for resting SBP, resting DBP, resting HR, gender, age, and total percent body fat (B = 0.42, SE = 0.15, t = 2.74, p < 0.01, change R2 = 0.07), such that higher levels of social support were associated with greater HRR following exercise. Moreover, higher levels of social support were predictive of greater HRR even after measures of depression and perceived stress were additionally included in the model (B = 0.39, SE = 0.18, t = 2.18, p = 0.03, change R2 = 0.05).

Conclusions: Higher levels of perceived availability of social support were associated with greater HRR from exercise in a sample of prehypertensive adults, even after controlling for a host of demographic, clinical and psychological factors. This investigation lends support to the polyvagal theory in a clinical population.

111) Abstract 785

SLEEP QUALITY AND RECOVERY FROM INJURY IN NCAA DIVISION I ATHLETES: THE IMPACT OF AN INNOVATIVE SLEEP EDUCATION INTERVENTION

Lisa D. Cromer, Ph.D., Emily Kaier, B.S., Joanne L. Davis, Ph.D., Psychology, Kathleen Strunk, APRN, CNS, School of Nursing, University of Tulsa, Tulsa, OK

The American College Health Association (2005) identified sleep problems as being among the top three obstacles to academic achievement in college. Poor sleep quality and quantity have been related to numerous health problems including suppression of the immune system and increase in pro-inflammatory hormones (Irwin, 2002). College athletes may be a particularly vulnerable group because demanding athletic schedules and 4 a.m. practices can thwart efforts for good quality and reasonable quantities of sleep. College athletes are also more likely to sustain injuries compared to non-athlete college students. In part 1 of the present study we examined the relationship between NCAA Division I athletes (N = 304) self-reported sleep quality and quantity in relation to training room (objective) records of incidents of injury and recovery time after an injury. Findings indicated that on the Pittsburgh Sleep Quality Index (Buysse et al., 1998), 65% of athletes reported poor sleep quality. In addition, poor sleep quality related to more injuries and longer recovery from injuries. In part 2 of this study, we conducted a sleep-health educational intervention in which athletes were taught about the importance of sleep quality and were given concrete strategies for improving sleep. We present improvements in sleep knowledge and changes in sleep hygiene behaviors based on the novel intervention which employed clicker technology and impairment goggles interactive demonstrations. Analysis on the impact of recovery after injury is on-going.

112) Abstract 149

CORTISOL RESPONSES TO MILD PSYCHOSOCIAL STRESS AND ITS ASSOCIATION WITH GLUCOCORTICOID SENSITIVITY

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OBJECTIVE: Psychosocial stress is a risk factor for cardiovascular disease. Previous theories have emphasized the role of excessive glucocorticoid activity in the development of chronic stress related pathologies. Nevertheless, insufficient glucocorticoid signalling (resulting from decreased glucocorticoid levels or reduced glucocorticoid sensitivity) may have equally devastating effects on bodily function. The mechanisms, which lead both of these extremes to pathology, are not completely understood. We have examined the association between cortisol response to psychosocial stress and glucocorticoid sensitivity in an increased risk group for heart disease, type II diabetes.

METHOD: Participants were 145 people with type II diabetes. Mean age (57.3 ± 1.9 years), sixty-two % men. At the baseline assessment, salivary cortisol was measured in response to mental stressors, consisting of a 5-min stroop task and a 5-min mirror-tracing task. We investigated individual differences in cortisol responses and their
association with glucocorticoid sensitivity. We defined the Cortisol change >0.5 SD with the highest cortisol response to stress as the cortisol responder group and Cortisol change <0.5 SD with the lowest response as the cortisol non-responder group. In this subset of people, we measured glucocorticoid sensitivity. Diluted whole blood cells were incubated for 24h in the presence or absence of lipopolysaccharide (LPS) and dexamethasone. Glucocorticoid sensitivity was analysed by dexamethasone-inhibition of lipopolysaccharide induced interleukin 6 levels (IL-6).

RESULTS: The cortisol responder group had decreased sensitivity to glucocorticoids when compared to the non-responder group at the baseline. During the stress test, only the non-responder group showed decreased sensitivity to glucocorticoids. At 75 min post-stress, however, the non-responder group had recovered completely, while the responder group still had decreased sensitivity to glucocorticoids.

CONCLUSIONS: We conclude that individual variations in neuroendocrine stress responsiveness, in part due to the glucocorticoid sensitivity, may have an impact on proinflammatory cytokines. Both high and low cortisol stress responsiveness have potentially adverse effects.

Figure 1 – Glucocorticoid sensitivity in responders and non-responders to mental stress at baseline, during stress, at 45 and 75 minutes post stress. Glucocorticoid sensitivity was measured by glucocorticoid inhibition of LPS-induced IL-6 levels.

113) Abstract 338
ADHERENCE TO A SUPPORTED DEPRESSION SELF-CARE INTERVENTION AS IT RELATES TO 6-MONTH CHANGES IN PHYSICAL HEALTH AND ACTIVITY IN PRIMARY CARE PATIENTS WITH COMORBID CHRONIC PHYSICAL ILLNESS (PROJECT DIRECT-SC)
Maida J. Sewitch, PhD, Medicine, Jane McCusker, MD, Epidemiology, Biostatistics and Occupational Health, Mark Yaffe, MD, Family Medicine, Martin Cole, MD, Psychiatry, Tamara Sussman, PhD, Social Work, Erin Strumpf, PhD, Economics, McGill University, Montreal, Quebec, Canada, Kim L. Lavoie, PhD, Psychology, University of Quebec at Montreal, Montreal, Quebec, Canada; Russell Simco, MSc, Eric Belzile, MSc, Research, St. Mary's Research Centre, Montreal, Quebec, Canada

Objectives. We evaluated the relationship between adherence to a supported self-care intervention for depression and 6-month changes in physical health and health behaviors in primary care patients with comorbid chronic illness.

Methods. This study is a secondary analysis of a longitudinal intervention study with 2- and 6-month telephone follow-up that was conducted in Montreal among depressed adults aged 40+ with selected chronic physical illnesses. Depression was identified using a 2-step depression screening (PHQ-2 and PHQ-9). The intervention involved participants selecting self-care tools from among 3 cognitive-behavioral depression screening (PHQ-2 and PHQ-9). The intervention involved participants selecting self-care tools from among 3 cognitive-behavioral and educational/informational tools, and receiving support for up to 6 months from a coach who provided telephone guidance. Any tool adherence was measured at 2 months. Short Form (SF)-12 and health behaviors were assessed at baseline and 6 months. Medication adherence was assessed using the Morisky scale; physical health by the SF-12 physical component score; and physical activity by the Godin Leisure Time Exercise Questionnaire (GLTEQ). Multivariable linear regression was used to determine associations between adherence and 6-month outcomes.

Results. Of the 63 individuals who completed the baseline interview, 47 (74.6%) completed measures of adherence and both follow-up interviews, and comprise the study sample (average age = 60, 72.3% female). Low-level tool adherence was marginally associated with lower scores on the SF-12 (p=0.087), but not with scores on the GLTEQ at 6 months. Medication adherence was not associated with either physical health or activity scores.

Conclusions. Low tool adherence at 2 months was marginally associated with declining physical health at 6 months, but not with changes in physical activity or medication adherence. Future research using larger samples is needed to confirm these findings.

114) Abstract 259
HEART RATE VARIABILITY IS INDEPENDENTLY ASSOCIATED WITH GLYCEMIC STATUS AFTER CONTROLLING FOR WORK STRESS AND SYMPATHETIC NERVOUS SYSTEM ACTIVITY
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Background: Work stress and sympathetic nervous system (SNS) activity have both been associated with impaired glycemic status. We and others have recently shown that vagally-mediated heart rate variability (HRV) is inversely associated with glycemic status. Moreover we and others have shown that work stress is associated with decreased HRV. However to date no studies have examined the relationship between glycemic status and HRV while controlling for work stress and a validated measure of SNS activity.

Methods: In the present study we examined the relationship between resting vagally-mediated HRV as indexed by the root mean squared successive differences (rMSSD) and glycemic status as indexed by fasting plasma glucose (FPG) and glycosylated hemoglobin (HbA1c). Work stress was indexed by Effort-Reward Imbalance (ERI) to quantify the degree of mismatch between high “cost” and low “gain” at the individual level and SNS activity by overnight urinary norepinephrine (NE). Data were collected from 572 apparently healthy employees (age 42 ±11years) of an airplane manufacturing plant in Southern Germany between September 2003 and February 2004.

Results: In univariate analyses ERI and NE were positively associated with glycemic status and HRV was inversely associated with glycemic status. We have recently shown that vagally-mediated HRV is inversely associated with glycemic status. Moreover we and others have shown that work stress is associated with decreased HRV. However to date no studies have examined the relationship between glycemic status and HRV while controlling for work stress and a validated measure of SNS activity.

Conclusions: These results replicate and extend our previous findings and suggest that the association between work stress and glycemic status may be due to a common association with vagally-mediated HRV independent of SNS activity.

Table 1 Bivariate and partial correlation coefficients between ANS indices and glycemic status (N=572)

<table>
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<th></th>
<th>FPG (mg/dL)</th>
<th>HbA1c (%)</th>
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<tr>
<td></td>
<td>Pearson</td>
<td>Partial</td>
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<tr>
<td>rMSSD (ms)</td>
<td>-0.20</td>
<td>-0.08</td>
</tr>
<tr>
<td>NE (per gram urinary creatinine)</td>
<td>-0.04</td>
<td>0.03</td>
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<tr>
<td>ERI</td>
<td>0.09</td>
<td>0.02</td>
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Significant correlation coefficients P<0.05 are given in bold numbers. Model fit for partial correlations models: both models R^2=0.17.
A COMPARISON OF HEALTH BEHAVIORS BY BLOOD PRESSURE STATUS
Marissa D. Alert, AB, Erin N. Etzel, BS, Patrice G. Saab, PhD, Judith R. McCulla, PhD, Psychology, University of Miami, Coral Gables, FL, Judy Brown, EdD, Lucia Williams, BA, Education, Miami Science Magnet, Miami, FL

Background: Alcoholic and sodium intake, physical activity, and smoking have been shown to vary by blood pressure (BP) status. Little research has been conducted to examine how normotensive, prehypertensive, and hypertensive adults differ on other behaviors that could influence hypertension or cardiovascular disease risk. This study explored whether BP status groups differed in reported fruit, vegetable, and soda intake, hours spent watching TV or using a computer, and stress.

Methods: 3,872 adults (ages 35-90, M = 46.5, SD = 9.9) completed a brief survey on lifestyle habits and had their BP measured while visiting an interactive science museum exhibition. 55.8% were women; 49.3% were white, 38.7% were Hispanic, 3.4% were African-American, and 6.6% were classified as Other; 56.9% of adults had normal BP, 33.7% had prehypertension, and 9.3% had hypertension. Multivariable logistic regression models that included age, gender, and ethnicity as controls were used to examine health-related behaviors in prehypertensive and hypertensive individuals relative to normotensive individuals.

Results: Compared to those with normal BP, adults with prehypertension were more likely to consume regular soda two or more times daily (odds ratio [OR] = 1.29, 95% CI = 1.04 – 1.58, p = .018). Individuals with prehypertension and hypertension were more likely to spend three or more hours watching TV or using a computer at home (OR = 1.28, 95% CI = 1.11 – 1.48, p < .001 and OR = 1.52, CI = 1.21 – 1.92, p < .001, respectively) compared to persons with normal BP. Those with hypertension were also more likely to report feeling stressed or nervous often or most of the time (OR = 1.39, CI = 1.09 – 1.78, p = .007) and were less likely to consume two or more servings of fruits daily (OR = .72, 95% CI = .57 – .92, p = .008) compared to those with normal BP. Other comparisons were not significantly different.

Conclusion: These findings suggested that adults with prehypertension and hypertension were more likely to be sedentary and to show evidence of poor dietary habits than those with normal BP. That those with hypertension were more likely to report feeling stressed reinforces the need for the dissemination of stress management techniques to this population. Future studies should explore the effects of stress management and multiple health behavior change as a means of improving lifestyle and reducing cardiovascular risk in those with prehypertension and hypertension.
excessive. Different ways of coping or focusing attention may mitigate pain. For example, focusing on painful sensations themselves, distracting oneself, suppressing the pain, or accepting the pain may attenuate the painful experience. Method: One hundred thirty-five participants (59 females) engaged in a five-minute baseline, a cold pressor (CP), and a ten-minute recovery period. During the CP, they engaged in one of four pain attention strategies: Sensory focus (n = 26), Distraction (n = 45), Suppression (n = 35), or Acceptance (n = 29). Visual analog scales of pain and distress intensities were measured at the end of baseline, CP, and recovery. Results: Pain intensity increased from baseline to CP (p < .001) and decreased from CP to recovery (p < .001). Also, there was a difference in baseline to CP change scores of pain intensity when comparing attention strategy groups (p < .05). Relative to the Distraction group, the Suppression group demonstrated a greater increase in pain intensity from baseline to CP (p = .004). No other group differences were found for changes in pain intensity. Although distress ratings increased from baseline to CP (p < .001) and decreased from CP to recovery (p < .001), there was no significant difference in change scores for distress ratings between the attention strategy groups. Conclusion: Attempting to suppress pain may paradoxically increase perceived intensity of pain, possibly due to exhaustion of cognitive resources required to continually suppress painful stimuli. In contrast, distraction may reduce pain’s perceived intensity more effectively due to more efficient use of cognitive resources. Although pain induces distress, differing attention strategies do not moderate distress. In conclusion, while both suppression and distraction modify the perception of pain, distraction better attenuates it.

119) Abstract 414
MUSIC HELPS BUT SHADOWING DOESN’T: THE EFFECTS OF EMOTIONAL AND COGNITIVE DISTRACTION ON MOTION-INDUCED NAUSEA AND GASTRIC DYSRHYTHMIA
Max E. Levine, Ph.D., Psychology, Siena College, Albany, NY, Kristina M. Puzino, BA, Psychology, Saint Joseph’s University, Philadelphia, PA Background: Distraction is known to have beneficial effects on pain; for instance, those who are engaged in a cognitive task that is demanding of their attention, or an activity they find interesting and enjoyable tend to report pain as less severe. The purpose of the present study was to examine the effects of two sorts of distraction on reports of nausea made by people exposed to a device that induces the illusion of self-motion, and on the development of gastric tachyarrhythmia and other physiological responses. Method: A randomized, independent-groups design was employed in which 60 participants were assigned to one of three experimental groups. One group completed a cognitive/attentional task called shadowing during exposure to a rotating optokinetic drum. A second group engaged in an interest/engagement task that combines attentional distraction with a source of emotional enjoyment. Participants in this group listened to their favorite variety of music while exposed to the rotating drum. The third group received no distraction. It was hypothesized that participants in each of the distraction groups would report less severe nausea and other symptoms of motion sickness, and exhibit less gastric tachyarrhythmia, more heart rate variability, and lower skin conductance levels than participants receiving no distraction. Results: A significant effect of distraction on the development of nausea was observed, F(2,57)=4.48, p=.02. As predicted, participants who were permitted to listen to music during their exposure to the motion stimulus experienced significantly less severe nausea; contrary to the hypotheses, however, participants in the ‘task only’ condition significantly more severe nausea than the music group. Analysis of the physiological data is ongoing, and may contribute to the elucidation of the physiological mechanism responsible for emotional distraction’s beneficial effect. Conclusion: The emotional distraction of listening to familiar and preferred music appeared to have had the desired effect of redirecting the focus of the participants away from the negative experience of nausea and towards the positive experience of enjoying a familiar tune. Although the harmful effects of shadowing were not anticipated, they are understandable given the difficult nature of this cognitive task. Stress tends to aggravate the intensity of the symptoms experienced, and amplify the physiological responses that often accompany nausea. These results suggest that for individuals likely to suffer from nausea, it is important to distract oneself with an activity or task that is interesting and enjoyable, but not one that is excessively demanding of one’s cognitive resources.

120) Abstract 750
ADRENERGIC GENE VARIANTS ARE ASSOCIATED WITH PLATELET AGGREGATION TO EPINEPHRINE
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In humans the ADRB1 and ADRB2 genes play a critical role in regulating beta-adrenergic receptor function. Specific polymorphisms of these genes have been associated with a variety of cardiovascular-related endophenotypes, including heart failure and sudden cardiac death, but little is known about these polymorphisms with respect to platelet function. We examined the association between 12 tagging single nucleotide polymorphisms (SNPs) on these genes (5 from ADRB1 and 7 from ADRB2) and in vitro platelet aggregation in response to epinephrine in 521 adults (219 men, 302 women, 351 White, 170 African American, median age = 28 years). Fasting blood samples, obtained in the morning to avoid circadian variation in platelet response, were assayed using light transmittance platelet aggregometry to measure aggregation to submaximal concentration of epinephrine. Stimulation with a submaximal 2μM concentration of epinephrine elicited a distinct bimodal distribution: 66% ≤ 60%, 34% ≤ 60% aggregation (Berger et al. Thrombosis & Haemostasis, In Press). We used generalized linear models to estimate the association between each SNP and aggregation ≤60% vs. >60% to 2μM of epinephrine, adjusting for race, gender, and age, and accounting for familial clustering. We first estimated models with genotype and race (White/Black) by genotype interaction terms. No gene main effects or race interactions were observed. Gender by genotype interactions were observed in 4 of the models for ADRB2 SNPs (RS10064479, p = .035; RS1042711, p = .009; RS1042714, p = .009; and RS1801704 p = .007) and 1 of the ADRB1 SNPs (RS1801253, p < .005). Associations were strongest among men. Men homozygous for the minor allele tended to display the least exacerbation of aggregation compared to major allele carriers. In conclusion, men who are homozygous for minor allele tagging SNPs on the ADRB1 and ADRB2 genes exhibit levels of platelet aggregation to 2μM epinephrine that differ significantly from those seen in major allele carriers. Results were not materially altered with additional adjustment for tobacco use and body mass index. It will be possible to document the clinical significance of these associations if future research in both clinical and healthy samples shows that the genotypes on these SNPs that are associated with increased platelet aggregation to epinephrine are also associated with increased CHD prevalence, more severe coronary atherosclerosis and/or a more adverse clinical course. Supported by NHLBI grant P01HL63587.

121) Abstract 573
VALIDATING A NOVEL WIRELESS AMBULATORY TECHNOLOGY IN THE ASSESSMENT OF STRESS: A PILOT STUDY
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The goal of this study was to evaluate the validity and reliability of physiological stress response measured by AutoSense (a body-area, wireless sensor network designed to measure a person’s context, including physiological state, location, and activity) with that observed by the Biopac system, considered the standard. Twenty-six healthy individuals (13 women; mean age: 20, SD: 1.7) completed a laboratory session which included 30 min instrumentation, 30 min resting baseline, 30 min stress period (public speaking, mental math, and cold pressor), and 30 min recovery. Participants were attached with AutoSense system and Biopac MP100, EKG and cooperation activity were continuously monitored by both systems throughout the study.
Heart rate (HR), heart rate variability (HRV), and respiration rate (RR) from the both systems were then collected and calculated. Intra-class correlation coefficients, Bland-Altman plots, and repeated measures ANOVAs were conducted for data analysis. The results indicated that both devices captured elevation in HR during stress and decrease in RR during speech preparation relative to baseline (p<.05) and gave essentially the same values. HR measured by AutoSense was highly correlated with HR observed by the Biopac during baseline (rs=.97), psychological stress (rs=.93), and recovery (rs=.98). Correlations in RR were moderate to high during baseline (rs=.63-.95) and recovery (rs.69-.91) but the associations varied during stress periods (rs.28-.91). Similar patterns were found in high (rs.19-.92) and low (rs.57-.99) frequency components of HRV. Bland-Altman plots supported these findings. Overall, these results demonstrated potential usefulness of Autosense in the real-time assessment of stress. No sex differences found in cardiovascular and respiratory measures suggested that the Autosense chestband could be suitable in both men and women. Moderate correlations in RR and HRV may be related to differences in technology (how the hardware captured respiration activity) and algorithms used for data extraction and calculation.

122) Abstract 519

CHILDREN’S SLEEP AND THE AUTONOMIC FUNCTION: LOW SLEEP QUALITY HAS AN IMPACT ON HEART RATE VARIABILITY INDEPENDENT OF STRESS

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Background The study investigates whether sleep deprivation could disturb autonomic nervous function with consequences for cardiovascular health. To study this, heart rate variability (HRV) is a non-invasive indicator for the autonomic function, especially as it has been linked to morbidity. Methods In 2010 (N=334) and 2011 (N=293), HRV, sleep and stress were measured in Belgian children (5-10y) of the ChiBS study. HRV measurements (5-minutes) in supine position were analysed with frequency and time domain methodology. Sleep duration was reported and sleep quality was measured in a subgroup with accelerometry (sleep efficiency, sleep latency, ’awakenings’ during the night based on movements). Linear regressions were executed with sleep duration or sleep quality as predictor, corrected for age, sex, physical activity and stress. Stress (2-score sum of emotions and problems) was tested as mediator and moderator in the sleep-HRV association. Finally, longitudinal mixed models were used to examine the impact of sleep on HRV over 1 year. Results Awakenings and especially sleep latency were related to a lower parasympathetic tone and higher sympathetic tone. Consequently, lower sleep efficiency and corrected sleep duration were also related to a more sympathetic over parasympathetic dominance. Reported sleep duration was not associated with HRV, even not after categorization. Since stress has been related to both HRV and sleep, a correction for stress was done but findings did not change. Consequently, stress was no mediator. Nevertheless, stress was a moderator in the sleep-HRV relation for both sleep quality and duration e.g. sleep efficiency was only related to HRV in high stressed children. Longitudinally, sleep quality and corrected sleep duration could again predict HRV, but reported sleep duration could not. Conclusion Low sleep quality but not reported sleep duration was cross-sectionally and longitudinally related to an unhealthier HRV pattern (parasympathetic over sympathetic dominance), independently from the stress level. The results stress the health impact of a good sleep quality since sleep quality can already influence HRV in childhood and as such determine future cardiovascular risk.

123) Abstract 751

TRAIT HEDONIC AND EUDEMONIC WELL-BEING AND DIURNAL CORTISOL PATTERNS

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The field of Positive Psychology has generated interest into the beneficial health outcomes of trait well-being. Two strands of well-being are documented: hedonia, which refers to pleasure and satisfaction in life and eudaimonia which refers more to meaning and fulfillment in life. Debate exists within the literature over the relative independence and importance of these two strands of well-being for health. Although well-being has been related to cortisol secretion studies have mostly been in middle-aged and older populations and have focused on hedonic, largely ignoring eudemonic, aspects of well-being. This study aimed to explore the independence of hedonic and eudemonic well-being and examine relationships with cortisol secretion in a young healthy female sample. Participants (n=50; mean age 21 years) completed measures of trait hedonic well-being (e.g. subjective happiness and life satisfaction), trait eudemonic well-being (e.g. psychological well-being) and ill-being (e.g. perceived stress and depression). Over four study days’ participants collected saliva samples at 0, 15, 30 and 45 min post-wakening to measure the cortisol awakening response, and again at 3 and 12 hr post-wakening to measure the diurnal decline. Objective measures of awakening and adherence to the saliva sampling protocol were taken to encourage and monitor adherence to the protocol. Factor analyses of a larger population from which this sample was taken (n=240; mean age 21 years) showed that there were two components of well-being which were interpreted as hedonic well-being and eudemonic ill-being. Non-adherent saliva samples were excluded; well-being or ill-being was not related to the cortisol awakening response or the diurnal decline.

We conclude that in a study carefully controlled for adherence to protocol in healthy young females neither hedonic well-being nor eudemonic ill-being was related to patterns of cortisol secretion. Relationships between trait well-being and cortisol secretion may emerge in later life as a consequence of neurotoxicity across the lifespan.

124) Abstract 228

PROACTIVE REHABILITATION AND TELEPHONE INTERVENTION IN TYPE 2 DIABETES: RESULTS OF THE PARTID-TRIAL

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Diabetes greatly increases the risk of cardiovascular disease and other disorders. Targeted interventions addressing multiple risk factors have shown to reduce the risk of late complications in diabetes. In line with these results the PARTID-Trial included two interventions: (1) a three week multifactorial treatment in a rehab clinic specializing in diabetes care, and (2) an additional 12 month telephone follow-up. Patients were recruited from a Disease Management Program with predominantly lower-class insurants. Those meeting the inclusion criteria (N = 401) were randomized to the rehab treatment or usual care. Fifty-seven percent of the patients followed written advice to attend rehab treatment (adherence rate). Patients in the intervention group were randomized once more into the telephone intervention group with additional subjects recruited from the clinic because of the unexpectedly small sample size. Primary outcome was the overall lower cardiovascular risk. Analyses were conducted using multilevel models for change (growth curve modelling). Intention-to-treat analysis yielded no statistically significant effect of rehab treatment alone (p = .60), and analysis per-protocol just barely missed statistical significance (p = .06). However, telephone follow-up proved to be beneficial as to coronary risk over 12 months (intention-to-treat: p < .01). Further analyses showed that men (p = .02) benefited from rehab treatment, but women did not. Thus, proactive singular rehabilitation does not seem to have an overall positive impact on cardiovascular risk in patients with lower socio-economic status by the majority, but additional telephone counselling following rehabilitation helps to improve patient’s risk.
PSYCHOLOGICAL DISTRESS IS ASSOCIATED WITH AN INCREASED RISK OF INCIDENT DIABETES DURING 18 YEAR FOLLOW-UP: RESULTS FROM THE BRITISH HOUSEHOLD PANEL SURVEY

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Background. Reviews have shown that depression is a risk factor for the development of type 2 diabetes. However, there is limited evidence for general psychological distress to be associated with incident diabetes. The aim of the present study was to test whether psychological distress is related to an increased risk to develop type 2 diabetes during 18 years follow up, adjusted for confounders.

Methods. A prospective analysis using data from 9,514 participants (41 years, SD=14; 44% men) of the British Household Panel Survey. The General Health Questionnaire 12 item version was used to assess psychological distress. Cox proportional hazards regression models were used to calculate the multivariate-adjusted hazard ratio (HR) of incident diabetes during 18 years follow up, comparing participants with low versus high psychological distress at baseline (1991).

Results. A total of 472 participants developed diabetes 18 year follow up. Those with a high level of psychological distress had a 34% higher hazard of developing diabetes (HR=1.34, 95%CI 1.10–1.61), relative to those with a low level of psychological distress, adjusted for age, sex, education level and household income. After further adjustment for differences in level of energy compared to age, health status, health problems and leisure-time activity, higher psychological distress was no longer associated with incident diabetes (HR=1.11, 95%CI 0.91-1.35), whereas health status and energy compared to age were.

Conclusions. Higher levels of psychological distress are a risk factor for the development of diabetes during an 18 year follow up period. This association may be potentially mediated by low energy level and health status.

VOLATILE INTERPERSONAL EMOTION DYNAMICS IN MIXED-WEIGHT COUPLES

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Purpose: Well-regulated emotions, both within people and between relationship partners, play a key role in facilitating physical well-being. Research suggests that mixed-weight couples (one partner healthy weight and the other partner overweight) are at risk for emotional challenges surrounding health. Partners who have incompatible emotional responses to lifestyle issues may have a more difficult time achieving coordinated, health-related goals. The present study examined the interpersonal emotion dynamics of couples who varied in dyadic weight statuses, during a discussion of lifestyle choices.

Method: Couples (N = 44 dyads) discussed the importance of a healthy lifestyle and then watched the video of their conversation while reporting on their second-by-second recalled emotional experiences. Height and weight were measured and used to calculate body-mass index (BMI). A coupled oscillator model was used to investigate interpersonal emotion dynamics. The model includes estimates of both partners’ frequency and amplification of emotional responding, as well as coupling between partners.

Results: Results show that mismatched couples in which the female had a higher BMI than her male partner displayed antagonistic frequencies (Figure 1A) and higher amplifications (Figure 1B) of emotional responding, compared to similarly-matched BMI couples. Specifically, in mismatched couples, males displayed faster emotional frequencies than their female partners and both partners displayed more emotional amplification than matched-weight couples. There were no effects of BMI on coupling between partners.

Discussion: Mixed-weight couples displayed volatile emotional patterns in both frequency and amplification of emotional responding while discussing lifestyle issues. These data support the hypothesis that mismatched couples show less evidence of interpersonal emotion regulation than couples with other weight combinations, which could prevent mismatched couples from achieving a compatible emotional state and, ultimately, coordinated healthy behaviors. As such, it may be especially important to address these emotional dynamics when helping relationship partners achieve a healthy lifestyle.
women meeting DSM-IV-TR criteria for BED, 10 obese non-BED women, and 12 non-obese non-BED women were assessed for cardiovascular reactivity to, and recovery from, mental stress during days 1-7 of their menstrual cycle. Cardiovascular factors of systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) were assessed at baseline, during the Trier Social Stress Test (TSST), and throughout stress recovery. Food anticipation was induced by asking participants to rank order their preference for given snack foods immediately following the TSST. At 45 minutes post-stress, participants were given access to their chosen snack and could eat as much or as little as they liked. Differences in cardiovascular response to, and recovery, from mental stress were examined by calculating delta scores (Stress or Recovery – Baseline) and performing a repeated measures ANCOVA with Time as the repeated factor. Amount of food consumed post-stress served as a covariate, although groups did not differ on this measure. A Time x Group interaction was observed for delta DBP (p < .05). While all groups showed similar cardiovascular reactivity to mental stress and recovery during food anticipation, only obese BED women failed to show continued physiological recovery following food consumption. Similar trends were found for HR and SBP, but were non-significant given the small BED sample. Since prior studies assessing cardiovascular factors report failure to recover from stress in BED, our data suggests that comfort food anticipation may normalize cardiovascular recovery. Recovery from physical consumption may not, in fact, serve as a stress-relieving reward for BED women. Ongoing research will examine this effect in a larger sample, as well as investigate neuroendocrine and psychological stress reactivity and recovery in BED.

128) Abstract 395
THE INFLUENCE OF A MINDFULNESS INTERVENTION ON THE HEART HEALTH OF LOW-INCOME OLDER ADULTS
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Purpose: This study examined whether a mindfulness intervention could impact health-related outcomes in a population of older adults with low socioeconomic status (SES) when taught in the context of a physical fitness course. Methods: Adults aged 55+ were recruited from low-income residential complexes in a large metropolitan mid-west city. In groups of ten or less, participants received 45 minutes of aerobic and strength training in addition to 30 minutes of mindfulness practice once a week for 12 weeks. Individuals were excluded if they could not stand unassisted for 30 minutes. Participants were given mindfulness and exercise cue cards, in which instructions for additional practice were listed. Pre-study heart rate variability (HRV) data was collected 1 week prior to the intervention and 1 week following the intervention. Results: The study consisted of complete pre and post data from 40 females and 6 males with a mean age of 68 (SD=9.87). Health related variables, including height, weight, prescription medication, and the presence of any health disorders were collected in addition to demographic information. Significant covariates (sex and presence of a heart condition) were controlled for in subsequent analyses. Repeated-measures analyses of variance were conducted to test changes in pre- and post-heart functioning, specifically changes in parasympathetically-mediated outcomes thought to be influenced by Mindfulness. Two indicators of heart rate variability (HRV), mean inter-beat interval (MIBI) and the standard deviation of normal-to-normal intervals (SDNN) showed increases from pre to post assessment (MIBI: F(1, 37)= 9.10, p<.005; SDNN: F(1, 41)=3.46, p =.07). Discussion: A brief physical exercise and mindfulness training intervention resulted in increases in MIBI and marginal increases in SDNN in a low income, older population. Given that HRV is an important health indicator, future research should explore how similar interventions might be related to improved disease outcomes. Given that low income, older populations typically face serious health threats, this study indicates that mindfulness combined with gentle activity might be a worthwhile intervention with potential health benefits.

129) Abstract 711
PAIN SENSITIVITY PREDICTS BLOOD PRESSURE LONGITUDINALLY IN CHILDREN
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Elevated blood pressure is associated with diminished pain sensitivity. While this finding is well established in adult populations, it is less clear when the relation between blood pressure and pain sensitivity emerges across the lifespan. Evidence suggests this phenomenon may exist during childhood. The aim of the present study was to investigate the longitudinal relation between blood pressure and pain sensitivity in boys and girls. Children aged 10-15 years (N = 309; 56% boys; Mage = 12.33) and their parents participated in the larger Healthy Heart Project at Concordia University, Montreal. Resting blood pressure readings were taken during a seated baseline with an IBS Model 5D-700A electrophysiomonometer. Maximum pain intensity was rated using a visual analogue scale (rated 0-10) in response to a finger prick pain induction. Participants who met the 1.5 year milestone returned for a follow-up visit and underwent an identical protocol. We tested the hypothesis that children’s lower pain ratings at the first visit would predict higher blood pressure at the repeat visit. After controlling for the corresponding blood pressure at the first visit, child pain ratings longitudinally predicted DBP 1.5 years later (p = .05). Female sex was associated with lower pain sensitivity. Future research should explore how similar interventions might be reported compliance and patient-doctor relationship
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Background: Chronic hepatitis B (CHB) is a severe disease, which may cause cirrhosis and liver cancer. Hepatitis B Virus has infected about one third of the world population at some point in their lives, including 350 million who are chronic carriers. Tenofovir DF (TDF) is a nucleotide analog, first approved for the treatment of HIV-1, and then for CHB. Given the frequent asymptomatic nature of the disease, sustained therapeutic compliance is needed for achieving a control of Viral Load (VL).

Objective: To search for behavioral determinants of biological outcome within a study aimed at examining the efficacy and the tolerance of TDF in CHB patients.
Methods: 440 CHB patients (70.9% males, 59.1% already treated before this study, mean age 45.3 (SD 14.3) were invited to fill in a short self-reported compliance questionnaire at 3, 6 and 12-month follow-up. Their practitioners were also invited, on the same visits, to fill in a short questionnaire describing patients’ level of information about their disease, motivation, and reluctance against treatment, mood, and therapeutic alliance with the practitioner. VL was measured at baseline, 3, 6 and 12 month.
Results: VL significantly increased from baseline to 12 months, with a final VL positively correlated with baseline VL. After adjusting for...
baseline VL, higher final VL was found in patients who reported having skipped their last medication at 3-month visit (p = .001) or at 12-month visit (p = .0017) having stopped taking drugs at 12-month visit (p = .001), patients considered by their practitioner as insufficiently informed about their disease at 3-month visit (p = .02) or at 12-month visit (p = .008) or reluctant against treatment at 12-month visit (p = .003).

Conclusions: Simple questions asked to CHB patients or to their practitioners can provide useful information about risk factors for a poorer efficacy of antiviral treatment in hepatitis B. These indications could help practitioners to better motivate and manage these patients and prevent disappointing biological results, with their long-term severe consequences.

131) Abstract 194
BLUNTING AS A POSSIBLE TYPE D MECHANISM OF EFFECT?
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Type D personality, identified by high negative affectivity and high social inhibition, is a prognostic risk factor for poor recovery following coronary events. However, its mechanisms of effect are unclear, and so its etiology within the literature is not fully depicted.

Aims: This study presents data from three different laboratory studies examining the cardiovascular system as a potential underlying mechanism linking Type D personality to ill-health. Employing a traditional cardiovascular reactivity paradigm in each study, cardiovascular function was measured during a resting baseline period and during a stressor task. Type D personality was established using the DS16. In Study 1, using a sample of 90 women, mixed-factorial ANOVA analyses indicated that at Type D individuals showed blunted heart rate responses to asocial stress, F(1,87) = 4.44, p = .038. In Study 2, in a sample of 40 males and 36 females, Type D females showed blunted systolic blood pressure (SBP; F[2.01, 144.34] = 5.17, p = .007) and diastolic blood pressure (DBP; F[2.05,147.54] = 2.96, p = .054) responding to asocial stress.

Finally, in Study 3, in a sample of 28 females using a repeated-measures design, ANOVA analyses confirmed that Type D females demonstrated blunted DBP responses to social, as well as, asocial stress, F(1.81, 46.95) = 3.88, p = .031, with a similar (non-significant) trend evident on SBP, F(1.7, 44.19) = 2.98, p = .069. Together, these studies identify blunted cardiovascular reactivity as a potential mediator of the cardio-toxic effects of the Type D personality. This consistent pattern of findings is interesting given recent evidence linking blunted cardiovascular reactions to a range of negative health outcomes. As a result, it has been suggested that a broadening of the established cardiovascular reactivity hypothesis is required, to include both exaggerated and blunted reactivity as predictors of ill-health.

For the present paper, blunted reactivity to psychological stress appears to be a characteristic of the Type D person and suggests that the cardiovascular system is a potential mediator of its associations with cardiac outcomes.

132) Abstract 160
THE RELATIONSHIP OF DISABILITY, ANXIETY, AND DEPRESSION TO ILLNESS INTRUSIVENESS IN PATIENTS WITH MULTIPLE SCLEROSIS
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Disability factors, as well as psychological factors, may contribute to illness intrusiveness in patients with Multiple Sclerosis. The aim of this study was to determine if level of disability, anxiety, and depression predicted illness intrusiveness in patients with Multiple Sclerosis. Another aim of this study was to determine if anxiety and depression moderated the impact of disability on illness intrusiveness. The sample included 185 participants diagnosed with Multiple Sclerosis who were recruited from a Multiple Sclerosis outpatient clinic that was part of a major medical center in New Jersey. It was hypothesized that disability, anxiety, and depression would predict illness intrusiveness and anxiety and depression would moderate the impact of disability on illness intrusiveness. A hierarchical linear regression showed that years of education, disability, depression, and disability x depression interaction accounted for 42.2 percent of the variation in illness intrusiveness. Another hierarchical linear regression showed that years of education, disability, anxiety, and disability x anxiety interaction accounted for 34.3 percent of the variation in illness intrusiveness. Disability, anxiety, and depression were significant individual predictors of illness intrusiveness. Implications of these results suggest that reducing psychological distress such as anxiety and depression may also reduce illness intrusiveness in patients with Multiple Sclerosis.

133) Abstract 55
PERCEIVED STRESS, CORTISOL, AND BMI AS PREDICTORS OF WOUND HEALING IN WOMEN WITH ENDOMETRIAL CANCER
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Purpose: Endometrial cancer is the most common gynecologic malignancy and the fourth most common cancer affecting women in the US. Wound healing complications, present in up to 34% of women undergoing gynecologic cancer surgery, have been associated with increased healthcare costs, more specialized care, longer hospitalizations, and postoperative fatigue. Both experimental and clinical studies have shown that stress can disrupt the wound healing process, leading to longer recovery times and poorer surgical outcomes. The purpose of the present study is to expand upon findings from healthy and general surgery populations to assess predictors of wound healing complications following surgical intervention among women with endometrial cancer. Methods: 69 women (M age = 61.20, SD = 8.803) undergoing surgery completed the Perceived Stress Scale at their pre-operative visit. Saliva was collected at 8A, 12P, 5P, and 9P for 3 days immediately prior to surgery and assayed using ELISA. Area under the curve with respect to ground (AUCg) was calculated using a previously published trapezoidal formula. Body Mass Index (BMI) and wound healing complications were abstracted from participant medical records prior to surgery. Results: Results revealed that 31.9% of women experienced a wound healing complication that Type D personality accounted for 42.2 percent of the variation in illness intrusiveness. Disability, anxiety, and depression were significant individual predictors of illness intrusiveness. Implications of these results suggest that reducing psychological distress such as anxiety and depression may also reduce illness intrusiveness in patients with Multiple Sclerosis.
those free of reported non-melanoma cancer and clinical cardiovascular disease at baseline. Vital status (mortality) was ascertained by linking to the National Death Index. Employment status, emotional support and social contact frequency) rendered both hazards nonsignificant (HR’s = .75 & .73, 95%CI’s 1.10, p = .14 and 0.49-1.08, p = .12, respectively). With life were strongly associated with reduced mortality risk. Entering the comprehensive battery of SES markers (education, family income, employment status, emotional support and social contact frequency) rendered both hazards nonsignificant (HR’s = .75 & .73, 95%CI’s 1.10, p = .14 and 0.49-1.08, p = .12, respectively). In this large prospective study the association between well-being and mortality was largely explained by an integrative set of SES markers. The apparent advantage of greater well-being for survival may be driven by other established health correlates.

135) Abstract 120
METABOLIC SYNDROME AND CHANGES IN PHYSICAL PERFORMANCE IN ELDERLY MEN: THE OSTEOPOROTIC FRACTURES IN MEN (MROS) STUDY
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Declines in both muscle strength and mass typically occur with age. Research is needed to better understand factors that may accelerate the aging process and contribute to disability. Metabolic Syndrome (MetS) components, combined and individually, are known to have adverse influences on physical performance and muscle strength. This study investigated whether MetS contributes to declines in objectively measured physical performance over time in an elderly cohort. Participants were 4,547 men (92% Non-Hispanic white; mean age, 73.0 ± 5.5 years) from the Osteoporotic Fractures In Men (MrOS) Study, an ongoing, multisite cohort study of healthy aging and fracture risk in men. Physical performance assessments were completed at baseline and up to four additional visits over the subsequent 7 years. Measures were grip strength, timed walk, narrow walk speed and repeated chair stands; scores on each measure were converted to quintiles from low (1) to high (5), with unable to complete coded 0, and summed to give an overall summary score ranging from 0 (worst) to 20 (best). Generalized estimating equation (GEE) models were used to examine average performance scores and changes over time by MetS status. At baseline, 26% of men met World Health Organization criteria for MetS. Average performance score at baseline was 12.1 ± 4.1. Adjusting for age, race, education and site, men with MetS had a 1.27-point lower performance score at baseline than men without MetS. This association, although somewhat attenuated, persisted in the GEE model that also adjusted for behavioral risk factors, history of falls/fractures, health status, and chronic medical conditions (estimate, -0.93; 95% CI, -1.17 to -0.69; p<.0001). All men showed a significant one-half point decline in performance scores per visit (p<.0001) but the rate of decline did not differ by MetS (MetS x time estimate, -0.05; p=14) with or without risk factor adjustment. Among relatively healthy elderly men, metabolic dysregulation was strongly related to worse overall physical performance, but did not consistently contribute to accelerated declines over time.

136) Abstract 736
MINDFULNESS, MENSTRUAL MOOD DISORDERS, AND EARLY LIFE ABUSE: BIOPSYCHOSOCIAL MECHANISMS
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Early life abuse (ELA) disrupts stress-responsive neuroendocrine pathways. Menstrual mood disorders (MRMDs), defined by the cyclic recurrence of affective and somatic symptoms in the luteal phase of the menstrual cycle, are associated with rates of ELA ≥50%. Women with MRMD+ELA have greater premenstrual symptom severity, sensitivity to pain, sympathetic reactivity, but blunted HPA reactivity. We conducted a feasibility study that also examined potential mediators of a manualized 8-week mindfulness based stress reduction (MBSR) intervention in 24 MRMD women, 10 with ELA (sexual or physical abuse ≤ 16 yrs of age). Currently lived mindfulness was also assessed. Outcomes assessed before and after MBSR were prospective premenstrual symptoms, cold pressor pain sensitivity, and function (SF36). Mediators of MBSR were baroreceptor reflex sensitivity (BRS), BP and HR reactivity to the Trier, and trait mindfulness. Data from a prior study in 80 MRMD women who underwent identical procedures over two months provide a no MBSR comparison group. Twenty one women completed MBSR (87%; 9 with ELA) and practiced on average 43/49 days (87% adherence), for 21 min/day. MBSR was associated with an increase in SF36 general health, a decrease in role limitations due to emotional problems (F =2.4, p≤ .05), and a decrease in premenstrual symptoms (F = 5.3 – 18.9, p<.05). However, each of these effects was stronger in the ELA group (p = .05 - .07). MBSR increased cold pressor tolerance (F=7.4, p<.01), but the effect was 126% greater in those with ELA. There was no evidence from the no MBSR comparison group that symptoms or cold pain sensitivity change over time. Cumulative trauma predicted greater decreases in premenstrual depression (r = -0.51, p<.05) and greater increases in general health (r = +0.38, p<.10). MBSR increased trait mindfulness (e.g., nonjudgmental attitude; ts = 2.28 – 3.93, ps<.05), but the effect was greater in those with ELA. BRS increased only in those with ELA (9.8 to 14.83 msec/mmHG; F=3.66, p<.05) and DBP reactivity decreased more in the ELA group (F=6.7, p<.05). Greater cumulative trauma predicted greater increases in BRS (r = +0.51, p<.05) and decreases in DBP reactivity (r = -0.37, p<.10). Together, trauma and accountability of being in a group with MRMD+ELA, and suggest that ELA predicts greater benefit of MBSR in MRMDs. The predictive ability of cumulative trauma is consistent with an ‘allostatic load’ model, reflecting the ‘war and tear’ on stress-pathways that mediate risk for mood disorders.

137) Abstract 747
CORTISOL, SALIVARY ALPHA-AMYLASE (SAA), AND DEHYDROEPiandroSTERONE SulfATE (DHEA-S) RESPONSES TO, AND RECOVERY FROM, REAL-LIFE HIGH AND LOW STAKES STRESSORS AMONG UNIVERSITY STUDENTS
Terry K. Borsook, Ph.D., Judith Andersen, Ph.D., Psychology, University of Toronto, Mississauga, ON, Canada

In pursuit of a more extreme stressor, we examined the body’s responses to real-life stressors, a moderate-stakes (midterm) and a high stakes (final) exam among 40 university students. Biomarkers of both sympathetic-adrenal-medullary (SAM) system (heart rate variability [HRV], salivary alpha amylase [sAA]) and hypothalamic-pituitary-adrenal (HPA) activation (DHEA-S, cortisol) and recovery were assessed before, during and after both tests. At the outset of each test, students were outfitted with an unobtrusive ambulatory monitor to measure heart rate variability and respiration. Students also provided saliva samples during their test (sAA was measured 5 minutes from onset of stressor and cortisol/DHEA-S was measured 18 minutes from onset of exam stressor). These measures were compared against baseline levels assessed during a non-testing session. Preliminary results using single-sample t-tests of change in scores from baseline levels show that sAA, but not cortisol or DHEA-S, increased significantly during both the midterm (t[21]=2.78, p = .01) and final exams (t[21]=2.40, p = .03). Thus in the context of both moderate and high stakes exams, with serious real-life consequences, only SAM activity was evident. Furthermore, sAA levels remained elevated during the post-exam period. These results are consistent with evidence showing that cortisol secretion in the HPA activation cascade occurs primarily in response to uncontrollable and social-evaluative threats. Our findings suggest that students did not find either the low or high stakes exams to be socially evaluative or uncontrollable. In addition to these hormonal results, we will present the findings from our analyses of Heart Rate Variability. Our talk will situate these

138) Abstract 200
IS ATTACHMENT INSECURITY A MEDIATOR BETWEEN CHILDHOOD ADVERSITY AND SMOKING?
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Background: Despite public health efforts and smoking cessation programs, the prevalence of smoking remains at about 20%. Adult attachment describes biological and psychological processes in close relationships that relate to many health outcomes. Previous studies have found graded relationships between the number of adverse childhood experiences (ACEs) and smoking. Attachment insecurity is associated with ACEs.

Hypothesis: We hypothesized that attachment insecurity mediates the relationships between ACEs and smoking commencement and cessation.

Methods: A cross-sectional study of primary care patients aged 25-65 excluding pregnant and breastfeeding women included validated measures of previous and current smoking, attachment anxiety, attachment avoidance, childhood adversity, and psychological distress (anxiety and depressive symptoms). Mediation was tested using the method of Baron and Kenny.

Results: Among 356 subjects, 60% had experienced childhood abuse, neglect or adversity, 44% started smoking and 19% were current smokers. Gender, socioeconomic status, health and psychological distress were not related to the main variables. Minimum attachment anxiety was associated with starting smoking ($\beta=.63$, $p=0.004$) and with not quitting smoking ($\beta=.93$, $p=.003$). Lower attachment anxiety was associated with quitting smoking ($\beta=.56$, $p=0.046$) and was a weak partial mediator between childhood adversity and quitting smoking ($f$ reduced from .93 to .86). Attachment avoidance was neither related to starting nor quitting smoking.

Conclusion: Contrary to our hypothesis, attachment avoidance is not a mediator between ACEs and smoking commencement or cessation. However, attachment anxiety is a partial mediator between ACEs and smoking cessation. There are numerous smoking cessation methods, such as nicotine replacement and medications, but most do not emphasize emotional support. These results suggest it would be helpful to consider interventions that include relational support in addition to conventional interventions especially for those with high attachment anxiety who have difficulty stopping smoking.

139) Abstract 455

CEREBRAL BLOOD FLOW EFFECTS OF HYPERVENTILATION IN BLOOD-INJECTION-INJURY PHOBIA: A PILOT STUDY

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Patients with blood-injection-injury (BII) phobia suffer from syncopal episodes in exposure to feared stimuli. Patients also experience hyperventilation during exposure. Hypocapnia-induced cerebral vasosconstriction may be a contributing factor to brain hypoperfusion and fainting proneness. However, little is known about effects of hyperventilation on cerebral blood flow (CBF) in these patients. In this proof-of-concept study we measured changes in mean blood flow velocity in the middle cerebral artery (MCAVm, transcranial doppler sonography), beat-by-beat blood pressure, and breath-by-breath end-tidal partial pressure of carbon dioxide (PETO2) continuously while eight patients viewed surgery films as well as anger- and disgust-inducing films. One set of surgery films was viewed only, whereas the other set was combined with two 2-min bouts of voluntary hyperventilation (VH). One trial of VH was also administered without film presentation. Early termination due to pre-syncope occurred in three patients during surgery film viewing and in five patients when combined with VH. VH alone did not lead to termination. Minimum PCO2 (as an index of phasic hyperventilation) remained stable from quiet sitting to anger and disgust films , but decreased significantly during surgery film (p<0.05), surgery films with VH (p<0.001), and VH only (p<0.001). Decreases in PCO2 were significantly associated with decreases in MCAVm. Within-individual correlations between PCO2 and MCAVm were moderate for the surgery film (median r=.35) and higher for surgery and VH combined (median r=.68). Thus, hyperventilation in BH phobia during exposure is associated with reductions in CBF that may increase the risk of fainting.

140) Abstract 79

WORKSITE CONTEXT AND MEASURES OF STRESS, SOCIAL SUPPORT, AND SYSTEMIC INFLAMMATION AMONG EMPLOYEES

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Understanding the degree to which environment contributes to the stress process may suggest mechanisms linking neighborhood context and chronic disease outcomes. Home neighborhood context has been associated with measures of stress, yet less is known about how other contexts such as the workplace may contribute to stress burden. Analyses were performed within mostly white older adults participating in the Promoting Activity and Changes in Eating (PACE) study, a worksite-randomized obesity prevention intervention. Neighborhood context was assessed by worksite-level socioeconomic status, worksite class, and neighborhood density around the worksite. Stress-related measures included: the Perceived Stress Scale (PSS-10), C-reactive protein (CRP), work demands, and social support at work. Linear mixed models adjusted for childhood adversity to term. Minimum density associated with starting smoking ($\beta=.63$, $p=0.004$) and with not quitting smoking ($\beta=.93$, $p=.003$). Lower attachment anxiety was associated with quitting smoking ($\beta=.56$, $p=0.046$) and was a weak partial mediator between childhood adversity and quitting smoking ($f$ reduced from .93 to .86). Attachment avoidance was neither related to starting nor quitting smoking.

Conclusion: Contrary to our hypothesis, attachment avoidance is not a mediator between ACEs and smoking commencement or cessation. However, attachment anxiety is a partial mediator between ACEs and smoking cessation. There are numerous smoking cessation methods, such as nicotine replacement and medications, but most do not emphasize emotional support. These results suggest it would be helpful to consider interventions that include relational support in addition to conventional interventions especially for those with high attachment anxiety who have difficulty stopping smoking.
language use was positively associated with waist circumference ($\beta=2.042$, SE=0.353, $p<0.001$) whereas Spanish language use was inversely associated ($\beta=-3.515$, SE=0.662, $p<0.001$); neither non-H/L ($\beta=0.543$, SE=0.372, $p=0.145$) nor H/L ($\beta=-0.411$, SE=1.664, $p=0.805$) social affiliations was associated with waist circumference. In a multivariate analysis, English – but not Spanish – language use remained significantly associated with waist circumference ($\beta=3.047$, SE=0.614, $p<0.001$), and an inverse association between non-H/L social affiliation and waist circumference emerged ($\beta=1.209$, SE=0.524, $p=0.021$). These findings suggest that different domains of acculturation among H/Ls may differentially relate to adiposity. While our results are consistent with previous studies demonstrating a positive association between U.S. acculturation and obesity (e.g., in terms of English language use), they also point to an interesting protective role of acculturation (e.g., in terms of non-H/L social affiliations) when controlling for language use. Given there was less variability in H/L cultural orientation compared to American cultural orientation constructs, it is difficult to discern whether the risk for – and/or protection against – adiposity conferred by different domains of U.S. acculturation outweigh any potential protective effects of retaining H/L culture. By separately recoding different dimensions of acculturation using data gathered from a commonly employed measure, this study provides insights regarding how the operationalization of acculturation may influence research findings, and suggests for further investigation of this complex process as it relates to indices of cardiometabolic health among ethnic minority populations.

142) Abstract 116

**TRAIT HOSTILITY PREDICTS GREATER BLOOD PRESSURE RESPONSES TO POST-STRESSOR RUMINATION**

Wilson Figueroa, BA, Peggy M. Zoccola, PhD, Erin Rabideau, MS, Psychology, Ohio University, Athens, OH

Sustained stress-related increases in blood pressure (BP) have been linked to the development of cardiovascular disease (CVD; for review, see Schwartz et al., 2003). Trait hostility has been examined as a risk factor for exaggerated cardiovascular stress responses, but the ability of trait hostility to predict exaggerated reactivity to laboratory-based stressors has been somewhat weak and mixed (for reviews, see Barefoot et al., 1992; Suls & Wan, 1993). Perseverative cognition (e.g., tendency for repetitive rumination or recall of a stressor) has been linked to CVD (for review, see Brosschot et al., 2005). However, previous studies have focused largely on anger recall (i.e., tasks that involved harassment or anger provoking situations) and results have been mixed (i.e., positive and null associations; Glynn et al., 2007; Neumann et al., 2004). Some evidence links higher trait hostility and cardiovascular activation during mental recall (e.g., Neumann et al., 2004). The current study tested whether hostility predicts greater BP responses to a stressor in the laboratory and subsequent rumination on the stress. Healthy undergraduates ($n=136$; $50\%$ male) performed an impromptu speech stressor task in front of a video camera and two-way mirror. After a brief delay, participants were instructed to mentally focus on the speech and audio prompts were provided to guide the participant through the recall. Continuous non-invasive BP was measured during each 3-minute task and averaged. Trait hostility was assessed via the Cook-Medley Hostility Scale (Barefoot et al., 1989). Multiple regression analyses were conducted. Higher trait hostility predicted higher mean systolic blood pressure (SBP) at baseline, $\beta=0.37$, $t(117)=1.97$, $p<.05$. Trait hostility significantly predicted SBP increases in response to the speech task, controlling for gender and body mass index, relative to baseline, $\beta=0.30$, $t(109)=2.38$, $p<.05$. In a significantly predicted greater SBP response to the stressor recall relative to baseline, $\beta=0.42$, $t(110)=2.47$, $p=.01$. This effect remained significant when SBP reactivity to the speech task was included in the model, $\beta=0.30$, $t(107)=2.10$, $p=.04$. These results support previous findings that linked trait hostility to greater BP reactivity to laboratory stressors. These results also extend previous research on anger recall by demonstrating the ability of trait hostility to predict BP responses to guided rumination on a performance stressor.

143) Abstract 193

**APPLICATION OF REAL-TIME FMRI TO COCKROACH PHOBIA**

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For coping with anxiety and fear, ‘mindfulness and acceptance’ is now the key therapeutic concept that emphasizes on paying attention to ‘here and now’ and ‘avoiding avoidance of fear/anxiety’. Also it stresses attentional flexibility, i.e., attention is not fixed with a stressful stimulus triggering anxiety and fear. In this study, we tried to apply a cutting-edge neurofeedback technique using real-time functional MRI (rtfMRI) to phobia patients. They were trained to control their own brain activity in a brain region associated with direct and instant attention to visual stimuli, which should build their mindful attentional ability and also make them avoid avoidance and get more confident to face the emotional triggers. Subjects are 3 cases (23y.o. male, 22y.o. male, and 22y.o. female) who all had an excess fear of cockroach (which met the criteria of simple phobia in DSM-IV) and could not cope with it appropriately when they come across it in everyday life. First they underwent the neurofeedback training session, in which they saw a cockroach movie clips passively (40sec x 5times with interleaved rest, ~7min in total). An individual activated cluster in MT/V5 region was immediately extracted. This region has been frequently reported as reflecting instant attentional modulation of visual input. Next the subjects saw the cockroach movie clips and in parallel a bar graph that indicates real-time hemodynamic changes in the cluster. Subjects were instructed to up- and down-regulate the bar graph, alternatively, for 40sec in each. As a result, after the repeated sessions (25-58 times), subjective sense of control of all subjects linearly increases as training sessions progressed, $T=31.0$, $p<.001$. Their avoidance of cockroach measured with a 7-point scale decreased, $T=5.0$, $p<.019$. Confidence of coping with cockroach for the future increased, $T=3.02$, $p=.047$, and fear of cockroach decreased, $T=3.02$, $p=.047$. Despite we did not obtain control samples yet, results show that the neurofeedback with rtfMRI promotes significant clinical effectiveness and that this method has a good potential of application to patients with fear and anxiety.

144) Abstract 220

**EFFECTS OF CANCER CAREGIVING TASKS ON DEVELOPMENT OF STROKE AMONG FAMILY CAREGIVERS**

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Evidence supporting the potentially hazardous effect of cancer caregiving on family caregivers’ health has grown in recent years. Unexamined, however, is the extent to which development of morbidity among the caregivers is predicted by (a) specific care tasks family caregivers frequently provided and found difficult, and (b) subsequent changes in caregiving status. This study addresses these gaps by predicting the occurrence of stroke at 5 and 8 years post-diagnosis by caregiving tasks provided at 2 years (T1) post-diagnosis and changes in caregiving status at 2, 5 (T2), and 8 (T3) years post-diagnosis. A total of 536 cancer caregivers (mean age 55) participated in a nationwide longitudinal study. Frequency of and difficulty with types of care (using the Dimensions of Care Task scale), age, gender, education, income, spousal relationship to the care recipient, hours of caregiving, and receipt of paid or non-paid help were measured at T1. Self-report of having received treatment for stroke was measured at T1. Predictors of having had a stroke at T1 was significant (Exp(B)s > 1.70, ps < .01), above and beyond the effect of age. Among caregivers bereaved at each assessment were also measured. Logistic multi-level model analyses revealed that frequency of and difficulty with emotional care and difficulty with medical care related to having had a stroke at T1 was significant (Exp(B)s > 1.70, ps < .01), above and beyond the effect of age. Among caregivers bereaved at follow-ups, initial frequent provision of instrumental and tangible care and greater difficulty with emotional care (Exp(B)s > 1.5, ps < .01) predicted occurrence of stroke at follow-ups; among non-bereaved
PRINCIPAL OF ADVERSITY IN SECOND GENERATION IRENISH PEOPLE IN BRITAIN

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Objectives: Worldwide, the Irish diaspora experience elevated mortality and morbidity across generations, not accounted for through socioeconomic position. The main objective of the present study was to assess if psychosocial risk factors over the life-course account for poorer mental and physical health in adulthood, in second generation Irish people.

Design: Analysis of prospectively collected birth cohort data, with participants followed to mid-life.

Setting & participants: 17,000 babies born in a single week in 1958 in England, Scotland and Wales. 6% of the cohort were of second generation Irish descent. Main outcomes were common mental disorders assessed at ages 23, 33 and 44/45 and self-rated health at age 23, 33 and 42.

Results: Relative to the rest of the cohort, second generation Irish cohort members experienced marked psychosocial adversity in childhood, which tracked into early adulthood. By mid-life, parity was reached between second generation Irish cohort members and the rest of the sample on most adversity indicators. At age 23 Irish cohort members were more likely to screen positive for common mental disorders (OR: 1.44; 95% CI: 1.06, 1.94). This had reduced slightly by mid-life (OR: 1.27; 95% CI: 0.96, 1.69). Whereas at age 23 second generation cohort members were just as likely to report poorer self-rated health (OR: 1.06; 95% CI: 0.79, 1.43), by mid-life this difference had increased (OR: 1.25; 95% CI: 0.98,1.60). Adjustment for childhood and early adulthood adversity fully attenuated differences in adult health disadvantages.

Conclusions: Psychosocial adversity experienced in childhood continues to have long-range adverse effects on physical and mental health at mid-life, in second generation Irish cohort members. This suggests important mechanisms relating to psychosocial adversity experienced over the life-course, which has important policy implications in the settlement of migrant families.
POSTER SESSION 2

146) Abstract 511

PUZZLING RELATIONSHIP OF HYPERTENSION WITH DEPRESSION: RESULTS FROM THE GUTENBERG HEALTH STUDY
Matthias Michal, Dr., psychosomatic medicine and psychotherapy, Isabella Zwiener, Dr., Institut für Medizinische Biometrie, Epidemiologie und Informatik, University Medical Center Mainz, Mainz, RLP, Germany; Philip S. Wild, Prof., Center für Thrombose und Hämostase, University Medical Center Mainz, Mainz, RLP, Germany; Manfred E. Beutel, Prof., psychosomatic medicine and psychotherapy, University Medical Center Mainz, Mainz, RLP, Germany

Objective: The literature on the depression-hypertension relationship came to conflicting results. Previous studies reported close positive as well as close negative associations between hypertension and depression. Against this background, the present study sought to analyze this relationship in a large population based study. Methods: This cross-sectional population-based study (N = 5000) analyzed the association of depression and hypertension in persons with different conditions of hypertension (unaware of hypertension, sufficient treatment of hypertension, insufficient treatment of hypertension) as compared to persons without hypertension. Furthermore, the relationships of depressive symptoms with antihypertensive drugs and blood pressure were examined. Results: 48.6% of participants were classified as “no hypertension”, 13.5% had sufficient treatment and 23.4% had insufficient treatment of hypertension. 14.2% were unaware of their hypertension. Unawareness of hypertension was inversely associated with burden of depression. Sufficient treatment of hypertension was positively associated with depression. However, this association was due to generally increased disease burden (e.g. stroke, diabetes). Severity of cognitive symptoms of depression was negatively associated with systolic blood pressure in persons free of antihypertensive drugs (Beta = -0.64, p=0.0005). Intake of beta-blockers and agents acting on the renin-angiotensin system were associated with severity of somatic symptoms of depression (e.g. fatigue). Conclusions: The competing literature about the relationships linking depressive symptoms with blood pressure, hypertension and related medications.

147) Abstract 512

SLEEP DISTURBANCES ARE ASSOCIATED WITH CARDIOVASCULAR DISEASE IN THE COMMUNITY: RESULTS FROM THE GUTENBERG HEALTH STUDY
Matthias Michal, Dr., Matthias Michal, Dr., Psychosomatic Medicine and Psychotherapy, Astrid Schneider, Dr., Institut für Medizinische Biometrie, Epidemiologie und Informatik, Philipp S. Wild, Prof., Center for Thrombosis and Hemostasis, Manfred E. Wild, Prof., Psychosomatic Medicine and Psychotherapy, University Medical Center Mainz, Mainz, RLP, Germany

Background: Despite the large prevalence of sleep disturbances and their significant burden for the patient and the health care system, sleep disorders often remain unrecognized and untreated because of barriers to assessment and management. The aims of the present study were, to test the feasibility of a single question for identifying sleep disturbances and to examine associations of sleep disturbances with cardiovascular disease, related risk factors, inflammation and physical health in the community.

Methods: The sample consists of n=10,000 participants aged 35 to 74 years; the sample was stratified 1:1 for gender and residence and in equal strata for decades of age. Associations of sleep disturbances with cardiovascular disease, cardiovascular risk factors, depression, anxiety, physical health status, and markers of inflammation (C-reactive protein, fibrinogen and albumin) were analyzed cross-sectionally. The main predictor was sleep disturbances as assessed by a single item from the Patient Health Questionnaire. Further measures included computer assisted assessment of the medical history and health status, laboratory assessments, and depression and anxiety questionnaires.

Results: 20% of our sample endorsed to be bothered by trouble falling asleep or sleeping too much over the last 2 weeks for at least more than half a night. In the unadjusted analyses severe sleep disturbances increased with female sex, low socioeconomic status, living without a partnership, several cardiovascular diseases, depression, anxiety, self-rated physical health status, C-reactive protein and fibrinogen. After multivariate adjustment robust associations with coronary heart disease, myocardial infarction, depression, anxiety and poor physical health status remained.

Conclusions: Given the strong impact of sleep disturbances on self-perceived health increased efforts should be undertaken for its identification and treatment. The corresponding item from the Patient Health Questionnaire seems to be a promising tool.

148) Abstract 794

CARDIAC COMPONENTS OF ANXIETY: CORRELATES AND INTERVENTIONS
Adrian D. Thompson, M.S. Psychology, Psychology, Howard University, Washington, District of Columbia (DC), Jules P. Harrell, PhD, Psychology, Howard University, Washington, District Of Columbia

Anxious individuals exhibit significant if not distinct patterns of cardiovascular activity. Changes in heart rate variability reflect alterations in the input of the sympathetic and parasympathetic branches cardiac autonomic nervous system (ANS). The current study examined the relationship between dispositional anxiety and the parasympathetic and sympathetic control of the heart as laboratory challenges were encountered. In order to better understand the multidimensional relationship between anxiety and autonomic control of the heart each participant was mapped spatially according to both anxiety predispositions and cardiovascular reactions during the experiment. In this study, 50 African American college students performed a variety of inhibition and stressor tasks to assess cardiac activity using an ambulatory impedance cardiograph. Measures of cardiac sympathetic and parasympathetic activity were derived based on inter-beat intervals, that is the number of milliseconds between each heart beat. Trait anxiety was assessed using the Endler multidimensional scale which measures behavioral and somatic components of anxiety in several situations. An analyses of variance revealed that there were significant differences in sympathetic and parasympathetic control of the heart across several of our experimental tasks. Findings confirm past studies that indicate an individual's vagal control contributes to increases and decreases of heart rate in several different situations. Self-reported levels of anxious predisposition were associated with several measures of cardiac responses to laboratory stressors. This is likely due to the demands of the tasks themselves or to a heightened sensitivity to social cues that are embedded in the context of task performance. When the reported anxiety by situation matched in the laboratory context associated with performing the task, the facet of anxiety correlated with cardiac activity. The added analyses of each individual's autonomic space helped illuminate the relationship between subject's reporting of state and trait anxiety and physiological responses across stressors by parasympathetic and sympathetic domains.

149) Abstract 710

EFFECTS OF EXERCISE ON SLEEP MORPHOLOGY IN HEALTHY CONTROLS AND PATIENTS WITH CHRONIC FATIGUE SYNDROME
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We studied the effects of exercise on dynamic aspects of sleep in 17 female patients with CFS [10 with CFS alone and 7 with CFS+Fibromyalgia] and in 16 female healthy controls [HCs]. We hypothesized that exercise would affect dynamic sleep morphology differently in CFS compared to HCs and that additional differences would exist between CFS alone and CFS+F.M. Subjects underwent overnight polysomnography on a baseline night and on a night after a maximal exercise test. We calculated transition probabilities between sleep stages (waking, rapid eye movement [REM] sleep, N1, N2 and N3) and cumulative duration distributions of each sleep stage and sleep as a whole. Heart rate controls showed a significantly greater probability of transition from N1 to N2 on the post-exercise night than on the baseline night.

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CFS patients showed a significantly greater probability of transition from N2 to N3 on the post-exercise night than on the baseline night – i.e., improved sleep for both groups. Controls showed more continuous sleep on the post-exercise night than on the baseline night. Differences based on co-existing FM emerged: those with CFS alone had less continuous N1 sleep, while those with CFS+FM had more continuous REM sleep on the post-exercise night than on the baseline night. Differences based on co-existing FM emerged: those with CFS alone had less continuous N1 sleep, while those with CFS+FM had more continuous REM sleep on the post-exercise night. Patients with CFS alone reported significantly greater fatigue on the morning after exercise than on their baseline morning. Those with CFS+FM showed significantly less depressed mood following exercise than on the baseline night.

In conclusion, exercise promotes transitions to deeper sleep stages for both healthy controls and CFS patients, but CFS patients showed co-existing sleep fragmentation and more fatigue. CFS alone and CFS+FM showed different responses in sleep-stage continuity to daytime exercise, and their responses appear to be associated with patients’ subjective feelings, suggesting that CFS and FM may be different illnesses with different effects of exercise on sleep.

Support: This work was supported in part by NIH AI-32247 to BHN and from the Foundation for Research in Sleep Disorders and the Georgia Waeche Memorial Foundation to AK.

150) Abstract 539
PERSONALITY AND EXERCISE BEHAVIOR IN AFRICAN AMERICAN MEN
Alana F. Mohammed, M.S., Camara Jules P. Harrell, Ph.D., Psychology, Teletia R. Taylor, Ph.D., Cancer Center, Howard University, Washington, D.C.

BACKGROUND: According to the American Cancer Society (ACS), approximately 25% of the adult African American population does not exercise, and roughly three quarters is overweight/obese. The ACS lists lack of exercise and being overweight/obese as major risk factors for disease, which may in part explain why African Americans are disproportionately afflicted by cancer and other leading causes of death compared to other ethnicities. In view of the positive health implications of motivating this population to exercise, it is important to identify factors affecting African American men’s exercise behavior. One factor of primary interest is personality which may be related to the frequency, intensity and duration of exercise. This study examined the relationship between personality and exercise behavior.

METHODS: A survey was administered to 150 male African American participants, ages 30 – 70, who could speak and read English, and who were physically able to exercise. Men’s exercise behavior was measured using the International Physical Activity Questionnaire (IPAQ). Personality was measured using an adapted short version of the IPIN-NEO.

RESULTS: Principal component analyses were used to derive component scores for the five major personality domains: Conscientiousness, Extraversion, Neuroticism, Extraversion, and Openness to Experience. Preliminary results showed that the Self-Discipline facet of Conscientiousness (r(113) = .20, p = .035), as well as a first-order component of Extraversion (r(113) = .19, p = .039), consisting of the facets Assertiveness, Activity Level, and Cheerfulness, were significantly related to men’s moderate physical activity.

CONCLUSION: African American men’s inclination to participate in moderate exercise may be related to specific facets of personality such as Self-Discipline, Assertiveness, Activity Level, and Cheerfulness. This study has implications for future American exercise interventions intended to lower disease risk in African Americans.

151) Abstract 212
TRAIT RUMINATION MODERATES THE EFFECT OF MENTATION TYPE ON HEART RATE DURING STRESSOR-FOCUSED RUMINATION
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Type of mentation during worry episodes can affect heart rate (HR). Specifically, mental imagery increases HR, while verbal self-talk decreases HR (Borkovec et al, 1993; Pitman et al, 1987). Rumination, often conflated with worry, may also prolong the HR stress response (Brosschot et al, 2006). However, the cognitive mechanisms involved are only partially explored. The current study explored the relationship between rumination type and trait rumination (i.e., tendency to ruminate) using a 2 (mentation type: mental imagery or verbal thought) x 2 (trait rumination: high or low) between-subjects ANOVA with repeated measures on the within-subject factor (mentation). Results showed a significant interaction (F(1, 111) = 4.54, p = .037), indicating that trait rumination moderated the effect of rumination type on HR.

152) Abstract 529
DOES PANIC DISORDER CONFER A PROTECTIVE EFFECT ON LUNG FUNCTION IN ASTHMA?
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Background: Anxiety disorders have been shown to be more prevalent in asthmatics and have been associated with worse asthma outcomes. The mechanisms remain poorly understood but may involve autonomic and/or immune dysregulation associated with chronic anxiety. This study evaluated the association between anxiety sensitivity (AS) and diagnoses of panic disorder (PD) on immune measures, lung function, and asthma symptoms in asthmatics. We hypothesized that higher levels of AS and the presence of PD would be associated with worse pulmonary and immune functioning.

Methods: 98 asthmatics with asthma and/or occupational asthma were recruited from HSCM. Participants underwent a sociodemographic and psychiatric interview (PRIME-MD), and completed a number of psychological and asthma questionnaires including the Anxiety Sensitivity Index (ASI) and the Asthma Control Questionnaire (ACQ). Baseline levels of forced expiratory volume in one second (FEV1), forced vital capacity (FVC), PC20, and sputum neutrophils, eosinophils, macrophages, and lymphocytes were obtained from standard spirometry, methacholine challenge, and induced sputum.

Results: 63 participants had low AS (ASI < 18), 24 had moderate AS (ASI 18 - 29), and 11 had probable PD (according to PRIME-MD or ASI ≥ 20). Analyses revealed that the low and moderate AS groups had significantly worse lung functioning (% predicted FEV1 β = -14.68, p = .012), % predicted FVC (β = -13.92, p = .002) respectively and % predicted PD (β = -16.53, p = .001; β = -13.92, p = .012) compared to the PD group. In addition, though not statistically significant, the low AS group had clinically worse asthma control (β = -.497, p = .207) and tended to react to lower levels of methacholine (PC20: β = -433, p = .069) than the PD group. AS and PD were not associated with any immune measures.

Conclusions: Asthmatics with probable PD displayed better pulmonary function, clinically better asthma control, and similar immune function as their moderate and low AS counterparts. One possibility is that increased anxiety-related sympathetic input may confer a protective bronchodilatory effect among patients with probable PD. Further investigation is needed to confirm the extent to which anxiety may be protective in asthmatics.
Academic exam stress on the fraction of NO in exhaled air (FeNO) in reductions in serum NO. In this study, we examined the effect of factors such as depression and stress have been previously linked to depression during final exams are associated with reductions in exhaled nitric Oxide in healthy students.

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Research suggests that reduced nitric oxide (NO) levels can have adverse effects on cardiovascular and immune health. Psychosocial factors such as depression and stress have been previously linked to reductions in serum NO. In this study, we examined the effect of academic exam stress on the fraction of NO in exhaled air (FeNO) in 41 healthy college students (36 females and 7 males). Measurement were taken during a low stress period during the term and during the final academic exam period, with one measurement early and one late during the exam period approximately seven days apart. FeNO decreased towards the late final exam period, while negative affect was elevated in the early and late final exams (p<.050), and depressive mood was elevated during the early final exam (p=.050). Higher depressive symptoms was associated with lower FeNO levels (p<.010). In contrast, higher state negative affect was associated with higher FeNO levels (p=.050). Salivary cortisol was elevated in the late (p=.050) but was not associated with FeNO. Overall these findings suggest that depressive mood and prolonged stress reduce FeNO in healthy individuals, which may indicate potentially adverse effects on cardiovascular health and immune function.

Expressive writing in male infertility - A randomized controlled study.

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Over 20 years ago the American Psychologist James W. Pennebaker developed the theory of expressive writing. This theory is based on the essential idea that actively inhibiting thoughts and feelings about traumatic events can serve as a cumulative stressor. The efficacy of expressive writing was confirmed in over 100 experimental studies and many studies confirmed its positive influence on physiological and psychological parameters. In the present study, the efficacy of this intervention has been studied for the first time in patients with a diagnosis of male infertility. This group of patients appeared particularly suitable, because the diagnosis of male infertility is seen as stigmatizing by many affected men. Male infertile patients (18 and 55 years) with a pathological spermogram were included. Patients were randomly allocated to two treatment conditions. The intervention group wrote on three days for 20 minutes about highly emotional topics, the control group wrote about neutral topics. Primary outcome measure was the Infertility Distress Scale three months after the intervention, secondary outcome measures included infertility-related thoughts of helplessness, sexual satisfaction, personality dimensions (Temperament and Character Inventory) and sperm parameters. 56 patients could be included. Patients were selected from a second study in which cardiac output) and electrocardiography (heart rate, HR); three additional tasks (PASAT) were measured using Doppler echocardiography (cardiac output, stroke volume). There were no differences between exaggerated cardiac stress reactors, M (S D) age = 20.9 (1.56) years. Twenty participants were selected from a study in which cardiac disease outcomes. Additionally, mean reaction time (RT) on an acute stress task has been found to be inversely related to CV reactivity, suggesting an association between lower cognitive ability and lower CV reactivity. Further, an inverse relationship exists between neural efficiency in synaptic transmission and RT variability. The relationship between neural efficiency and CV reactivity has not been examined and may serve as a mechanism linking CV reactivity and health outcomes. Methods: Using RT variability as a proxy for neural efficiency during a 5-min acute stress Stroop color naming task and measuring CV reactivity via blood pressure and heart rate, 253 healthy men and women (63.3 ± 5.4 years) from the Whitehall II Epidemiological Cohort were assessed. After removing RT outliers, the standard error (SE) of each participant's mean RT on correct trials was tested as a predictor of CV reactivity.

Results: Greater systolic (SE RT β = -0.243, p = 0.015; model R2 = 0.120, p < 0.001) and diastolic (SE RT β = -0.224, p = 0.026; model R2 = 0.105, p = 0.001) blood pressure reactivity from baseline to the Stroop acute stressor was related to lower RT variability; only smaller blunted cardiac blood pressure recovery was related to lower RT variability (β = -0.218, p = 0.077). Blood pressure reactivity was related to RT variability via blood pressure and heart rate, 253 healthy men and women (63.3 ± 5.4 years) from the Whitehall II Epidemiological Cohort were assessed. After removing RT outliers, the standard error (SE) of each participant's mean RT on correct trials was tested as a predictor of CV reactivity.

Conclusions: Neuronal transmission can be indirectly measured from RT variability. This is the first study to report an association between higher neural efficiency, as indexed by lower RT variability, and worse CV reactivity and recovery from acute stress. Although associated with better cognitive functioning, being “hardwired” for more efficient neuronal transmission as indexed by decreased RT variability may be one salient mechanism linking increased CV reactivity, decreased CV recovery, and worse CV health outcomes.

Extreme stress responses and regional grey matter volume differences.

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Exaggerated cardiovascular reactions to acute psychological stress have been associated with hypertension and other manifestations of cardiovascular disease that are themselves associated with alterations in brain morphology. It is still unclear, however, whether cardiovascular stress reactions may relate to brain morphology in the absence of disease. Accordingly, we examined regional grey matter volume in 23 healthy young men (11 exaggerated cardiac stress reactors and 12 blunted cardiac stress reactors), M (SD) age = 20.9 (1.56) years. Twenty participants were selected from a study in which cardiac reactions to a 10-minute version of the paced auditory serial arithmetic task (PASAT) were measured using Doppler echocardiography (cardiac output, stroke volume) and electrocardiography (heart rate, HR); three additional participants were selected from a second study in which cardiac reactions to the same stress task were measured using electrocardiography. Selected exaggerated reactors were at least two SDs above their respective sample means in terms of cardiac reactivity and selected blunted reactors were at least two SDs below their respective sample means in terms of cardiac reactivity. There were no differences between exaggeration groups in terms of age (p = .96), BMI (p = .40), or baseline HR (p = .63). Participants underwent a structural magnetic resonance imaging scan and a computational structural neuroimaging method (voxel-based morphometry) was used to explore group differences in regional grey matter volume. The analyses revealed that exaggerated cardiac reactors exhibited greater grey matter volume in the bilateral insula and thalamus and periaqueductal gray, whereas blunted cardiac reactors had greater grey matter volume in the mid anterior cingulate cortex (uncorrected Pr<.005, cluster extents of...
K > 26 voxels). These differences survived adjustment for total grey matter volume. The present study indicates that there are regional structural differences in grey matter between exaggerated and blunted matter volume. The present study indicates that there are regional K > 26 voxels). These differences survived adjustment for total grey matter volume. The present study indicates that there are regional differences between exaggerated and blunted matter volume. The present study indicates that there are regional

**THE ROLE OF BELIEFS AND EMOTIONS IN EXPLAINING SYMPTOMS AND NONADHERENCE AMONG WOMEN TAKING ADJUVANT ENDOCRINE THERAPY FOR BREAST CANCER**

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Background: Nonadherence to adjuvant endocrine therapy with either tamoxifen or aromatase inhibitors significantly increases the risk of breast cancer recurrence. Side effects are a key driver of nonadherence to this treatment. This study explored the possibility that the self-regulatory model of illness provides a framework for understanding both the experience of side effects and treatment nonadherence among women taking adjuvant endocrine therapy.

Method: This prospective study examined illness and medication beliefs, and emotions such as fear of recurrence as predictors of reported symptoms and nonadherence among women prescribed tamoxifen or aromatase inhibitors for early-stage breast cancer. Surveys were conducted prior to treatment initiation (N = 125) and at 3-months follow-up (N = 120). Univariate analyses included Pearson correlations, t tests, Chi square analyses and ANOVA, and multivariate analyses included multiple regression (stepwise and simultaneous entry).

Results: Results showed that lower illness coherence beliefs and higher symptom severity were the strongest predictors. Symptoms were predicted by factors such as fear of recurrence and patient beliefs including low personal control over cancer recurrence, and high perceived sensitivity to the effects of medicines. Finally, results highlighted the dynamic nature of these associations over time.

Conclusion: This study showed that psychological factors such as illness and medication beliefs contribute unique variance to symptom reports and nonadherence among women taking adjuvant endocrine therapy. These novel findings suggest that there may be benefit to supplementing pharmacological approaches to side effect management with psychological approaches. Future research is needed to explore the effects of interventions aimed at changing illness and medication beliefs, and to determine their optimal timing in order to improve clinically relevant outcomes among women taking adjuvant endocrine therapy.

**CAN WOMEN SUFFERING FROM EATING DISORDERS ACTUALLY BENEFIT FROM SOCIAL SUPPORT?**

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The etiology and maintenance of eating disorders (ED) have been repeatedly associated not only with chronic stress, but also with low perceived social support. However, while high social support protects against perceived stress in healthy individuals, it is unclear whether high perceived social support would protect against perceived stress for ED patients as well. This study aimed to explore this question.

For that, 18 healthy women, and 19 women suffering from eating disorders (7 bulimic, 12 anorexic) with a mean age of 23.4 years (SD=±6.5) completed the Perceived Stress Scale and a perceived social support measure (Fragebogen zur Sozialen Unterstützung). Salivary samples were collected upon awakening and +30 minutes on two consecutive days. Max cortisol increases were computed using values averaged over the two days. Consistent with ED patients reported significantly less social support in all domains: emotional, practical, social integration, reciprocity, availability of a confidant, satisfaction with support, and overall perceived support (all p<.02) as well as more social strain (t=3.7, p=.001). They also reported more perceived stress (t=6.2, p<.001).

Interestingly, however, there were significant interactions between all support domains except social strain and group membership predicting perceived stress level (all p<.05), such that support domains were negatively associated with stress in healthy individuals, but unrelated in patients. For perceived stress associations with max cortisol increases, again only healthy individuals showed a link between the two variables (β=−.58, p=.04).

While we found the expected link between high social support and low perceived stress for healthy individuals, interestingly, ED patients seemed to exhibit a disconnect between social support and stress, both on a self-reported perceived chronic stress level as well as on a biological level assessed by cortisol awakening responses. This suggests that ED patients appear unable to translate high social support into a stress buffer, and as such, these findings have implications both with regard to understanding the stress-related dysfunctions in ED as well as the complex role of social support in ED intervention.

**DIASTOLIC PREHYPERTENSION PREDICTS POOR VISUAL-SPATIAL ABILITY IN AFRICAN-AMERICANS BUT NOT EUROPEAN-AMERICANS**

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Despite replicated associations between higher blood pressure (BP) and mild cognitive deficits, the effects of BP upon specific cognitive abilities have been mixed. This could be due to preliminary evidence of racial differences in the effects of hypertension upon spatial perception and visual attention. This study aimed to explore racial differences in the effects of mildly elevated BP (i.e., prehypertension) on visual-spatial ability. The central hypothesis was that elevated BP would be associated more strongly with poor visual-spatial ability among African-Americans (AA’s) relative to European-Americans (EA’s).

Systolic (SBP) and diastolic BP (DBP) was measured from 74 EA’s (M age = 47 years; 50% male) and 41 AA’s (M age = 47 years; 51% male) collected from an urban community. Subjects were all in the normotensive to prehypertensive range (i.e., SBP < 140, DBP < 90) and not receiving antihypertensive medication. A visual-spatial ability composite score was calculated as the average z-score of two measures of visual-spatial performance (Rey Complex Figure Delayed Recall score and Digit Symbol Substitution score) and one measure of visual-spatial processing speed (Trail Making A completion time). Separate hierarchical linear regressions were employed for AA’s and EA’s to assess differential associations between BP and visual-spatial ability (composite & specific test scores). Separate regressions were computed because race differences in BP induced a co-linearity that suggested a greater validity for separate analyses by race. Analysis of composite scores showed that DBP accounted for 11% of the variance in AA’s visual-spatial ability (β = -3.4, t = -2.41, p = .02), but was unrelated to EA’s performance (β = -0.5, t = -0.40, p = .69). Regression analyses of the individual tests showed similar results for the Rey Complex Figure Delayed Recall and Digit Symbol Substitution scores, but not Trail Making A completion time. SBP was not predictive of visual-spatial ability for EA’s or AA’s (all p > 0.37). Furthermore, sub-samples matched for visual-spatial ability yielded the same findings, which suggest the results are not related to overall cognitive differences. Thus, these results show that elevated BP is related more strongly to poor visual-spatial ability among AA’s compared to EA’s, but these differences may be specific to diastolic prehypertension and visual-spatial performance rather than systolic prehypertension and visual-spatial processing speed.
160) Abstract 604
REAL-TIME ECOLOGICALLY-VALID ASSESSMENT OF COGNITIVE AND CARDIOVASCULAR LOAD IN REAL-LIFE IN MID-CAREER FEMALE MANAGERS
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Background: There is a need to develop feasible methodologies that allows for real-time workplace monitoring of high and low-intensity stressors of relevance to adverse cardiovascular wear and tear. Such knowledge would drive mechanistic understanding of stress-cardiovascular disease links. It would also promote the development and assessment of real-life workplace interventions.
Methods: A novel wireless algorithm-driven smart phone controlled body area network sensor system (SPA) was used to continuously track female middle managers' heart rate (HR) and cognitive load in their everyday work. SPA allowed for both random and algorithm-driven collection of HR and self-reported stress. Data was analyzed using Hierarchical linear modeling.
Results: Baseline self-reported stress and lifestyle factors, e.g., smoking and coffee consumption, correlated significantly with baseline HR. Baseline HR and chronic, but not acute work stress, potentiated acute HR responses during work. There were significant differences in HR depending on type of tasks managers were engaged in.
Conclusion: SPA offers a feasible means to study real-time reactions to ecologically-valid (workplace) stressors in female managers, a high-risk group for the development of low-energy syndrome ("burn-out"). Results suggest an interaction between chronic workplace stressors and workplace cardiovascular reactions. SPA offers a feasible way to guide and assess personalized anti-stress interventions in the workplace.
Acknowledgement: Funded by the Swedish Council for Working life and Social Research (FAS) and Wayne State University.

161) Abstract 598
STRESS MANAGEMENT REDUCES DISTRESS AMONG HEALTHY WOMEN AT RISK FOR BREAST CANCER, A RANDOMIZED CONTROLLED TRIAL
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Women at elevated risk for breast cancer report elevated psychological distress, which has been adversely associated with many cancer relevant behaviors, such as suboptimal screening behaviors. Rigorous research for interventions to address this specific population is lacking.
This study sought to examine the effects of a 10-week manualized cognitive behavioral stress management (CBSM) group intervention on distress among 156 women with a family history of breast cancer. Participants were randomly assigned to the intervention or wait-list control. Repeated measures ANCOVA examined the baseline (T1) to post-intervention (T2) effects of intervention on distress scores. Significant intervention effects were found on anxiety (F(1,86)=5.67, p=.02, MSE=43.53) and depression (β=.40, p=.006), but longer sleep duration (β=.34, p=.01) but increased SWS (β=.44, p=.001). Disruptive patient behavior was correlated with more subjective sleep complaints (β=.45, p=.007), decreased SWS (β=.40, p=.006), but longer sleep duration (β=.39, p=.01). Conversely, depressive patient behavior was associated with shorter sleep duration (β=.34, p=.01) but increased SWS. Spousal caregiving and sleep are strongly associated. This study is the first to highlight the complexity of the caregiver burden/sleep relationship and provide preliminary support for the development of targeted interventions to reduce caregiver burden and improve caregiver sleep.

162) Abstract 635
CAREGIVING AND SLEEP: A STRONG YET COMPLEX RELATIONSHIP
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Caring for a spouse with Alzheimer’s Disease (AD) has long been recognized as a chronic stressor, with adverse consequences to health and functioning, including sleep disturbance. The literature on sleep and AD caregiving consists of comparisons between caregivers and non-caregivers. We know of no prior studies that have examined specific characteristics of the caregiver experience in relation to sleep. Identifying the sources of caregiver burden associated with sleep disturbance is critical to the development of interventions aimed at enhancing health and functioning in caregivers.
In the present report, we examined specific characteristics of the caregiving experience in relation to sleep. Fifty caregivers (84% female, mean age, 73.1±7.1), completed a series of caregiver burden measures. Sleep was measured by self-report (Pittsburgh Sleep Quality Index; PSQI) and in-home polysomnography (PSG). Models adjusted for age and perceived stress.
Over 25% of the variance in caregivers’ sleep profiles was accounted for by caregiver burden. Results of hierarchical linear regression indicated that caregiver burden was a strong correlate of sleep quality complaints (F(6,37)=2.57, p=.03), PSG-assessed sleep duration (F(6,38)=3.26, p=.01), and slow wave sleep percent (SWS; F(6,38)=6.03, p=.001). Loss of caregiver independence was associated with reduced SWS (β=.27, p=.04) while loss of physical intimacy was associated with increased SWS (β=.44, p=.001). Disruptive patient behavior was correlated with more subjective sleep complaints (β=.45, p=.007), decreased SWS (β=.40, p=.006), but longer sleep duration (β=.39, p=.01). Conversely, depressive patient behavior was associated with shorter sleep duration (β=.34, p=.01) but increased SWS. Spousal caregiving and sleep are strongly associated. This study is the first to highlight the complexity of the caregiver burden/sleep relationship and provide preliminary support for the development of targeted interventions to reduce caregiver burden and improve caregiver sleep.

163) Abstract 532
INFLUENCE OF ANXIETY AND DEPRESSIVE SYMPTOMS ON BODILY PAIN: A LONGITUDINAL COMPARISON BETWEEN COLOMBIAN CORONARY HEART DISEASE PATIENTS AND CONTROLS
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Introduction: Pain is a pervasive experience influenced by mood symptoms and also a symptom of coronary heart disease (CHD). Depression and anxiety common in CHD patients and are risk factors for future coronary events. Nineteen 221 participants (114 CHD patients, 107 healthy controls) were recruited in Medellin, Colombia. All CHD patients experienced a coronary event due to CHD and were admitted to a cardiovascular clinic. At baseline and 6 months, the Patient Health Questionnaire (PHQ-9) from the PRIME-MD measured depressive symptoms, the State-Trait Anxiety Inventory measured trait anxiety (STAI-T) and state anxiety (STAI-S), and the Short Form-36 Health Survey (SF-36) measured health-related quality of life. The principal influence of anxiety and depressive symptoms on bodily pain was assessed in this analysis was the SF-36 bodily pain subscale score; lower scores indicate higher pain. Results: Compared to controls, the CHD group was significantly older, less educated, with lower socio-economic status (SES), and was more likely to be male (p<.05). These factors were added as covariates in all subsequent analyses. The CHD group had significantly lower baseline SF-36 pain scores (CHD: M=100.4, Control: M=107.4, p<.001) and higher pain scores at 6-month follow-up (CHD: M=87, Control: M=66.5, p<.001). The following variables were added to the logistic regression model: age, sex, education, SES, depression, anxiety, and treatment group. The model was significant (χ²=39.2, df=9, p<.001). The CHD group was significantly more likely to report higher pain scores than controls (OR=1.6, 95% CI [1.2, 2.2]). The results suggest that anxiety and depressive symptoms have a significant influence on bodily pain in CHD patients, and that these symptoms may be contributing factors to the higher pain levels reported by CHD patients compared to healthy controls.
motivation, empowerment and a sense of teamness, has often been
resources at the workplace.

Transformational leadership, a behavior of superiors that fosters
employees and a perception of more available psychosocial resources.
In both groups, females reported less pain than males. This is consistent with experiences of silent ischemia common in women with CHD. CHD patients with lower SES also experienced more pain, potentially due to the lack of medical and follow-up care available for their condition. These findings confirm prior research on the importance of depressive and anxiety symptoms on pain, regardless of presence or absence of CHD.

LEADERSHIP AND ITS EFFECT ON PSYCHOLOGICAL STRAIN PSYCHOSOCIAL RESOURCES AS A POTENTIAL MEDIATOR?
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Purpose: Leadership behavior can be seen as potential stressor or resource for psychological distress in the adult population. Transformational leadership, a behavior of superiors that fosters motivation, empowerment and a sense of teamness, has often been associated with better employee well-being and reduced stress, but the mechanisms for these potential effects remain unclear. This study examines the relationship of this leadership style and stress more closely and secondarily suggests a mediating role in this potential relationship for protective factors at the employee and organizational level.

Methods: We conducted a survey of employees at a German company in 2009. Previously validated instruments measured participants’ perceptions of the prevailing leadership style, their work-related psychological strain and protective psychosocial resources. Linear regression and structural equation modeling assessed mediation following the method outlined by Baron and Kenny.

Results: In a sample consisting of mostly white-collar employees (n=320, 42.6 % male), we observed a relationship between leadership perceived as transformational and employees’ perceived work-related stress that was fully mediated by protective resources such as social support (ß=-0.33, p<0.001). Additionally, we found that a perceived transformational leadership style positively affected these resources (ß=0.61; p<0.001) and that absence of resources led to more psychological strain (ß=0.54; p<0.001).

Conclusion: Leadership behavior is associated with lower stress among employees and a perception of more available psychosocial resources. With respect to reducing strain at the workplace, the results show the potential of transformational leadership to strengthen protective resources at the workplace.

PRELIMINARY RESULTS FOR THE EFFECTS OF A PSYCHOEDUCATIONAL INTERVENTION UPON PHYSIOLOGICAL MARKERS ASSOCIATED WITH COGNITIVE IMPAIRMENT
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Background: Previous research demonstrated improved memory appraisal and better performance on word list memorization for patients enrolled in an educational group intervention, slowing the progression of memory problems associated with Alzheimer’s disease.1 The current study aims to determine whether the above group intervention will have beneficial effects upon cognition and physiological markers associated with MCI and caregiving stress relative to controls. Procedure: Participants were grouped into either a treatment (n=9) or control group (n=5) within the older adult with MCI and care partner groups. In addition to the neurocognitive test battery and some standard physiological measurements (e.g. blood pressure), blood samples were collected at baseline (time 1) and three months after intervention (time 2) in order to determine if there are differences between time points and groups. Insulin, glucose, triglycerides, cholesterol (total, LDL, and HDL), D Dimer, and CRP levels were measured. Results: A multivariate ANOVA indicated significant group differences (p<.05) between time 1 and time 2 blood draws for total cholesterol and LDL and an interaction between treatment group and time point for total cholesterol. T-tests indicated a significant increase in cholesterol and LDL from time 1 to time 2 for care partners in the control group but no significant differences between time points for care partners in the treatment group.

Conclusion: The interaction showed that cholesterol increased from time 1 to time 2 only for the care partners in the control group. For this group, physiological risk therefore progressed. Insignificant differences between time points for participants and care partners in the treatment group suggest that the group education intervention may prevent the progression of physiological measures of risk factors seen in decline. Replication with larger samples is needed to confirm this result. References: 1Rapp, S., Brenes, G., & Marsh, N. P. (2002). Memory enhancement training for older adults with mild cognitive impairment: A preliminary study. Aging & Mental Health, 6, 5-11.

YOGA AND VIOLENCE SURVIVOR MENTAL HEALTH: A PILOT FEASIBILITY STUDY AMONG GROUP-THERAPY CLIENTS
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Intimate partner violence (IPV) affects nearly 1 in 4 women in the US and is associated with increased risks of depression, anxiety, and PTSD. Furthermore, detection of IPV in the health care setting is poor. Interventions to mitigate the mental health effects of IPV outside the health sector are warranted, particularly in settings where survivors seek services. Therefore, this study tests the feasibility of a 12-week yoga intervention (combination of breathing techniques, meditation for relaxation, and physical postures) designed to improve the mental health and coping skills of women receiving IPV. Specific components tested included recruitment, safety, acceptability, and participant reaction. The yoga protocol used in the study was designed by The Trauma Center, Boston, MA as an adjunct treatment for survivors of complex trauma. In this study, yoga was offered weekly for approximately 40 minutes at the end of the psychological and educational components of group. A control group preceded the intervention group. Questionnaires were administered at baseline and weekly throughout the course of the two groups. The questionnaires varied in length from nearly 30 minutes at baseline and weeks 4, 8 and 12 to fewer than 10 minutes every other week. The questionnaires contained validated scales to measure the participants mental health (depression, anxiety, PTSD, distress, perceived stress, hopelessness, and emotion regulation), exposure to IPV, social support, coping self-efficacy, self-care, and study participation. The study successfully recruited 85% (17/20) of those screened eligible (9
control, 8 intervention). Loss to follow up was 30% (5/17). No one reported emotional or physical harm. All intervention participants reported that the intervention was an appropriate level of difficulty that it was a meaningful contribution to group therapy. Both groups felt that their study-related rights were respected. 17% (2/12) thought the study questionnaire raised intense emotional issues for them; 92% (11/12) would participate again if they knew in advance what the study would be like. All participants thought the study was personally and socially beneficial (12/12). Next steps include partnering with other non-profits offering similar services to enable the study to scale up to a fully-powered group randomized controlled trial [Grant support includes 1UL1RR03183-01, 8UL1RR00114-02, and funds from the Program in Health Disparities Research].

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DAILY PHYSICAL ACTIVITY AND HOT FLASHES IN THE STUDY OF WOMEN'S HEALTH ACROSS THE NATION FLASHES STUDY
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Background: Hot flashes are a common complaint of midlife women. The role of physical activity in hot flash occurrence is debated, with a mini-literature suggesting that it may increase, decrease, or have no effect on hot flashes. Few studies have examined this relationship prospectively.

Methods: Over 24 hour-periods, 52 midlife women wore a physiological hot flash monitor and activity monitor, and reported their hot flashes as they occurred in an electronic diary. Self-reported and physiologically measured hot flashes were related to mean activity counts of the 15 minutes prior to a flash compared to mean activity counts at all non-flash times. Covariates were age, menopausal status, BMI, race, education, and time of day.

Results: Self-reported hot flashes without physiologic evidence (n=240) were more likely after increases in activity (for every unit increase in activity: OR 1.01, p=.04). There were no significant associations between physiological hot flash monitor and activity monitor, and reported their hot flashes as they occurred in an electronic diary. Self-reported and physiologically measured hot flashes were related to mean activity counts of the 15 minutes prior to a flash compared to mean activity counts at all non-flash times. Covariates were age, menopausal status, BMI, race, education, and time of day.

Results: Self-reported hot flashes without physiologic evidence (n=240) were more likely after increases in activity (for every unit increase in activity: OR 1.0004, p<.01). This was modified by depressive symptoms (p<.01), anxiety (p<.05), education (p<.01) and habitual physical activity (p=.05). In stratified analyses, this association was seen among women with higher CESD scores (OR 1.001, p<.01), higher anxiety (OR 1.001, p=.02), and lower habitual physical activity (OR 1.01, p=.04). There were no significant associations between activity and physiologically monitored hot flashes (n=1587).

Conclusion: Among women in midlife, small increases in daily physical activity increase odds of reporting hot flashes lacking physiologic evidence, but not physiologically detected hot flashes, particularly among women with higher levels of mood symptoms and low habitual physical activity levels. This highlights the subjective nature of symptom reporting, and may guide interventions by improving clinical understanding of symptom experience. The Study of Women's Health Across the Nation (SWAN) has grant support from the NIH, DHHS, through the NIA, the NINR and the NIH ORWH (Grants NR00461; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495; SWAN FLASHES K23AG029216). The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH.

168) Abstract 504

PSYCHOPHYSIOLOGICAL CONSEQUENCES OF THE FLOW EXPERIENCE BASED ON EXPERIMENTAL ANALYSES
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Introduction: The experience of flow (Csikszentmihalyi, 1975), reflects an intense and focused involvement in an activity perceived as intrinsically rewarding. Experience of flow is accompanied by merging of action and awareness, a loss of reflective self-consciousness and a sense of personal control over the situation of activity. Additionally, subjective experience of time is altered. In the literature, flow experience is discussed as an ‘optimal experience’ with the advice to maximize time in flow to enhance life-satisfaction and subjective well-being. However, this advice seems premature because consequences of flow experiences have not been systematically assessed yet.

Methods: In order to address this gap, we investigated the influence of skills-demands-compatibility (the central precondition of flow experiences) on well-established psychophysiological parameters (hypothalamic-pituitary-adrenal (HPA) axis and heart rate variability (HRV)) under experimental conditions. The experience of (non-)flow was manipulated using a computerized math task. Participants (40 healthy subjects, 40–75 years old) worked on the task in two non-adaptive conditions (“boredom” or “overload”) and in an adaptive playing mode condition, in which the difficulty level was constantly adapted to participants’ individual performance level (within-subject design with randomized order conditions). The latter reliably leads to significantly higher levels of self-reported flow experience compared to non-adaptive conditions.

Results and Conclusion. Our results indicate that flow compared to non-flow conditions lead to a decreased heart rate variability and an increase in HPA axis activity indicating a heightening in mental workload and stress. These results suggest a modified perspective on flow-experiences since stress-related parameters are activated. This finding may have implications for reconsiderations regarding flow experience. Long-term analyses during experience of flow as well as patient studies are needed to provide more inside into potential side effects of flow experience.

169) Abstract 381

BEYOND INDIVIDUAL WEALTH: INCOME INEQUALITIES PREDICT LOW BIRTH WEIGHT AND PRETERM BIRTH IN THE U.S.
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According to the CDC, low birth weight and preterm birth are the leading causes of infant deaths in nonanomalous infants in the United States. Further, rates of preterm birth and low birth weight are high in the US, particularly when compared to other developed countries. Despite considerable efforts directed at their reduction, rates have not decreased, and still 1 in every 8 infants is born early and just under 12% of infants are born low birth weight. Understanding these trends, this association may be like. All participants thought the study was personally and socially beneficial (12/12). Next steps include partnering with other non-profits on flow-experiences since stress-related parameters are activated. This finding may have implications for reconsiderations regarding flow experience. Long-term analyses during experience of flow as well as patient studies are needed to provide more inside into potential side effects of flow experience.
women. Leptin and adiponectin may contribute to this disparity; leptin enhances inflammation, while adiponectin has anti-inflammatory properties. Elevated leptin and lower adiponectin have also been linked to breast cancer risk and progression. In a sample of 161 breast cancer survivors (stage 0-IIIA), the current study sought to determine if SES was associated with adiponectin, leptin, and the ratio of leptin to adiponectin. Participants completed questionnaires and provided a blood sample to assess adiponectin and leptin. Women who had lower incomes and less education had higher leptin, lower adiponectin, and a higher leptin to adiponectin ratio compared with those who had higher incomes and more education. Body mass index (BMI) partially contributed to these associations. Leptin and adiponectin may play an important role in SES-related cancer health disparities. A better understanding of how SES contributes to poor health will help in tailoring and therefore enhancing the efficacy of interventions aimed at reducing the burden of cancer that exists among low SES individuals.

171) Abstract 96
SOCIAL INTEGRATION, SPECIFIC SOCIAL ROLES AND PULMONARY FUNCTION IN THE ELDERLY
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Methods: High functioning men (N = 603) and women (N = 749) ages 70-79 were recruited as part of the MacArthur Studies of Successful Aging and data were collected on social roles as well as pulmonary function as assessed by peak expiratory flow rate (PEFR). Multiple regressions were conducted predicting PEFR from the total number of social roles, as well as individual roles, controlling for age, sex, race, education, weight and height. In addition, psychological, social, and physiological factors were tested as mediators of the association between social roles and PEFR. Results: More social roles predicted better PEFR (β=1.11, p<.001). Individual role analyses indicated that marriage was the strongest predictor of PEFR (β=1.16, p<.001), followed by employment in the social role (β=0.067, p<.001) or relative (β=0.055, p=.023). However, number of roles also predicted PEFR independent of these individual roles. Mediational analyses, including Sobel tests, were consistent with greater happiness and life satisfaction, decreased norepinephrine, less smoking, and more physical activity acting as pathways linking the number of roles to PEFR. Conclusions: Overall, social roles are an important correlate of healthy lung function, and this is particularly true for marriage and other intimate relationships. This association may be driven by healthier behaviors, lower stress hormones, and greater feelings of well-being.

172) Abstract 587
SOCIAL ENVIRONMENT, ATHEROSCLEROSIS AND REMODELING OF SYMPATHETIC NERVOUS SYSTEM INNERVATION OF VASCULAR TISSUE
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Purpose: research studies demonstrated that a social network that influences the progression of atherosclerosis and heart disease. One of the most likely mediators linking social environment to disease is the sympathetic nervous system (SNS), and it has been proposed that the SNS may influence the progression of atherosclerosis via hemodynamic changes, endothelial damage/dysfunction, or direct effects on vascular inflammation/oxidative stress. A recent series of studies involving the immune system has provided a novel alternative to understanding the putative effects of the SNS on disease progression. It was demonstrated that an unstable social environment was associated with a SNS hyperinnervation of lymphoid tissue. This behaviorally induced SNS structural plasticity was dependent upon the presence of activated immune cells in the tissue and local secretion of nerve growth factor, leading to an increase in viral replication rate and subsequent disease. In light of this work, the current study examined SNS innervation of vascular tissue as a function of social environment in the Watanabe Heritable Hyperlipidemic rabbit (WHHL), a genetically hyperlipidemic model of atherosclerosis, versus normolipidemic controls (New Zealand White rabbits; NZW). Following 4 months of exposure to unstable, stable, or individually-caged social conditions, aortic tissue was harvested from WHHLs and NZWs, processed immunohistochemically, and SNS varicosities were quantified using confocal microscopy and stereological analysis. Preliminary data suggest that WHHLs exhibit dense SNS hyperinnervation in the vascular media and neointima (i.e., atherosclerotic lesion), which has not been previously reported. In contrast, SNS vascular innervation in NZWs was confined to the vascular adventitia, terminating at the adventitia-media border. Subsequent work will explore the influence of social environment on these SNS innervation patterns. It is proposed that chronic remodeling of SNS innervation, induced by social/emotional behavior and/or pathophysiological sequelae (e.g., macrophage infiltration), alters vascular inflammation/oxidative stress and influences the progression of atherosclerosis.

173) Abstract 74
PERITRAUMATIC DISTRESS, WATCHING TELEVISION AND POSTTRAUMATIC STRESS SYMPTOMS AMONG RESCUE WORKERS AFTER THE GREAT EAST JAPAN EARTHQUAKE
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Background: The Great East Japan Earthquake of March 11, 2001 left around 20,000 dead or missing. Previous studies have shown that rescue workers, as well as survivors, of disasters are at high risk for posttraumatic stress disorder (PTSD). This study examined the predictive usefulness of the Peritraumatic Distress Inventory (PDI) among rescue workers of Disaster Medical Assistance Teams (DMATs) deployed during the acute disaster phase of the Great East Japan Earthquake.

Method: In this prospective observational study, the DMAT member (physicians, nurses, and operational coordination staff) recruited for this study was assessed 1 month after the earthquake on the PDI and 4 months after the earthquake on the Impact of Event Scale-Revised to determine PTSD symptoms. The predictive value of the PDI at initial assessment for PTSD symptoms at the follow-up assessment was examined by univariate and multivariate regression analysis.

Results: Of the 254 rescue workers who participated in the initial assessment, 173 completed the follow-up assessment. Univariate regression analysis revealed that PDI total score and most individual item scores predicted PTSD symptoms. In particular, high predictive values were seen for peritraumatic emotional distress such as losing control of emotions and being ashamed of emotional reactions. In multivariate regression analysis, PDI total score was an independent predictor for PTSD symptoms after adjusting for covariates. As for correlates specifically with disaster social environment, watching earthquake television news reports for more than 4 hours per day predicted PTSD symptoms.

Discussion: The PDI predicted PTSD symptoms in rescue workers after the Great East Japan Earthquake. Peritraumatic emotional distress appears to be an important factor to screen for individuals at risk for developing PTSD among medical rescue workers. In addition, watching television for extended period of time might require attention at a time of crisis.

174) Abstract 437
SALIVARY CORTISOL RESPONSE TO LABORATORY-INDUCED INTERPERSONAL RELATIONSHIP RELEVANT STRESS
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Background: In moments of stress, adults often turn to their romantic partner as a regulatory agent. Moreover, research suggests that the HPA-axis is particularly responsive to interpersonal and socio-evaluative contexts. The degree to which the presence of a romantic partner, versus a stranger, influences one’s physiological arousal during moments of acute stress is largely unknown. The current study sought to determine whether a) individuals’ cortisol levels would rise and fall in response to stress task onset and cessation, and b) participants’ cortisol levels would be predicted by that of their study partner, which would be moderated by study condition (paired vs. with a stranger). Method: Young dating couples (N=40; Mean age=23; 48% Hispanic) provided valid data including demographic and cortisol data. Participants were randomized into two study conditions: couple (paired with romantic partner) or stranger (paired with a stranger). Salivary cortisol was sampled twice to reflect resting levels (B1 and B2), and twice after the stress task: 11 minutes (T1) and 19 minutes after stress onset (T2). Stress task asked participants to respond to a scenario wherein romantic partner was involved in hit-and-run car accident and had no means to seek out immediate help. Results: Using general linear modeling with four repeated cortisol measures, a significant quadratic trend in cortisol was found, with levels increasing from resting (B1 and B2) to T1 and decreasing from T1 to T2, $F(1,39)=15.20, p<.001$. Hierarchical linear regression models revealed that study partner’s prior cortisol level did not significantly predict one’s T1 cortisol ($p=.14$) or T2 cortisol ($p=.43$), controlling for one’s prior cortisol level, time of day, and gender. The interactions between study condition and partner’s prior cortisol levels on one’s T1/T2 cortisol was not significant, $p>.34$. Discussion: Findings suggest that the acute stressor that is interpersonal relationship relevant may be sufficient to activate the HPA-axis reactivity during the 8 minute laboratory induced stress session. However, the cortisol reaction to the stress was not predicted by the study partner, which suggests future studies need to investigate individual difference and contextual factors that play important roles in HPA-axis responses to the interpersonal- and health-related stress.

175) Abstract 534

BODY IMAGE AND DIETING BEHAVIORS AMONG GAY AND HETEROSEXUAL MEN: IS THERE REALLY A DIFFERENCE?

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For the past several decades, researchers and clinicians alike have generally concluded that gay men are at notably higher risk than heterosexual men for developing body dissatisfaction and disordered eating patterns. This conclusion and the accompanying research, however, have recently been subjected to critical evaluation that raises notable concerns regarding the validity of the studies in this literature and the conclusions drawn from them. Specifically, Kane (2010) notes that the existing literature relies heavily on extremely small and biased samples, makes broad claims based on small effect sizes, and fails to conform to appropriate statistical practices. To provide a more detailed picture of body image among gay and heterosexual men, we present the results of three large-scale online studies completed by over 100,000 visitors to NBCTNews.com website. While overall differences between gay and heterosexual men on a number of items assessing body image were small, these concerns were substantially moderated by Body Mass Index (BMI) and the aspect of body image assessed. Overall, the results suggest that sexual orientation is a relevant factor in predicting body dissatisfaction, particularly for heavier men. Given the relationship between poor body image and eating disorders, certain gay men may be at heightened risk for developing disordered eating.

176) Abstract 536

SOCIAL SUPPORT AND DEPRESSIVE SYMPTOMS PREDICT CLINICAL EXACERBATIONS IN BNP AND HEART FAILURE SEVERITY: THE BETHEART STUDY

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Background: Heart failure (HF) patients show frequent exacerbations in clinical condition. We examined effects of depression and social support on changes in beta-natriuretic peptide (BNP), HF functional status, and HF symptoms. Methods: 125 HF patients (96 males) with ejection fraction (EF) <40% completed the Beck Depression Inventory-II (BDI) and Interpersonal Support Evaluation List (ISEL). Measured at baseline and 3 months were: BNP (marker of ventricular wall stress); HF symptoms (Kansas City Cardiomyopathy Questionnaire; KCCQ); and functional status (6 minute walk test; 6MWT). For BNP, clinically significant exacerbations were defined as a doubling of baseline levels. Results: Repeated measure GUs showed that on average, KCCQ, 6MWT, and BNP improved over 3 months ($p<.001$). In univariate regressions, higher ISEL scores predicted decreased BNP (model $p=0.040$; $B=-12.86$, CI $=-25.10$– $-0.62$, $p=0.040$) and fewer BNP exacerbations (n=9; model $p=0.034$; OR $=0.89$, CI $=0.80–0.99$, $p=0.038$). Social support was not associated with changed 6MWT (model $p=0.211$) or KCCQ overall score (KCCQ-OS; $p=0.523$). BDI predicted increased BNP (model $p=-0.14$; $B=-8.07$, CI $=-3.81$– $-0.05$, $p=0.038$) and marginally predicted BNP exacerbations (model $p=0.088$; OR $=1.06$, CI $=0.99-1.12$, $p=0.079$). High BDI predicted improved KCCQ-OS scores (model $p=0.020$; $B=3.55$, CI $=0.66–0.65$, $p=0.020$), and marginally with increased 6MWT (model $p=0.099$; B=-7.65, CI $=-15.52$– $0.053$) and clinical exacerbations (model $p=0.447$; OR $=1.06$, CI $=0.99–1.13$, $p=0.076$). Including covariates, social support was marginally predictive of decreased BNP (model $p=0.099$; $B=-12.31$, CI $=-24.60$– $0.01$, $p=0.050$), and fewer BNP exacerbations (model $p=0.29$; OR $=0.90$, CI $=0.80–1.00$, $p=0.046$). Conclusions: Social support and depressive symptoms predict 3 month changes in cardiac wall stress in HF. Depression predicts changes in symptoms.

177) Abstract 510

EFFICACY OF A HOME-BASED MOTIVATIONALLY-TAILORED EXERCISE INTERVENTION FOR INCREASING PHYSICAL ACTIVITY DURING PREGNANCY

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Despite the health benefits associated with leisure-time physical activity (LTPA) during pregnancy, a large proportion of pregnant women do not engage in sufficient amounts of LTPA. Moreover, women tend to decrease their LTPA when they become pregnant and this decline continues as the pregnancy progresses and may persist into the postpartum. The objectives of this study were to compare the efficacy of a motivationally-tailored (M-T) exercise intervention to usual exercise advice (providing women with a copy of the PARmed X for Pregnancy) for increasing LTPA and enhancing women’s physical and mental health during pregnancy. Seventy pregnant women in their second trimester were randomized into the 12 week M-T exercise intervention (n=35) or to the usual advice group (n=35). Outcomes assessed post-treatment included LTPA, depressed mood, state anxiety and physical health status. Following the 12-week intervention, during a time when the majority of pregnant women decrease LTPA, total minutes of LTPA (walking and sports/recreational activities) per week increased significantly for both groups (p=0.016), however the increase did not differ significantly between the two groups (p=0.959). The M-T group increased their weekly LTPA by 35 minutes (36%) over the usual advice group increased LTPA by 34 minutes (33%). Kilocalories per week expended from sports and recreational activities in the third trimester increased from baseline for both groups (p=0.030). No group differences post intervention was found for depressed mood and state anxiety. A greater increase in LTPA over time for both groups was associated with greater improvements in depressed mood during pregnancy (r=0.33; p=0.017). Physical health status increased significantly during pregnancy for both groups (p=0.011), with a more pronounced
A preliminary investigation of a new method to quantify characteristics of life-course social transitions
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The impact of accumulated life-course stress on long-term health and well-being outcomes is of great interest to researchers. Limitations of current stress measures for life-course investigations include short retrospective scopes and stress-level assignment based on events rather than impact to the individual. Longitudinal data to explore characteristics of life-course social environment change are scarce; there is need for a method to collect data from which the frequency, severity, and duration of life-course social transitions can be extracted. This study piloted a measure to address this need. A sample of 61 adults ages 34 to 87 (M = 58.12 ± 13.62; 44.3% Male; 91.8% White) completed a pilot protocol of the new measure. Designed as a graph, it included a customized x-axis with each year/age of a participant’s life, and a y-axis on which the participants rated social connectedness (number of people, number of roles, quality of relationships) on a scale of 0 (complete social isolation) to 10 (complete connectedness). Participants placed personally relevant events along the x-axis as “memory joggers” for recalling phases of their lives. Participants rated the years they could recall, and then connected ratings to create a line indicating how their social connectedness increased, decreased, and remained the same over time (see figure for example). Participants provided feedback about the graph, and completed psychological and health questionnaires for preliminary validity and predictive value analyses. Calculations of frequency, severity, and duration of social transitions and stable periods were extracted via computerized analysis. On average, participants rated chart completion fun, easy, informative, quick, and interesting, and indicated a mean frequency of 15.72 ± 6.12 (1-33) transitions. Variations of exploring characteristics of life-course social transitions, preliminary validity and findings regarding relations of these variables to health and well-being, and planned further development of this measure in the context of adult and early childhood experiences research will be presented.

Fatigue in (long-term) colorectal cancer survivors: A study from the population-based profiles registry
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Background: Colorectal cancer (CRC) survivors often report feeling fatigued which could be consequential to their disease and treatment. We postulate that fatigue morbidity will only increase among CRC survivors with the broadening indications and increasing prescription for (neo-)adjuvant treatments. Few studies specifically focus on fatigue and its correlates among (long-term) colorectal cancer (CRC) survivors or compare fatigue levels with a normative population. Association between multiple primary cancers (≥1 cancer diagnoses prior to CRC) and fatigue is also explored.

Methods: Survivors diagnosed from 1998-2009 were identified from the Eindhoven Cancer Registry. In total, 3939 (79%) respondents and an age- and gender-matched norm population (n=338) completed questionnaires on fatigue and psychological distress. Fatigue scores of survivors stratified by years since diagnosis and the norm population were compared with ANCOVA. Logistic regression identified factors associated with fatigue levels with a normative population. Association between fatigue and psychological distress and its correlates among (long-term) colorectal cancer (CRC) survivors or compare fatigue levels with a normative population. Association between multiple primary cancers (≥1 cancer diagnoses prior to CRC) and fatigue is also explored.

Results: More survivors reported feeling fatigued than the normative population (39% vs. 22%, p<0.0001). Short-term survivors (<5 years completed a pilot protocol of the new measure. Designed as a graph, it included a customized x-axis with each year/age of a participant’s life, and a y-axis on which the participants rated social connectedness (number of people, number of roles, quality of relationships) on a scale of 0 (complete social isolation) to 10 (complete connectedness). Participants placed personally relevant events along the x-axis as “memory joggers” for recalling phases of their lives. Participants rated the years they could recall, and then connected ratings to create a line indicating how their social connectedness increased, decreased, and remained the same over time (see figure for example). Participants provided feedback about the graph, and completed psychological and health questionnaires for preliminary validity and predictive value analyses. Calculations of frequency, severity, and duration of social transitions and stable periods were extracted via computerized analysis. On average, participants rated chart completion fun, easy, informative, quick, and interesting, and indicated a mean frequency of 15.72 ± 6.12 (1-33) transitions. Variations of exploring characteristics of life-course social transitions, preliminary validity and findings regarding relations of these variables to health and well-being, and planned further development of this measure in the context of adult and early childhood experiences research will be presented.

Life-Course Social Connectedness

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Melissa Thong, PhD, Floor J. Mols, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Brabant, The Netherlands, Xin S. Wang, MD, Symptom Research, University of Texas M.D. Anderson Cancer Center, Houston, Texas, Valery Lemmens, PhD, Research, Comprehensive Cancer Centre South, Eindhoven, Brabant, The Netherlands, Tineke Smilde, PhD, Oncology, Jeroen Bosch Hospital, ’s Hertogenbosch, Brabant, The Netherlands, Lonneke van de Poll-Franse, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Brabant, The Netherlands

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Results: More survivors reported feeling fatigued than the normative population (39% vs. 22%, p<0.0001). Short-term survivors (<5 years completed a pilot protocol of the new measure. Designed as a graph, it included a customized x-axis with each year/age of a participant’s life, and a y-axis on which the participants rated social connectedness (number of people, number of roles, quality of relationships) on a scale of 0 (complete social isolation) to 10 (complete connectedness). Participants placed personally relevant events along the x-axis as “memory joggers” for recalling phases of their lives. Participants rated the years they could recall, and then connected ratings to create a line indicating how their social connectedness increased, decreased, and remained the same over time (see figure for example). Participants provided feedback about the graph, and completed psychological and health questionnaires for preliminary validity and predictive value analyses. Calculations of frequency, severity, and duration of social transitions and stable periods were extracted via computerized analysis. On average, participants rated chart completion fun, easy, informative, quick, and interesting, and indicated a mean frequency of 15.72 ± 6.12 (1-33) transitions. Variations of exploring characteristics of life-course social transitions, preliminary validity and findings regarding relations of these variables to health and well-being, and planned further development of this measure in the context of adult and early childhood experiences research will be presented.

Life-Course Social Connectedness

post-diagnosis) had the highest mean fatigue scores compared with long-term survivors (≥5 years post-diagnosis) or the normative population (21±7 vs. 20±7 vs. 18±5, p=0.0001, respectively). Having primary cancers prior to CRC was associated with more fatigue (Figure 1). Surgery-chemoradiation was independently associated with fatigue (OR: 1.63, 95%CI: 1.16-2.28, p=0.004) as were anxiety (OR: 1.16, 95%CI: 1.12-1.19, p<0.0001) and depressive symptoms (OR: 1.38, 95%CI: 1.33-1.43, p<0.0001).

Conclusions: Fatigue is a significant problem, especially for short-term CRC survivors and those with previous primary cancers. The association between chemoradiation and fatigue suggests that patients could benefit from better information on treatment side-effects. When treating fatigue, clinical care should also focus on survivors’ psychological needs, especially survivors of multiple primary cancers as this is no longer a rare clinical picture.

![Figure 1. Colon cancer survivors stratified by years since last diagnosis (short-term: <5 years; long-term: ≥5 years) and multiple primary cancer, and normative population by fatigue levels. FAS total score cut-offs: not fatigued (10-21), fatigued (22-34), very fatigued (35-50). Significant differences noted between the survivors and the normative population (p<0.0001) and between short- and long-term survivors with/out multiple primary cancers (p=0.002).]

181) Abstract 245

USE OF BENZODIAZEPINES AND Z-DRUGS AMONG HIV-INFECTED INDIVIDUALS IN TAIWAN: A NATIONWIDE 9-YEARS COHORT STUDY

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Introduction: Insomnia and anxiety were common complaints among HIV-infected individuals. Hypnotics and anxiolytics including Benzodiazepines (BZDs) and Z-drugs (Zolpidem, Zolpidone, Zaleplon) were often prescribed. In this study, we aimed to clarify the characteristics and the associated factors of BZDs and Z-drugs use among HIV-infected individuals in Taiwan.

Methods: Using the claims data of a nationally representative cohort from Taiwan National Health Insurance Research Database, 1,000,000 random subjects (4.3% of the Taiwan population) were enrolled from 1998 to 2007. The psychiatric diagnoses and the prescriptions of BZDs and Z-drugs of the patients were analyzed.

Results: A total of 1304 HIV-infected patients (41.6% were male) were identified. 855 of them had received prescriptions of BZDs and Z-drugs. 48% of the medications were prescribed by internal medical doctors, 12.5% by psychiatrists, and 40% by other specialties. Patients with mood disorders (OR: 34.68, CI:4.57-263.42), anxiety disorders (OR:5.53, CI: 2.87-10.69), insomnia (OR:3.22, CI:1.72-6.03), any psychiatric disease (OR:1.97, CI:1.02-3.64), and HIV infection in later life (OR:1.04, CI:1.03-1.06) had significantly higher risks of BZDs and Z-drugs use. Patients with BZDs and Z-drugs prescription before the HIV infection, comparing to those who were prescribed after the infection, were male predominant (55.2% vs. 25.3%, p<0.001), had shorter duration of HIV infection (4.72±2.88 vs. 7.35±7.20 years, p<0.001), higher rates of combination prescriptions (40.0% vs. 22.7%, p<0.001), and higher psychiatric comorbidities such as mood disorders (12.8% vs. 7.7%, p=0.010), anxiety disorders (34.9 % vs. 26.0%, p=0.003), substance use disorder (15.2% vs. 3.4%, p<0.001), and insomnia (53.5% vs. 41.5%, p<0.001).

Conclusions: BZDs and Z-drugs were very frequently prescribed among HIV-infected patients in Taiwan, and mostly by non-psychiatrists. It gives significant alert that the underlying psychiatric problems of these patients must be carefully evaluated and treated.

182) Abstract 695

PAST ABUSE AND ITS ASSOCIATION WITH STRESS HORMONES IN HIV

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Introduction: Stress is high in people with HIV and it has been related to important outcomes such as faster disease progression and poorer health behaviors. This study examined one aspect of stress, namely past abuse. We examined the prevalence of past abuse in an HIV sample as well as its relation to objective biological measures of stress; cortisol and norepinephrine.

Method: A diverse sample of 177 people with HIV were given questionnaires regarding stress and coping including one asking about different types of past abuse. Past abuse questions covered sexual abuse, physical abuse, psychological abuse, and neglect. Measures of stress hormones were obtained from overnight urine [collected after getting home from work (or after 5pm if unemployed) through first void of the next morning (about 15 hours)]. The sample was 70% men, 30% women; 36% African Americans, 31% Non-Hispanic White, 28% Hispanic White and 6% Mixed; with 55% gay/bisexual (45% heterosexual).

Results: The prevalence of past abuse was high: 34% of women and 31% of men reported some type of past abuse. Women and men reported similar rates of sexual abuse (18% vs 20%), physical abuse (15% vs 14%), and neglect (3% vs 6%), although men reported higher levels of psychological abuse (16% vs 2%). A composite measure of any type of abuse was significantly correlated with greater cortisol concentration(ng/ml), r= .246, p = .003; but not significantly with norepinephrine r = .04, p=.625.

Conclusion: Rates of past abuse in a diverse sample of people with HIV are high (about one-third) and are similar in both men and women. Past abuse was significantly related to higher cortisol. Since past research has shown that higher cortisol predicts faster disease progression, the abuse-cortisol relationship should be investigated further for a potential role in disease progression.

183) Abstract 692

VALIDATION OF THE SUBJECTIVE SOCIAL STATUS SCALE IN PRE-ADOLESCENT CHILDREN

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Subjective socioeconomic status, or the perception of one’s social rank, has been linked to health outcomes in adults and adolescents. The Subjective Social Status Scale (Adler et al., 2000) has been adapted for use with adolescents (Youth Version; Goodman et al., 2001). The youth version consists of two 10-point ladders designed to measure perception of family status within society and individual status within school in adolescents 12 years and older. The purpose of the current study was to validate this measure in pre-adolescent children. Participants (N = 245) aged 8 to 18 years who took part in the larger Healthy Heart Project at Concordia University were grade-stratified into two groups: pre-adolescent (grade 3-6; n = 93; Mage = 10.6 years) and adolescent (grade 7-12; n = 152; Mage = 13.9). Youth completed the Subjective Social Status Scale-Youth Version (society, school ladders); parents completed the Adult Version (society, community ladder) and reported education level and household income. Fisher’s Z was used to test whether correlations were significantly different across age groups. Society ladder showed similar correlations (all Z-tests were non-significant) for pre-adolescents and adolescents with school ladder (r = .52 vs .39; p = .24), parent education (r = .26 vs .13; p = .30), household income (r = .17 vs .28; p = .39), parent society ladder (r = .26 vs .21; p = .52), and parent community ladder (r = .26 vs .19; p = .58). School ladder also showed similar correlations across age groups (all Z-tests were non-significant), although it was not significantly

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associated with parent socioeconomic status. Overall, these results suggest pre-adolescents interpret the Subjective Social Status Scale-Youth Version in a similar way to adolescents. Children may use parental education and school status to anchor their own status ratings, while adolescents may be more aware of household income. This study suggests that pre-adolescent children have an emerging sense of their own social status, which they can meaningfully report on ladder rating scales. Future research should examine the association between subjective socioeconomic status and health outcomes in pre-adolescent children.

184) Abstract 677

THE ASSOCIATION BETWEEN SOMATIC, DEPRESSION, AND PANIC SYMPTOMS IN AFRICAN AMERICAN WOMEN IN A PRIMARY CARE SETTING

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African American women are exposed to various mental health risk factors (e.g., racism, poverty, and violence); however, somatization is characterized by a health disorder that is greater among African Americans than other ethnic groups. Many African Americans suffering from somatization disorder, and other common conditions, seek help from primary care clinics. It is well documented that somatic symptoms frequently co-occur with anxiety and depression seen in the primary care setting. However, to date, these associations have not yet been explored in African American women. Somatization is changing owing to its attachments out of, but when complicated by co-morbid conditions, it is more difficult and expensive to treat. Thus, in this preliminary study, we have explored the association between somatic, depression, and panic symptoms in an urban sample of African American women seen in a primary care clinic. In addition to exploring associations between somatic, depression, and panic symptoms for the overall sample, we have investigated the extent to which demographics moderates the size of these relationships to determine which group, if any, was at greater risk for co-morbidity. Somatic, depression, and panic symptoms were assessed using the Patient Health Questionnaire (PHQ). In the overall sample of African American women (n =111), 17.1% screened positively for somatization, 7.2% met the criteria for major depression, and 11.7% met the criteria for panic disorder. Zero-order correlations between total scores revealed a substantially larger, positive correlation between somatic symptoms and depression, r(109) = 0.74, p<.01 than somatic and panic symptoms, r(109)=0.53, p<.01, although both were robust. Interestingly, these relationships remained similar regardless of age, employment status, SES, and marital status. Taken together, these findings suggest that, African American women with somatic symptoms who are seen in primary care clinics are likely to experience depression and anxiety. Our preliminary research also shows that demographic characteristics are unlikely to distinguish those at higher risk for comorbidity. Thus, to direct screening procedures and inform care, this study examines relationships between caregiver responses to CFS symptoms and reports of patient distress and CFS symptom frequency and severity. To date, 17 individuals with CFS and their partners have participated. Dyads completed reports of perceived stress, depression, and perceptions of caregivers’ responses to patients’ symptoms in a solicitous, punishing, and/or empathic manner. Absolute values of the differences between reports of the caregivers’ perceived response tendencies were computed for analyses. CFS patients reported on symptom frequency and severity. Pearson correlations revealed that patient reports of stress and depression were highly interrelated (r=.89, p<.01) and depression was related to greater CFS symptom frequency and severity (r’s=.54–.58, p’s<.05). Results support the theory that distress is linked with CFS symptoms. Caregiver reports of a tendency to respond in an empathic or solicitous manner was related to patient reports of depression and stress (r’s=.49–.56, p’s<.05), indicating that caregivers may be particularly supportive when the care recipient is distressed. Independent patient and caregiver reports of the caregivers’ tendency to respond in a punishing manner were not associated with distress or symptoms. However, higher reports of patient distress percentages of the partner’s punishing responses was related to patient’s reports of depression and stress (r’s=.52–.56, p’s<.05). Thus, discrepancy in perception of negative responding may be a more salient predictor of maladjustment. Further research should examine the impact of interventions targeting dyadic communication and reductions in discrepancy on emotional distress and CFS symptom reports.

186) Abstract 480

ENVIRONMENTAL BACKGROUND IN RELATION TO COGNITIVE AND EMOTIONAL DEVELOPMENT IN CHILDREN

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Background: An important persistent organic pollutants are polychlorinated biphenyls (PCBs), which are widespread in environment. These fat-soluble toxicants enter in human beings cross the placenta during pregnancy, thereby exposing children during the rapid development of the CNS. Negative effects of low levels of PCBs on early cognitive and psychomotor development in children have been observed in number of bird cohort studies. In other studies, effects have been found on children’s behavior in preschool age, however, there were not detects any effects on motor or cognitive development. Now, there is growing evidence to support the hypothesis of negative effects of social background and emotional family problems strong as confounders, which affect emotional and behavioral development of children strongly, as environmental PCBs.

Methods: Cord blood and samples at 6-years of age were analyzed, and levels of PCBs were evaluated. In each period the organochlorines were measured by high-resolution gas chromatography, and grouped as dioxin-like, non-dioxin-like, estrogenic, or anti-estrogenic activity. In effort to find an effort to find environmental PCBs.

Results: Only cord blood concentrations of the dioxin-like PCBs (DL-PCBs) were significantly associated with lower scores in cognitive tasks (concentration of attention, short memory) and also with scores of lower emotional contacts Matrics (child and mother) and actual negative changes in behavior. Anti-estrogenic PCBs did not show any statistically significant association, also we did not observe the association with NDL-PCBs from actual samples.

Conclusions: This study provides evidence of an association between DL-PCBs and decreased performance on the intelligence and emotional disruptions of mother-child contacts in children with lower social background.

185) Abstract 224

THE ROLE OF DYADIC COMMUNICATION ON EMOTIONAL DISTRESS AND SYMPTOM LOAD IN INDIVIDUALS WITH CHRONIC FATIGUE SYNDROME

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Chronic Fatigue Syndrome (CFS) is a multi-systemic disorder characterized by debilitating fatigue and other related symptoms. Given the nature of this illness, partners of CFS patients often take on the caregiver role. Research indicates that emotional distress may exacerbate CFS symptoms while social support may buffer the impact of stress. Little is known regarding the role of caregivers’ responses to the needs of CFS patients and how these responses relate to the patient’s distress and symptoms. This study examines relationships between caregiver responses to CFS symptoms and reports of patient distress and CFS symptom frequency and severity. To date, 17 individuals with CFS and their partners have participated. Dyads completed reports of perceived stress, depression, and perceptions of caregivers’ responses to patients’ symptoms in a solicitous, punishing, and/or empathic manner. Absolute values of the differences between reports of the caregivers’ perceived response tendencies were computed for analyses. CFS patients reported on symptom frequency and severity. Pearson correlations revealed that patient reports of stress and depression were highly interrelated (r=.89, p<.01) and depression was related to greater CFS symptom frequency and severity (r’s=.54–.58, p’s<.05). Results support the theory that distress is linked with CFS symptoms. Caregiver reports of a tendency to respond in an empathic or solicitous manner was related to patient reports of depression and stress (r’s=.49–.56, p’s<.05), indicating that caregivers may be particularly supportive when the care recipient is distressed. Independent patient and caregiver reports of the caregivers’ tendency to respond in a punishing manner were not associated with distress or symptoms. However, higher reports of patient distress percentages of the partner’s punishing responses was related to patient’s reports of depression and stress (r’s=.52–.56, p’s<.05). Thus, discrepancy in perception of negative responding may be a more salient predictor of maladjustment. Further research should examine the impact of interventions targeting dyadic communication and reductions in discrepancy on emotional distress and CFS symptom reports.

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187) Abstract 544

OXYTOCIN AND ITS RELATIONSHIP TO PSYCHOSOCIAL FACTORS IN HIV
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Purpose: The hormone oxytocin is known to play a role in social relationships and bonding, yet it has been relatively unexplored in relation to psychosocial variables. The aim of this study was to determine whether associations exist among oxytocin and the psychological resource factors spirituality, coping, and optimism, as well as depression and anxiety, in a diverse HIV-positive sample.

Methods: Interviews and questionnaires were administered to 79 HIV-positive individuals, 38 of whom were from a chronic disease sample, and 41 of whom were from a study investigating spiritual transformation (ST). Plasma samples were collected and assayed for oxytocin after being purified by an extraction procedure. Questionnaire measures included spirituality, coping, optimism, depression, and anxiety. Qualitative measurement of the occurrence of Spiritual Transformation was also included and was determine by interview.

Results: Higher oxytocin levels were significantly associated with greater spirituality (p = .017), and Spiritual Transformation (p = .020). Moreover, oxytocin levels of those who reported of ST were twice times higher (p = 0.000) than those who did not undergo an ST (13.13 pg/ml). Oxytocin levels were not associated with coping, optimism, depression, or anxiety. Conclusions: Multiple measures of spirituality were found to be associated with increased levels of oxytocin, suggesting that future studies should consider whether this hormone may play a protective role in spirituality-health relationships in HIV/AIDS.

188) Abstract 748

TELEMEDICINE TREATMENT FOR VETERANS WITH GULF WAR ILLNESS
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Background: War-related syndromes such as Gulf War Illness (GWI) are diagnosed in 45% to 60% of returning military personnel. Diagnosis of GWI requires the presence of two of the following: pain, fatigue, cognitive/mood disturbance. Despite an uncertain etiology, GWI has substantial consequences for health and well being that include increased medical visitation, physical disability, and psychological distress. Cognitive Behavioral Therapy (CBT) has been shown to be efficacious for this problem, but patients must attend sessions in person, limiting its clinical effectiveness. Our study sought to address this important public health problem by testing a novel treatment for GWI, namely CBT delivered over the telephone.

Objectives: 1. Determine the efficacy of Telephone CBT for veterans with Gulf War Illness (GWI) who are high medical utilizers; and 2. Identify predictors of change in physical symptoms. Methods: Veterans who utilize VA health care services at the 80th percentile (or above) and satisfied diagnostic criteria for GWI (N=128) were randomized to: (1) Telephone CBT + Usual Care; (2) In-Person CBT + Usual Care; or (3) Usual Care Only. Participants in the Telephone and In-Person CBT groups were offered 10 sessions of CBT for GWI. Assessment occurred at baseline, post-treatment, and 12-months.

Results: There was a main effect of time on symptom severity (F=6.7, p<.005), with improvement evidenced across all groups. The In-Person and Telephone CBT groups were statistically similar. Unexpectedly, we observed that veterans in the control group improved more than those in the treatment groups (F=3.88, p<.05), possibly due to uneven baseline rates resulting in a regression to the mean effect. Predictors of symptom improvement included treatment compliance (F=8.3, p<.005), and reduction in catastrophizing thoughts (F=5.99, p<.05).

Discussion: Due to the greater symptom improvement in the control group, the efficacy of CBT in this trial is inconclusive. However, the association between reduction in catastrophizing cognitions and improved symptoms highlights the important role of cognition in the suffering and individual's ability to manage Gulf War Illness.

189) Abstract 256

VAGAL TONE MODULATES FRICTIONAL BRAIN-BODY ASSOCIATION
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Bidirectional channels including the vagus nerve enable the immune and the central nervous systems to communicate. This study investigated whether vagal tone, indexed by heart rate variability (HRV), modulates the neural correlates of immune and physiological responses to acute stress. Twenty healthy men underwent a stochastic reversal learning task as an acute cognitive stressor where they learned contingencies between behavioral options and monetary gains or losses, in which the contingencies changed without notification during the task. Proportions of natural killer (NK) cells, and levels of norepinephrine and adrenocorticotrophic hormone (ACTH) were measured during the tasks over 6 blocks. Participants were grouped at the median into high and low HRV groups. Concomitantly, their brain activity was measured using 150 positron emission tomography (PET). The high HRV group showed a reduction in NK cells in the early phase of the task, and an increase in NK cells in the reversal phase (p<.05), with significant option-outcome contingency, while the low HRV group showed a blunted NK cell response during both phases. Differentiated responses between the high and low HRV groups were shown also in autonomic and endocrine indices (norepinephrine and ACTH) which are possible mediators of the NK cell response. Only in the high HRV group, proportion of NK cells correlated positively with activity in the anterior cingulate cortex and inversely with activity in the nucleus accumbens. These brain regions have been previously reported as neural sources and regulators of cardiovascular activity, particularly of HRV. In the low HRV group, number of NK cells did not correlate with brain activity. Therefore, vagal tone indexed by HRV can indicate patterns of neuroimmune connections. In people with higher HRV, the top-down regulation by the brain over immune and physiological activity might be more dominant and flexible, which could enable adaptive immune responses to challenges, and potentially lower health costs in the long-term.

190) Abstract 617

ECOLOGICAL MOMENTARY ASSESSMENT OF APPETITE AND ITS RELATION TO PSYCHOSOCIAL FACTORS
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Eating behavior is important for health education in healthy people as well as for treatment in clinical population. Although psychosocial factors have been suggested to affect eating behavior, most previous studies were either in laboratory settings or with recalled self-reports. We have investigated the relationships between food intake and psychosocial factors using ecological momentary assessment (EMA) and validated personal digital assistant (PDA)-based food diary with the advantage of their high ecological validity. The aim of this study was to develop a scale for EMA to evaluate within-individual variation of momentary appetite and to discuss the relationships between appetite and psychological factors using the scale. Twenty healthy subjects (age 23.6 ± 4.2 yo) wore a watch-type computer for a week and recorded everything that they ate and drank. Multilevel factor analyses suggested two factors at the within-individual level (hunger-fullness and cravings) and one factor at the between-individual level. Medians of individually calculated Cronbach's alphas were 0.89 for hunger-fullness and cravings, 0.71 for cravings and 0.86 for total appetite (the sum of hunger-fullness and cravings). Hunger-fullness, cravings and total appetite all decreased significantly after meals compared with those before meals and those before meals were positively associated with energy intake. There
were significantly negative associations between hunger-fullness and anxiety and depression; between cravings, and psychological stress and depression; and between total appetite, and anxiety and depression. Although the validity of the momentary appetite scale was confirmed, internal consistency was not sufficient and varied across subjects. It was also suggested that different aspects of appetite were associated with psychological factors differently. Further refinement of the scale and investigation of its relationship with psychological factors should be conducted in a clinical population.

191) Abstract 675
SHORTER SLEEP IS ASSOCIATED WITH HIGHER ENERGY INTAKE IN INFANTS
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Background: Shorter sleep is consistently associated with higher weight in childhood. Studies in adults suggest that sleep deprivation affects the hormonal regulators of energy intake, but there have been no pediatric studies relating habitual sleep to energy intake. Participants and Methods: Parents of 1303 infants from the Gemini twin birth cohort (one child per family) provided data on their child's sleep (using a modified version of the Brief Infant Sleep questionnaire) when the child was 15 months old. They also completed a detailed 3 day dietary diary when the child was 20 months old. Dietary outcomes studied were total energy intake in calories (total EI; kcals), and grams of fat, carbohydrate and protein. Results: At this age, there was no association between sleep and weight (p=.914). Total EI was significantly higher in shorter sleepers (9.8) for linear trend: (p=0.021) as was intake of carbohydrate (linear trend: p=0.008). These effects remained after adjusting for potential confounders. Protein intake did not significantly differ by sleep duration. Conclusion: Shorter night time sleep duration is associated with higher energy intake in infants. These effects were observed before any association between sleep and weight emerged and implicates energy intake as a mechanism through which sleep could influence future weight gain. Promoting adequate sleep in infancy could be part of a suite of strategies to reduce weight gain.

192) Abstract 782
SELF-AFFIRMATION AND SOCIAL SUPPORT: A POSSIBLE SHARED MECHANISM
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Research has shown that self-affirmation, or reflecting on important personal values, causes people to respond less defensively towards self-relevant, threatening health messages (Sherman & Cohen, 2006). However, the mechanism that underlies these effects is not well understood. Research has shown that self-affirmation increases feelings of social connection and these feelings mediate the relationship between self-affirmation and reduced defensiveness (Crocker, Niiya, & Mischkowsk, 2008). Interestingly, social support has been found to reduce psychological distress and improve a variety of health outcomes (Taylor, Dickerson & Klein, 2002) and may have a similar mechanism, and this study was designed to investigate this link. We recruited diet cola drinkers (N=51) and randomly assigned them to one of four conditions: self-affirmation, social support or social support control. In the self-affirmation condition, participants wrote about an important personal value, and controls wrote about a less important personal value. In the social support condition, participants wrote about a close relationship, and controls wrote about the appearance of an acquaintance. Following all writing tasks, participants’ feelings of social connection and positive affect were assessed. They were then given a purported health article outlining research that suggests that diet cola may be unhealthy and then assessed how much they believed the article (standard defensiveness outcome measure). Self-affirmation robustly increased positive affect (M=10.4) as compared to the control task (M=7.31; p<.001), and so did social support (M=10.0) as compared to control (M=6.61; p<.001). Self-affirmation also increased feelings of social connection (M=13.6) as compared to the control task (M=12.9; p<.001). Again, the social support group mirrored this effect (M=19.3) as compared to following the control task (M=12.1; p<.001). However, there were no differences in defensiveness towards the threatening health message. This suggests that self-affirmation and social support may operate via the same psychological mechanism, but future studies should use another health-related outcome to assess if both manipulations are effective at reducing defensiveness towards threatening health messages.

193) Abstract 287
DOES CONTENT OF WRITTEN EMOTIONAL DISCLOSURE PREDICT HEALTH IMPROVEMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS?
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Rheumatoid arthritis (RA) causes pain, disability, and negative mood; and written emotional disclosure (WED) about trauma or stress can improve adjustment, but its effects are small. Patients vary in how they engage in WED, and certain types or content of writing is more likely to lead to health improvements than other writing. We analyzed the WED writings provided by 136 patients with RA (80.9% female, age M = 55.6, 63.2% Caucasian, 33% African American) who were in a clinical trial, and related the content to health changes over time. The 4 writings of each patient were rated by trained judges on various indices, and a computer program (LIWC2007) analyzed several language categories. At 1-, 4- and 12-month follow-ups, patients completed measures of mood, pain and physical functioning (Arthritis Impact Measurement Scales-2) and had disease activity assessed by a blinded rheumatologist. Partial correlations (pr) were calculated between writing content (mean over 4 days) and outcomes (residuals covarying baseline), controlling for baseline negative affect. Many significant (pr > |.18|, p < .05) and marginal (pr > |.15|, p < .10) associations were noted. First, stressor characteristics predicted health improvements. That is, lower stressor severity predicted less pain at 1 month (pr=.18), and stressors attributed to the actions of others predicted improved mood at 1 month (pr=.18) and improved physical functioning at 4 and 12 months (pr=.18). Second, more self-reflective content predicted better outcomes. That is, at 1-month, more cognitive language predicted improved mood (pr=.17), more use of first-person pronouns predicted improved physical functioning (pr=.15), and less rumination about the stressor predicted better outcomes generally. Finally, disclosing negative emotions rather than anxiety or health concerns predicted better outcomes. That is, greater expression of negative emotions,
These results help explain why WED has weak and variable effects in patients with RA; many patients do not write optimally. Ideal writing focuses on moderate level stressors that were caused by others (i.e., not accidents or normal life transitions), is self-reflective, and accesses negative emotions rather than bodily symptoms. The effects of WED may be enhanced with guidance or feedback.

194) Abstract 538

GLYCEMIC CONTROL AMONG LATINOS WITH TYPE 2 DIABETES IN THE HCHS/SOL SOCIOCULTURAL ANCESTRY STUDY: DO STRUCTURAL AND FUNCTIONAL SOCIAL SUPPORT PLAY A ROLE?

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Latinos with diabetes commonly exhibit poorer glycemic control and, in turn, more frequent health complications, greater disease severity, and worse outcomes than non-Latino whites. Given the purported cultural value placed on personal relationships within the Latino population, social support may represent an important source of resiliency that may be protective in the context of chronic disease management and outcomes in this group. This study examined the relationships of structural (network integration) and functional (or perceived) social support with glycemic control (glycosylated hemoglobin; HbA1c) in US Hispanics/Latinos from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL), a large study of 16,415 adults of Latino descent, recruited from Chicago, IL, Miami, FL, Bronx, NY, and San Diego, CA. The current study included 624 HCHS/SOL participants [81% >45 years old; 86% born outside of US mainland; 57% women (all weighted to 2010 US census)] with diagnosed diabetes (according to medication review), who completed structured (Cohen Social Network Index) and functional (Interpersonal Support Evaluation List-12) support measures as part of the HCHS/SOL Sociocultural Ancillary Study (total ancillary N=5,313). Regression analyses showed that after accounting for design effects and sample weights, greater social network integration (β=0.12, 95%CI 0.04,0.20) related to higher HbA1c levels; this effect was attenuated to nonsignificance (β=0.01, 95%CI -0.07,0.09) with adjustment for demographic factors. Functional support did not relate significantly to HbA1c in unadjusted (β=0.07, 95%CI -0.04,0.18) or adjusted (β=0.05, 95%CI 0.04,0.13) models. Prior studies have shown that social support and other psychosocial factors are associated with glycemic control in persons with diabetes. In the current study, social support was not consistently related to HbA1c. Other factors (e.g., healthcare access, adherence, depression) may be more important determinants of glycemic control in this population. Future studies should explore specific social factors (e.g., support for diabetes management; family cohesion) that may relate to glycemic control among Hispanics/Latinos with diabetes.

195) Abstract 505

NON-CONSCIOUS AGONISTIC MOTIVES INTERACT WITH PTSD DIAGNOSIS TO PREDICT SLOWED CARDIAC RECOVERY FROM ANGER IN VETERANS WITH SUBSTANCE USE PROBLEMS

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Persistent agonistic striving (AS), a non-conscious motivational focus on influencing or controlling other people, predicts increased cardiovascular (CV) responses to anger provocation and higher ambulatory blood pressure (BP) in adolescents, and may contribute to future CV disease. We tested the hypothesis that AS slows CV recovery from anger in adult veterans with post-traumatic stress disorder (PTSD) and related substance use problems.

Participants were 49 male veterans (67% White, age = 49.5 ± 8.4 years, 40% with a diagnosis of PTSD) undergoing treatment for substance use disorders at a VA hospital. Non-conscious AS was assessed with the Social Competence Interview (SCI). Anger recovery was assessed with the Anger Transcendence Challenge (ATC), an interview consisting of a 3-min anger recall portion followed immediately by a 6-min role-playing task that involved sharing an important personal memory with a new friend. HR and BP were measured at 2-min intervals before, during, and after the ATC. CV recovery was the change in HR and BP from peak anger recall (minute 3) to 6-min post-ATC baseline. Hypothesized relationships among AS, PTSD, and CV outcomes were tested with GLM analyses controlling for age, smoking, and medications that could affect CV responses.

Results revealed that PTSD diagnosis interacted with AS to predict HR recovery. Veterans with PTSD who were also high in AS showed significantly less HR recovery (p < .01) than high-AS participants without PTSD or low-AS participants with PTSD. The direct associations of PTSD (p = .15) and AS (p = .93) with HR were not statistically significant, and neither PTSD, AS, nor their interaction predicted BP recovery.

Findings suggest that AS, by slowing cardiac recovery from anger, may promote the stress response in veterans with a PTSD diagnosis who have substance use problems. Elevated resting HR has been found to be a strong predictor of cardiovascular mortality, further reinforcing the potential health-damaging consequences of AS in this population.

196) Abstract 783

PSYCHOSOCIAL RESOURCES AT WORK ARE THE MOST IMPORTANT PREDICTOR OF HEALTH-RELATED PRODUCTIVITY LOSSES

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Background: Workplace health promotion has predominantly focused on individual’s health behavior and health competence to reduce health-related productivity losses. Less focus has been invested on differences in psychosocial resources at work, in particular supportive leadership behavior.

Methods: First we developed a single measure estimating health-related productivity loss by integrating self reported absenteeism, presenteeism and work-ability into a single number. To this end, self-reported days of work-sick-leave were counted as full days lost, working while being sick as partial days lost (using a German short form of the Stanford Presenteeism Scale and the WPAI (Work Productivity and Activity Impairment Questionnaire) and productivity during healthy days as partial impairment estimated from the WAI-Index (Workability-Index). Estimates were expressed as total days lost per year on an individual level and as “required full time equivalent replacement” per 1000 employees at the department or company level.

Second we regressed the health-related loss of productivity on objective health measures including night time heart rate variability, self-reported health behavior and psychosocial work characteristics in two independent samples (S1: n = 5267, mean age 40.5 years, ± 10.6, 81% m Results: On an individual level, age (standardized beta (s.b.) = 0.09), gender (s.b. = 0.05), BMI (s.b. = 0.07), being blue-collar worker (s.b. = 0.12), health related resources (s.b. = 0.12), personal resources (s.b. = 0.08), sleep quality (s.b. = -0.17) (all p < 0.001) and night time heart rate variability (RMSSD, s.b. = -0.05, p = 0.02) significantly predicted health-related productivity loss. On a department level, supportive leadership behavior emerged as the single most important psychosocial resource at work, accounting for 41% of the variance. The attributable difference between departments in the top quartile and bottom quartile for leadership amounted to 50,3 person years per 1000 employees or 5% productivity.

Conclusion: Health related productivity loss is explained to a much larger extent by differences in work related stress and work related resources than by personal health behavior.
A MULTILEVEL STRUCTURAL EQUATION MODELING ANALYSIS OF VULNERABILITIES AND RESILIENCE RESOURCES INFLUENCING AFFECTIVE ADAPTATION TO CHRONIC PAIN

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Background: The processes of individual adaptation to chronic pain are complex and occur across multiple domains. Purpose: The current study examined the social, cognitive, and affective context of daily pain adaptation in chronic pain. Methods: Using a sample of 260 women with fibromyalgia or osteoarthritis, this study examined the independent contributions of pain catastrophizing and positive interpersonal events to adaptation to pain and pain-related affective dysregulation. These effects occur both between persons and within a person’s everyday life.

A CONTROLLED COMPARISON OF HEART RATE VARIABILITY AND BAROREFLEX RESPONSE IN FIBROMYALGIA PATIENTS AND HEALTHY CONTROLS UNDER MULTIPLE BREATHING CONDITIONS

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Use of paced breathing and HRV biofeedback are gaining in popularity in behavioral interventions for managing fibromyalgia symptoms with evidence of success, but the mechanisms associated with symptom changes are largely unknown. In the present study we explored changes in heart rate variability during paced and mechanically assisted breathing in untrained fibromyalgia patients and controls. Participants were patients with fibromyalgia (n=20) and controls (n=14, age, BMI matched). During a single visit, participants completed three 15-minute breathing sessions: 1) normal breathing, 2) paced breathing, and 3) assisted breathing (C-PAP) while supine. Continuous blood pressure and ECG were recorded. Differences in HRV during normal, paced, and mechanically assisted breathing in untrained fibromyalgia patients and controls. Participants were patients with fibromyalgia (n=20) and controls (n=14, age, BMI matched). During a single visit, participants completed three 15-minute breathing sessions: 1) normal breathing, 2) paced breathing, and 3) assisted breathing (C-PAP) while supine. Continuous blood pressure and ECG were recorded. Differences in HRV during normal breathing fibromyalgia patients had higher HR and LF, lower RMSSD, HF, and sBRS compared to controls (p<.05) with no difference in breathing rate. During paced breathing (6bpm), differences in HR and RMSSD remained significant. During assisted breathing, RMSSD remained significantly lower in the fibro group. There were no significant changes in HR, RMSSD, or sBRS in the control group between sessions. However HR and RMSSD were significantly different between sessions in the fibro group with lowest HR and highest RMSSD during assisted breathing. The differences between the groups at baseline suggest higher resting sympathetic and lower parasympathetic activity in the fibro patients. These differences were maintained during paced breathing suggesting that simply changing breathing rate does not change autonomic activity in fibromyalgia patients. During assisted breathing, HRV and sBRS in the fibro group were comparable to controls suggesting a limited central respiratory drive and autonomic control of heart rate. Together these results suggest changes in HRV after training in intervention studies are not due to simply changing breathing rate, but more likely due to paced breathing practice leading to altered autonomic control of heart rate and improved affective regulation. While the specific mechanisms remain unknown, the assisted breathing data raise the possibility that central remodeling of autonomic pathways is a possibility.

EXPRESSION OF STAT TRANSCRIPTION FACTORS IN LYMPHOCYTIC THYROIDITIS AS A PATHOLOGICAL MODEL FOR THE STUDY OF CYTOKINE EFFECTS

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Clinically, lymphocytic (Hashimoto) thyroiditis has been associated with hypothyroidism as well as psychiatric conditions including depression, panic attacks, mania, and fatigue. Similar to depressed patients, in patients with autoimmune thyroiditis, increased serum concentrations of pro-inflammatory cytokines, such as interleukin-6, have been reported, suggesting that enhanced synthesis of cytokines plays an important role in the pathogenesis of thyroid autoimmunity and possibly also comorbid depression. Upon binding of cytokines to their cognate receptors, inflammatory cytokines act via tyrosine-phosphorylated STAT (signal transducer and activator of transcription) proteins which, in the nucleus, function as transcription factors of cytokine-driven target genes. In an immunohistochemical approach, we investigated the cell type-specific expression of cytokine-regulated STAT proteins in patients diagnosed as having Hashimoto’s disease or focal lymphocytic thyroiditis (n=10). All surgical specimens showed histological features of lymphocytic thyroiditis, e.g. diffuse infiltration of the gland with mononuclear cells and destruction of thyroid follicles, resulting in altered glandular tissue architecture. We observed differential expression patterns of the various STAT transcription factors examined, indicating that each member of this conserved protein family in different functions in the development of autoimmunity. Using an antibody that specifically recognized tyrosine-phosphorylated STAT1, we detected phospho-STAT1 in numerous germinal macrophages and infiltrating lymphocytes as well as oncocites. In contrast, STAT3 expression was restricted to epithelial cells and showed a clear colocalization with the anti-apoptotic protein Bcl-2. Moreover, we found that expression of phosphorylated STAT3 was associated with low levels of stromal fibrosis. Phospho-STAT5 immunoreactivity was detected in numerous infiltrating cells of haematopoietic origin and, additionally, in hyperplastic follicular epithelia. Given these cell type-specific expression patterns of STAT proteins in human lymphocytic thyroiditis, it will be interesting to decipher which of these signal transducers may contribute to the physical and psychic symptoms of the disease.

SELF-COMPASSION AS A PREDICTOR OF INNATE IMMUNE RESPONSES TO PSYCHOSOCIAL STRESS

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Objective: Prior research suggests that shame-based states are associated with increased pro-inflammatory cytokine activity, a marker of disease risk. Building on this research, we hypothesized that self-compassion, which involves treating oneself with kindness and understanding rather than harsh judgment, might predict lower levels of stress-induced inflammation.

Methods: On two consecutive days, plasma concentrations of interleukin-6 (IL-6) were assessed at baseline and at 30 and 120 minutes following exposure to a standardized laboratory stressor in a sample of 40 healthy adults.

Results: On average, participants showed a significant increase in IL-6 in response to stress (F = 15.46, p < .001), and a significant increase in IL-6 response from day 1 to day 2 (F = 7.13, p = .011). Results of regression analyses indicated that participants who were higher in dispositional self-compassion exhibited significantly lower day 2 IL-6 responses (computed as area under curve with respect to ground [AUCg]; β = -.38, p < .05) and showed significantly lower sensitization across the two study days (computed as day 1 minus day 2 IL-6 AUCg; β = -.36, p < .05). These results remained significant when controlling for age, gender, and Body Mass Index (BMI). Furthermore, the relationship between self-compassion and IL-6 was mediated by post-TSST shame, which was negatively related to self-compassion.

Conclusions: These results suggest that self-compassion, through its relationship with stress-induced inflammation, may be beneficial for physical health. On a broader level, these results contribute to our understanding of the interactions between psychological and biological processes in shaping human health.
by contrast, that on the incongruent group was accompanied with a
different color. In this task, we measured response bias, which was
defined as the rate of selection of the advantageous stimulus.
As a result participants in the stress group showed a significant increase
of cortisol just after the TSST and recovery to the baseline level after
30 min (p < .05), whereas those in the control group showed no change.
Moreover we observed response bias on the stress and incongruent
group was increased compared than the congruent group. This is the
first study indicating that acute stress may affect learning processes
through PIT in humans.

203) Abstract 264
MACROPHAGE MIGRATORY INHIBITORY FACTOR (MIF)
PROFILES ASSOCIATED WITH INDICATORS OF PHYSICAL
AND PSYCHOSOCIAL STRESS IN PROFESSIONAL
ATHLETES
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Purpose: MIF is an inflammatory cytokine which has a remarkable
array of functions, including immune, metabolic and angiogenic
effects. There is substantial evidence linking MIF to hypothalamic-
pituitary-adrenal (HPA) axis functions, with MIF hypothesised to
control and regulate the anti-inflammatory and glucocorticoids (GC)
at least partially by reducing the HPA-sensitivity of immune cells. There
is also evidence that changes in MIF are part of the well-established bi-
directional links between psychological stress factors and dysregulation
of inflammatory systems and HPA function. In professional athletes
there is a unique combination of both physical and psychosocial stress
which has been hypothesised to include immune dysfunction. The
current study examined the relationship between indicators of physical
and psychosocial stress on changes in MIF across a competitive season
in professional rugby league players.
Methods: Players (n=29) from a Sydney National Rugby League club
participated in the study from February – August 2012. MIF was
analysed in resting blood samples taken at least 24 hrs after the most
recent exercise bout on six occasions approximately 1 month apart,
with the first (baseline) sample taken prior to season start. From the
same time points, data from standardised wellness questions was
extracted from player diaries.
Results: A significant effect of Time was observed in MIF levels
(p<0.001), with a nadir at time 4 (May), and no difference between
baseline and final samples (Feb-Aug). To determine salient
associations, change in MIF from baseline to time 4 was calculated,
and found to be negatively associated with the change over the same time
period in stress/mood, sleep and muscle soreness, such that better
mood, sleep quality and less muscle soreness were associated with
lower levels of MIF.
Conclusion: The current findings provide evidence that in a highly
physically fit cohort, inflammatory markers are associated with
indicators of both physical and psychosocial stress. MIF appears to be a
reactive marker associated with stress and deserves further attention.
Further, it may be important for athlete preparation to determine sleep
and psychosocial stress influences on the homeostasis of inflammatory
stress through GC function.

204) Abstract 566
THE ROLE OF PSYCHOLOGICAL FACTORS IN THE
CLINICAL MANIFESTATION OF EASTING ASSOCIATED
SYMPTOMS
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Background: Eating associated symptoms (EAS) are common
gastrointestinal (GI) complaints and possess a significant impact on
patient well-being and quality of life. However, the mechanisms
underlying these symptoms and the contribution of psychological factors to the clinical manifestation of EAS have not been previously investigated, thus limiting effective treatment options.

Purpose: To investigate the role of psychological factors in the pathogenesis of EAS.

Methods: Subjects with chronic recurrent EAS and healthy controls (HC) were evaluated using validated questionnaires. Variables of interest included: I. Demographic and Clinical Parameters, II. EAS including frequency and severity of symptoms. III. Psychosocial factors including anxiety, depression and somatization (Brief Symptom Inventory), GI specific anxiety (Visceral Sensitivity Index) and catastrophizing (Coping Strategies Questionnaire).

Revised vvvvvbb suffixes: A total of 44 subjects (EAS, n=28; HC, n=16), mean age 32 years, 75% females were investigated. Compared to HC, subjects with EAS scored significantly higher on all psychological variables (p<0.05 for all variables by t-test). The number of days with EAS and EAS severity significantly correlated with most psychological variables (by Pearson correlation; Table 1, *p<0.01). Regression analysis predicting frequency of EAS, showed that the differences between EAS and HC disappeared (β=1.60; p=0.43) when controlling for GI specific anxiety (β=0.60; p=0.001; R²=0.60) suggesting that 60% of the clinical manifestation of EAS can be explained by psychological factors.

Conclusion: We provide first evidence for the significant association between psychological factors and the clinical manifestation of EAS. Patients with EAS have significantly higher psychological difficulties which strongly correlate with the frequency and severity of these symptoms. Evaluating and addressing psychological factors may help the management of patients with EAS.

<table>
<thead>
<tr>
<th>Significant EAS by Psychological Measure</th>
<th>Average EAS Symptom Severity</th>
<th>Days with EAS Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI anxiety</td>
<td>R=.795*</td>
<td>R=789*</td>
</tr>
<tr>
<td>Somatization</td>
<td>R=.666*</td>
<td>R=507*</td>
</tr>
<tr>
<td>Anxiety</td>
<td>R=.664*</td>
<td>R=.439</td>
</tr>
<tr>
<td>Depression</td>
<td>R=.45*</td>
<td>R=.18</td>
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<tr>
<td>Catastrophizing</td>
<td>R=.31</td>
<td>R=.26</td>
</tr>
</tbody>
</table>

205) Abstract 546

RELATIONSHIP STRESS AND INFLAMMATION IN ADOLESCENCE
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Mounting evidence suggests that the qualities of individuals’ close relationships are associated with chronic inflammation (Kiecolt-Glaser et al., 2010). Much of this research, however, has been done using adult samples or retrospective studies, and much less is known about how close relationships in childhood or adolescence prospectively predict inflammatory activity (but see Fuligni et al., 2009, for an exception). Further, in light of cultural variation in depressive symptoms resulting from stressful relationships (Greenberger et al., 2000), it is important to examine how links between relationships and inflammation differ as a function of race.

We examined adolescents’ reports of stress in their close relationships as predictors of subsequent inflammation in a longitudinal study of adolescent girls who were at risk for depression. Across three yearly visits, participants reported about their close relationships (in the UCLA Life Stress Interview; Adrian & Hammen, 1993) and provided blood samples via antecubital venipuncture. Researchers rated adolescents’ stress in close relationships. C-reactive protein (CRP), a measure of inflammatory activity, was measured using high-sensitivity chemiluminescence.

Data analysis proceeded in two stages. First, we used k-means cluster analysis to group participants based on their stress across relationships. We identified two clusters of adolescents at each time point: (a) T1 High Stress (n = 33) and Low Stress (n = 74) and (b) T2 High Stress (n = 46) and Low Stress (n = 61). Then, we conducted an ANCOVA to examine how the experience of relationship stress at these two time points predicted levels of inflammation the following year. We also examined how the connection between stress and inflammation varied as a function of race.

Analysis revealed that, after controlling for age, T2 CRP, and T3 waist circumference, T2 relationship stress predicted T3 levels of CRP, such that girls in the high stress cluster had greater inflammation than girls in the low stress cluster. In addition, a significant T1 Stress × Race interaction emerged. Post-hoc probing of the estimated marginal means revealed that, in the low stress cluster, Asian participants had marginally lower levels of CRP than White participants (Mdiff = −.77, p < .07), but in the high stress cluster, Asian participants had greater levels of CRP than White participants (Mdiff = .99, p = .05).

These findings highlight important connections between relationship stress and inflammation in adolescence, as well as meaningful race-related variation in stress-inflammation links.

206) Abstract 757

PREDICTORS OF INFLAMMATORY BIOMARKERS FOLLOWING EXERCISE AND WEIGHT LOSS IN INDIVIDUALS WITH ELEVATED BLOOD PRESSURE
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Physical cardiorespiratory fitness and higher weight are associated with an increased inflammatory state. This study examined the contributions of cardiopulmonary fitness and weight on circulating biomarkers of inflammation and coagulation in 65 sedentary women and men with either pre-hypertension (BP >120/80 < 140/90 mmHg) or hypertension (BP >140/90 < 179/109 mmHg) (20-60 years; BMI 23-34 kg/m2).

Participants were randomized to a 3-month exercise intervention, a 3-month exercise plus diet (DASH diet; daily calorie deficit goal of 500Cal/ day) intervention, or waitlist control. Cardiorespiratory fitness (mL/kg/min) increased (F=3.59; p=0.032) and BMI decreased (F=3.98; p=0.023) in the exercise and exercise plus diet groups but not in the waitlist group. Linear regressions predicting post-intervention inflammatory markers included these independent variables: the respective pre-intervention biomarker, age, gender, group assignment, pre- & post-intervention BMI, age- & pre-post-intervention cardiorespiratory fitness, total minutes spent on cardio and total minutes spent on weights. Post-intervention IL-6 was predicted by pre-intervention IL-6 (p=0.006), post-intervention cardiorespiratory fitness (p=0.007), and total minutes spent on cardio (p=0.001) (final model of R=0.592; F=9.77; p<0.001). Post-intervention TNF-a was predicted by pre-intervention TNF-a (p=0.001) and group assignment (p=0.028) (final model of R=0.771; F=28.1; p<0.001). Post-intervention von Willebrand factor (vWF) was predicted by pre-intervention vWF (p=0.001) and total minutes spent on weights (p=0.007) (final model of R=0.728; F=29.3; p<0.001). Findings indicate that the inflammatory profile of individuals with elevated blood pressure is influenced by the degree of cardiorespiratory fitness as well as the amount of time spent exercising.

207) Abstract 716

USING ECOLOGICAL MOMENTARY ASSESSMENT TO EVALUATE A COGNITIVE-BEHAVIOR THERAPY INTERVENTION FOR THE REDUCTION OF CHRONIC ANGER
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METHODS: We conducted a randomized controlled trial of CBT for adult subjects scoring at least one SD above the normative mean on Spielberger’s Trait Anger scale. Subjects were assigned to either a wait-list condition (n=75) or 12 weeks of CBT intervention (n=77) using cognitive restructuring, relaxation, behavioral training and exposure to triggers to practice using new social and communication skills. All subjects provided 1 day of EMA data using a handheld electronic diary programmed at fixed intervals to assess positive and negative mood, quality of SIs, and SLEs at baseline and once again after 12 weeks of intervention or wait-list (average of 30.1 and 30.2 observations per person at times 1 and 2, respectively).
RESULTS: Trait anger scores decreased significantly (p < .0001) for those in the treatment but not for the wait list condition. Contrary to expectations, linear regression analyses revealed no significant effect of treatment on any EMA-reported affect or SLE variables. Subjects in the treatment condition did report a significant increase in frequency of SI after completing therapy (p = .038). According to the Baron & Kenny criteria, mediation analyses revealed that the increase in SI frequency was partially (27%) explained by the change in trait anger scores (p = .037), though a test of the indirect effect only bordered significance (p = .066). All analyses treated age, gender, and ethnicity as covariates.

CONCLUSIONS: Our CBT intervention significantly decreased trait anger but did not alter moment-to-moment mood, quality of SI, or the experience of SLEs. The higher levels of SI reported after treatment may be evidence of subjects’ decreased behavioral avoidance of potentially triggering interpersonal situations.

DEPRESSIVE SYMPTOMS MODERATE THE EFFECTIVENESS OF A QIGONG INTERVENTION IN IMPROVING QUALITY OF LIFE (QOL) IN BREAST CANCER PATIENTS UNDERGOING RADIOThERAPY (XRT)

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While most behavioral interventions in cancer patients targeting improved QOL use an “all-comer” approach to participant enrollment, a recent meta-analysis demonstrated that pre-intervention depressive symptoms moderate the efficacy of psychosocial/behavioral treatment. Consequently, we conducted secondary analyses of a qigong intervention previously found to reduce depressive symptoms involving breast cancer patients undergoing XRT to examine if women with high baseline depressive symptoms would benefit more from the intervention compared to those with low baseline depressive symptoms in regards to improved QOL outcomes and cortisol rhythmicity. Ninety-six women with breast cancer were recruited at the start of XRT from a cancer center in Shanghai, China, and randomized to the qigong (N=49) or waitlist control (N=47) group. Women in the qigong group attended 5 weekly classes over 5-6 weeks of radiotherapy while those in the control group received usual care. All women completed measures of depressive symptoms (CES-D), fatigue (BFI), sleep disturbance (PSQI), and overall QOL (FACT-G) and provided saliva samples for diurnal cortisol analyses at baseline, during and at the end of treatment, and 1 and 3 months later. The mean age of the women was 46 years (range 25-64) with stage 0 (7%), I (25%), II (40%) and III (28%). Consistent with our hypothesis, multilevel analyses revealed that women with elevated depressive symptoms at treatment initiation reported clinically and statistically less depressive symptoms (P<.01) and fatigue (P<.01) and better overall QOL (P<.05) in the qigong compared to the control group. There were no group differences for those reporting low levels of depressive symptoms at treatment initiation. Significant differences in outcomes emerged after but not during treatment suggesting that qigong may prevent delayed symptom burden or expedite the radiotherapy recovery process for women with elevated baseline levels of depressive symptoms. No significant differences were found for sleep disturbance and cortisol slopes. Qigong may be particularly effective in the management of QOL in women with breast cancer for those with pre-intervention elevated levels of depressive symptoms.
Background: Effects of nicotine on cognitive performance have been shown but are influenced by non-pharmacological expectancies in smokers, while there is little knowledge about expectancy effects in non-smokers. Sex differences in nicotine expectancy effects and in placebo effects in general are in part conflicting. Methods: Healthy non-smokers (n=46) and minimally deprived smokers (n=50) were randomly assigned to 4 groups in a double-blind balanced placebo cross-over design. They came to the lab twice at least 5 days apart and received a nicotine or placebo patch according to study design: 1) nicotine/placebo, 2) placebo/nicotine, 3) nicotine/nicotine, or 4) placebo/placebo, but expected to receive nicotine and placebo patches in random order. They completed a parametric go/no-go task to assess reaction time (RTT, in ms), sustained attention (% correct trials, PCTT), and response inhibition (% correct inhibition trials, PCIT) in three levels of difficulty. Expectations about nicotine effects were assessed on visual analog scales (VAS, response expectancy) and they were asked which patch they believed to receive (stimulus expectancy). Results: Smokers expected more often to receive nicotine than non-smokers on day 1 (65% vs. 50%), and their expectancies about concentration and vigilance were significantly more positive than non-smokers’ (p<0.05) whereas both groups exhibited low expectations for an effect of nicotine on reaction times. Both non-smokers and smokers failed to correctly assess the patch they had received on both days. Participants who expected nicotine were faster at all levels on day 1 (RTT; p<0.05) but not on day 2, irrespective of patch, smoking status, or sex, whereas PCTT and PCIT were only randomly affected by these factors. Conclusion: ‘Non-smokers’ and non-deprived smokers’ reaction times in a go/no-go task are affected by stimulus expectancies only but not by expectations for an effect of nicotine on reaction times. Furthermore, there were no sex differences in expectancy or nicotine effects. Results have implications for research on the establishment and maintenance of smoking behavior, and on clinical trials using nicotine for enhancement of cognitive deficits. (Supported by an unrestricted educational grant from Benfina GmbH, Oldenburg, Germany)
heart failure. Symptoms of depression were assessed via structured interview during the index hospitalization, and the participants were reinterviewed by telephone every 3 months for one year. The number of symptoms of major depression (range, 0-9) was determined on each occasion. Deaths and rehospitalizations were ascertained by review of medical records, and by patient and collateral informant interviews. Cox regression models evaluated the effect of depression on time to first rehospitalization or death, adjusting for demographic factors, medical comorbidity, and indicators of illness severity. Results: In an age- and sex-adjusted model that included depression level at index only, depression predicted the time to first event (HR, 1.07; 95% CI, 1.01-1.12; p=0.01), but the effect was not significant in the fully adjusted model (HR, 1.05; 95% CI, 0.99-1.05; p=0.08). In an age- and sex-adjusted model that included time-dependent depression data (i.e., depression levels at index and on each follow-up occasion), depression had a significant effect (HR, 1.09; 95% CI, 1.04-1.14; p=0.0006). The effect of time-dependent depression remained significant in the fully adjusted model (HR, 1.07; 95% CI, 1.02-1.13; p=0.005). Conclusion: The effect of depression on rehospitalization and mortality in patients with heart failure was greater when depression was measured repeatedly over the follow-up period, rather than only once at index. Repeated measures should be collected, if possible, in future studies of the relationship between depression and medical outcomes in patients with heart disease.

213) Abstract 673
SOCIO-CULTURAL CORRELATES OF MATERNAL DEPRESSION DURING PREGNANCY IN THE US MEXICAN POPULATION
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Mexican-American women exhibit high levels of depressive symptoms during the perinatal period that can lead to adverse maternal/child outcomes. Thus, it is important to understand what socio-cultural variables contribute to depression in Mexican-American women. This study evaluated the relationship between elevated depressive symptoms and acculturation status, social support, relationship satisfaction and pregnancy-specific stress in pregnant Mexican-American women. Depression levels, social support, pregnancy-specific stress and overall relationship ratings were determined early, mid and late pregnancy (15-19, 26-29, and 32-36 weeks gestation) from 54 pregnant Mexican-American women. Multiple regression analyses revealed a combination of number of stressful life events, dissatisfaction with social support from the child’s father and increased frequency of arguments with partner predicted depression early in pregnancy (R²=0.41, p=0.001). In mid pregnancy, dissatisfaction with s child’s father and increased frequency of arguments and pregnancy-specific stress predicted depression (R²=0.40, p=0.010). In late pregnancy, pregnancy-specific stress and dissatisfaction with the child’s father predicted depression early in pregnancy (R²=0.30, p=0.010). In addition, less acculturated women on averaged reported more pregnancy-related stresses and argued more with their partners than more acculturated women (t=-3.17, p=0.003). Also, less acculturated women experiencing pregnancy specific stress reported less satisfaction with the medical staff during pregnancy than acculturated pregnant women. Identifying the socio-cultural correlates of depression in the pregnant Mexican-American population may lead to increased culturally competent care.

214) Abstract 622
EFFECT OF EARLY FAMILY ADVERSITY ON RESILIENCE FACTORS, BODY IMAGE, AND UNHEALTHY EATING AND WEIGHT BEHAVIOR CONTROLS
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An early adverse family environment can lead to a range of negative outcomes in adulthood, including poor health behaviors (notably eating and weight control behaviors). We propose a three-stage path model to understand this relationship in which childhood adversity negatively impacts resiliency factors, which in turn are associated with greater body shape concerns that can lead to unhealthy eating and weight control behaviors. Undergraduate women (N=24) completed measures of adverse childhood environment, resiliency factors (self-esteem, personal growth, social support, gratitude), and one body shape concern factor (BSQ, EDE-Q shape subscale). Disordered eating behaviors were indexed using three latent factors derived primarily from EDE-Q items (eating/weight control attempts, fasting, binge/vomit frequency). Childhood adversity predicted lower self-focused (β=-0.46, p<0.001) and other-focused (β=-0.52, p<0.001) resiliency. Self-focused resiliency predicted less body shape concern (β=0.40, p<0.001), whereas other-focused resiliency predicted more body shape concerns (β=0.40, p<0.001). More body shape concerns predicted greater weight control behaviors (β=0.75, p<0.001), fasting (β=0.67, p<0.001), and binge/vomit behaviors (β=0.47, p<0.001). The model explained 56.1% of the variance in weight control, 44.8% in fasting, and 21.8% in binge/vomit behaviors. Findings suggest the relationship between early adversity and disordered eating was mediated by resiliency factors and body shape concerns. A body-focused resiliency reduced body concerns, other-focused resiliency may be in part detrimental to healthy body image, potentially due to increased concern for others’ views. These findings have implications for our understanding of the development and maintenance of body image, eating and weight, and related health outcomes (e.g., binge eating, obesity).

215) Abstract 476
ADDITIVE ASSOCIATION OF ANXIETY AND DEPRESSION WITH ALL-CAUSE MORTALITY IN INDIVIDUALS WITH CORONARY HEART DISEASE
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Depression has been related to mortality in coronary heart disease (CHD) patients, but few studies have evaluated the role of anxiety or the role of the co-occurrence of depression and anxiety. We examined whether anxiety is associated with increased risk of mortality after accounting for depression in individuals with established CHD. The cohort was composed of 934 men and women with confirmed CHD (mean age: 62+11 years) who completed the Hospital Anxiety and Depression scale during hospitalization for coronary angiography. Over the 3-year follow-up period, there were 133 deaths. Anxiety was associated with an increased risk of mortality after accounting for established risk factors including age, congestive heart failure, left ventricular ejection fraction, 3-vein vessel and renal disease (Hazard Ratio [HR], 2.27; 95% CI, 1.55 to 3.33, p<0.001). Similar associations were observed for depression (HR, 2.18; 95% CI, 1.47 to 3.22, p<0.001). When both psychosocial factors were included in the model, each maintained an association with mortality (anxiety, HR, 1.83; 95% CI, 1.18 to 2.83, p=0.006; depression, HR, 1.66; 95% CI, 1.06 to 2.58, p=0.025). Estimation of the HR for patients with both anxiety and depression versus those with neither revealed a larger HR for patients with both anxiety and depression than for patients with either factor alone (HR=3.04; 95% CI, 1.93 to 4.79, p<0.001). Anxiety is more strongly associated with increased risk of mortality in CHD patients, particularly when found with depression. Future studies should focus on the co-occurrence of psychosocial factors as markers of increased risk.

216) Abstract 628
SELF-REPORTED SNORING AND C-REACTIVE PROTEIN AMONG MIDLIFE WOMEN
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Self-reported snoring and C-reactive protein among midlife women was examined. This study used the Pittsburgh Sleep Quality Index (PSQI) and measured self-reported snoring (yes/no) and C-reactive protein (CRP) in a sample of 313 women aged 40-65 years from the National Health and Nutrition Examination Survey (NHANES). Snoring was associated with higher CRP levels (β=0.04, p=0.03). This relationship was independent of age, body mass index, smoking status, and use of sleep medications. These findings suggest that snoring may be a marker of subclinical inflammation and that interventions to reduce snoring may be beneficial for cardiovascular health.
The prevalence of nocturnal snoring increases as women reach midlife. In epidemiological studies, higher self-reported snoring frequency in midlife women has been associated with systemic hypertension, coronary heart disease, and stroke. The downstream effects of snoring-induced oscillatory pressure waves on inflammation may represent one pathway through which snoring contributes to cardiovascular disease (CVD). This study is the first to examine the relationship between self-reported snoring frequency in midlife women and C-reactive protein (CRP), a proximal measure of inflammation. Self-reported average weekly snoring frequency and circulating hsCRP levels were assessed in 370 SWAN Sleep Study participants (age range 48-57 years). Participants who provided any response to the snoring question (n=211) were categorized by snoring frequency: Never (0 times/week), Occasional (<5 times/week), and Frequent (5-7 times/week). Statistical models adjusted for body mass index (BMI), given its strong associations with both snoring and CRP. Other covariates were age, self-reported current smoking status, and number of days between sleep visit and CRP collection dates. Higher frequency of nocturnal snoring was significantly associated with increased CRP levels (r=11.14, p<0.001). Univariate post-hoc tests revealed a positive linear association between greater CRP and each of the 3 snoring groups (p<0.05). However, these associations were no longer significant after adjusting for BMI (r=0.50, p=0.61).

Self-reported snoring was not associated with circulating hsCRP in midlife women after adjusting for BMI. However, it may be premature to reject CRP as a possible mechanism linking snoring to CVD for two reasons. First, objective measures of snoring may better characterize snoring severity compared to self-report. Second, the downstream effects of snoring-induced oscillatory pressure waves on CRP may be localized to the carotid artery, and therefore may not be captured by a more global measure of inflammation. [Supported by NIH/DHHS grants AG019360, AG019361, AG019362, AG019363.]

VAGAL NERVE INFLUENCE AND EMOTION: RESPIRATORY SINUS ARRHYTHMIA PREDICTS EMOTION RECOGNITION
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The vagal nerve generates fluctuations in heart rate as a part of regular respiration. These fluctuations vary depending on the degree of vagal influence and are termed respiratory sinus arrhythmia (RSA). RSA has been shown to index aspects of human attention and emotion, particularly one’s ability to regulate emotion. However, it is largely unknown whether RSA, both resting as well as change with task engagement, might also index one’s ability to recognize others’ emotions. Healthy participants (N=40), mean age of 45.3 (SD=7.7), were recruited as part of a larger study and completed a resting, a control stimulus-detection, and an experimental working-memory condition in an MRI scanner. Concurrent EKG data were filtered to remove scanner artifact and submitted to spectral analysis. Resting RSA and change in RSA, the difference of control minus experimental RSA, were calculated. Emotion recognition was assessed outside the scanner through the Perception of Affect Task’s Sentences and Faces subtasks (Lane et al., 1996). Both tasks required participants to identify the emotion of a stimulus person, either an underlined target in a written sentence (Sentences) or a person’s face (Faces). As predicted, a decrease in RSA indicated better emotion recognition on both the Sentences task (r=41, p<0.01) and Faces task (r=49, p<0.01) and remained when controlling for age, race, gender, BMI, and education. Resting, or trait, RSA was unrelated to task engagement. However, trait RSA was related to performance on the Sentences task (r=0.40, p<0.01) only. RSA level during the control condition was related to greater emotion recognition on the Sentences task (r=0.40, p<0.05) but not the Faces task. Conversely, lower RSA during the experimental task was marginally related to better performance on the Faces task (r=0.27, p=0.09), but unrelated to the Sentences. These condition-task correlations were significantly different from one another (p<0.01).

Overall, change in RSA was related to one’s ability to recognize others’ emotions. The different relationship of change and trait RSA to emotion recognition suggests that individuals who may vary in which type of RSA is best associated with this skill. Similarly, the processes underlying the two emotion recognition tasks seem to differ as relationships to condition RSA were in opposing directions. Additional research into the established connection between RSA and emotion regulation should more closely examine the role of emotion recognition and include concurrent assessment of cardiac and respiratory change.

218) Abstract 488
PSYCHOSOCIAL MEDIATORS OF ETHNIC DISPARITIES IN ALLOSTATIC LOAD
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Purpose: Allostatic Load (AL) is a cumulative index of physiological dysregulation, which is predictive of morbidity and mortality over and above its individual components. African Americans (AA) have traditionally had higher AL than their Caucasian American (CA) counterparts, a disparity that persists across socioeconomic levels. It has been theorized that differences in psychosocial factors and negative health practices that disproportionately occur in certain groups may account for ethnic differences in AL; however this hypothesis has yet to be explicitly tested. We investigated if differences in psychosocial stressors, non-stress psychological variables and health practices measured were associated with ethnic differences in AL.
Methods: Data were collected as part of a larger study investigating ethnic differences in cardiovascular risk factors. Participants included working AA (N = 75) and CA (N = 100), middle aged (M = 35.2, SD = 9.7 years), adult men and women. Participants completed questionnaires assessing demographics, psychosocial stressors, non-stress psychological variables, and health practices. Biological data were collected as part of an overnight hospital stay.
Results: The covariates age, gender and socioeconomic status (SES) were held constant in all analysis. Findings showed significant ethnic differences in AL, such that AA had higher AL than their CA counterparts (MAA = 0.110, SE = 0.050 vs. MCA = -0.91, SE = 0.043, p < 0.01). Non-stress psychological variables (Point estimate = -0.057, bias-corrected and accelerated confidence interval (BCa) = -0.137 - 0.065) and health practices (Point estimate = -0.148 - 0.010) were partial mediators of the relationship between ethnicity and AL. The experience of anger subscale from the Buss-Durkee Hostility Scale (Point Estimate = -0.064, BCa = -0.052 - -0.007) and the Pittsburgh Sleep Quality Index (PSQI) total score (Point Estimate = -0.037, BCa = -0.105 - -0.003) were each significant mediators of the ethnicity-AL relationship.
Conclusion: These results suggest that non-stress psychological factors and health practices, especially the experience of anger and subjective sleep quality, play an important role in explaining ethnic differences in AL.

219) Abstract 614
STRESS APPRAISALS AT FIRST EXPOSURE PREDICT CORTISOL RESPONSES TO A SUBSEQUENT STRESS TASK
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Objective: Dysregulation of hypothalamic-pituitary-adrenal (HPA) axis stress responses, in particular non-habituation to repeated exposure, is hypothesized to contribute to negative health outcomes. Anticipatory cognitive appraisals have been associated with stress hormone release, but to date, study has investigated cognitive appraisal in response to stress situation affect responses to future exposure. We therefore set out in this study to test whether appraisals of a stress task would predict HPA axis responses to repeated exposure to a similar task.
Methods: Thirty-three young adults (19 male, 14 female; mean BMI=24.02; mean age=21.52) were exposed to the Trier Social Stress Test (TSST) on two consecutive days. Cortisol was measured one minute before the TSST as well as immediately, 10, 30, 60, and 120 minutes after. To assess stress appraisals, participants completed the Primary Appraisal Secondary Appraisal (PASA) scale during each TSST. Results: Analysis showed a significant cortisol response to the TSST on both days (day 1 time effect; F=20.78, p<0.001; day 2 time effect; F=10.63, p<0.001). Second day were lower than first day cortisol responses indicating habituation (day*time interaction; F=3.19, p = 0.045). Day one total PASA score (r=465, p<0.10) and include concurrent assessment of cardiac and respiratory change.
and self-concept (r=-.369, p=.049), were predictors of second day cortisol responses. Conclusions: We found here that initial appraisals of threat, control, and self-concept predict cortisol responses to a second exposure. Inter-individual difference in these appraisals might explain differences in habituation, as those who perceive more threat and less control continue to respond higher to a repeated stressor. As a predictor of habituation, stress appraisals could be an important factor in distinguishing between adaptive and maladaptive stress response patterns.

220) Abstract 586
NARRATIVE EXPOSURE THERAPY TO TREAT TRAUMATIC STRESS IN MIDDLE EASTERN REFUGEES: A CLINICAL TRIAL
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Background: Refugees often experience multiple stressors across the various stages of their experience, which increases their risk for various mental health problems, including PTSD. One promising treatment for people exposed to organized violence, including refugee trauma, is Narrative Exposure Therapy (NET), which combines elements of exposure therapy with the construction of a detailed life narrative found in therapy. NET is usually given over approximately 10 sessions, but the goal of this trial was to evaluate a brief NET in a sample of traumatized Iraqi refugees. Methods: We recruited through community programs in a large U.S. city 63 Iraqi adult refugees (44.4% mean age 40 years, 79% Chaldean; mean age 48 years) who experienced a traumatic incident and reported elevated PTSD symptoms: 92% had been oppressed because of race or religion, 90% exposed to combat situation, 40% physically harmed, 30% imprisoned arbitrarily, 28% tortured, and 26% kidnapped. Participants were randomized (in a 2:1 ratio) to a treatment group which received 3 individual sessions of NET, in Arabic (n = 42), or a wait-list control group (n = 21). Participants completed measures of posttraumatic growth as well as trauma symptoms, depression, sleep quality, physical health problems, and overall well-being at baseline and 2- and 4-month follow-ups. Results: All but 2 refugees in the NET group completed all 3 sessions, all but 5 patients provided follow-up data. Intent-to-treat analyses indicated that the NET group reported significantly greater post traumatic growth at the 4-month follow-up compared to controls, F(1, 62) = 10.38, p < .003. At the 2-month follow-up, the NET group also reported trends towards lower depression, F(1, 62) = 3.17, p = .08, and PTSD symptoms, F(1, 62) = 3.435, p = .069, and higher psychological well-being, F(1, 62) = 2.952, p = .091, compared to the control group. Conclusion: This study shows that a brief course of NET increases posttraumatic growth and secondarily reduces symptoms among Arabic-speaking Iraqi refugees in the U.S. A longer course of intervention is likely needed to strengthen and prolong the effects.

221) Abstract 342
INDIVIDUAL PROFILES OF THE IMPACT THAT INTIMATE MALE PARTNER VIOLENCE HAS ON THE MENTAL AND PHYSICAL HEALTH, ENDOCRINE AND IMMUNE SYSTEMS OF WOMEN VICTIMS
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Intimate partner violence (IPV) is a chronic stressful experience with high impact on women’s health, IPV victims having higher incidence of health complaints than non-abused women. The aim of this study was to establish different profiles of health deterioration in women victims. To this purpose, a cross-sectional study was carried out in Valencia, Valencia, Valencian Community, Spain
Participants completed measures of PTSD symptoms there were three profiles: a) IPV-no symptoms (n=19); b) IPV-depressive (n=36), and c) IPV-depressive/PTSD (n=18). None of the non-abused women had depressive or PTSD symptoms. Moreover, the IPV victims had higher incidence of physical complaints and lower capacity to neutralize herpes simplex virus than non-abused women, only the IPV-depressive had higher evening cortisol, and morning and evening DHEA, but lower morning cortisol/DHEA ratio than non-abused women. Furthermore, there were differences between the IPV groups. While the IPV-depressive/PTSD had higher incidence of physical complaints than the other IPV groups and higher morning cortisol/DHEA ratio than the IPV-depressive, the latter had lower morning cortisol and morning cortisol/DHEA ratio than IPV-no symptoms. In conclusion, these results show that there are individual differences in the vulnerability and resilience to the impact of IPV on women’s health. Supported by the Institute of the Woman (ref:53/98), FEDER and Ministry of Science and Innovation (ref:BSO2001-3134) and Generalitat Valenciana (PROMETEO 2011/048).

222) Abstract 258
SMOKING MUM: HEART RATE RECOVERY OF 3-TO-6 YEAR-OLD PRE-SCHOOL CHILDREN IS IMPAIRED IF THEIR MOTHERS SMOKED BEFORE OR AFTER AWARENESS PREGNANCY
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Background: Before the awareness of pregnancy 30% of mothers smoke and of these, 33% quit within the first 3 months. Smoking during pregnancy is associated with postnatal growth and developmental disorders including an increased risk of type 2 diabetes and cardiovascular diseases (CVD) in later adulthood. Similarly, impaired HRR (an indicator of vagal tone) is associated with CVD and mortality. To date, the association between maternal smoking behavior and HRR in children has not been investigated. Method: Cross-sectional baseline data from a cluster-RCT in 52 pre-schools (N=782) in Germany evaluating a state-sponsored health promotion program were used. HRR was assessed by recording HR during 3 minutes of rest, 2 minutes of circle-running with submaximal exertion and 3 minutes of post-exercise rest. Peak HR was defined as the highest HR in the final 60 seconds of running. HRR was calculated as peak HR minus HR 1 minute after exercise ends. Children were grouped by smoking status of the mother: (A) not smoking before & after awareness of pregnancy (Aop) (B) smoking before but not after Aop (C) smoking before & after Aop. Adjusted mean HRR for (A) was 77 BPM and 71 BPM (-6.1 BPM, p=0.01) for (B) as well as (C) (-6.2 BPM, p=0.02). Current smoking was not related to HRR. Conclusion: HRR in children of mothers that smoked at any time before or during pregnancy was impaired relative to those whose mothers did not smoke. Prenatal tobacco smoke exposure including the first pregnancy weeks thus might produce clinically significant reductions in vagal tone. Maternal smoking may thus impact the future health status of the offspring via altered autonomic nervous system function.
BE ENCOURAGED!: STRIVING AT LOW CHILDHOOD SOCIOECONOMIC STATUS PREDICTS VASCULAR RECOVERY TO POST-ANGER RECALL DISTRACTION, BUT NOT RUMINATION

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Distractive (vs. ruminative) coping predicts better cardiovascular recovery to mental stress. John Henryism active coping (JHAC), or constant striving with daily psychosocial challenges, appears more protective of negative health outcomes at higher levels of coping resources such as parents’ education (i.e., the John Henryism hypothesis). So the present study examined if high JHAC along with low parent’s education impedes cardiovascular recovery to post-anger recall rumination but improves cardiovascular recovery to post-anger recall distraction.

75 young adults (aged 18 to 34; 55% female; 60% White, and 25% Black) completed psychosocial surveys and a laboratory reactivity protocol involving an anger recall task. During the five-minute recovery period, participants were randomly assigned to one of two conditions, a rumination period where they continued to revisit the anger recall event or a distraction period involving a boring demographic survey. Measures of total peripheral resistance (TPR) and cardiac output (CO), reliable indices of vascular risk, were obtained continuously using a Portapres blood pressure monitor. Regression tests included JHAC, parents’ education and the rumination / distraction manipulation (RUDIS) as predictors of pre-anger recall rest adjusted cardiovascular change scores for post-anger recall recovery (i.e., post anger recall recovery minus anger recall talk and anger recall think, respectively).

The three-way effects for JHAC, mother’s education, and RUDIS were significant for TPR [F(1, 50) = 8.54, p < .005]. At low mother’s education, while higher JHAC scores were correlated with higher TPR change scores in the rumination group (see the attached Figure), higher JHAC scores did not impact TPR change scores in the distraction group.

The findings expand the JHAC hypothesis by showing that distraction overrides cardiovascular risk at high JHAC and low coping resources while rumination worsens vascular recovery for go-getters with lower mother’s education. This is the first study to highlight the potential vascular risks of rumination and the benefits of distraction coping in the context of the JHAC hypothesis.

AN APPLE A DAY: THE IMPACT OF NUTRITION QUALITY ON SEVERITY OF COMORBID LOW BACK PAIN AND INSOMNIA

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The connection between nutrition and health conditions is becoming more evident in the scientific literature. Most investigations address either medical or psychological conditions separately; few address both. Comorbid low back pain (LBP) and insomnia represents this combination. Low back pain has an 80% lifetime incidence (Walker, 2000) and affects 20% of the population, 50% of whom have sleep problems (Alsaadi, McAuley, Hush, & Maher, 2012). Interestingly, nothing has been reported about the role of nutrition quality in this patient population. In response, this study assesses the relative contribution of nutrition quality on severity of comorbid LBP and sleep problems among digital health coaching users.

The 450 participants (Female=65.1%; mean age = 45.6±14 years; Caucasian = 74%) were categorized by severity. The “low” (score 0-5; n=262) and “high” (score >5-10; n=188) groups for LBP were based on average intensity and unpleasantness ratings; “low” (>6 hours; n=204) and “high” (≤6 hours; n=246) groups for sleep problems based on average hours per night; and a self-rating of nutrition behavior (1-5 scale from poor to excellent) was the nutrition outcome measure. Four categories of individuals emerged: low severity for LBP and sleep problems (n=126), high severity for LBP and sleep problems (n=110), low severity for LBP and high severity for sleep problems (n=136), and high severity for LBP and low severity for sleep problems (n=78). A one-way analysis of variance test compared the self-reported nutrition ratings of the 4 groups and Bonferroni adjustments were used on pairwise comparisons.

Participants with low severity for sleep and LBP problems reported the best nutrition rating, while participants with high sleep and LBP severities had the poorest nutrition rating. Mean nutrition rating was significantly different between the low and high severity groups (p=.002). Mean nutrition rating was also significantly different between the low severity group and the group with low severity for LBP and high severity for sleep problems (p=.033).

These findings suggest that poor nutrition is associated with higher severity ratings of LBP and sleep. And, the relationship between nutrition and sleep appears more pronounced. Future research is needed to assess the reliability of these findings and if replicated, hypothesize potential mechanisms of action.
IMPROVEMENT OF INTERPERSONAL DIFFICULTIES DURING A MULTIDISCIPLINARY, MULTIMODAL PSYchotherapy predicts depressive symptoms, anxiety and quality of life

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Patients with severe depressive, anxiety, eating, somatoform, personality and trauma related disorders affecting their ability to work or to manage their everyday life are offered a multidisciplinary, multimodal psychotherapeutic treatment as in-patients and/or in a day clinic. Most of the psychotherapeutic treatment is given in a group setting. We studied whether the improvement of interpersonal difficulties predicts depressive symptoms, anxiety and quality of life at the end of treatment.

From 6/2006 until 6/2012 572 patients (mean age 33.7, range 14.7-78.8; 79.9% 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. Interpersonal difficulties (IIP), depressive symptoms and anxiety (HADS), and quality of life (SF36) were assessed at the beginning and at the end of the treatment.

Overall there were significant improvements of the interpersonal difficulties (B = .05, p<.05), depressive symptoms (HADS; p<.05), anxiety (HADS; p<.05) and quality of life (mental component summary of the SF-36; p<.05). The improvement of interpersonal difficulties during treatment predicts depressive symptoms (HADS; p<.05), anxiety (HADS; p<.05) and quality of life (mental component summary of the SF-36; p<.05) at the end of treatment.

The multidisciplinary, multimodal psychotherapeutic treatment achieved a significant improvement of interpersonal difficulties, depressive symptoms, anxiety and quality of life. The improvement of interpersonal difficulties predicts the outcome of the treatment assessed as depressive symptoms, anxiety and quality of life.

SEX GUILT AND EMOTIONAL SUPPORT SATISFACTION: CORRELATES OF POSITIVE STATES OF MIND IN SEXUAL AND GENDER MINORITIES

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Living as a sexual or a gender minority can be highly isolating. Studies that explore sexual and gender minorities typically focus on negative moods such as depression, anxiety or hostility (1). In this study, we concentrate on sex guilt and emotional support satisfaction as correlates of a person’s positive states of mind. Evidence support positive states of mind serve as a buffer against deleterious physiological consequences of stress (2). Using the Minority Stress Model as a framework, we tested three hypotheses: sex guilt (Revised Mosher Guilt Inventory; a=90) is negatively associated with positive states of mind (Positive States of Mind Scale; a=.77), emotional support satisfaction (UCLA Social Support Inventory; a=.89) is positively associated with positive states of mind, and both sex guilt and emotional support satisfaction account for a significant portion of the variance in positive states of mind (3). After receiving IRB approval we recruited 175 LGBT participants from community based organizations throughout Dallas/Fort Worth and obtained informed consent from participants. Our diverse, gender balanced convenience sample (69.3% European American, 11.7% African American, 10.6% Latino, 2.2% Asian American, and 6.1% other) reported a mean age of 34.7 years (SD=14.2). A hierarchical regression analysis revealed our model to be significant (F (2.16, 8.60), p < .001) accounting for 25.9% of the variance in positive states of mind. Sex guilt (B = .91, t = .26, p = .01) and emotional support satisfaction (B = .41, t = 5.92, p < .001) were significantly associated with positive states of mind. African American ethnicity was also significantly associated with positive states of mind (B = .17, t = .22, p = .03). Our findings suggest that public health programs should assess a person’s sex guilt, emotional support satisfaction, and ethnicity when addressing positive states of mind in a sexual or gender minority person.

SLEEP EFFICIENCY BY ACTIGRAPHY IS ASSOCIATED WITH CAROTID INTIMA-MEDIA THICKNESS IN LATE MIDDLE ADULTHOOD

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Background: Objective measures of sleep have improved the ability to assess the relationship between poor sleep and cardiovascular disease (CVD). There is recent evidence that actigraphy measured short sleep duration is associated with carotid intima-media thickness (CIMT), a subclinical marker of atherosclerosis, in healthy middle-aged men. Whether actigraphy measured sleep efficiency is associated with CIMT in healthy middle-aged men and women is unknown.

Objective: The purpose of the study was to determine whether actigraphy measured sleep efficiency is associated with CIMT, and whether this association varies by age, race, sex, or education.

Methods: 367 healthy, middle-aged adults with at least 7 days of sleep data were included in analyses (mean age 43, range 30-54; 53% female, 85% Caucasian). Average sleep efficiency was quantified as the percentage of resting time in bed spent sleeping and assessed using automated data from wrist actigraphy monitors worn 24 hours a day for consecutive days. Sonographic measures of CIMT at 6 sites were averaged and then log transformed.
Results: Adjusting for demographics (age, race, sex, and education), age significantly moderated the association between sleep efficiency and CVD risk factors, F(1,360) = 4.08, p < .05. Additional adjustment for traditional CVD risk factors (smoking, BMI, blood pressure, glucose, LDL) did not reduce the significance of this age-by-sleep efficiency interaction, F(1,353) = 4.31, p < .05. Age-stratified analyses were conducted to explore this interaction. Adjusting for demographic and traditional CVD risk factors, poor sleep efficiency was associated with greater CIMT (p < .05) in those 48-54 years old (upper age tertile), but not in the younger age groups. In the 48-54 age group, the adjusted mean CIMT of persons in the low sleep efficiency tertile was higher than that of those with moderate and high sleep efficiency (mean difference = .10 mm and .08 mm, respectively). Sex did not moderate results.

Conclusions: Poor sleep efficiency may be particularly associated with CVD risk as we age. Findings add to the nascent literature documenting connections between actigraphy measured poor sleep and atherosclerosis. Supported by HL040962 and HL07560.

229) Abstract 526
CHILDREN’S HEART RATE VARIABILITY AS STRESS INDICATOR: ASSOCIATION WITH EMOTIONS, PROBLEMS AND CORTISOL
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Background: Stress is a complex phenomenon coordinated by two main neural systems. Cortisol is the classical stress biomarker representing the hypothalamic-pituitary-adrenal system. Heart rate variability (HRV) is recently also used as stress marker representing the autonomic nervous system (sympathetic and parasympathetic activity). Low HRV (especially low parasympathetic activity) will be tested as stress indicator in young children by associating it with self-reported stress and salivary cortisol.

Methods: In children (5-10y) of the Belgian ChiBS study, 5-minute HRV measurements in supine position were performed. Cross-sectionally, salivary cortisol (N=293) and stress questionnaires (negative events, emotions and problems) (N=334) were collected. Saliva was sampled on two weekdays when waking up, 30 minutes and 60 minutes after wake up and in the evening. Adjusted linear regression was used for HRV versus questionnaires and multilevel modelling was used to analyze the associations with overall cortisol, cortisol awakening response (CAR) and cortisol diurnal decline.

Results: Peer problems, anger, anxiety and sadness were associated with lower parasympathetic activity, while anxiety also with higher sympathetic activity. Emotional problems and events were related to higher cortisol levels and/or cortisol decline, while happiness and peer problems were related to lower cortisol levels. Also HRV-cortisol correlations were found: higher cortisol levels were associated with lower parasympathetic activity; a larger CAR and steeper diurnal decline were associated with more sympathetic over parasympathetic dominance. Conclusions: Low HRV (especially lower parasympathetic activity) could serve as a stress indicator in children since it reflects some aspects of their stress status as measured by questionnaires and cortisol. Since low HRV is a pathway of increased morbidity and mortality, HRV may be a potential mechanism linking negative emotions to ill health. We recommend measuring both neural stress pathways (by HRV and cortisol) as they might be stimulated differently depending on the stressor or stress experience.
Many studies have explored the relationship between cortisol secretion and state well-being or ill-being; however, results are inconsistent. This may be explained to some extent by participant non-adherence to the saliva sampling protocol particularly for studies investigating the cortisol awakening response (CAR) as delays (>5 min) in collecting the first saliva sample lead to misleading measurements of the CAR. Another factor may be the age group of the participants. Consistent associations are found in middle-aged and older populations, whereas relatively weak relationships tend to be found in younger individuals. This study aimed to objectively monitor adherence to the saliva sampling protocol and investigate the relationship between well-being and the CAR and cortisol over the day in a young healthy female sample. 50 healthy female students collected saliva samples on four days at 0, 15, 30, and 45 minutes, and 3 and 12 hours post-wakening. State well-being and ill-being was assessed by mood ratings throughout each sampling day. Participants rated the extent to which they felt pleased, happy, goal-directed, stressed, out of control, frustrated, and down using electronic devices. Participants were made aware that awakening and sampling times were objectively monitored. Participants were relatively adherent to the saliva sampling protocol, delays of <5 min (mean: ±1 min) was achieved on the majority of sampling days (N=80). Days with delays of over 5 minutes (mean: ±3±12 min) were excluded (N=73) from analyses involving the CAR. Mixed modelling showed there was no relationship between well-being or ill-being and the CAR, the diurnal decline and cortisol over the day. The lack of an association between well-being or ill-being and cortisol on days where saliva samples were collected accurately supports the neurotoxicity hypothesis of HPA axis dysregulation. In young healthy individuals the HPA-axis is resilient and thus associations between neurotoxicity and cortisol will be absent or weak. We would hypothesise that these associations would be stronger in participants with vulnerability as a result of early life stress (not measured in this study) and in older adults.

Results: Problems with crying ability were reported by 74% of the patients and by 46% of the controls (Figure 1). Compared to controls, scores of patients were lower on crying ability (p<.001, d=0.64), higher on frustration (p<.001, d=0.33) and somatic consequences (p<.05, d=0.27), and not different on suppression. In patients, ocular dryness correlated with lower crying ability (r=-.26, p<.001) and more frustration (r=-.19, p<.001) and physical consequences (r=-.22, p<.001), but not with suppression.

Conclusions: A large number of patients with Sjögren’s syndrome, but also relatively many people in the general population, reported reduced ability to cry with tears, frustration of the reduced ability to cry, and somatic consequences of crying. Crying problems correlated to some extent with ocular dryness. Crying is believed to be a strong form of human emotional expression. Patients who cannot use tears to process and express emotions may experience adjustment problems in tear-inducing situations. This study is a first step towards a better understanding of the observation of Henrik Sjögren eighty years ago. Supported by the Dutch Arthritis Association.

![Figure 1. Percentages of patients with Sjögren's syndrome and control participants obtaining a mean score reflecting a low (seldom or never) to high (very often) frequency of crying problems on the four dimensions of the Sicsa Crying Inventory](image)

### Abstract 320
**STATE WELL-BEING OR ILL-BEING DOES NOT PREDICT CORTISOL PATTERNS IN A YOUNG HEALTHY SAMPLE**
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### Abstract 321
**CRYING WITHOUT TEARS: DIMENSIONS OF CRYING ABILITY AND RELATIONS WITH OCULAR DRYNESS IN PATIENTS WITH SJÖGREN’S SYNDROME**
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232) Abstract 137

**FOCUSING ATTENTION TO SOMATIC SIGNALS AND ANXIETY: A TEST OF THE MEDIATING ROLE OF CATASTROPHIZING AND THE MODERATING ROLE OF MINDFULNESS**
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Background: Focusing attention to somatic signals (FA-Soma), defined as the degree to which individuals actively monitor their body in order to detect cues and changes, is mostly assumed to reflect a maladaptive tendency which is associated with anxiety. Yet, the mechanism which underlies this association is not clearly established. The first aim of this study was to examine the process by which FA-Soma increases anxiety. More specifically, it examined the hypothesis that FA-Soma escalates catastrophizing orientation towards body signals, which in turn, increases anxiety. A different perspective, originated in contemporary scopes of human health and well-being, suggests that FA-Soma is not always maladaptive. Rather, this association is dependent on the individual's mode of attention. Thus, the second aim was to examine whether the association between FA-Soma and anxiety is moderated by mindfulness. Based on this perspective, it was hypothesized that FA-Soma escalates catastrophizing orientation towards body signals, which in turn, increases anxiety. A different perspective, originated in contemporary scopes of human health and well-being, suggests that FA-Soma is not always maladaptive. Rather, this association is dependent on the individual's mode of attention. Thus, the second aim was to examine whether the association between FA-Soma and anxiety is moderated by mindfulness.

Method: 106 young adults completed questionnaires assessing FA-Soma, anxiety, pain catastrophizing, and the two components of mindfulness.
mindfulness: dispositional mindful attention awareness, and non-judging of experience

Results: The analysis indicated that the association between FA-Soma and anxiety is mediated by pain catastrophizing. One component of mindfulness (i.e. dispositional mindful attention awareness) was inversely correlated with anxiety. The other component (i.e. non-judging of experience), was found to moderate the association between FA-Soma and anxiety. That is, level of FA-Soma predicted anxiety among those with strong tendency to judge their experiences, but not among those with low tendency. In addition, the mediating role of catastrophizing was observed among individuals with low levels of mindfulness, but not among those with high levels.

Conclusion: These findings emphasize the determining role of the individual's mode of attention towards somatic information. When this mode of attention is characterized by high levels of judgment towards experience, the FA-Soma manifests as a maladaptive tendency, which increases anxiety by escalating catastrophizing. Yet, when the attention is characterized by high levels of mindfulness, the maladaptivity of the tendency to FA-Soma reduces. Last, the findings suggest that mindfulness reflects a complex quality, in which its two components play different roles in somatosensory attention processes.

234) Abstract 784
THE RELATION BETWEEN SPIRITUALITY AND RELIGIOSITY ON EXECUTIVE FUNCTION IN AFRICAN AMERICANS
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Spirituality and religiosity are important components of health and well-being. Recent research suggests spiritual practices activate the prefrontal and anterior cingulate cortices, which may improve cognitive function. In comparison to other ethnic groups, spirituality and religiosity play a distinct role in African-American culture. Because African Americans are disproportionately represented by cardiovascular disease (CVD) and other conditions that negatively influence cognitive function, research is necessary to determine potentially beneficial effects of spirituality and religiosity on cognitive function in African Americans. Objective: The current study examined the relations among spirituality, religiosity, and cognitive function in African Americans. In addition, since research has demonstrated that spiritual and religious practice vary as a function of age and gender, we investigated the moderating effects of age and gender. Method: A sample of 139 African Americans completed the Religiosity Scale and the Daily Spiritual Experiences Scale. In addition, they completed measures of executive function, the Wisconsin Card Sorting Test (WCST) and Stroop Color and Word Test (Stroop). Results: Zero order correlations showed no significant associations between religiosity and performance on the WCST or Stroop; however, there was a significant association between spirituality and performance on the Stroop (r = -.156; p = .03). This association did not remain significant in the regression analysis after adjusting for age, body mass index, gender, and years of education, and did not vary as a function of gender or age. Conclusions: Lack of significant associations in this study may be attributed to data that reflect only moderate levels of religiosity and spirituality. In previous studies, cognitive benefits manifested among individuals with high levels of these constructs. Significant results were found among African Americans who are devoutly religious or spiritual. Also, because the sample was middle age on average, and executive function was relatively normal, participants may not yet be sensitive to the cognitive benefits of spirituality and religiosity.

235) Abstract 481
HOMOCYSTEINE INCREASES FOLLOWING STRESS IN OLDER BUT NOT YOUNGER MEN
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Background: The incidence and prevalence of cardiovascular disease (CVD) increases with age. Some evidence suggests that mental stress may increase plasma homocysteine (Hcy), an amino acid relating to CVD. However, none of these studies assessed age effects on Hcy stress reactivity, nor did they control for age. The objective of this study was a) to investigate whether Hcy reactivity to psychosocial stress differs between younger and middle-aged to older men and b) to study whether psychosocial stress induces Hcy increases independent of age.

Methods: 28 younger (20-30 yrs) and 28 middle-aged to older (40-65 yrs) apparently healthy men underwent an acute standardized psychosocial stress task combining public speaking and mental arithmetic in front of an audience. Blood samples for Hcy measurements were obtained immediately before and after, as well as 10 and 20 minutes after stress. Moreover, salivary cortisol was repeatedly measured to test the effectiveness of the stress task in triggering a neuroendocrine stress response.

Results: Hcy reactivity to stress differed between age groups (F(1,4, 68.6)=4.43, p=.027). While the older group displayed an increase in the Hcy response to stress (F(2,4, 53.5)=4.59, p=.01), Hcy levels in the younger group did not change (p=.27). Psychosocial stress per se did not change Hcy levels independently (p=.20).

Conclusions: Our findings suggest that psychosocial stress does not evoke an Hcy response per se, but only in interaction with age pointing to a mechanism by which mental stress may increase CVD risk in older individuals.

236) Abstract 433
DEMOGRAPHIC AND SMOKING HISTORY PREDICTORS OF MOTIVATION TO QUIT SMOKING AMONG PREGNANT WOMEN
Rebecca Emery, BA, BS, Psychology, Michele Levine, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Motivation for smoking cessation is an important aspect of the quitting process. Research has identified both intrinsic (e.g., health concerns and self-control) and extrinsic (e.g., social pressures and immediate reinforcement) dimensions of motivation that are related to smoking cessation. Pregnancy offers a unique period in which these two dimensions of motivation may uniquely affect women. Indeed, pregnant women with higher levels of intrinsic relative to extrinsic motivation are more likely to quit smoking. However, the relationship between the level of intrinsic relative to extrinsic motivation and individual differences among pregnant women remains unclear. Accordingly, we sought to identify prenatal demographic and smoking history predictors of the level of intrinsic relative to extrinsic motivation for smoking cessation. Pregnant former smokers (N = 127) who provided biochemical validation of cessation were interviewed at the end of their pregnancy using time follow back methodology to document days quit and self-reported demographic and smoking history information. Motivation for smoking cessation was measured using the Reasons for Quitting scale, which assessed intrinsic and extrinsic motivation. The level of intrinsic relative to extrinsic motivation was calculated by subtracting individual extrinsic from intrinsic motivation scores. Univariate logistic regression analyses were conducted to determine demographic and smoking history predictors of the level of intrinsic relative to extrinsic motivation. On average, women in our sample were 24.7 (SD = 5.27) years old and 70.2% were white. Women who were non-white (b = -.18; p < .05), were less nicotine dependent (b = -.22; p < .01), quit smoking earlier in pregnancy (b = -.21; p < .05), and smoked fewer cigarettes per day prior to quitting (b = -.20; p < .05) had significantly higher levels of intrinsic relative to extrinsic motivation for smoking cessation. These findings document that individual differences among pregnant women are predictive of motivation for successful smoking cessation. Future research should aim to replicate and extend these findings to better inform smoking cessation intervention programs for pregnant women.
AS DISTINCT CLINICAL ENTITIES WITH RESPECT TO EVIDENCE FOR BINGE EATING DISORDER AND OBESITY

237) Abstract 418

Binge eating disorder (BED) occurs predominantly in obese women. It has been postulated that in BED, stress is the most common trigger of binge eating. It has been documented in both obesity and BED, and stress is the most common trigger of binge eating. It has been postulated that in BED, stress dysregulation is attributed to obesity rather than the disorder itself. However, recent studies show neuroendocrine and autonomic dysregulation in obese BED compared to obese non-BED women. The current study investigated cardiovascular stress reactivity in BED women and furthered previous work by including both obese and non-obese controls and using a valid and reliable mental stress task involving social-evaluative threat. Five obese women meeting DSM-IV-TR criteria for BED, 15 obese non-BED women, and 15 non-obese non-BED women were assessed for cardiovascular reactivity to, and recovery from, mental stress. Systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) and anxiety were assessed at baseline, during the Trier Social Stress Test (TSST), and throughout 60 mins of stress recovery. BED women showed greater baseline depression scores and perceived stress compared to obese and non-obese controls, and these measures were included as covariates. Repeated measures ANCOVAs with Time as the repeated factor showed significant effects of Time for all cardiovascular measures (ps < .05), indicating that the TSST successfully elicited a stress response. Obese BED women showed overall more negative mood compared to obese controls (p < .05) as well as heightened SBP compared to both obese and non-obese controls (p < .01). Time x Group effects were seen for anxiety ratings (p < .05), DBP (p = .06), and HR (p < .05). Obese BED women displayed heightened DBP and HR compared to obese and non-obese controls and reported greater anxiety than obese controls as a self-reported symptom of stress recovery. These preliminary analyses indicate that stress dysregulation in BED is a function of the disorder, not obesity, given the differentiation in stress responses between BED women and both obese and non-obese controls. Ongoing research aims to further support BED and obesity as distinct clinical entities by investigating these effects in a larger sample and by including neuroendocrine measures of stress reactivity.

238) Abstract 87

RELATION OF LEISURE SATISFACTION WITH SYSTEMIC INFLAMMATION AND COAGULATION ACTIVITY IN ELDERLY INDIVIDUALS: A FOUR-YEAR LONGITUDINAL STUDY

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Objective: Depression has been associated with an increased risk of cardiovascular heart disease (CVD). Low-grade inflammation and hypercoagulability seem to partially explain this link. We hypothesized that a behavioural correlate of depression, which is low leisure satisfaction, is associated with increased levels of atherothrombotic biomarkers. Methods: We studied 179 community-dwelling elderly (mean age 75±8 years, 69% women) who were repeatedly assessed for depressive symptoms, leisure satisfaction, and biomarkers over a period of up to 4 years (mean of 3.9 assessments per participant). Mixed-regression analyses with adjustments for sociodemographic and health-relevant covariates were used to examine longitudinal relationships between the constructs of interest. Results: In the fully adjusted model, there was a significant and inverse association between leisure satisfaction and tumor necrosis factor-alpha (p = .02), interleukin IL-6 (p = .039), IL-8 (p = .001), interferon-gamma (p = .002), and plasminogen activator inhibitor-1 (p = .004) but not with C-reactive protein (p = .69), and fibrin D-dimer (0.36) levels. In contrast, depressive symptoms were associated with lower IL-8 (p = .003) but not with any other biomarker (all p-values>.30). These results were essentially maintained when depressive symptoms and leisure satisfaction were removed from the respective models (with the relation between depressive symptoms and IL-8 becoming nonsignificant). Conclusions: The findings suggest that lower engagement in enjoyable leisure activities is related to increased systemic inflammation and coagulation activity. This knowledge may offer a promising way of improving cardiovascular health in the elderly through behavioral treatments for depression targeting low leisure satisfaction.

239) Abstract 277

SYMPTOMS OF DEPRESSION AND CARDIOVASCULAR STRESS REACTIVITY: THE ROLE OF STRESS EXPOSURE AND STRESS PERCEPTION

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Recent research indicates that depression and symptoms of depression are associated with heightened cardiovascular stress reactivity, while perceived stress mediates the relationship between symptoms of depression and blunted systolic blood pressure stress reactivity. In the case of the former, both measures of perceived stress, but not actual life events exposure, were revealed to mediate the association between symptoms of depression and blunted systolic blood pressure stress reactivity. In the case of the later, chronic perceived stress mediated the relationship between symptoms of depression and blunted heart rate reactivity. The present study confirms the negative association between depression and cardiovascular stress reactivity and suggests that, to an extent, this may be mediated by perceived stress although not by actual stress exposure.

240) Abstract 721

FACTORS ASSOCIATED WITH LOW HEALTH-RELATED QUALITY OF LIFE IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE

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Inflammatory Bowel Disease (IBD) is a chronic gastrointestinal condition. Symptoms include abdominal pain, cramping, diarrhea, and fatigue. While studies have shown decreased health-related quality of life (HRQOL) in children with IBD, factors associated with “at-risk” status (i.e., very low HRQOL) using the Pediatric Quality of Life Inventory (PedsQL) cut-off scores in this population have not been previously explored.

The sample included 174 parent-child dyads. Demographic characteristics for parents were: M (SD) age = 43.53 (7.80), 90% female, 2% Hispanic, 93% Caucasian, and 47% college-educated; for children these were M (SD) age = 13.84 (2.71); 48% female, 5% Hispanic, 88% Caucasian.

Children completed measures of HRQOL, illness symptoms, pain severity, expressivity, emotional distress, functional disability, and catastrophic thinking. Parents completed proxy-reports of these measures, and health care utilization over the past year. HRQOL was assessed using the PedsQL.

Mean (SD) PedsQL summary scores were as follows: Physical Functioning: 79.89 (18.13) child, 73.99 (20.97) parent; Psychosocial Summary Score: 76.99 (15.38) child, 72.49 (17.75) parent; and Total Score: 78.01 (14.91) child, 73.00 (17.08) parent. These values are comparable to other pediatric IBD studies, and are lower than those of...
healthy children. Scores for 24% of participants fell below the PedsQL child-report cut-off value; these children were determined to be "at-risk" for low HRQOL. Children in the at-risk group spent more time in the hospital (M = 16.52 days) in the previous 12 months than the not at-risk group (mean = 7.40 hospital days, p<.05). They also reported significantly more pain, more disability, and endorsed more anxiety items than the not at-risk group (all p values <.001).

Logistic regression was conducted to determine the variables most likely to predict at-risk HRQOL. Healthcare utilization (medical provider visits), IBD symptoms, catastrophizing, and depressive thoughts each had significant (p<.05) partial effects (odds ratios ranged from 1.06 for catastrophizing to 1.97 for IBD symptoms). Demographic characteristics (child age and gender) were not significant predictors. Clinicians should assess their pediatric IBD patients for these risk factors to best address the myriad adverse consequences of poor HRQOL.

241) Abstract 429
THE MENTAL HEALTH STATUS OF ETHNOCULTURAL MINORITIES IN ONTARIO
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Introduction: Mental disorders are an important cause of disability and early mortality. The objective of this study was to describe and compare psychosocial indicators among ethnoculturally-diverse Ontarian residents.

Methods: This is a cross-sectional analysis of the Ontario Health Study pilot. Residents were mailed an invitation to one of 3 assessment centres (urban, rural and northern sites) from March 2009 to July 2010. Participants had an interview with a nurse and completed a questionnaire on a touchscreen kiosk. The questionnaire included sociodemographic items, and scales assessing symptoms of depression (CES-D-10), anxiety (GAD-7), social support (Lubben), stressful life events, and mental health service use. Analysis of variance was used to compare psychosocial scores by ethnocultural background, with post-hoc LSD tests.

Results: 8235 residents participated (54.3% female; age 35-70), among which 1870 (23.1%) self-reported as non-white (e.g., 225 [2.8%] South Asian, 222 [2.8%] East Asian, 214 [2.7%] Southeast Asian, 197 [2.4%] Black, and 102 [1.3%] Latin American/Hispanic). There were significant difference in depression (p<.002), anxiety symptoms (p<.001), social support (p<.001), stressful life events (p<.001), and mental health service use (p<.001) by ethnocultural background. Post-hoc tests revealed that participants reporting West Asian (20.4±9.4) and Aboriginal (21.9±9.7) backgrounds had significantly greater depressive symptoms than almost all other groups (p<.05). Participants reporting South Asian, Arab, West Asian, Aboriginal and Latin/Hispanic backgrounds had significantly greater anxiety than participants reporting a white ethnocultural background (p<.05). Stressful life events were significantly higher among participants reporting Arab (2.5±1.9) and Aboriginal (2.3±1.5) backgrounds than their counterparts (p<.05). Filipino (19.0±5.7) participants reported significantly higher social support than their white (17.4±5.4; p=.02) counterparts, yet East Asian, Southeast Asian and Latin /Hispanic participants reported significantly less support (p<.05). Mental health service use was significantly higher among participants reporting White (6.1±1.0), West Asian (7.9±9), Jewish (8±9) and Aboriginal (8±1.0) backgrounds when compared to their counterparts (p<.05).

Conclusions: There is a high burden of psychosocial distress in several preponderant ethnocultural minorities in Ontario, and unfortunately many of these residents are not among those accessing the available mental health services.

242) Abstract 508
ARE SELFREPORTS OF WEIGHT, HEIGHT, AND BMI RELIABLE IN PATIENTS WITH ASTHMA?
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Background: There is a growing literature linking increasing body mass index (BMI) with a higher prevalence of asthma and worse asthma symptom burden. However, the majority of this data is drawn from epidemiological studies that have relied upon self-reported height and weight to calculate BMI. Whilst there is evidence from the NHANES study that such self-reported data are reliable in the general population, there are no such data in patients with asthma. As such, the current study assessed the reliability and accuracy of self-reports of height and weight, and thus the calculation of BMI, in an adult sample of asthma patients.

Methods: A total of 639 (65% women, average [SD] age = 53 [16]) physician-diagnosed asthma outpatients from a tertiary care clinic were asked to self-report their height and weight as part of a general screening questionnaire. Once the questionnaire was completed, height and weight was objectively measured using standard techniques by a trained clinical research assistant.

Results: Measured mean (range) BMI for the whole group, women and men was 28.4 (15.8 to 57.8), 28.3 (16.4 to 57.8), and 28.5 (15.8 to 51.5) kg/m2. Intraclass correlations showed very high reliability between self-reported and measured BMI for the whole group (rICC=0.954), women (rICC=0.956) and men (rICC=0.949). Bland-Altman plots demonstrated reasonable accuracy between self-reported and measured BMI in the whole group (mean [95% CI] difference self-report-measured = -0.81 [-4.47 to 2.85]), women (mean [95% CI] difference = -0.92 [-4.55 to 2.72]), and men (mean [95% CI] difference = -0.62 [-4.31 to 3.08]). As expected, patients tended to slightly under report BMI (which was a function of under reporting weight and over reporting height). It was also noted that accuracy decreased with increasing BMI.

Conclusion: Tertiary care asthma patients seem to be able to accurately and reliably self-report their height and weight for the calculation of BMI. There did not appear to be any reporting differences between men and women. As such, self-reported measures of height and weight can be used to reliably approximate objectively measured height and weight for the calculation of BMI in large scale studies in patients with asthma.

243) Abstract 136
CHANGE IN POSITIVE AFFECT DURING OUTPATIENT CARDIAC REHABILITATION PREDICTS VITAL EXHAUSTION IN PATIENTS WITH CORONARY HEART DISEASE
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Objectives: Vital exhaustion is an acknowledged psychosocial risk factor of incident coronary heart disease (CHD) and recurrent CHD events. Little is known about trajectories in vital exhaustion in patients with CHD and the factors predicting this change. We hypothesized that vital exhaustion would decrease during outpatient cardiac rehabilitation and that an increase in positive affect over time would be associated with decreased vital exhaustion at discharge from cardiac rehabilitation. We also explored the role of gender in this context.

Design and Methods: We examined 603 patients with CHD (81.9% men, mean age ±SD = 60.6±10.7) in the first week and at discharge of a 3-month outpatient cardiac rehabilitation program. Patients completed the 9-item short-form of the Maastricht Vital Exhaustion Questionnaire and the 20-item Global Mood Scale to rate feelings of exhaustion as well as positive affect and negative affect.

Results: Vital exhaustion significantly decreased over time with a medium effect size (Cohen’s d = .44). The change in positive affect over time was inversely associated with the level of vital exhaustion at discharge of the program, after controlling for socio-demographic variables, severity of CHD, baseline levels of vital exhaustion and change in negative affect (p<.001). Moderator analysis showed that this relationship was significant in men (p<.001) but not in women (p=11).
Conclusions: Our data suggest, that positive affect contributes to a reduction of vital exhaustion in patients with CHD during outpatient cardiac rehabilitation. Especially men seem to profit of an increase in positive affect concerning vital exhaustion. Future studies are warranted to investigate whether interventions to specifically improve positive affect during cardiac rehabilitation have the potential to result in reduction of vital exhaustion in patients with CHD.

244) Abstract 449
YOU FEEL THEIR PAIN MORE IF YOU HAVE FELT IT BEFORE
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Previous studies have demonstrated that chronic pain patients and normal volunteers can experience a physical, bodily, sensation of pain when observing others in pain. Currently it is uncertain if this pain experience is influenced by the clinical characteristics of the observer. To test the influence of pain sensitivity, 63 participants with either no (n=21), moderate (n=22) or high (n=20) tooth sensitivity were recruited. All participants observed a series of images depicting someone eating an ice-cream without expressing pain. Nine percent of the moderate sensitivity participants reported pain to the images depicting someone eating an ice-cream without expressing pain. It was emphasised that the pain should be physically felt and be more than an emotional or 'gut' reaction. None of the low sensitivity participants also reported pain to the images depicting someone eating an ice-cream without expressing pain. Nine percent of the moderate sensitivity participants also reported pain to the images depicting someone eating an ice-cream without expressing pain. To date, eight participants (four who reported pain and four who did not) have been scanned with fMRI while viewing the same images. Those who reported pain activated the anterior cingulate, insula and somatosensory cortices as well as temporal regions. These findings indicate that people are more likely to report pain when observing a pain they commonly experience.

Shared physical pain may therefore involve reactivation of pain memories or pain schema. This reactivation may involve temporal circuits and the usual neuronomatia for pain.

246) Abstract 184
EARLY ADVERSITY, RESILIENCY, AND HEALTH OUTCOMES
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Early family adversity has been shown to influence developmental processes and long term health outcomes. Research has also identified a range of resiliency factors that help explain individual responses to stress and promote good health. We hypothesize that early adversity may impair the development of resiliency factors which, in turn, mediates the long-term effects of early adversity on health. Undergraduate college women (n=795) completed measures of early adversity (risk factors), resiliency factors (self-esteem, personal growth, gratitude, and social support), and reported health and well-being outcomes (perceived stress, self-reported global health, and health behaviors including sleeping, exercising, and drinking items). We tested our proposed mediational model using Structural Equation Modeling. We identified two latent constructs from resiliency factors, self-focused resiliency (self-esteem/personal growth) and other-focused resiliency (gratitude/social support), which covaried with each other. Our model fit the data well (χ² fit acceptable, all other indices excellent) and supported our hypothesis that the link between early adversity and long-term health is mediated by resiliency factors. The model explained 60.3% of the variance in perceived stress, 15.4% in global health, and 27.4% in health behaviors. Self-focused resiliency strongly predicted less perceived stress (β=−1.02, p<.001) and better global health (β=.50, p<.001), but not health behaviors (ns). Other-focused resiliency predicted modestly increased perceived stress (β=.31, p<.05), was unrelated to global health (ns), but strongly predicted enhanced health behaviors (β=.61, p<.01).

As predicted, early family adversity affected an array of health outcomes due to impaired resiliency factors. We speculate self-focused and other-focused resiliency are related to intrinsic versus extrinsic motivation, respectively; future research may consider tailoring interventions towards intrinsic factors for managing stress and health issues, but extrinsic factors for health behaviors and self-care.

247) Abstract 780
THE ROLE OF DEPRESSION IN CARDIAC REHABILITATION ATTENDANCE
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Evidence of a dose-dependent relationship has been found between the number of cardiac rehabilitation (CR) sessions attended and risk reduction in all-cause mortality and subsequent myocardial infarction (Hamann, Curtis, Schulman, & Whellan, 2010) and depression has been implicated as a possible risk factor for reduced CR attendance (Casey et al., 2008). The purpose of the current study was to examine the role of depression in predicting CR attendance using retrospective examinations of CR medical records for 116 patients (M = 63.8 years, 26.7% female) enrolled in a hospital-based, phase II CR clinic. Data gathered from the chart review included the BDI-II, sociodemographic and other factors, the total number of sessions completed which includes the intake session (1-36).

In a linear regression analysis the total BDI-II score was not a significant predictor of CR attendance, R2 = .00, F(1, 114) = .00, p = .954. To determine the relative role of greater levels of depressive symptomatology as a predictor of attendance, a series of hierarchical regression analyses were conducted controlling for recognized sociodemographic and medical predictors of CR non-attendance. In the first regression analysis, the overall model was not significant; however, older age was a significant predictor of CR attendance when covariates were added into the model, b = .34, p = .002, 95% CI [.12, .55]. When the analysis was rerun adding employment status and the distance in miles to the CR clinic as covariates, the model again was not significant, though older age and closer distance were significant predictors of attendance. These findings indicate that people are more likely to report pain when observing a pain they commonly experience.
of two dimension scores of depressive symptoms derived from the BDI-II, somatic/affective symptoms or cognitive symptoms, predicted attendance. Two linear regression analyses were conducted. Both models were non-significant, $R^2 = .00, F(1, 114) = .05, p = .821$ and $R^2 = .01, F(1, 114) = 1.60, p = .209$, respectively.

In conclusion, greater levels of depressive symptomatology using the BDI-II were not associated with phase II, 36 session CR attendance, while one established covariate, age, and one exploratory covariate, distance in miles from residence to CR clinic, were significant predictors of CR attendance.

248) Abstract 448

INDIVIDUAL AND DYADIC EFFECTS OF OPTIMISM ON DEPRESSION: COLORECTAL CANCER PATIENTS AND THEIR CAREGIVERS

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Background. Cancer is a stressful event not only to patients but also to their family caregivers. Studies suggest that one's optimism is important in one's well-being when responding to such a life changing event. Yet unknown is whether patients' optimism impact their family caregivers' well-being and vice versa during the first year post-diagnosis. The study aims to examine the effects of optimism on depressive symptoms at individual and dyadic levels among colorectal cancer patients and their family caregivers.

Methods. A total of 71 patient-caregiver dyads (N=142; mean age 58) were recruited from five community hospitals in Atlanta, GA, and provided valid data for the study variables. Patients were diagnosed with colorectal cancer within two months prior to participation in the study (T1). Optimism (LOT-R) and depressive symptoms (CES-D) were measured at T1 for both patients and caregivers. The CES-D was measured again at 12 months post-diagnosis (T2) for both patients and caregivers.

Results. Participants were moderately optimistic (M=3.4, scale ranges 1 to 5) and reported mild levels of depressive symptoms at T1 and T2 (M = 28.6, M = 29.3, respectively) which did not differ between patients and caregivers (ps > .56). Actor Partner Interdependence Modeling revealed that caregivers' greater optimism predicted lower CES-D of caregivers at T1 and T2 (actor effects: ps < .05) and of patients at T2 (partner effect: $p = .09$). T1 CES-D predicted T2 CES-D for each person (ps<.001), $\chi^2 = 35.99$, df = 40, RMSEA = .001.

Conclusion. Results suggest that the extent to which caregivers espouse a positive outlook may ameliorate depressive symptoms of not only their own but also their care recipients. Family caregivers who lack optimism may benefit from programs designed to mitigate their depressive symptoms. Future studies are warranted to investigate social support, coping strategies, and biobehavioral factors as underlying pathways of this link from optimism to depression at both individual and dyadic levels.

249) Abstract 203

IS ATTACHMENT INSECURITY A MEDIATOR BETWEEN CHILDHOOD ADVERSITY AND HARMFUL ALCOHOL CONSUMPTION?

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Background: Alcohol abuse is among the leading causes of preventable death in Canada. Adult attachment describes biological and psychological processes in close relationships that relate to many health outcomes. Previous studies have found graded relationships between the number of adverse childhood experiences (ACEs) and harmful drinking. Attachment insecurity is associated with ACEs. Hypothesis: We hypothesized that attachment insecurity mediates the relationship between ACEs and harmful alcohol use.

Methods: A cross-sectional study of primary care patients aged 25-65 excluding pregnant and breastfeeding women included validated measures of childhood adversity, attachment anxiety, attachment avoidance, harmful drinking. Mediation was tested using the method of Baron and Kenny.

Results: Among 356 subjects, 60% had experienced childhood abuse, neglect or adversity, 18% of participants had harmful drinking patterns. Gender, socioeconomic status, and health were not related to the main variables. Childhood adversity was associated with harmful alcohol use ($\beta = .74, p=.002$). Higher attachment anxiety was directly associated with harmful alcohol use ($\beta = .81, p=.005$) and was a weak partial mediator between childhood adversity and harmful alcohol use ($\beta$ reduced from .74 to .47). Attachment avoidance was not related to harmful alcohol use.

Conclusion: Contrary to our hypothesis, attachment avoidance does not mediate between ACEs and harmful drinking. However, attachment anxiety is a partial mediator between ACEs and harmful drinking. There are various treatments for harmful drinking as well as harm reduction approaches. While there may be a bidirectional relationship between attachment styles and harmful drinking, these results suggest it would be helpful to consider interventions that include relational support in addition to conventional therapies especially for persons with harmful drinking patterns who have high attachment anxiety.

250) Abstract 778

A COMPARISON OF MEDICAL FEARS IN BLOOD-INJECTION-INJURY PHOBIA AND VOLUNTEER BLOOD DONORS

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Blood-injection-injury (BII) phobia patients suffer from intense fear and fainting when confronted with stimuli related to medical procedures and injuries. Interestingly, although volunteer blood donors are clearly not avoidant of blood and injection stimuli, donor reports of fear of blood draws are positively related to risk for vasovagal reactions to donation among both novice and experienced donors (France et al., 2011, 2012). Despite these interesting similarities, little is known about (1) the potential overlap in medical fears among volunteer blood donors, BII phobia patients, and (2) the potential role of individual difference factors such as gender, prior donation experience, or fainting experience on reported medical fears. Thus, we analyzed Medical Fear Survey subscales measuring the intensity of fear related to (i) injections and blood draws, (ii) blood, and (iii) mutilation, in 493 participants from five populations: first-time blood donors, blood donors with one prior donation, blood donors with multiple prior donations, BII phobia patients (diagnosed according to DSM-IV criteria), and healthy non-donor controls. Scores on all three subscales were higher in BII phobia patients than in all other groups (all ps<.001). Although blood donors were closer to healthy controls, scores of first-time donors were elevated above control levels on all three subscales (all ps<.05). In addition, the mutilation subscale was particularly high in female as compared to male blood donors and BII phobia patients (ps<.001). Self-reported fainting history did not affect subscale scores in BII phobia, but blood donors who had faintt showed stronger fears of injections and blood draws. Thus, although levels of medical fears in most blood donors are more closely resembling levels in healthy controls, first-time, and particularly female, donors may require particular attention in blood donation settings due to elevated fear levels.

251) Abstract 588

EFFECT OF TWO FORMS OF EMOTIONAL DISCLOSURE ON STATE ANXIETY AND CARdiovascular RESPONSIVEness IN COLlege STUDENTS: DOES disPOSITIONAL COPING MATTER?

Timothy Williamson, BA in progress, KaMala S. Thomas, PhD, Psychology, Pitzer College, Claremont University Consortium, Claremont, Ca

Expressive writing (EW) is a well-validated disclosure technique that has been consistently associated with enhanced psychological well-being and reduced biomarkers of stress. However, there is some evidence that not all individuals respond favorably to this disclosure task. Those who have difficulty verbally expressing their emotions may be less likely to benefit from expressive writing. An alternative approach, mandala drawing (MD), involves drawing symbolic representations of one’s emotions inside a circle. This study examined
the effectiveness of both disclosure techniques in reducing state anxiety and cardiovascular (CV) responsiveness to a past trauma in a sample of 76 college students between the ages of 18-22 years old. Participants were randomly assigned to one of four disclosure conditions (EW, MD, control drawing, control writing). In 3 weekly lab sessions, participants were asked to write (EW) or draw (MD) about their emotions during the most traumatic experience of their life. Control participants either wrote or drew about their last meal. State anxiety and CV measures were assessed at each visit immediately before and after completion of the disclosure task. At session one, there were no significant differences between conditions in state anxiety or CV measures. However, there was a tendency for participants in both EW and MD conditions to report more state anxiety reactivity than those in the control conditions. At session three, participants in the EW condition had less of an increase in systolic blood pressure than those in the MD and control conditions while recalling the past trauma ($F = 3.199, p < .05$). Similarly, there was a non-significant trend in which those in the EW condition had less state anxiety reactivity to recall of the past trauma ($F = 1.902, p = .15$). Follow-up analyses examined whether dispositional coping influenced participants’ response to the disclosure task. Results showed that those who preferred using emotional support to cope with stress had less state anxiety in response to EW ($r = -.578$, $p < .01$). In contrast, those who preferred using instrumental support had higher state anxiety in response to MD ($r = .627, p < .01$). These findings support previous research showing that EW is an effective technique for coping with traumatic events. Although there was no support for MD as an alternative technique, there was evidence that understanding an individual’s coping style may be important in predicting the effectiveness of emotional disclosure interventions.

252) Abstract 630

NOVEL MEASUREMENT METHODS FOR ASSESSING PSYCHOSOCIAL STRESS: PRELIMINARY VALIDATION

Thomas W. Kamarck, Ph.D., Psychology, Psychiatry, Barbara Anderson, Ph.D., Psychology, University of Pittsburgh, Pittsburgh, PA, Daniel Siewiorek, Ph.D, Electrical and Computer Engineering and Computer Science, Carnegie Mellon University, Pittsburgh, PA, Clem Stever, Ph.D., Psychology, University of Pittsburgh, Pittsburgh, PA, John Shiffman, Ph.D., Psychology, University of Pittsburgh, Pittsburgh, PA, Asim Smailagic, Ph.D., Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, Elaine Wethington, Ph.D., Human Development, Sociology, Cornell University, Ithaca, NY, Brian French, M.S., Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, Emily Heimeman, M.S., Psychology, University of Pittsburgh, Pittsburgh, PA, We sought to validate 2 new computer-assisted tools for capturing exposure to recent psychosocial stress: the SMART (Self-Report Mobile Activity Recording Tool), an EMA method for assessing daily stress, and the LEAP (Life Events Assessment Profile), a structured interview method for assessing recent life stressors. 100 healthy adults (68 % female, 25 % Black) were monitored over 4 days with hourly self-reports on the SMART, hourly ambulatory blood pressure (ABP), and 5 salivary cortisol samples daily. The LEAP and standard self-report stress measures were also administered. The SMART includes 13 3-item scales measuring momentary mood, activity characteristics and social interaction quality. Item selection and scoring was based upon computer adaptive testing methods. The LEAP assesses presence and duration of life stressors during the past year across 12 life domains, using observer-based coding methods. SMART scale scores were averaged across days. Analyses were adjusted for demographic covariates. For the LEAP, number of severe events was associated with the PERI, a traditional life events checklist ($p = .0001$) as well as the Perceived Stress Scale (PSS, $p = .01$). When compared with the PERI, the LEAP was somewhat more strongly associated with overall physical and mental health (SF-36 summary scores, $r = -.32$ vs. $r = -.16$ for physical, $r = -.31$ vs. $r = -.21$ for mental). These associations were accounted for specifically by the number of chronic stressors (difficulties exceeding a month in duration). For the SMART, mean momentary mood scales were associated with the PSS ($p < .01$) as well as number of severe life events over the past year (by LEAP, $p < .05$); activity characteristics (e.g., mean Demand, Decision Latitude) were associated with job stress ($p < .01$); and social interaction characteristics were associated with measures of perceived discrimination ($p < .05$). Mean momentary mood was associated with mean ABP ($p < .05$). Demand and Decision Latitude were associated with mean cortisol exposure (area under the curve) ($p = .01$), and social interaction quality measures were associated with mean cortisol awakening response ($p < .03$). No biological markers were associated with the PERI or the PSS.

Data support the construct validity of these new measures of psychosocial stress and suggest that such measures may outperform traditional assessments as predictors of proximate health outcomes. Supported by DA07005.

253) Abstract 242

CHRONIC STRESS AND DIETARY INTAKE BY GENDER, OBESITY-STATUS, AND STRESS VULNERABILITY: FINDINGS FROM THE VITAMINS AND LIFESTYLE (VITAL) STUDY

Wendy E. Barrington, PhD, Shirley A. A. Beresford, PhD, Epidemiology, Bonnie A. McGregor, PhD, Health Services, Emily White, PhD, Epidemiology, University of Washington, Seattle, WA Stress has been associated with eating patterns in human studies with differences due to the type and duration of stressor, type of food, as well as population group. Laboratory and some epidemiological studies have reported stress-associated preferences for more palatable foods high in sugar and fat and associations have been found more consistently among women. Among overweight and obese individuals, consumption of caloric intake or triggers increased consumption in susceptible groups as a means of coping. Therefore, those with fewer coping resources may also be vulnerable to stress-related eating. More epidemiologic studies employing large sample sizes are needed, however, to sufficiently test these relationships. The Vitamins and Lifestyle (VITAL) study provided opportunity to evaluate associations between self-reported amount of calories and dietary behaviors (eating occasions and intake of fruits and vegetables, fast food, and sweetened drinks) by gender, obesity-status, and stress vulnerability within a cohort of 65,235 older individuals (mean age=61.1 years; SD=7.4). Robust linear models estimated cross-sectional associations of stress with eating patterns while adjusting for known demographic factors, physical activity, alcohol intake, number of comorbidities, and other covariates. Stress vulnerability modified the association between stress and eating occasions ($p < 0.0001$) as well as fruit and vegetable ($p=0.02$), fast food ($p=0.03$), and sweetened drink ($p=0.04$) intake. Among those most vulnerable to stress, higher stress was associated with fewer eating occasions and fruit and vegetable servings as well as more fast foods and sweetened drinks. Higher stress was also differentially associated with more calories, fast food and sweetened drinks for men and the obese. Stress was not significantly associated with intake of added sugars in these data. Although demonstrated associations were small, significant relationships were found for everyday experiences of chronic stress among an older mostly white population.

254) Abstract 651

IS ANYBODY TALKING? SPOUSAL COMMUNICATION AND INFLUENCE ON COLORECTAL CANCER SCREENING IN AT-RISK INDIVIDUALS

Wendy Birmingham, Ph.D., Cancer Control and Population Sciences, Huntsman Cancer Institute, University of Utah, Salt Lake City, Utah, Watcharaporn Boonyasiriwat, Ph.D., Psychology, Chulalongkorn University, Patumwan, Bangkok, n/a, Thailand, Marc D. Schwartz, Ph.D., School of Medicine/Cancer Control Population Science, University of Pittsburgh, Pittsburgh, PA, Sandie Edwards, M.S., Division of Epidemiology, Anita Y. Kinney, Ph.D., School of Medicine/Cancer Control Population Science, Huntsman Cancer Institute, University of Utah, Salt Lake City, Utah Cancer screening increases the likelihood of detecting certain cancers early when they may be curable but screening adherence for colorectal cancer (CRC) remains less than optimal in individuals with increased familial risk. Theral influence (SI) from significant others, defined as support and encouragement to promote health behaviors, has been included in some theoretical models as a factor that may encourage individuals to comply with screening guidelines. As such, family support and recommendation may influence CRC screening participation but relatively little is known regarding the influence of spouses specifically. Additionally, spouses of at-risk individuals could exert SI if the couple is not actively communicating about screening. Methods: We assessed levels of family SI (“Generally
speaking, I want to do what my family or spouse think I should do."
and levels of spousal communication ("How much do you talk about
having a colonoscopy with your spouse?") in 159 married men and 214
married women with a familial history of CRC. Based on societal
gender norms and gender health behavior norms we predicted women
would report high levels of both SI and spousal communication about
CRC screening, and men would report low levels of both SI and spousal
communication about CRC screening. Results: Contrary to our
expectations we found no significant differences in SI (χ² = 4.48, df = 4, p = 0.34) and no significant differences in spousal communication
governing colonoscopy (χ² = 7.5, df = 3, p = 0.06) between men and
women. Most participants were high in SI (men = 68%; women = 60%)
yet over one third of high SI men (35%) and high SI women (45%)
reported little or no communication with their spouse regarding
colonoscopy and overall, regardless of SI, 43% of at-risk men and 49%
of at-risk women reported little or no communication with their spouse.
Conclusions: Regardless of level of SI, many at-risk men and women
are not communicating with their spouses about colonoscopy. At-risk
individuals cannot benefit from family support and recommendation if
they are not communicating with family members. Interventions aimed
at spousal communication and social support may motivate risk-
appropriate cancer screening

255) Abstract 313
SOCIAl SUPPORT IN LUNG CANCER PATIENTS: ASSOCIATION WITH ENDOCRINE AND IMMUNE FUNCTION
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Lung cancer patients demonstrate markedly poor integration of circadian neuroendocrine-immune function evidenced by high evening cortisol, suppressed melatonin, and changes in the circadian patterns of distribution of peripheral lymphocytes. These patients experience more distress than individuals who are suffering from other cancer types. Social support may help to alleviate physiological effects of stress in lung cancer. We hypothesized social support would be associated with diurnal cortisol rhythmicity, lower cortisol awakening response/overall cortisol secretion, lower serum inflammatory cytokine levels, and greater diurnal variability in cortisol levels. Seventy-nine lung cancer patients provided demographic and medical data and self-report data on social support (Duke-UNC Functional Social Support Questionnaire). Salivary cortisol was measured at home four times a day over two days. Cytokines (IFN-γ, IL-2, IL-4, IL-6, IL-10, IL-12, IL-1β, TNF-α) were measured after phytohemagglutinin stimulation. Age at diagnosis, income, and cancer stage were adjusted in hierarchical linear regressions exploring hypothesized relationships.
Greater confidant support was associated with higher cortisol awakening response (CAR) (p = 0.005). Secondary analyses indicated this finding was driven by data from heavy smokers: (among those above median pack years, association was p = 0.001). An interaction effect on CAR, (pack years X confidant support) approached significance (p = 0.055). Social support was not related to immune function.
The association of confidant support with higher CAR runs counter to our hypotheses, and was possibly driven by data from heavy smokers. It is possible that heavy smokers who are in close relationships represented by high confidant support experience greater guilt associated with their smoking history and cancer diagnosis, and that this may drive the higher CAR. This intriguing result highlights the import of examining effects of shame, guilt, social stigma in psychological studies of lung cancer patients. These data also highlight the need to consider the contextual nature of social support.

256) Abstract 724
ISOLATED AND GROUP HOUSING CONDITIONS AS RELATED TO BEHAVIORAL MEASURES, ADRENAL GLAND SIZE, AND POST-MYOCARDIAL INFARCTION HEART FAILURE PROGRESSION
Willem J. Kop, PhD, Medical Psychology and Neuropsychology, Tilburg University, Tilburg, -, Netherlands, Tatiana Galvao, MD, Stephen J. Synowska, Ph.D., Wenxiong Xu, Ph.D., Medicine (Cardiology), Adem Can, Ph.D, Psychiatry, Karen M. O’Shea, Ph.D., Medicine (Cardiology), Todd D. Gould, Ph.D., Psychiatry, William C. Stanley, Ph.D., Medicine (Cardiology), U Maryland, Baltimore, MD, Pucher, Heart failure (HF) progression is negatively influenced by depression and psychological distress. These psychological factors
associated with HF progression often result from adverse socio-
environmental circumstances combined with individual vulnerability factors. However, the distress-HF relationship could also reflect common characteristics of HF and distress-related symptoms (e.g., fatigue). To increase experimental control over the determinants of distress as related to HF, an animal model was used to systematically examine whether a distressing socio-environmental manipulation adversely affects HF progression.
Methods: A validated myocardial infarction (MI)-induced HF model was examined combined with a standardized housing paradigm. Left coronary artery ligation was performed in 52 Wistar rats to produce an MI and subsequent HF. Results were compared to animals receiving sham surgery (N=24). The housing condition (1/cage = isolation, 2/cage = standard, reference group, or 4/cage = crowding) was randomly assigned at 1 week post surgery and continued until the end of observation at 17 weeks. Behavioral tests included the open field test (OFT: duration in center-of-field [0-60 sec]; # fecal bolii) and adrenals were weighed throughout the study. Echocardiograms were obtained at 8 and 16 weeks, and MI and LV weights were obtained in week 17.
Results: The housing manipulation resulted in significant behavioral effects (Figure) including reduced center time in the 1/cage and 4/cage sham groups, increased fecal bolii in the single-housed MI animals, consistent with elevated distress. Adrenal weight was lower in the 4/cage sham group (p<0.05). MI-surgery resulted in cardiac impairments characteristic of HF (reduced LVEF at 8 and 16 weeks vs. sham [p<0.001; A=9.6±1.9% vs. 1.2±1.7%, p=0.008] and increased MI size [p<0.01]). Housing condition was not related to LVEF at 8 or 16 wk nor MI size or LV weight (Figure). Behavioral distress measures during OFT were also not correlated with cardiac indices (r-values< 0.25; p>0.08).
Conclusions: Housing condition manipulation results in behavioral distress markers. In this animal model of social isolation or crowding the distress response did not result in HF-specific cardiac abnormalities. It is possible that stronger challenges or different animal models are needed to elicit cardiac effects relevant to HF. Alternatively, the distress-HF associations in humans may not be attributable to causal pathways and rather reflect confounding by common underlying factors.

257) Abstract 657
PERSONAL PREDICTORS OF A SUBSTANCE USE DIAGNOSIS: ROLE OF FAMILY HISTORY, PERSONALITY, AFFECT, AND EARLY LIFE ADVERSITY
Kristen H. Sorocco, PhD, Geriatric Medicine, University of OK Health Science Center/OKC VAMC, Oklahoma City, OK, Bruce A. Carnes, PhD, Geriatric Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK, Andrew J. Cohoon, MPH, Psychiatry and Behavioral Sciences, University of OK Health Sciences Center, Oklahoma City, OK, Andrea S. Vincent, PhD, The Cognitive Science Research Center, University of Oklahoma, Norman, OK, William R. Lovoallo, PhD, Psychiatry and Behavioral Sciences, University of OK Health Sciences Center/OKC VAMC, Oklahoma City, OK
The Oklahoma Family Health Patterns project (OFHP) seeks to identify risk factors for substance use diagnoses in otherwise healthy persons.
MEASURING INSomnia IN SLEEP APNEA: A CONFIRMATORY FACTOR ANALYSIS OF THE INSomnia SEVERITY INDEX

William K. Wohlgemuth, Ph.D., Sleep Disorders Center, Miami VA Medical Center, Miami, FL, Douglas M. Wallace, M.D., Department of Neurology, University of Miami & Miami VA Medical Center, Miami, FL, Sean Robinson, B.A., Samantha Domingo, B.A., Psychology, Nova Southeastern University, Ft. Lauderdale, FL

Introduction: The co-occurrence of insomnia with obstructive sleep apnea (OSA) has received more attention over the last few years. Insomnia has been found to occur more frequently in OSA patients than in the general population. The Insomnia Severity Index (ISI) is a brief, validated instrument used to screen for clinically significant insomnia. The ISI contains 3 items which ask about the severity of difficulty 1) falling asleep, 2) staying asleep and 3) waking up too early, and 4 items which ask about the daytime consequences of nighttime sleep difficulty. Previous factor analyses in insomnia samples have found that the ISI has a 3 factor structure. No analysis has been conducted in a sample with comorbid sleep apnea/insomnia.

Methods: Consecutive OSA patients over a six month period (n=167) returned to the Miami VA CPAP clinic following diagnostic sleep study and CPAP initiation. At this visit patients received CPAP and completed questionnaires (demographics and the ISI). Medical history and polysomnography data were obtained from medical record. No patients had previously been diagnosed with OSA or had used CPAP.

Results: The sample included 167 (159 male) veterans with an average apnea-hypopnea index of 36 (SD=29), a mean BMI of 33 (SD=5.9), a mean age of 53 (SD=11.9) and a mean ISI of 18 (SD=6.1). These data indicate that, on average, this middle-aged sample was obese with severe OSA and moderately severe insomnia. Each of the 7 ISI items met criteria for normality. With Mplus, 1, 2, and 3 confirmatory factor models were tested. The best fitting model was a 2 factor model (chi sq=23.5, df=11; RMSEA=.083; CFI=977; TFI=.956; SRMR=.038). The loadings on factor 1 (nighttime sleep) were: ISI1=.65, ISI2=.92, ISI3=.66. Loadings on factor 2 (daytime consequences) were: ISI4=.86, ISI5=.76, ISI6=.49, ISI7=.74. The two factors had a correlation of .74. Although the 2 and 3 factor models provided similar fit indices (both better than the 1 factor model), the 3 factor model structure was not comparable to previous reports in the literature.

Conclusion: These data provide support for a 2 factor model of the ISI for both the patients with OSA and insomnia. Support for the 3 factor model was not obtained in this analysis.

259) Abstract 255

THE EFFECT OF HAPPY SMILE CLINIC GROUP PSYCHOTHERAPY ON DEPRESSIVE SYMPTOMS AND POSITIVE AFFECT IN A RANDOMIZED CONTROLLED TRIAL

Yoichi Chida, MD/PhD, Department of Medical Sciences, Happy Smile Clinic, Kawasaki City, Kanagawa, Japan

A large number of publications have previously shown spirituality/religiosity may boost mental resilience and alleviate psychiatric illness. Religiosity and spirituality can be defined broadly as feelings, thoughts, experiences, and behaviors that arise from a search for the “sacred”, with the former implying group or social practices and doctrines and the latter tending to refer to personal experiences and beliefs. Our previous study developed a novel spiritual group psychotherapy called “Happy Smile Clinic Group Psychotherapy”, based on the Four True Paths; Love, Wisdom, Self-reflection, and Progress, and reported a beneficial effect on depressive symptoms in a small randomized controlled trial with 26 part patients. In this study, we aimed to evaluate the efficacy on not only depressive symptoms, but also positive affect in a larger randomized controlled trial with more than 40 Japanese out-patients suffering from mood disorders or neurotic, stress-related, and somatoform disorders. The treatment participants took part in five 90-minutes group (3-6 people) sessions at one-week intervals, while the delayed-treatment control patients received usual care including medication. Mental status was assessed at three time-points before, after, and three months following the intervention using the Center for Epidemiologic Studies Depression scale. In an analysis comparing the intervention and control conditions, we adjusted for important confounders such as diagnosis, illness duration, medication, and religious background. The present report will explain the methods of this trial, demonstrating some intriguing results.

260) Abstract 553

THE PSYCHOLOGICAL impact of DEATHWATCH on STAFFS IN JAPANESE FEE-CHARGING NURSING HOMES

Yoshiyuki Takimoto, MD, PhD, Psychosomatic Medicine, The University of Tokyo, Tokyo, Japan, Satoru Yoshie, Gerontology, The University of Tokyo, Kashiwa, Chiba, Japan, Yoichi Chida, MD/PhD, Department of Medical Sciences, Happy Smile Clinic, Kawasaki City, Kanagawa, Japan

The deathwatch in nursing and personal care facilities increases the mood change after deathwatch for at least 1 year. The mood change after deathwatch is a concern among sleep for at least 1 year. The mood change after deathwatch is a concern among sleeping staffs. The correlation between feeling of death and deathwatch is high. The mood change after deathwatch is a concern among sleeping staffs. The correlation between feeling of death and deathwatch is high.

The correlation between experiences of deathwatch and deathwatch is high. The mood change after deathwatch is a concern among sleeping staffs. The correlation between feeling of death and deathwatch is high. The mood change after deathwatch is a concern among sleeping staffs. The correlation between feeling of death and deathwatch is high.
deathwatch and psychological influence varied according to job categories. In administrators, less experience of deathwatch positively correlated with negative attitudes such as “fear of death” (R=0.26, p=0.001) or “avoidance of death” (R=-0.33, p=0.002), and more coping with death was associated with positive attitudes such as “fulfillment after deathwatch” (R=0.22, p=0.03) or “delight after deathwatch” (R=0.21, p=0.04). Caring staffs more experiencing deathwatch had more “responsibility for deathwatch” (R=0.29, p=0.02) or “self-accusation after deathwatch” (R=0.28, p=0.02). In caring staffs, it correlated more experience of deathwatch with “regret after deathwatch” (R=0.23, p=0.005), “fulfillment after deathwatch” (R=0.29, p=0.0001) or “delight after deathwatch” (R=0.2, p=0.02). Because experiences of deathwatch in Japanese fee-charging nursing homes may affect staffs of all job categories, psychological supports for staffs coping with death are needed.

261) Abstract 397

**SLEEPINESS BY SLEEP DEBT ENHANCED AMYGDALA ACTIVATION FOR SUBLIMINAL SIGNALS OF FEAR**

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**INTRODUCTION:** Sleep loss often causes maladaptive emotional and mood regulation, and many psychiatric and neurological mood disorders are accompanied with abnormalities of sleep. These evidences suggest a potential intimate interaction between sleep and affective brain function. Also emotional experiences are easily influenced even if we are not consciously aware of the presence of emotional stimulus. Because subliminal visual information is transmitted to the amygdala without going through the visual cortex and subliminal and supraliminal stimulation induce different responses in the amygdala, it is possible that the transduction through subliminal signal pathways may also play an important role in changes in emotional responses to visual stimuli after sleep deprivation. Thus, in this study, we investigated the relationship between sleep debt by partial sleep deprivation and the unconscious emotional responses to masked emotional face stimuli.

**METHODS:** Fourteen healthy male volunteers (21-32 years old) underwent tasks in MRI following a 5-day regular sleep night (8h sleep: Sleep Control condition (SC)) and following 5-day sleep restriction night (4h sleep: Sleep Debt condition (SD)) in a within-subjects counter-balanced design. Using fMRI, we investigated the amygdala responses to seeing the conscious and unconscious (backwardly masked) emotional face stimuli. Under the unconscious condition, a happy or fear facial image was presented for 26 ms, followed by a neutral facial image of the same person for 174 ms.

**RESULTS:** In comparison of fear vs. neutral contrasts for the unconscious condition, we found the larger activity in the central nucleus of right amygdala in SD condition than SC condition, but it did not reach the significance level set for the analysis(p<0.001, k=5 continuous voxel). In detailed analysis, the activities in both sides of amygdala to unconscious fearful face stimuli were positively correlated with the subjective sleepiness during the task, independent of whether condition is SC or SD (Figure 1: p<0.001, k=5 continuous voxel).

**CONCLUSION:** These findings suggested that subjective sleepiness by sleep loss increases the effect of unconscious emotional processing. It is thought that the signal transduction to amygdala through subliminal pathways takes on the function to recognize danger rapidly. The enhancement of amygdala activity to unconscious fear stimuli may be a compensatory function of danger avoidance for the decline of alertness by the sleepiness.

262) Abstract 73

**FISH OIL FOR ATTENUATING POSTTRAUMATIC STRESS SYMPTOMS AMONG RESCUE WORKERS AFTER THE GREAT EAST JAPAN EARTHQUAKE: A RANDOMIZED CONTROLLED TRIAL**

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**INTRODUCTION:** The Great East Japan Earthquake left about 20,000 dead or missing. Previous studies showed rescue workers are at high risk for posttraumatic stress disorder (PTSD). This study aimed to determine whether fish oil supplementation could attenuate PTSD symptoms among rescue workers following the Great East Japan earthquake.

**METHODS AND MATERIALS:** In this single-blind, randomized trial, rescue workers who provided consent to participate were randomly allocated to a fish oil (1,568mg docosahexaenoic acid and 156.8mg eicosapentaenoic acid daily) plus psychoeducation group and a psychoeducation alone group. The primary outcome was PTSD symptoms assessed by the Impact of Event Scale-Revised (IES-R) at 12 weeks after shipment of fish oil supplements on April 19, 2011. All analyses were by intention to treat.

**RESULTS:** Of the 172 participants enrolled between April 2 and 12, 2011, 86 were assigned to each of the two groups. Only 1 participant in the psychoeducation alone group was lost to follow-up. When adjusted for age, sex, and IES-R score at baseline, no significant difference in primary outcome was seen between the two groups (-0.9, 95% CI, -3.0 to 1.2; P=.39). Remarkably, change in the IES-R score of women in the two groups from baseline to 12weeks was -3.9 (95% CI, -7.5 to -0.3; P=.04) when adjusted for age and IES-R scores at baseline. In terms of safety, the occurrence rate of adverse events was not significantly different between the two groups, with 32 participants (37%) in the fish oil plus psychoeducation group reporting at least one adverse event versus 22 (26%) of the psychoeducation alone group doing so. This trial did not show the effectiveness of fish oil supplementation for the prevention of posttraumatic stress symptoms in rescue workers. However, supplementation reduced PTSD symptoms significantly in women. Fish oil may offer a safe strategy for preventing PTSD in women.
WHEN YOU ARE ANXIOUS, PAIN IS TAKEN MORE SERIOUSLY

Joshua A. Rash, M.Sc., Psychology, University of Calgary, Calgary, Alberta, Canada, Kenneth M. Prkachin, Ph.D., Psychology, University of Northern British Columbia, Prince George, British Columbia, Canada, Tavis S. Campbell, Ph.D., Psychology, University of Calgary, Calgary, Alberta, Canada

Individual differences that influence the perception of pain are important in pain management.

Methods: 49 males and 46 females (M age = 20.5, SD = 2.8) completed a measure of trait anxiety and viewed four videos consisting of facial expressions of shoulder pain patients. 15 female and 15 male facial expressions were presented at no pain, low pain, and moderate pain defined by the intensity of four FACS based facial actions (brow lowering, orbit tightening, levator tightening, eye closure). Participants rated the pain of each facial expression.

Data Reduction: Hit and false alarm probabilities were used to calculate sensitivity and bias. Sensitivity was calculated as the area under the ROC curve. Bias by the signal detection index B, varies between +1.0 and -1.0 with positive or negative scores indicating conservative or liberal biases, respectively. The main effects of video on sensitivity, F (3, 89) = 1.28, p > .05, or bias, F (3, 89) = 1.27, p > .05, were not significant, justifying averaging of bias and sensitivity measures across videos.

Data Analysis: 2(patient sex) by 2(pain level: low, moderate) by 2(observer sex) mixed model MANCOVA's were run for bias and sensitivity with anxiety as a covariate.

Results: Sensitivity: There was a main effect of pain level, and patient sex by pain level and patient sex by pain level by observer sex interactions, see Table 1. There was no effect of anxiety.

Bias: There were main effects of pain level and anxiety, and patient sex by pain level by observer sex interactions, see Table 1. Parameter estimates indicated that anxious individuals were more willing to impute pain when observing males in low pain, b = -.008, t = 2.06, p < .05, and females in low, b = -.011, t = 2.54, p < .05, and moderate pain, b = -.013, t = 2.57, p < .05.

Conclusion: Anxious individuals take pain more seriously.

Table 1

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<td>Patient Sex*Pain Level *Observer Sex</td>
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df = 1,91; *p < .05, **p < .01
POSTER SESSION 3

264) Abstract 674
MODELING METABOLIC SYNDROME AND ITS ASSOCIATION WITH COGNITION
Bonnie E. Levin, Ph.D., Neurology, Maria A. Rossetti, M.S., Maria M. Llubre, Ph.D., Psychology, University of Miami, Miami, FL, Maria Santiago, A.A., Mitchell S. Elkind, M.D., M.S., MPH, Neurology, Columbia University, New York, New York, Tatjana Rundek, M.D., Ph.D., Ralph L. Sacco, M.D., M.S., Neurology, University of Miami, Miami, FL, Taakov A. Stern, Ph.D., Neurology, Columbia University, New York, NY, Clinton B. Wright, M.D., M.S., Neurology, University of Miami, Miami, FL

Introduction: The metabolic syndrome (MetS) is a clustering of vascular risk factors and is associated with an increased risk of cardiovascular disease. Less is known about the relationship between MetS and cognition. We used structural equation modeling (SEM) to examine component vascular risk factors of MetS as correlates of different cognitive domains.

Methods: The Northern Manhattan Study (NOMAS) includes 1,290 stroke-free participants from a largely Hispanic multi-ethnic urban community. Vascular risk factors were assessed at baseline and an average of ten years later, at which time participants also underwent a full cognitive battery.

Results: The two four factor models, of the metabolic syndrome (blood pressure, lipid levels, obesity, and fasting glucose) and of cognition (language, executive function, psychomotor, and memory), were each well supported (CFI=0.97 and CFI = 0.95 respectively). When the two models were combined, the correlation between metabolic syndrome and cognition was - .31. Among the metabolic syndrome components, only blood pressure predicted all four cognitive domains. After adjusting for age, gender, race/ethnicity, education, smoking, alcohol, and risk factor treatment variables, blood pressure remained a significant correlate of all domains except memory.

Discussion: In this stroke-free race/ethnically diverse community-based cohort, MetS was associated with cognitive function suggesting that MetS and its components may be important predictors of cognitive outcomes. After adjusting for sociodemographic and vascular risk factors, blood pressure was the strongest correlate of cognitive performance. Our findings suggest MetS, and in particular blood pressure, may reflect markers of vascular or neurodegenerative damage in aging populations.

265) Abstract 702
DIFFERENTIAL IMPACT OF PERCEPTION OF CANCER ON PATIENTS PHYSICAL HEALTH DURING THE FIRST YEAR OF SURVIVORSHIP: EFFECTS OF ETHNICITY
Alexis N. Milton, BS, Daniel L. Hall, BA, Aurelie N. Lucette, MS, Kelly N. Shaffer, BA, Youngmee N. Kim, PhD, Health Psychology, University of Miami, Coral Gables, FL

Background: Stress appraisal of cancer has been associated with less optimal physical health. Specificity of the effects of perceived stress on physical health among cancer patients, however, remains unknown. This study examined (a) the extent to which patients’ appraisal of the impact of cancer on themselves and on their family members related to the patients’ physical health and (b) the role of ethnicity in these associations.

Method: A total of 67 patients diagnosed with colorectal cancer, recruited from community hospitals, provided complete data for study variables at 2 (T1) and 12 (T2) months post-diagnosis. Self-reported ethnicity (53% African American), cancer stage, and physical functioning (MOS SF-12: PCS) were measured at T1; PCS and perceived cancer-related stress at the interval level (PCRS-I) and at the family level (PCRS-F) using the family member distress scale were measured at T2.

Results: Hierarchical regression analysis revealed that greater PCRS-F-related to poorer PCS at T2 (β = .31, p < .01), after controlling for cancer stage and T1 PCS. Furthermore, a significant interaction between PCRS-F and ethnicity was found (β = -.41, p = .04). Post-hoc analysis revealed that the detrimental effect of PCRS-F on PCS was significant only for African American patients (β = .53, p < .001), but not for non-African American patients (β = -.04, p = .80). PCRS-I was related to PCS at T2 (β = .95) after controlling for cancer stage and T1 PCS.

Discussion: Findings suggest that patients’ perception of their cancer diagnosis and treatment as disruptive to their family members’ daily life, but not their own, has a detrimental impact on their physical health during the first year of survivorship phase. Findings further highlight the significant role of ethnicity in the link of stress perception to health. Family-based interventions designed to address cancer-related stress may be beneficial to African American patients’ health, as such interventions are more culturally sensitive addressing the patients’ perception of their illness affecting the whole family as a unit.

266) Abstract 502
FINDING MEANING IN ILLNESS: DEVELOPMENT AND INITIAL VALIDATION OF A MEASURE OF SENSE-SEEKING AND SENSE-MAKING
Allen C. Sherman, PhD, Stephanie Simonton-Atchley, PhD, Behavioral Medicine, Dianne Campbell, MSW, Department of Social Work, Roghu M. Reddy, MD, Internal Medicine, Catherine E. O’Brien, PhD, Bethany Jensen, PharmD candidate, Department of Pharmacy Practice, Laura Wagner, BA candidate, Behavioral Medicine, Paula J. Anderson, MD, Internal Medicine, University of Arkansas for Medical Sciences, Little Rock, AR

There has been considerable interest in meaning-making processes among patients facing serious illness. Recent conceptual models have differentiated between sense-seeking (a process) and sense-making (an outcome). Other distinctions have focused on sense-making (comprehensibility) vs. benefit-finding (positive changes). Unfortunately, very few measures of illness-related sense-seeking or sense-finding are available, and investigators have often relied on crude single-item indices. This study involved development and initial validation of a brief, practical measure of these theoretically salient constructs.

Items were initially developed to address 6 domains in each of the 2 scales (sense-seeking and sense-finding), that were identified as important in the literature. Content validity was assessed by ratings from a panel of expert clinicians. In pilot testing, respondent interviews with head and neck cancer patients (n = 15) indicated that items were understandable, relevant, and acceptable. Psychometric testing was conducted in a sample of adult cystic fibrosis patients (n = 71, mean age = 27.8, mean FEV1% = 67.8). Items analyses resulted in elimination of 6 items and separation of one of the domains (religious framework) into 2 subscales; the final instrument included 7 brief subscales (i.e., illness information, causal attributions, social comparisons, existential awareness, purpose/mission, affirming religious framework, and burdensome religious framework) in each scale (sense-seeking and sense-finding). Internal consistency estimates were acceptable (alphas = .70 -.93). As hypothesized, the sense-seeking total and subscale scores were associated with conceptually relevant measures, including reevaluation of core beliefs (Core Beliefs Inventory, p < .05 for 6 of 8 scores) and global search for meaning (Meaning in Life Q, p < .05 for 5 of 8 scores). In contrast, the sense-finding scores were associated with measures of global found meaning (p < .01 for 6 of 8 scores). Significant correlations with measures of illness coherence (Illness Perception Q-2 Revised and religious coping (RCOPE) also supported convergent validity, whereas modest associations with social desirability (MCSDS) supported divergent validity. Overall, findings suggest that this instrument is a promising measure of theoretically discrete dimensions of illness-specific meaning, which may offer an important tool for further research. Cross-validation in other illness populations and evaluation of additional psychometric properties (e.g., factor structure) are underway.

267) Abstract 714
A SINGLE NUCLEOTIDE POLYMORPHISM IN THE GLUCOCORTICOID RECEPTOR GENE (GR-9B) MODERATES AN INVERSE ASSOCIATION OF SLEEP DURATION WITH INFLAMMATION
Alvin Lim, BS; Anna L. Marsland, PhD, Psychology, Robert E. Ferrell, PhD, Human Genetics, Stephen B. Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Sleep duration has been found to covary inversely with markers of systemic inflammation, an association that may be mediated, in part, by activity of the hypothalamic-pituitary-adrenocortical system. Here, we examined whether genotypes of a single nucleotide polymorphism of the glucocorticoid receptor gene—GR-9B (rs10889119)—influence the minor (C) allele of which confers reduced GR sensitivity—moderated effects
of sleep duration on circulating IL-6 in a midlife community sample. Subjects were 875 healthy community volunteers (51% F; 30-54 yr) of European ancestry. Covariates of IL-6 included age (r=0.069, p<.05), body mass index (r=0.315, p<.01), male gender (r=0.101, p<.01), current smoking status (r=0.102, p<.01), years of education (r=-0.075, p<.05), physical activity (r=-0.132, p<.01), and sleep duration (r=-0.081, p<.05). When adjusted for covariates in hierarchical regression, sleep duration did not predict IL-6 concentration, whereas subjects homozygous for the GR-9b C-allele had higher IL-6 levels than those of other GR-9b genotypes (R2=.13, p<.05). The interaction of GR-9b and sleep duration was also significant and showed shorter sleep associated with higher IL-6 levels (R2=.14, p<.05). These results suggest that a common genetic variant in the glucocorticoid receptor moderates an inverse association of sleep with systemic inflammation and may thus contribute to increased risk for inflammatory disease.

Effects of Emotion Regulation Strategies on Pain and Memory of Pain

Argine Hovasapian, B.A., Linda J. Levine, Ph.D., Psychology and Social Behavior, University of California, Irvine, Irvine, CA.

Emotion regulation strategies are often found to be effective in alleviating procedural pain, but relatively less research has studied their effects on memory of pain. This study aimed to test the efficacy of specific emotion regulation strategies on experienced and remembered pain. During a cold pressor pain induction, 131 Ss were instructed to focus attention on a nearby image (distraction), think about the benefits of the procedure (reappraisal), received empathetic support from experimenter (empathy) or received no regulating instructions (control). Only distraction significantly decreased real-time pain ratings compared to controls, though it led to exaggerated recall. Receiving empathic support led to increases in concern immediately before the pain task but also led to adopting more accepting attitudes toward the pain. At recall, reappraisal and empathy did not lead to significant changes in pain, though they protected against exaggerations of pain. Findings indicate that although distraction has immediate pain alleviating benefits, changing appraisals of pain carries long-term benefits.

Use of Complementary Alternative Medicine and Conventional Therapies for PTSD in a Veterans Administration Population: Data from the Mind Your Heart Study

Beth E. Cohen, MD, Medicine, University of California, San Francisco/San Francisco VA Medical Center, San Francisco, CA, Yongmei Li, PhD, Medicine, San Francisco VA, San Francisco, CA, Margaret Chesney, PhD, Medicine, University of California, San Francisco/Other Center for Integrative Medicine, San Francisco, CA.

Background: Many complementary alternative medicine (CAM) therapies are being studied for use in PTSD. If efficacious, these could expand therapeutic options for patients, including those who decline conventional therapy. However, little is known about the frequency of CAM use in patients with PTSD, the types of therapies used, or the patient characteristics associated with CAM use.

Methods: Patients from two VA medical centers (n=683) completed an interview asking about their use of therapies for PTSD, including conventional medications, individual counseling, group counseling, or CAM therapies, with participants asked to specify the type of therapy. CAM therapies were classified according to definitions from the National Center for Complementary and Alternative Medicine. Standardized questionnaires were used to assess demographics, PTSD diagnosis (the CAPS), PTSD symptom score (the CAPS and PTSD Checklist), depressive symptoms (the PHQ-9), combat exposure (the CES), self-rated overall health and quality of life, and health behaviors. Logistic regression models were used to examine patient characteristics associated with CAM use.

Results: Of 292 participants who reported using any therapy for PTSD, 69 (24%) used CAM, and the majority of these participants (61%) used CAM in conjunction with conventional therapies. Among those using CAM, the most common types were meditation (49%), yoga (38%) and acupuncture (15%). Participants who used CAM were significantly more likely to have a higher level of education (p<.002), report less lifetime tobacco use (p=.008), be more physically active (p=.006), and report lower combat exposure (p=.02) than those who did not use CAM. Those who used CAM versus conventional therapies alone did not differ by age, race, sex, income, level of alcohol use, level of PTSD or depressive symptoms, overall health, or quality of life.

Conclusions: These data indicate a substantial number of VA patients may use CAM to treat PTSD, often in conjunction with conventional therapies. CAM use may also be associated with other healthy behaviors, such as greater exercise and lower tobacco use. Given the large number of patients who decline conventional therapies, further study of the efficacy of CAM therapies and patient preferences for use may increase treatment options for patients with PTSD.

The Importance of Immobility: Cardiovascular Disease Risk Factors Associated with Rests Measured Using a Novel Application of Actigraphy Data

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A number of studies have demonstrated that greater physical activity during the day is associated with reduced cardiovascular disease (CVD) risk and mortality. In the analyses that use actigraphy data, activity is computed as counts per minute and then either averaged over time or summed across 7 days. This study assessed the relationship between daily rest periods and cardiovascular disease risk as suggested by literature on sedentary behavior or with reduced cardiovascular disease risk as suggested by literature on the benefits of various activities and breaks. In two studies of children, a number of significant associations were revealed. In Study I (N = 93, 9-11 year olds), more immobility during the day was associated with significantly lower total cholesterol, LDL, nonHDL cholesterol, and reduced cardiac autonomic regulation at rest (indexed by a longer pre-ejection period and lower heart rate variability), after controlling for relevant covariates (e.g., BMI, sleep the prior night, daily activity as indexed by average counts/min for minutes with counts > 0), p values < .05. In Study II (N = 246; 14-19 year olds), more immobility during the day was associated with significantly greater nocturnal dipping for SBP (beta=1.4, p < .05), but no significant association with lipid levels were found. In addition, a significant interaction between daily activity and immobility revealed that increasing immobility was associated with increasing insulin specifically for those with lower activity counts summed across 7 days. These analyses included relevant covariates. This pattern of associations suggests that rests during the day may be associated with a pattern of both costs and benefits, perhaps related to the existing literature on the costs of being sedentary but the benefits of taking breaks.

Associations Between Leadership and Self-rated Health at the Workplace Adjusted for Work Stress Findings from a Cross-sectional Study in Germany

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Purpose: Positive leadership behavior can be seen as a determinant of health in the working adult population. The objective of this study was to examine potential associations of perceived supportive leadership behaviors with self-reported physical and mental health, and to explore to what extent these associations are moderated by psychosocial resources.
Methods: In a cross-sectional occupational cohort (n=3331), supportive, employee-oriented leadership behavior was assessed as well as self-rated health as part of quality of life (SF-12). Psychosocial resources included Effort Reward Imbalance (ERI), Job Demand Control (JDC), social support, trust at the workplace and positive aspects of organizational culture (eg. transparency). Logistic regression was used to estimate odds ratios (OR) and corresponding 95% confidence intervals (CI) for the association between tertiles of supportive leadership with poor self-rated health and the SF12 mental and physical health score. Continuous scores falling in the lowest quartile for each health-related dependent variable were coded into a binary indicators of poor self-rated health and mental and physical functioning. Initially, models were adjusted for sociodemographic and lifestyle factors. Additional adjustments were made for individual psychosocial resources as well as for the entire set of resources simultaneously.

Results: Participants rating their immediate supervisor in the lowest tertile of supportive leadership were also more likely to report low general health [OR=2.49; 95% CI (1.89-3.30)], lower mental health [OR= 2.74; 95% CI (2.21-3.39)] and lower physical health scores [OR 1.51; 95% CI (1.22-1.88)] than the reference group. When all psychosocial resources were entered in the model, leadership was no longer associated with self-rated health, mental health or physical health with nonsignificant ORs between 0.9 and 1.08.

Conclusion: Our findings indicate that the lack of positive leadership behavior is associated with a higher risk to report lower quality of life and vice versa. The effect attenuates with different resources like ERI or JDC but stays stable unless all resources are added to the model.

272) Abstract 370

INDIVIDUAL DIFFERENCES IN PHYSICIANS’ JUDGMENTS OF PATIENT BENEFIT FROM CARDIAC REHABILITATION

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Purpose: One of the chief factors contributing to low cardiac rehabilitation (CR) utilization is lack of physician referral of indicated patients. The purpose of this study was to examine individual differences among physicians regarding how they valued patient characteristics (cues, including patient sex) when judging patients’ likelihood of benefit from CR, and how these judgments of benefit were related to referral decisions.

Methods: Data were collected using an online survey completed by a convenience sample of Canadian physicians. Active family and adult cardia specialist physicians listed in the Canada Medical Directory online were emailed through Qualtrics software, and asked to complete the online survey. A series of 36 vignettes describing a patient using five cues (age, sex, motivation, indication for CR, musculoskeletal comorbidity) were presented to participants. Participants were asked to make judgments about whether the patients would benefit from CR, and whether these judgments of benefit were related to referral decisions.

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Results: Overall, 51 physicians completed the survey, of which data from 36 (70.6%) was considered complete and valid for analysis. On average, physicians referred 85% of the hypothetical patients, and gave them a 66% chance of benefiting from CR. The correlation between mean judgments of benefit and referral rates was .433 (p = .008) suggesting that physicians who perceived CR as being more beneficial were more likely to refer patients. Judgment analysis, conducted ideographically, revealed considerable variation among physicians when evaluating the same set of patient profiles. Patient motivation was considered the most important cue by 29 (81%) of the physicians. Twenty-seven (75%) of the physicians had negative weights for the patient sex cue indicating that they perceived women as less likely than men to benefit from CR.

Conclusions: Individual patient characteristics were significant factors influencing the decision-making process that physicians undertake when considering CR referral. There was evidence that physicians perceived females were less likely to benefit than males.

273) Abstract 367

INTEGRATED CARDIAC REHABILITATION: HOW DO POLYVASCULAR PATIENTS FARE?

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The burden of non-communicable disease is increasing. Particularly, vascular diseases such as cardiac, stroke, renal disease as well as diabetes are a leading cause of morbidity. This highlights the importance of secondary prevention, and reduction of common underlying vascular risk factors such as high blood pressure, smoking, and obesity. Cardiac rehabilitation (CR) is a proven model of care to improve outcomes in cardiac patients, and preliminary evidence suggests these benefits are also observed in patients with stroke and diabetes. Therefore, the objectives of this study were to compare patients whose primary CR indication was cardiac versus other or poly-vascular, with regard to risk factors, functional status, psychosocial well-being, and health behaviours. Post-CR exercise self-efficacy, barriers, and perceptions of chronic care were also compared between patient groups.

Methods: As part of an ongoing CR program evaluation, new patients were approached to consider participating at one of 3 (1 academic, 2 community-based which promoted integrated chronic disease management) CR programs in Ontario, Canada. Consenting participants were requested to complete an online survey pre- and post-CR, and clinical data including risk factors and exercise test results were extracted from patient’s charts at both time points. The surveys included the Duke Activity Status Index, Godin Leisure Time Exercise Questionnaire, Morisky Medication Adherence Survey, Patient Health Questionnaire-8, Cardiac Exercise Self-Efficacy Instrument, and Patient Assessment of Chronic Illness Care.

Results: 243 (85% retention to date) completed the pre-CR, and 123 (50.6% retention to date) completed the post-CR survey. Polyvascular patients (n=58; 23.9%) were most often referred for diabetes (n=35; 60.3%) and stroke (n=19; 32.8%). Patients with cardiac disease were more often male, had significantly lower BMI, and higher TC/HDL ratio than polyvascular patients (p<0.05).

There were no significant differences in degree of CR participation by indication. After considering pre-CR scores, cardiac patients significantly improved their HDL, stress test performance, exercise behaviour and medication adherence, and polyvascular patients significantly improved their stress test performance and medication adherence post-program (p<0.05).

Conclusions: This pragmatic examination of integrated chronic disease management provides preliminary support for the benefits of CR for other vascular patients.

274) Abstract 279

CHILDHOOD ABUSE AND ELEVATED MARKERS OF INFLAMMATION IN ADULTHOOD: DO THE EFFECTS DIFFER ACROSS LIFE COURSE STAGES?

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Guided by life course and selective mortality approaches, this study investigates the extent to which the effects of childhood abuse on inflammatory markers vary over the life course and evaluates the extent to which these associations are mediated by four plausible pathways: sleep problems, body mass index (BMI), perceived stress, and family social ties. Data come from a biomarker study of the National Survey of Midlife Development in the United States (MIDUS, N = 1,255). I use the Childhood Trauma Questionnaires to identify non-abuse (65%) and abuse groups (35%). For inflammatory biomarkers, I use interleukin (IL)-6, C-reactive protein (CRP), and fibrinogen. To test the selective mortality hypothesis, I consider all-cause mortality between the surveys of MIDUS I and MIDUS II. I find significant main effects and age-by-abuse interaction effects on inflammatory markers. In the younger age groups (ages 34-44 and 45-54), victims of childhood abuse have elevated markers of inflammation for all three biomarkers, compared to non-victims. Yet, there are no significant effects of
childhood abuse on elevated markers of inflammation in the older age groups (ages 55-64 and 65-84). Victims of childhood abuse, compared to non-victims, have a greater mortality rate between MIDUS I and MIDUS II, suggesting selective mortality might contribute to a reduced gap in the markers of inflammation between the victims and non-victims in the older age groups. High BMI, poor sleep quality, and weak family social ties partially explain why the experience of childhood abuse increases the levels of inflammatory markers in the young age groups. High BMI, in particular, is the most significant mediator for all the inflammatory biomarkers. My findings highlight the importance of life course stages in understanding the effects of childhood abuse and its adverse health consequences. Targeted interventions to prevent the consequences of childhood abuse need to be started at an early age in order to help reduce the risk that individuals will develop chronic diseases through elevated markers of inflammation in adulthood.

275) Abstract 135
COGNITIVE REAPPRAISAL INFLUENCES PAIN VALUATION, NOT NOCICEPTION
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Although cognitive reappraisal has received much attention in the literature, it is unknown to what degree cognitive reappraisal influences core affective processes vs. decision-making process. Prior neuroimaging studies are inconclusive on this point because biomarkers for affective vs. decision processes have not been developed. It is also unclear how prefrontal cortex implicated in reappraisal interact with affective and decision processes. Recently, we have developed an fMRI-based biomarker (a pattern of activity) sensitive and specific to physical pain. Here, we investigated whether cognitive reappraisal modified reported pain and biomarker responses elicited by noxious heat (N = 33). Cognitive reappraisal strongly modulated pain report, but had no impact on the biomarker. Instead, cognitive reappraisal influenced brain regions involved in reward, valuation, and cognitive control. In addition, the activity of the right ventrolateral prefrontal cortex (vlPFC) that has been implicated in cognitive reappraisal predicted greater regulation success in both directions of reappraisal (i.e., the goal to increase and decrease pain), and this relationship was mediated by the activity of the periaqueductal gray (PAG), a descending pain modulatory region. These results provide evidence that cognitive reappraisal does not change early nociceptive processing, but late decision and valuation. In addition, it suggests a critical role of the prefrontal-brainstem pathway for pain valuation and decision processes.

276) Abstract 500
NEUROPEPTIDE Y LEVELS ARE ASSOCIATED WITH ANXIETY SCORES IN CORONARY HEART DISEASE PATIENTS
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Neuropetide Y (NPY) is a 36-amino acid neuropetide that acts as a neurotransmitter in the central nervous system (CNS) and the autonomic nervous system (ANS). NPY modulates the presynaptic release or the postsynaptic action of noradrenaline in the ANS and exerts anxiolytic-like effects in the CNS. In addition, NPY acts as a neuro-immune-modulator. Since anxiety seems to be an independent risk factor for the incidence of coronary heart disease (CHD) and cardiac mortality, we studied the kinetics of NPY and its N-terminally truncating enzyme dipeptidyl-peptidase IV (DPP4) in CHD patients during anxiety inducing mental stress test. Therefore, 58 patients and 15 healthy subjects (40-75 years old) were studied using the Trier Social Stress Test (TSST), a public speaking task followed by mental arithmetic challenge in front of a panel of judges. Hospital Anxiety and Depression Scale (HADS), state anxiety measure (STAI-S) and index for stress (PASA), prior to and after the stressor were applied. Blood samples were collected prior to 1, 5, and 15 minutes after the TSST and NPY, DPP4 protein, and catecholamines were determined. All blood parameters significantly increased due to stress (p<0.01) and reached pre-stress-levels 15 minutes after the procedure. DPP4 protein was positively correlated with the increase of stress (r=0.34), whereas dopamine was strongly associated with noradrenaline levels (r=0.45). Most importantly, at all time points, NPY was negatively correlated with anxiety scales in HADS (r=-0.45), STAI-S (r=-0.38) and threat scale of PASA, (r=-0.45) whereas HADS depression scale remained non-associated.

Our study with CAD patients (i) demonstrate an association of NPY levels with the corresponding sympathetic neurotransmitter noradrenaline, thereby contributing to the ANS. Furthermore, (ii) DPP4 and even more pronounced (iii) NPY were inversely correlated with scores of control, anxiety and threat. We speculate that the NPY-DPP4 axis is deeply involved in the modulation of the ANS and neuro-immune-modulator. Since anxiety seems to be an independent risk factor for the incidence of coronary heart disease (CHD) and cardiac mortality, we studied the kinetics of NPY and its N-terminally truncating enzyme dipeptidyl-peptidase IV (DPP4) in CHD patients during anxiety inducing mental stress test.

**277) Abstract 162**

**IMPACT OF THE LEVEL OF EMOTIONAL AWARENESS ON SELF REPORTED EMOTION REGULATION STRATEGIES AND NEGATIVE AFFECT**

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Objective: The levels of emotional awareness scale (LEAS; Lane et al., 1990) allows to differentiate between implicit/ subconscious and explicit/ conscious levels in the processing of affective arousal; as a performance test the LEAS does not rely on self-report but confronts subjects with standardized tasks that elicit their individual levels of emotional awareness. A decreased capacity to experience affective arousal consciously as emotion may have an impact on self-reported negative affect as well as on self-reported emotion regulation strategies. In order to evaluate the impact of the levels of emotional awareness on these self-reports, we applied the LEAS and self-report measures for negative affect, emotion regulation strategies to a representative sample of the German general population.

Sample and Methods: A short version of the LEAS, the HADS (Hospital Anxiety and Depression Scale) and the ERQ (Emotion Regulation Questionnaire) that asks for suppression and reappraisal as emotion regulation strategies were applied to a representative sample of the German general population.

Results: The LEAS-scores were independent from self-reported anxiety. In subsamples with implicit emotional awareness, levels of negative affect as well as on self-reported emotion regulation strategies were positively correlated with suppression as emotion regulation strategy. In contrast, in subsamples with explicit emotional awareness depression was positively correlated with suppression and negatively with reappraisal. This findings were independent from age, in women an increase of suppression and a decrease of reappraisal was related to higher amounts of negative affect as in men.

Discussion: The ability to experience one's emotions consciously could be a precondition for the use of adaptive emotion regulation strategies like reappraisal. The prevalence of implicit or subconscious levels of emotional awareness may foster the use of maladaptive emotion regulation strategies and increase the risk to suffer from heightened negative affect.

**278) Abstract 359**

**PRETASK SOCIAL SUPPORT MODERATES THE ASSOCIATION BETWEEN PERCEIVED CHALLENGE AND CARDIOVASCULAR REACTIVITY**

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How people appraise a stressful situation affects their cardiovascular reactivity (CVR) to stress. This study aimed to investigate the associations between cognition, emotion, and CVR and how social support provided before a stressor moderates these associations. When social support is received before an upcoming stressor, we predicted that the stress task would be associated with lower CVR. This is because social support affects anticipatory coping, which involves evaluating a future event and the demands this event will require (Folkman & Lazarus, 1985). Also, social support might be helpful in regulating emotions and preparing an individual for the task.

We had our female participants (N = 210) perform two stressful tasks in front of a video camera, two unsupportive audience members, and an experimenter. After a rest period, participants underwent a five-minute Task 1, which was to induce stress. Following this, they proceeded to a five-minute social support period when they either rested alone (the alone condition) or had a random chat with a stranger who gave encouraging feedback (the social support condition).

Next, participants performed a stressful Task 2, after which they rated how challenging they perceived the task to be. Blood pressure readings were measured throughout the experiment. Results showed that the perceived challenge of Task 2 was not significantly associated with CVR in the alone condition (Bs < 1.25). However, in the support condition a higher level of perceived challenge of Task 2 was associated with attenuated blood pressure and mean arterial pressure reactivity (Bs > 6.97). In addition, while perceived challenge was associated with higher ratings of hostility in the social condition (B = .26), it was unrelated to feelings of hostility in the social support condition (B = .08). These findings suggested that CVR following social support is related to different psychological processes than when no support is provided, perhaps indicating different physiological processes as well.

**279) Abstract 101**

**ZOLPIDEM-INDUCED GALACTORRHEA VIA GABAERGIC INHIBITION OF DOPAMINE: A CASE REPORT**

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Introduction: Insomnia, which can be defined as difficulty in falling and/or remaining asleep or simply reduced quality of sleep, can be secondary to a physical or psychiatric condition. The prevalence of insomnia has been estimated to be as high as 32 to 33% of the population. Non-benzodiazepines such as zolpidem have become more commonly used due to their more favorable adverse effect profile. In this report, we will describe a case of zolpidem-induced galactorrhea.
affinity for α5 receptor subunit. Due to its selective binding, zolpidem has been found to have very weak anxiolytic, muscle relaxing and anticonvulsant properties while having very strong hypnotic properties. Psychotropic drugs have been well recognized to produce hyperprolactinemia. However, there has been no reported case of zolpidem-induced hyperprolactinemia. Specifically, zolpidem has been noted to activate GABAergic neurons within the ventral tegmental area (VTA), where there is a sizable population of GABAergic neurons. These GABAergic neurons regulate the firing of dopaminergic counterparts, also located in the VTA, which send projections throughout the brain. This inhibition results in a decrease in the dopaminergic inhibitory influence on prolactin and an increase in prolactin releasing factors which act on the anterior pituitary, leading to hyperprolactinemia and thus galactorrhea. Conclusion: Pharmacologically induced hyperprolactinemia may be a problem of underestimated prevalence due to the lack of externally visible symptoms as well potential shame associated with reporting of symptoms. However, more research is needed in this area to definitively associate zolpidem with hyperprolactinemia and its related symptoms.

In this pilot study, we generated spectral components of 16 undergraduate participants (7 female, age M = 19.50, SD = 2.66) using JTFD analysis following a mental arithmetic task. Estimates of LF/HF ratio were generated once per second, starting 30 seconds into recovery to limit the effects of sympathetic dominance of reactivity, and continuing for a total of 300 seconds. While many potential methods to analyze these data exist, we first estimated regression residuals for 60 second blocks of recovery data. Hierarchical linear modeling was used to estimate changes in the residuals over time as well as gender differences in residuals. Results for this conceptual study showed a marginally significant increase in residuals across time (t(77) = 1.58, p < .12), as well as a marginal gender difference – with men showing greater overall residuals (t(14) = 1.99 p < .07). Initial results suggest that JTFD analysis may enable researchers to model group differences in SVB during recovery.

281) Abstract 375
SELF-CARE AND PATHOPHYSIOLOGICAL MARKERS OF DISEASE SEVERITY IN PATIENTS WITH CHRONIC HEART FAILURE
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Background: Chronic heart failure (HF) requires a considerable amount of self-care in order to maintain health, but the evidence to support a link between HF self-care and health outcomes is limited. Therefore, our aim was to prospectively examine the association between HF self-care and pathophysiological markers of HF-related disease severity at 1-year follow-up.

Methods: 482 chronic HF outpatients (mean age 66.2±9.5 years, 74% men) from 4 teaching hospitals in the Netherlands completed the European Heart Failure Self-care Behaviour scale to assess HF self-care and consultation behavior at baseline and 12-month follow-up. HF-related pathophysiological markers of HF disease progression were also measured at both consecutive time points, and included heart pump function (left ventricular ejection fraction and brain natriuretic peptide), kidney function (glomerular filtration rates), liver function, and anemia. Results: After adjustment for age, sex, severity of HF (New York Heart Association Class), and standard risk factors, better HF self-care and consultation behavior were associated with lower glomerular filtration rates over time (linear mixed modeling using maximum likelihood estimation; p= .009 and p=.06, respectively), indicating worse kidney functioning. However, regular physical activity was associated with better kidney functioning (p=.03). HF self-care was not associated with other pathophysiological markers of disease severity.

Conclusion: HF self-care was associated with impaired kidney functioning over time. Patient’s awareness of renal dysfunction might prompt better self-care, but other interventions are needed to ward of kidney failure. Critically, regular physical activity was associated with better kidney functioning over time. Self-care was not associated with other parameters of HF disease severity.

282) Abstract 371
MOTHER AND BABY UNITS FOR MOTHERS WHO ARE PSYCHIATRICALLY ILL
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Psychiatric Mother and Baby Units were developed in Great Britain in the 1950’s. The majority of Mother and Baby Units are located in the British Isles and with some in the Antipodes (Buist et al, 2004) and a few else worldwide. The presence of this marked variation in the provision of Mother and Baby Units raises the question as to the evidence for their necessity and benefit. The Royal College of Psychiatrists Council report of 2000 made a series of recommendations including the necessity of a local perinatal mental health strategy to provide effective treatment on a comprehensive basis. Included in these recommendations was that Mother and Baby Units be established to allow admission of mothers with their babies. It was understood that because of economies of scale that it may be necessary for these to serve the needs of a number of health authorities. The Marce clinical database (Salmon, 2004). This lead to an examination of maternal, clinical and parenting outcome related to diagnosis and associations with poor outcomes (Salmon et al, 2003). Information was collected on over 1,000 mother and baby admissions including 224 mothers with schizophrenia, 155 with bipolar disorder,
409 with non-psychotic depression. There was a generally good clinical outcome in 78% of cases but there were particular predictors of poor outcome. In particular the factors that predicted poor outcome were a diagnosis of schizophrenia, behavioural disturbance during admission, low social class and psychiatric illness in the woman’s partner or a poor relationship with a partner. In those with poor outcome on all these four variables 66% suffered schizophrenia. A Cochrane review of Mother and Baby Units and schizophrenia (Joy and Saylan, 2007) discusses the issue of admitting mothers with schizophrenia and their babies together might be felt to be particularly important because of the difficulties for women with schizophrenia in forming attachment to their children. There is a dilemma in the US where there has been insufficient evidence to support the development of Mother and Baby units (Wisner, 1996)

283) Abstract 263
CIRCADIAN DISRUPTION AND TUMOR PROMOTION/PROGRESSION SIGNALS IN NEWLY DIAGNOSED BREAST CANCER PATIENTS
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Distress that begins with cancer diagnosis and continues with treatment is linked with circadian and endocrine disruption. Circadian/endocrine factors are potent immune modulators, and immune factors can, in turn, alter circadian/endocrine function. We hypothesized that distress and circadian/endocrine disruption would be positively associated with tumor-promoting immune and angiogenic factors.

Newly-diagnosed breast cancer patients (n=57) provided data on cancer-specific distress, rest-activity rhythm (actigraphy) and salivary cortisol levels. Carcinoma antigen (CAR) was positively associated with signals of tumor promotion and progression (Factor 1; R^2=.172, p=.047). Similarly, CAR activity rhythms were positively associated with signals of tumor promotion and progression (Factor 1; R^2=.172, p=.047). Thus, a high CAR activity level on the GSLP (p=.01). Fifty percent of SLE subjects were inactive (vs. 29% of controls), 20% were moderately active (vs. 14% controls), and 30% were active (vs. 57% controls). Walking was the most common activity in subjects with SLE compared to running or biking in controls. There were no between-group differences for VO2MAX or forced expiratory volumes. No group difference on the CII was found; 30% of the SLE subjects and 14% of the control subjects were globally impaired. Self-report activity was correlated with distance covered during the 6MWT (p=0.008) but not with VO2MAX. We found an inverse correlation between CII and distance walked during the 6MWT (p=0.03), but no correlation between CII and GLST, VO2MAX, BDI, or PSQI.

Conclusions: Subjects with SLE have lower self-report physical activity and objective exercise capacity than healthy controls. Cognitive impairment was associated with distance walked during the 6MWT but not forced expiratory lung volumes or depressive symptoms. Preliminary findings in our sample indicate that greater walk distance is related to subjective assessment of physical activity and better cognitive function. Techniques to increase “active” exercise participation in SLE may be useful in reducing cognitive difficulties.

285) Abstract 691
SUBJECTIVE SOCIOECONOMIC STATUS AND ADOLESCENT HEALTH OUTCOMES: A META-ANALYSIS
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Relative standing in the social hierarchy may underlie the graded relation that is consistently observed between socioeconomic status (SES) and health. Subjective SES, or the perception of one’s social rank, has been linked to health independently of objective SES and may be particularly relevant during adolescence due to inherent measurement issues to using parental SES during this transition time. The aim of the current study was to conduct a comprehensive systematic review of the literature to examine the association between subjective SES and health in adolescents and to identify factors that influence inclusion criteria for the meta-analysis. Information on study quality, demographics, subjective SES, health outcomes, and covariates were extracted from each study. Fisher’s Z was selected as the common effect size metric across studies. Random-effect meta-analytic models were conducted. Fail-safe numbers were calculated to address publication bias. Overall, subjective SES was associated with health during adolescence (Z = .10). A significant, positive association was observed for self-rated health (Z = .18), mental health outcomes (e.g., depression; Z = .19), body mass index (Z = .05), and general health symptoms (e.g., headaches; Z = .25); there was no association for biomarkers (e.g., cortisol; Z = .01) or health behaviours (e.g., smoking; Z = .01). Financial strain measures of subjective SES yielded the strongest association with adolescent health outcomes (Z = .24). Compared to ladder-style or Likert-scale measures, Controlling for objective SES did not attenuate the association between subjective SES
and health. These findings support previous hypotheses that subjective and objective SES measures reflect independent constructs, namely relative and absolute social status. This meta-analysis has important theoretical implications for the plausible pathways underlying SES and health in adolescents as perception of social status was most strongly linked to mental and self-rated health outcomes, which are closely tied to psychological processes. Future research should include measures of objective and subjective SES to increase understanding of pathways to health disparities across the lifespan.

286) Abstract 634

SAFETY VALUE OF SOCIAL SUPPORT STIMULI
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Although research has consistently highlighted the benefits of social support for mental and physical health, the mechanisms underlying these benefits are not well understood. By combining social support research with well-established models of fear conditioning and safety signaling, this study examines whether social support figures act as “prepared safety stimuli” during times of threat—naturally signaling safety and reducing threat-related stress, and consequently inhibiting fear learning. We hypothesize that social support reminders, in the form of images of close others, will interfere with fear learning such that individuals will less strongly associate fear with close others. To examine this, we used a classic fear-conditioning paradigm, investigating the strength of conditioned fear for 3 different types of stimuli: social support stimuli (images of social support figures), stranger stimuli (images of strangers), and neutral stimuli (images of flowers and mushrooms). For each subject, images from each set were first paired with shock, during an acquisition phase, and then presented without shock during an extinction phase, in order to test the strength of fear associations. Results showed that individuals formed typical fear associations for stranger and neutral stimuli—strong conditioned fear after acquisition, as measured by higher galvanic skin response (GSR), that were reduced but still present after extinction, as measured by marginally significant differences. Social support stimuli, however, did not produce any conditioned fear after acquisition, and, because there was no initial conditioning, no response was elicited. These results show that people do not form fear associations for their social support figures, suggesting that social support figures act as prepared safety stimuli—抑制ing fear learning and reducing threat-related stress—providing us with a novel way of understanding the links between social support and well-being.

287) Abstract 261

PSYCHOLOGICAL FACTORS ASSOCIATED WITH AEROBIC FITNESS, BUT NOT INFLAMMATION, IN ADOLESCENTS AT RISK FOR CARDIOVASCULAR DISEASE
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Background and Aims: Subclinical symptoms of psychological distress have been associated with increased expression of inflammatory markers in adults. However, the few extant studies of the relationship between psychological distress and inflammation in youth have produced mixed results. A direct relationship between psychological well-being and physical activity has been found across the lifespan, but studies using objectively measured aerobic fitness are scarce. This study investigated the relationships between psychological factors (depressive symptoms and perceived stress) and inflammatory markers in adolescents.

Methods: Depressive symptoms (CDI scores) and perceived stress (PSS), as well as maximal oxygen uptake (VO2max), plasma concentrations of CRP, and waist circumference were measured in 146 adolescents (109 boys; 11.3% Caucasian; 51.1% Hispanic) with a mean age of 16.1 years. Multiple regression analyses were used to examine associations between psychological factors and traditional CVD risk factors, controlling for gender and parental education.

Results: Multiple regression analyses indicated that depressive symptoms (β=−0.160, p<0.01) and perceived stress (β=−0.116, p<0.05) explained approximately 3% and 1%, respectively, of the variance in VO2max, above and beyond demographic variables and waist circumference. Depressive symptoms (β=−0.101, p<0.01) and perceived stress (β=0.007, p>0.01) were not associated with CRP, though traditional CVD risk factors, such as waist circumference (β=−0.529, p<0.01) and VO2max (β=−0.54, p<0.01), were associated with CRP in the expected directions, after controlling for demographic variables.

Discussion: Negative affect was associated with aerobic fitness, but not inflammation, in adolescents with elevated BP. This relationship may be bidirectional, as youth exhibiting depressive symptoms and higher perceived stress may be less likely to exercise and be fit, or, improved aerobic fitness is protective against the consequences of psychological distress. Future research should longitudinally examine whether aerobic fitness in youth is a mechanism by which psychological factors become associated with CRP and other CVD risk factors.

288) Abstract 432

THE RELATIONSHIP BETWEEN PERINATAL CHANGES IN SLEEP, DEPRESSION, STRESS AND BIRTH OUTCOMES IN PREGNANT MEXICAN-AMERICAN WOMEN
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Mexican Americans are the fastest growing population in the US (Ennis, Rios-Vargas & Albert, 2010). Mexican-American women have high birth rates per capita and adverse perinatal outcomes. It has been suggested that these adverse perinatal outcomes, such as stress and depression, may be related to changes in sleep during pregnancy, but this has yet to be investigated. The present study examined if changes in sleep relate to stress, depression, and other negative perinatal outcomes in pregnant Mexican American women. It was hypothesized that disruptive changes in the quality and quantity of sleep would alter levels of depression and stress during pregnancy as well as gestational age and birthweight of offspring. Pregnancy specific stress levels and depressive symptoms were measured via the New Prenatal Distress Questionnaire Revised (NUPDQ) and the Edinburg Postnatal Scale of Depression (EPDS) during early, mid, and late pregnancy (15-19, 26-29, 32-36 weeks gestation). Across three days at each time point, women also self-reported on quantities of sleep as well as quality of sleep on a 7-point Likert scale in a daily sleep diary. Values were averaged across three days per time point. Correlational analyses revealed that low birthweight was associated with more hours slept in early (r=0.36, p=0.02) and mid pregnancy (r=0.37, p=0.01). In addition, early gestational age was associated with waking less refreshed (r=0.40, p=0.01) and increased pregnancy specific stress in mid pregnancy (r=−0.37, p=0.01). Changes in sleep and pregnancy specific distress were adversely related throughout pregnancy such that waking less refreshed in early pregnancy was associated with increased pregnancy specific stress in mid pregnancy (r=−0.33, p=0.04) and pregnancy specific stress in early pregnancy was associated increased the hours slept in mid pregnancy (r=0.40, p=0.008). Mid pregnancy stress levels were also associated with increased hours slept (r=0.40, p=0.00). It was also found that a higher average level of depression was associated with more restful sleep (r=0.36, p=0.013). This report of stabilized values may be due the stigma of depression in this culture. The data suggests stress may be a better indicator of adverse outcomes than depression, and variations in sleep patterns and sleep quality early in the prenatal period may affect maternal and infant outcomes. It is imperative to examine the underlying culprits of maternal stress and depression as it may have long lasting effects not only on the mother, but also on the unborn child.

289) Abstract 704

EFFECTS OF SOCIAL STATUS AND SOCIAL EXCLUSION ON LABORATORY-INDUCED HEAT PAIN TOLERANCE AND INTENSITY
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Previous research points out that one’s social position may impact acute and chronic pain. There is also evidence for overlapping neural systems underlying social and physical pain. We aimed to learn whether subclinical symptoms of psychological distress and perceived social exclusion affect heat pain tolerance and intensity. Sixty-two women (aged 20 to 65) completed a
number of psychometric measures, including objective and subjective social status, pain catastrophizing and somatic symptoms, before baseline, heart rate tolerance and intensity. Subsequently, participants played a virtual ball-tossing game (cyberball) in which they were either included (social inclusion condition) or excluded (social exclusion condition). After the game, heart rate tolerance and intensity were assessed again. Results indicated that social exclusion but social inclusion results in an increased report of pain intensity. This increase was higher in individuals who report a stronger tendency to magnify pain (magnification subscale of the pain catastrophizing scale). There was no effect on pain tolerance. Subjective and objective social status variables were related to self-reported somatic symptoms (patient health questionnaire 15) and in part to measures of pain catastrophizing, but did neither affect baseline laboratory heat pain measures nor moderate the impact of virtual exclusion/inclusion on pain. Our findings suggest that associations between social variables and physical complaints are more complex and may differ depending on the nature of social experiences, the method of symptom assessment and dimensions of pain. Implications for future research are discussed.

290) Abstract 640
EFFECTS OF INTENSIVE ZEN TRAINING ON GENERAL MENTAL HEALTH: A CROSS-SECTIONAL STUDY USING A GHQ-28 QUESTIONNAIRE
Fumio Shaku, MD, Madoka Tsutsumi, MA, General Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan
Objectives: Meditation is a popular method for attaining mental peace. Zen is an effective meditation method. However, an advanced Zen state is very difficult to attain. In Japanese Zen monasteries, many trainees feel distress because of the demanding nature of training in the practice of their advanced Zen doctrines. In addition, the trainees are raised in different from modern lifestyles. Does their mental status change during the intensive training period? This study investigates the current situation regarding general mental health among Zen trainees in Japan.
Method: A total of 20 Rinzai Zen monasteries in Japan were selected. Personal information questionnaires and the Japanese edition of the international mental health assessment general health questionnaire (GHQ-28) were distributed to Zen trainees who trained in Zen more than six months. Acknowledged and fully completed answer forms were then statistically analyzed. The GHQ total scores and four subscales (Somatization, Anxiety, Social Dysfunction, and Depression) for the less than and more than six-month length training groups were compared. Result: A total of 275 information questionnaires and GHQs from 12 monasteries were returned to us. A total of 256 acknowledged and completed questionnaires were analyzed in this study. All trainees were male. Mean age was 27.6±6.7 years. Mean training length was 29.8 months. The GHQ mean total scores for less than and more than six months were 12.74 and 7.90 respectively, which indicates statistical significance (p<0.001). Additionally, three subscales (Somatization, Anxiety and Social Dysfunction) mean scores for less than and more than six months were also significant (p<0.05).
Conclusion: More than six months of Zen training can lead to significant improvement in trainees’ general mental health.

291) Abstract 726
RELATIVE CONTRIBUTION OF STRESS INDUCED CHANGES IN DIASTOLIC FUNCTION TO FOLLOW-UP HEART FUNCTION TWO YEAR LATER
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Objective: Heart failure caused by diastolic dysfunction is associated with high cardiovascular morbidity and mortality in adults. Whether reactive diastolic function (DF) to mental stress may predict future DF deterioration is unknown. We hypothesis that mental stress induced changes in the ratio of early to late velocities of mitral inflow (E/A ratio) will determine future DF. Methods. To address this issue, 10 healthy individuals (African American: 50%) aged 30 to 50 years were evaluated during 2 visits (years apart) consisting of a resting and a videogame challenge stressor phases (40 minutes each). After a 3 day sodium control diet, hemodynamics, and E/A ratio were examined every 20 minutes. Results. Among the 10 subjects those with the lowest resting E/A ratio at the follow-up either had low E/A at previous visit or large decreases of E/A ratio during the stressor. In fact the E/A ratio stressor value at Visit 1 correlated higher with the follow-up resting value than did the resting value at Visit 1 (r=.86 vs. r=.59).
Specifically, 40% of individuals who exhibited greater drop in E/A during stress at first visit had decreased E/A ratio at rest during follow-up (FU), 20% were unchanged. The remaining 40% had a slight E/A increase both during stress and resting FU. In this sample, Blacks showed more reactivity at 2 years FU than Whites (E/A reactivity= -16±11 vs. 12±13, respectively, p<0.05). Conclusion. These findings suggest that E/A response to mental stress may be predictive of future deterioration of heart function and cardiovascular health disparity.

292) Abstract 451
CAN VISCERAL ANXIETY, SLEEP AND DAILY HASSLES PREDICT SEVERITY OF SOMATIC SYMPTOMS?
Genna F. Hymowitz, Ph.D., Psychology, Stony Brook University, Stony Brook, NY
A growing body of research indicates an association between anxiety related to visceral sensations and somatic symptoms. Additionally, previous research supports relationships among sleep, stress and somatic symptoms. However, few, if any, studies have simultaneously evaluated relationships among visceral anxiety, sleep, daily hassles, and severity of somatic symptoms. The purpose of this project was to evaluate whether visceral anxiety, sleep impairment and daily hassle stressors predict presence of somatic symptoms. This study involved a secondary analysis of data collected as part of an investigation of gastrointestinal symptoms and stress response to a transient naturalistic stessor. The current analyses evaluated baseline levels of self-reported viscer anxiety, sleep and daily lifesty stressors and somatic ymptoms and sleep impairment in 91 undergraduate students and tested the following hypotheses a) daily stressors and visceral anxiety would significantly predict the presence of somatic symptoms and b) visceral anxiety would be a unique predictor of somatic symptoms. Results of study analyses supported both hypotheses. Sleep impairment, visceral anxiety and daily hassle stressors significantly predicted severity of somatic symptoms (respectively, β = 31, t(89) = 3.10, p < .01; β = .49, t(89) = .52, p < .01; β = 44, t(89) = 4.57, p < .01). The results of a hierarchical regression analysis indicated that the combination of the three predictors, visceral anxiety, daily hassle stressors and sleep impairment accounted for approximately 30% of the variation in somatic symptom severity (adjusted R2 = .28). However, visceral anxiety significantly predicted severity of somatic symptoms over and above sleep impairment and daily hassle stressors (Table 1). In sum, results suggest that sleep, daily hassle stressors and visceral anxiety predict somatic symptom severity, but only anxiety about visceral sensations uniquely contributes to the explanation of somatic symptom severity, highlighting the importance of assessing cognitive biases toward somatic sensations when evaluating patients presenting with somatic symptoms. Additional research is needed to more thoroughly evaluate potential cognitive and attentional biases toward somatic sensations and to assess whether addressing such biases can impact somatic symptom severity. A more comprehensive understanding of such associations will strengthen our efforts to effectively prevent and treat functional somatic disorders and other stress related health conditions.
The relationship between systolic blood pressure changes and affective states


Situations that disrupt pleasant moods or increase negative emotions are known to cause transient increases in blood pressure. Indeed, white coat hypertension is a condition where individuals exhibit extensive elevations in blood pressure in clinical settings compared to ambulatory recordings obtained outside of the medical surroundings. However, separate neural circuits are responsible for positive and negative affect, and these states may contribute differentially to blood pressure fluctuations. Two studies reported here assessed systolic blood pressure (SBP) when participants arrived for experimental sessions, which constitute novel contexts, high in uncertainty. A second measure was taken after a ten-minute rest period. We examined the correlation between SBP changes based on these two assessments and positive and negative moods measured when individuals reported to the sessions. In the first study, sympatico-vagal components accounted for 277 (241) of the variability of blood pressure levels in clinical settings.

293) Abstract 744
THE RELATIONSHIP BETWEEN SYSTOLIC BLOOD PRESSURE CHANGES AND AFFECTIVE STATES

Prospective validation of the panic screening score and the autonomic nervous system questionnaire in emergency department patients with unexplained chest pain: a preliminary investigation

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Introduction. Close to half of chest pain cases seen in the emergency department (ED) remain unexplained at discharge. Up to 44% of ED patients with unexplained chest pain (UCP) have panic attacks. However, more than 90% of cases remain undetected. We derived the Panic Screening Score (PSS), a four item questionnaire in an effort to help ED physicians identify panic attacks more effectively in patients with UCP. Objectives. 1) To prospectively validate the PSS in a sample of ED patients with UCP and 2) to assess the predictive validity of the 2 item Autonomic Nervous System Questionnaire for panic attacks in this patient population. Methods and Results. A total of 324 patients consulting ED with UCP were assessed using a validated four item questionnaire and the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV). Results. Nearly every second patient consulting ED with UCP suffered from insomnia. In comparison with primary insomniacs, insomniacs with UCP held more rigid attitudes about their sleep needs, had more erroneous beliefs about sleep-promoting practices, and were more likely to engage in worrying and distractions in their sleep. Psychiatric comorbidities, particularly anxiety disorders, were common and were associated with more severe sleep problems. Conclusions. Although not a life-threatening condition, sleep disturbances can provoke and exacerbate psychiatric symptoms and physical symptoms, and can lead to further emergency medical visits. Such disturbances should be addressed in ED.

290) Abstract 85
RANDOM ASSIGNMENT TO VOLUNTEERING IMPROVES CARDIOVASCULAR RISK MARKERS AMONG HEALTHY ADOLESCENTS

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The question of whether helping others (i.e., volunteering) benefits one’s own physical health has been suggested, but primarily investigated among older adults and never tested in an experimental design. This study aimed to assess potential benefits of volunteering among adolescents by randomizing 106 healthy grade 10 students (average age M = 14.9 ± .63 years, 52% male) to either weekly volunteering (assisting elementary school children during after school programs) for two months or to a wait-list control group. Participants completed questionnaires and underwent blood draws for the assessment of inflammatory and metabolic risk markers both at baseline and again four months later following the intervention. No group differences were found at baseline. Following the intervention, significant group differences were found across several markers, including lower levels of the inflammatory marker, CRP (adjusted log10 mean difference, .13; 95% CI, -0.111 to .275), and significantly lower interleukin-6 (adjusted log10 mean difference, .13; 95% CI, .004 to .251), total cholesterol (adjusted log10 mean difference, .03; 95% CI, .003 to .059), and body mass index (adjusted mean difference, .39; 95% CI, 0.7 to 7.1) when compared to students in the wait-list control group and adjusting for baseline. Results remained unchanged after adjusting for physical activity. Additional analyses within the intervention group only suggested that greater baseline-adjusted empathy (beta = -.33, P = 0.04) and altruism (beta = -.44, P = 0.004) were associated with lower IL-6 and cholesterol at follow-up, respectively. Higher baseline-adjusted negative mood was associated with higher CRP (beta = .46, P = 0.003) at follow-up. These psychosocial variables were not associated with physiological health outcomes. This intervention suggests that adolescents who volunteer not only help others but may benefit in...
Background: Acute mental arousal is a potent trigger of life-threatening cardiac arrhythmias, mediated by autonomic nervous system (ANS) dysregulation. The insula is part of the Central Autonomic Network (CAN) and may play a critical role in mental arousal-induced arrhythmias. The right insula is predominantly involved in sympathetic control and the left insula in parasympathetic control. The aim was to investigate ANS modulation during surgical brain tumor removal in two unique cases of right and left insular glioma. We hypothesized that insular tumor resection would affect ANS modulation and could cause cardiac arrhythmias, particularly in the patient with the right insular tumor. Methods: Elective craniotomy for low-grade astrocytoma (WHO grade II) removal was performed in 2 male patients (age = 44 and 50 years) in the right and left insula, respectively. ECG was obtained from the evening before surgery until completion of surgery. High-frequency heart rate variability (HF-HRV; 0.15 – 0.40 Hz, Fast Fourier Transform) was determined for 5 targeted 5-min epochs: nighttime (3 am); 15 min prior to, at the start of, and 15 min into tumor resection in the insula; and at the end of surgery (after suturing). Surgery was performed under sleep-awake-sleep conditions. The patient with the left insular tumor was awake during resection of the tumor in the insula and the patient with the right insular tumor was under mild sedation with propofol. Both were under mild sedation with propofol at the end of surgery. Results: Right insular tumor resection was accompanied by an increase in HF-HRV, followed by multiple premature atrial activations, sinus arrests and atrial escape beats. This condition was resolved with atropine. Left insular tumor resection was accompanied by a slight drop in HF-HRV. Conclusions: Right insular tumor removal resulted in parasympathetic activation and subsequent benign cardiac arrhythmias. Our findings indicate that a transient CNS-related increase in cardiac vagal activation may result in benign arrhythmias. Larger studies are needed to examine the interplay between emotional arousal and CAN activation as related to ANS dysregulation and cardiac arrhythmias.
THE IMPACT OF AGING ON DIURNAL RHYTHMS OF SALIVARY CORTISOL AND ALPHA-AMYLASE
Christiane A. Hoppmann, PhD, Psychology, University of British Columbia, Vancouver, BC, Canada, Stacey Scott, PhD, Center for Healthy Aging, Pennsylvania State University, University Park, PA, Urs M. Nater, PhD, Psychology, Philippus-Universität Marburg, Marburg, Hessen, Germany

Objectives: Salivary cortisol and alpha-amylase as central indicators of hypothalamus-pituitary-adrenal and autonomic nervous system functioning, respectively, are known to have distinct diurnal profiles. However, little is know about systematic changes in these key biomarkers across the adult lifespan. This study targets the impact of age on diurnal rhythms of cortisol and alpha-amylase.

Methods: A total of 185 participants (aged 20-81 years) provided time-stamped saliva samples for assessment of cortisol and alpha-amylase 7 times/day over 10 days. Samples were taken upon waking up, 30 minutes later, and then approximately every 3 hours until going to bed. We also assessed key control variables (e.g. BMI, sex, smoking).

Results: Multilevel models show that advanced age was associated with increased daily cortisol secretion as indicated by the area under the curve, attenuated wake-evening slopes, and more pronounced cortisol awakening responses. Furthermore, results concerning alpha-amylase indicate that higher age was related to increased alpha-amylase outputs and attenuated wake-evening slopes. No age differences were observed regarding the alpha-amylase awakening response.

Conclusions: These findings are in accord with previous work suggesting age-related wear and tear in biological stress systems. They contribute to a better understanding of age-related differences in daily stress responses. Future studies assessing diurnal rhythms of cortisol and alpha-amylase should take into account age as a key factor.

301) Abstract 735
MULTIPLE FACTORS OF NEIGHBORHOOD DEPRIVATION DIFFERENTIALLY PREDICT PHYSICAL HEALTH IN A LARGE AFRICAN AMERICAN SAMPLE
Israel C. Christie, PhD, Biostatistics, Larkin L. Strong, PhD, Seann D. Reitze, MA, Health Disparities Research, Jian Wang, PhD, Biostatistics, Lorraine R. Reitze, PhD, David W. Wetter, PhD, Lorna H. McNeill, PhD, Health Disparities Research, The University of Texas MD Anderson Cancer Center, Houston, TX

The socioeconomic status of communities, also referred to in its inverse as neighborhood deprivation, is increasingly viewed as a potential contributor to racial/ethnic and socioeconomic health disparities. Neighborhood deprivation indices and generally constructed using multivariate reduction of census data and have resulted in a single factor or deprivation index. The aims of this study were: 1) to determine if a single factor solution is sufficient to describe neighborhood deprivation in the present study and 2) to determine how the resulting neighborhood deprivation factor(s) are related to self-reported physical health. The sample was recruited from a predominantly African American church in Houston, TX (N = 1374; 75% female; 99% African American). Principal components analysis with oblique rotation of 11 commonly employed American Community Survey variables at the tract level yielded a two factor solution. The first factor, accounting for 41% of the variance, represented education, occupation, housing, and income and the second factor, accounted for an additional 25% variance, represented unemployment and poverty. Self-reported physical health was assessed as the number of self-reported chronic conditions from the following list: diabetes, heart disease, kidney disease, high blood pressure, asthma/lung disease, stroke, high cholesterol, and thyroid problems. The number of chronic conditions was regressed onto the two z-transformed neighborhood deprivation factors using Poisson regression within a generalized estimating equation framework to account for clustering of participants within 312 unique census tracts. In adjusted models (controlling for participant age, gender, education, and household income), only the first factor significantly predicted physical health (incidence rate = 1.07; p = 0.016). Findings suggest a multifactorial view of the neighborhood deprivation construct may be warranted and could reveal some elements are more strongly associated with physical health than others. Additional research is needed to determine if these findings are generalizable to other populations. Supported in part by NIH CA016672.

302) Abstract 384
INCREASED MID-CINGULATE RESPONSES TO INHIBITORY STIMULI IN VETERANS WITH PTSD AFTER COMBAT-RELATED CONCLUSION
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Background. Over twenty-five percent of military personnel who experience mild traumatic brain injury (mTBI) during combat in Operations Enduring or Iraqi Freedom (OEF/OIF) develop posttraumatic stress disorder (PTSD). In veterans with mTBI, comorbid PTSD is associated with increased risk of cognitive, mood and medical problems including alcohol or substance use and suicide. Symptoms of PTSD include hyperarousal, which has been associated with overactive brain activity, especially in response to emotional stimuli. Over-active areas include the dorsal cingulate, an area responsible for selecting optimal motor and mental responses to salient stimuli. Approach. We hypothesized that, compared to veterans with mTBI only, veterans who develop PTSD after mTBI would exhibit altered dorsal cingulate activity during response inhibition. To test this hypothesis, we recorded electroencephalography (EEG) in 33 OEF/OIF veterans (16 mTBI only; 17 mTBI+PTSD) during the Stop Task, a validated inhibitory control task requiring inhibition of initiated motor responses. Results. Behaviorally, no group differences in accuracy were observed. In the 150-250 ms window after onset of the Stop Signal (auditory beep), all veterans exhibited the N200, an event-related potential (ERP) associated with conflict monitoring and response inhibition, that consistently source localizes to the dorsal cingulate. Compared to mTBI only veterans, veterans with mTBI+PTSD exhibited greater peak N200 amplitudes (p < 0.001). Greater N200 negativity (at Cz) correlated with greater PTSD severity (p < 0.005). Independent brain components contributing maximally to N200 source localized to 3 primary clusters: mid-cingulate (MCC), parietal and occipital cortex. Only the MCC cluster reproduced greater N200 amplitudes in mTBI+PTSD versus mTBI only veterans. Furthermore, greater MCC N200 amplitudes correlated with greater PTSD symptom severity.

Conclusion. Consistent with our hypothesis, these results demonstrate that veterans with PTSD after mTBI exhibit altered brain activity in dorsal cingulate areas responsible for optimal response selection. These changes may suggest the hypothesis that cognitive, mood and medical disabilities in veterans with mTBI+PTSD arise, at least in part, from abnormal mid-cingulate responses during processing of salient stimuli.

303) Abstract 570
DOES CARDIOVASCULAR EMOTIONAL DAMPENING REDUCE SOCIAL SUPPORT?
Jack G. Graham, Pre-BS, Melissa A. Hibdon, Pre-BS, Aaron W. Nathan, Pre-BS, Ronald R. Schram, Pre-BS, Psychology, Meredith T. Caldwell, Pre-BA, Biological Sciences, James A. McCubbin, PhD, Psychology and Public Health Sciences, Clemson University, Clemson, SC

Elevations in resting blood pressure are associated with reduced recognition of emotion in facial expressions and in other emotionally relevant stimuli. This cardiovascular emotional dampening may have a significant impact on psychosocial functioning. For example, reduced recognition accuracy of emotions in facial expression could produce a cascade of communication difficulties that undermine close personal relationships and impair the development of social support networks. We measured this by assessing resting blood pressure perception of affect and perception of social support in 72 young women and men. After measurement of resting systolic and diastolic blood pressure with a calibrated Dinamap Pro 100, participants were giving the Perception of Affect Task (PAT), the Social Provisions Scale (SPS) and the Toronto Alexithymia Scale (TAS-20).

Results. Behaviorally, no group differences in accuracy were observed. In the 150-250 ms window after onset of the Stop Signal (auditory beep), all veterans exhibited the N200, an event-related potential (ERP) associated with conflict monitoring and response inhibition, that consistently source localizes to the dorsal cingulate. Compared to mTBI only veterans, veterans with mTBI+PTSD exhibited greater peak N200 amplitudes (p < 0.001). Greater N200 negativity (at Cz) correlated with greater PTSD severity (p < 0.005). Independent brain components contributing maximally to N200 source localized to 3 primary clusters: mid-cingulate (MCC), parietal and occipital cortex. Only the MCC cluster reproduced greater N200 amplitudes in mTBI+PTSD versus mTBI only veterans. Furthermore, greater MCC N200 amplitudes correlated with greater PTSD symptom severity.

Conclusion. Consistent with our hypothesis, these results demonstrate that veterans with PTSD after mTBI exhibit altered brain activity in dorsal cingulate areas responsible for optional response selection. These changes may suggest the hypothesis that cognitive, mood and medical disabilities in veterans with mTBI+PTSD arise, at least in part, from abnormal mid-cingulate responses during processing of salient stimuli.

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Elevations in resting blood pressure are associated with reduced recognition of emotion in facial expressions and in other emotionally relevant stimuli. This cardiovascular emotional dampening may have a significant impact on psychosocial functioning. For example, reduced recognition accuracy of emotions in facial expression could produce a cascade of communication difficulties that undermine close personal relationships and impair the development of social support networks. We measured this by assessing resting blood pressure perception of affect and perception of social support in 72 young women and men. After measurement of resting systolic and diastolic blood pressure with a calibrated Dinamap Pro 100, participants were giving the Perception of Affect Task (PAT), the Social Provisions Scale (SPS) and the Toronto Alexithymia Scale (TAS-20).

Results. Behaviorally, no group differences in accuracy were observed. In the 150-250 ms window after onset of the Stop Signal (auditory beep), all veterans exhibited the N200, an event-related potential (ERP) associated with conflict monitoring and response inhibition, that consistently source localizes to the dorsal cingulate. Compared to mTBI only veterans, veterans with mTBI+PTSD exhibited greater peak N200 amplitudes (p < 0.001). Greater N200 negativity (at Cz) correlated with greater PTSD severity (p < 0.005). Independent brain components contributing maximally to N200 source localized to 3 primary clusters: mid-cingulate (MCC), parietal and occipital cortex. Only the MCC cluster reproduced greater N200 amplitudes in mTBI+PTSD versus mTBI only veterans. Furthermore, greater MCC N200 amplitudes correlated with greater PTSD symptom severity.

Conclusion. Consistent with our hypothesis, these results demonstrate that veterans with PTSD after mTBI exhibit altered brain activity in dorsal cingulate areas responsible for optimal response selection. These changes may suggest the hypothesis that cognitive, mood and medical disabilities in veterans with mTBI+PTSD arise, at least in part, from abnormal mid-cingulate responses during processing of salient stimuli.
The observed relationship between diastolic blood pressure and PAT scores replicates other studies of cardiovascular emotional dampening. The interaction of blood pressure and PAT scores is independent of health status as measured by the Total TAS-20 scores. Interestingly, systolic blood pressure was inversely related to PAT scores, but not SBP scores. SBP scores were, however, correlated with TAS-20 scores, suggesting that the relationship between SBP and PAT is mediated, at least in part, by alexithymia. These results could be reflected as a lack of emotional dampening on subjective PAT scores. Alternatively, these results could reflect two forms of cardiovascular emotional dampening, with diastolic emotional dampening affecting the perception of affect independent of alexithymia and systolic emotional dampening affecting social support in concert with alexithymia.

304) Abstract 323
CAN EMOTION REGULATION TRAINING ENHANCE CBT FOR MULTIPLE SOMATOFORM SYMPTOMS? RESULTS OF A NON-RANDOMIZED CONTROLLED PILOT STUDY
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Purpose: Multiple somatoform symptoms (MSS) are associated with increased health care use. Psychological interventions consistently did not exceed medium effect sizes. Since many MSS patients lack emotional awareness the integration of emotion regulation training could enhance the effects of psychological interventions. Can CBT achieve better outcomes if it is enriched with emotion regulation training (ENCERT)? Intervention: Both treatment conditions consist of 20 weekly individual sessions. ENCERT contains: 1) psychoeducation and relaxation techniques, 2) non-judgmental awareness of body perceptions, 3) modifying illness behavior, 4) accepting unpleasant body perceptions, 5) defocusing the attention on positive perceptions, 6) emotional self-support, 7) analyzing difficult situations and change of behavior and thoughts. Method: The study took place in the clinics of the universities of Marburg and Mainz with each center providing one intervention. Patients presenting at least 3 medically unexplained somatic symptoms for a minimum of 6 months were included. Assessments took place before beginning and after completion of therapy. Primary outcome is the somatic symptom severity during the last 7 days (SOMS-7). Secondary outcome variables are emotion regulation skills, illness behavior, general psychopathology, disability, quality of life, symptom intensity and subjective impairment. Results: Both groups (CBT n=22, ENCERT n=20) showed significant improvement in the somatization severity index (CBT d=0.46; ENCERT d=0.70) and for the somatization symptom count (CBT d=0.50; ENCERT d=0.72). Controlling for clinical relevant baseline variables (depression, health related QoL) there is nearly a significant difference between the groups in favour of ENCERT in the somatization severity index after completion of therapy (ANOVA: F(1,37)=4.058, p=.051). Regarding secondary outcomes patients significantly improve during ENCERT in the intensity (d=0.59) and in the annoyance (d=1.25) of symptoms, and they acquire greater emotion regulation competence (d=1.14). Conclusion: Patients with MSS improve during ENCERT and CBT with consistently larger effect sizes for ENCERT. However we were not able to find time by group interactions. This might be due to a lack of statistical power. Therefore our next step is the preparation of a large randomized, controlled multicenter trial. So far there is enough evidence that ENCERT can lead to a significant increase of treatment efficiency for this costly group.

305) Abstract 596
RELATIONS OF BLOOD PRESSURE AND HEAD INJURY TO REGIONAL CEREBRAL BLOOD FLOW
Jason Kissler, BS, Allyssa J. Allen, MA, Psychology, University of Maryland, Baltimore County, Baltimore, MD, Leslie I. Katz, MD, Geriatrics, University of Maryland, School of Medicine, Baltimore, MD, Elliot L. Siegel, MD, Radiology and Nuclear Medicine, University of Maryland Medical Center, Baltimore, MD, David Lefkowitz, MD, Neuroimaging, Banner University Medical Center Phoenix, AZ, Cerrington B. Wendell, Ph.D., Department of Radiology, Johns Hopkins University School of Medicine, Baltimore, MD, Shari R. Waldstein, Ph.D., Psychology, University of Maryland, Baltimore County, Baltimore, MD, Hypertension increases risk for cognitive decline, dementia, and cerebrovascular disease. These associations have been attributed, at least in part, to cerebral hyperperfusion. Here we posit that previously noted relations of higher blood pressure to lower levels of cerebral perfusion may be potentiated by a prior head injury. Participants were 87 community-dwelling older adults (69% men, 89.7% white, mean age= 66.9 years, 27.6% with a history of mild head injury defined as a loss of consciousness less than 30 minutes) free of major medical (other than hypertension), neurological (including severe head injury) or psychiatric comorbidities, all engaged in clinical assessment of systolic and diastolic blood pressure (SBP, DBP) and single photon emission computed tomography (SPECT). Computerized coding of the SPECT images yielded relative ratios of blood flow in left and right cortical and select subcortical regions. Cerebellum served as the denominator. Multiple regression analyses examined potential interactive relations of SBP (and DBP in separate models) and history of mild head injury to regional cerebral blood flow estimates. Analyses were sex-stratified (due to known sex differences) and adjusted for age, education, race, alcohol consumption, smoking status, and depressive symptomatology. Analyses revealed significant interactions of blood pressure and head injury to cerebral blood flow in men only. Specifically, among men with a history of head injury, higher systolic blood pressure was associated with lower levels of perfusion in the left orbital (β=−2.74, p=.031) and left dorsolateral (β=−2.48, p=.039) prefrontal cortex, and left temporal cortex (β=−3.00, p=.016); higher diastolic blood pressure was similarly associated with lower levels of perfusion in the left dorsolateral prefrontal cortex (β=−2.68, p=.037). These results indicate that men with a history of head injury may be particularly vulnerable to the impact of higher blood pressure on cerebral perfusion in left anterior regions, thus potentially enhancing risk for adverse brain and neurocognitive outcomes.

306) Abstract 633
THE INTERACTION BETWEEN PERCEIVED SOCIAL SUPPORT AND SALIVARY OXYTOCIN IN THE CORTISOL STRESS RESPONSE
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Both social support and oxytocin (OT) are thought to play a role in buffering the physiological stress response. Little work has tested both variables together, however, and no study has tested whether natural levels of OT play a role in reactivity and recovery. The goal of the current study was, therefore, to test whether naturally occurring resting OT interacted with perceived support to determine cortisol responses before and after an evaluative speech task. Ninety two participants (ages 17 to 25) were assessed in this study. Saliva was sampled for hormonal assessments at baseline, 15 minutes after the speech stress and following a recovery period at the end of the study. Regression analyses were conducted controlling for hours of sleep, hours since eating, oral contraceptives, exercise, and general caffeine, alcohol, and smoking intake. Participants were also in an experimental trial (as part of a larger study) and therefore condition was controlled. Regressions revealed a marginally significant interaction between OT and perceived social support on cortisol stress reactivity induced by a speech task (β =−3.50, p=.09) where those with lower support had no change relating to OT while those higher in support and OT had higher reactivity. Support and OT also interacted to predict cortisol stress recovery (β =−4.00, p=.021). In this case, low social support did not vary with baseline OT levels, but those with higher in social support and higher OT had better cortisol recovery than those with higher social support and low OT. These findings suggest that the combination of social support and high OT produces a stronger stress reaction, but also a better stress recovery where cortisol returns to baseline faster than those individuals with high support but low OT. Those with low support, however, do not have altered stress responses based on OT. This suggests a need for an interactionist perspective when considering the effects of OT on physiology and health.
307) Abstract 715

CAFFEINE AND SEX INFLUENCE INFLAMMATORY RESPONSES TO ACUTE STRESS

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The connection between caffeine and cardiovascular disease (CVD) pathogenesis is controversial. However, chronic inflammation is associated with elevated CVD risk. In vitro caffeine exposure appears to decrease both anti-inflammatory [e.g., interleukin (IL)-4, IL-10] and proinflammatory [e.g., IL-2, IL-6, IL-1beta (1b), tumor necrosis factor–alpha (TNF-a)] cytokine production. Acute stress reliably increases proinflammatory markers such as IL-6 and IL-1b. We examined the effect of caffeine administration on the inflammatory stress response in 26 males and 26 females (age 18-29 years) with a confirmed family history of hypertension. Daily caffeine consumers were included following an intensive health screening to confirm normal cholesterol levels and health status. Following confirmation of parental hypertension, participants completed a 3.5-hr lab session to examine inflammatory responses to a speech and mental arithmetic stressor either without (N=26) or with (N=26) 3.5 mg/kg orally administered caffeine. Blood samples were collected immediately before stress (20 mins pre-stress), post-stress caffeine administration) and 15 mins apres. Women completed their lab session during the luteal phase of their menstrual cycle. When controlling for pre-stress levels, IL-6, IL-2, and IL-1b levels increased and IL-10 levels decreased in response to stress (P< .05). Caffeine and sex interacted with stress to effect IL-4 levels such that males, regardless of caffeine exposure, displayed a similar decrease while caffeine-treated females exhibited an increase and placebo-treated females showed a decrease. In addition, caffeine treatment influenced TNF-a levels following stress. Specifically, TNF-a levels increased in response to caffeine and stress yet decreased under placebo and stress conditions. These results suggest that caffeine administration under stress can influence the inflammatory response to acute stress and may have significantly different effects between the sexes. The adenosine receptor, caffeine’s endogenous cite of action, has been purported as a novel pathway to control inflammatory disease and our data suggest the need for closer examination of this potential mechanism.

308) Abstract 475

FEASIBILITY AND UTILITY OF SCREENING FOR DEPRESSION AND ANXIETY DISORDERS IN PATIENTS WITH CARDIOVASCULAR DISEASE

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Background: Depression and anxiety disorders in cardiac patients are common and independently associated with adverse outcomes. Routine depression screening for cardiac patients has been recommended, though there are concerns about feasibility. Furthermore, there has been minimal focus on screening for anxiety disorders in this cohort.

Methods: As part of a care management trial, a three-step screening procedure was used to detect depression, generalized anxiety disorder (GAD), and panic disorder (PD) among patients admitted to two cardiac care units at an urban academic medical center. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-2 (GAD-2), and one item about panic attacks. Patients with positive follow-up assessments then underwent diagnostic assessments for depression (PHQ-9) and GAD/PD (PRIME-MD modules) via the social worker. Age, gender, and screening results were recorded for all patients admitted to the two units (September 2010 - August 2012). Logistic regression analyses that included age, gender, and each Coping Screen item were performed for each psychiatric diagnosis to assess whether positive screens on any of the Coping Screen items were independently associated with an ultimate diagnosis of depression/GAD/PD. A second set of analyses were performed to assess the predictive value of the 5 follow-up assessment items (i.e., PHQ-2/GAD-2/panic).

Results: In total, 6212 patients completed the Coping Screen items. Overall, 582 completed the three-step screening, and 36% (207) patients received a psychiatric diagnosis (143 depression, 129 GAD, 30 PD). A substantial minority of positive-screen patients were discharged before completing all three stages. The PHQ-2 items were both independently associated with a subsequent depression diagnosis, the GAD-2 items were both associated with GAD, and the panic attack item with PD; the Coping Screen items were largely not associated with a psychiatric diagnosis.

Conclusions: GAD was nearly as prevalent as depression in cardiac inpatients, and given its links to cardiac events, should be a focus of screening alongside depression. The three-item screening process was inefficient, and a more feasible two-stage method would use the PHQ-2 plus GAD-2 followed by diagnostic assessment.

309) Abstract 768

EXAMINING THE RELATIONSHIPS BETWEEN HEALTH-RELATED QUALITY OF LIFE IN INDIVIDUALS WITH SCI AND THE MENTAL HEALTH OF THEIR CAREGIVERS IN COLOMBIA, SOUTH AMERICA

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Background: Although much research has been conducted on family caregivers of individuals with various types of disabilities, SCI caregivers have received considerably less research focus, especially in global regions like Latin America. Method: Participants included thirty-four individuals with SCI and their primary caregivers (34 dyads; n = 68). The eight subscales of the Short-Form-36 assessed HRQOL in individuals with SCI. Five aspects of caregiver mental health were assessed, including burden (ZBI), satisfaction with life (SWLS), depression (PHQ-9), self-esteem (Rosenberg SES), and anxiety (STAI). Results: A series of multiple regressions uncovered strong associations among the HRQOL of individuals with SCI and various aspects of caregiver mental health. The regression using the eight SF-36 subscales of individuals with SCI to predict caregiver burden was statistically significant, F (8, 25) = 2.51, p = .037, R2 = .446. Physical functioning, t(25) = -2.29, p = .032 and pain, t(25) = 2.60, p = .015, were independently associated with caregiver burden, such that higher physical functioning scores and higher pain in individuals with SCI were associated with lower caregiver burden. Patient pain, t(25) = -3.10, p = .005, and general health, t(25) = 2.69, p = .013, were also independently related to caregiver satisfaction with life, such that better patient general health was associated with higher caregiver satisfaction with life, and less patient pain was associated with lower caregiver satisfaction with life. Patient pain was also independently related to caregiver anxiety, t(25) = 2.71, p = .012, such that lower patient pain was associated with higher caregiver anxiety. Conclusion: Lower physical functioning and health in individuals with SCI can place a very heavy burden on family caregivers, requiring them to perform basic duties such as bathing, feeding, and dressing. These more basic care responsibilities likely channel directly into psychological burden on family caregivers and lower their satisfaction with life. As HRQOL in individuals with SCI has been shown to be robustly related to their caregiver’s mental health in the current study, these findings suggest that the two sets of variables are intimately linked. Thus, further research should address patient and caregiver physical and mental health needs to help reduce distress and to promote higher quality of life, especially in Latin America.
Socioeconomic Status and Health: Income and Education Are Joint Predictors of Telomere Length in Middle-aged and Older Women

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Lower socioeconomic status (SES) is associated with increased risk of morbidity and mortality across a number of different diseases. Telomere length is thought to index the biological process of aging and has also been associated with a general increase in risk of death and disease. Hence, shortened telomere length, suggesting quickened biological aging, may be one mechanism by which lower SES is generally, inversely associated with negative health outcomes. To date, studies on the relationship between telomere length and SES have been inconsistent, and few studies have examined potential interactions with gender or interactions among different indicators of SES (e.g., education and income). In this study, we examined both simple and more complex associations (i.e., interactions) between gender, different indicators of SES, and telomere length. Our sample consisted of one hundred fifty-five individuals from a community sample, who were between the ages of 48 and 77 years old. Telomere length was determined from peripheral blood mononuclear cells via quantitative polymerase chain reaction. Statistically controlling for age, we found no main effect of income or education on telomere length. However, there was an interaction between gender and income such that higher income was associated with longer telomere length for women but not men. Additionally, this two-way interaction was moderated by education. The positive relationship between income and telomere length was only found for women who had acquired less education. There was no relationship between income and telomere length for women who had acquired more education. Results suggest that associations among indicators of SES and telomere length may differ by gender, independent of age.
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Rates of diabetes are rising rapidly worldwide. In the US, Latinos and other ethnic minorities are disproportionately affected by these trends. Higher levels of social support are associated with health behaviors that are critical for diabetes prevention, including physical activity and favorable dietary intake. However, little is known about the association between social support and diabetes in the US Latino population. We explored the relationship of structural and functional social support with diabetes prevalence among participants from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). HCHS/SOL is a cohort study of 16,415 Latino adults aged 18-74 years, recruited from four US cities (Chicago, IL; Miami, FL; Bronx, NY; San Diego, CA). The current analyses included 5187 HCHS/SOL participants [42% > 45 years old; 77% born outside of US mainland; 55% women (all weighted to 2010 US census)] who completed structural social support (Cohen Social Network Index) and functional social support (Interpersonal Support Evaluation List-12) measures. Diabetes was defined as present if any of the following criteria was met: fasting glucose >126, glycosylated hemoglobin >6.5%, post-oral glucose tolerance test glucose >200, and/or, on glucose-lowering medication. Diabetes prevalence was 15.8% (95% CI 14.5%, 17.2%; weighted to 2010 US census). Logistic regression analyses showed that after adjusting for design effects, sample weights, and demographic factors, fewer high contact roles (OR=1.08, 95% CI 1.02, 1.14) and lower perceived social support [OR (1-1.15), 95% CI 0.96, 1.04] were significantly related to increased diabetes prevalence. On average, one less social role and one SD lower perceived support related to 8% and 15% increased odds of prevalent diabetes, respectively. The cross-sectional study design limits assessment of directionality; however, this study suggests that reduced structural and functional support are associated with a modestly elevated diabetes prevalence among US Latinos. These findings may help inform future prevention and intervention efforts.

314) Abstract 686
THE IMPACT OF POOR QUALITY RESIDENTIAL ENVIRONMENTS ON PHYSICAL AND MENTAL HEALTH RELATED QUALITY OF LIFE IN URBAN DWELLING ADULTS
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Identifying contextual factors that negatively impact health within urban neighborhoods is critically important to eliminate socioeconomic inequalities in health. In that regard, we posited that people living below poverty status would reside in neighborhoods with poor quality residential conditions. Additionally, we hypothesized those individual aspects of poor residential conditions would be associated with lower physical and mental health-related quality of life (QoL) in 2,802 diverse adults enrolled in the HANDLS study. At the baseline visit volunteers completed a 12-item Short Form (SF-12) Health Survey. Residential characteristics by census tract were obtained from the American Community Survey. The sample was 57.2% female, and 44% male, 58% black, and 41% reported income less than 125% of the Federal poverty level. Independent sample t-tests confirmed that people living below poverty status resided in neighborhoods with a higher percent of households without mortgages (p<.001), higher percent vacant units (p<.001), higher percent of people without a vehicle (p<.001), higher percent of homes without heating (p<.001), higher percent of homes without complete plumbing (p<.01), higher percent of homes without telephone (p<.001), and higher percent of people living per room, [between 1-1.5 (p<.01), greater than 1.5 (p<.001)]. Separate multiple regression analyses for each residential factor, adjusted for age, sex, race and poverty status, revealed that higher percent vacant units (p<.05), higher percent of people without a vehicle (p<.05), higher percent of homes without complete plumbing (p<.05), or higher percent of homes without a complete kitchen (p<.05), was associated with lower physical QoL. Only higher percent of homes with greater than 1.51 people living per room was related with lower mental health QoL (p<.01). Standard physical living conditions were associated with lower physical QoL, whereas residential crowding was associated with lower mental QoL. People below poverty status resided in neighborhoods with poor quality residential environments, however distinct residential characteristics were differentially associated with physical and mental health QoL.

315) Abstract 424
OPTIMIZING PREOPERATIVE EXPECTATIONS IN HEART SURGERY PATIENTS: A RANDOMIZED CONTROLLED TRIAL
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In coronary heart disease and heart surgery there is sound evidence for the relationship between patients’ expectations and treatment outcome. In addition, patients’ expectations have been shown to be modifiable through psychological interventions. Therefore targeting patients’ expectations might offer a promising opportunity to enhance heart surgery outcome. However, few studies have thus far investigated patients’ expectations before surgery. The purpose of this clinical trial is to optimize patients’ outcome expectations before undergoing coronary artery bypass graft surgery (CABG) through a brief psycho-educational program. Method: 75 patients waiting for elective CABG have been randomly assigned to one of three groups: Expectation manipulation intervention (EMI), supportive therapy (SP) or standard medical care. Satisfaction with EMI (M = 32.50; SD = 3.94) and SP (M = 29.11; SD = 4.57), assessed after the interventions but before surgery, is very high (7 item scale ranging from 0 to 35). Expectations in the EMI group improved significantly compared to both control groups. Only Patients receiving EMI showed increased scores on the expectations concerning disease duration (F=5.80; p = .02; h2=24) and personal control (F=6.49; p = .01; h2=27). Long-term follow up investigations are currently undertaken. Discussion: This brief psycho-educational intervention leads to optimized preoperative expectations. Patients in the EMI group developed a more realistic view about disease duration and improved expectations in being able to control the course of their disease themselves. Future analysis will show whether improved expectations lead to better recovery from CABG.

316) Abstract 756
HEALTHY WOMEN AT FAMILIAL RISK FOR BREAST CANCER: EVIDENCE ALTERATIONS IN SYMPATHOVAGAL BALANCE IN AN EXPERIMENTAL STRESS STUDY
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A growing body of research suggests that a mean age of 47.2 ± 22 years), women with breast cancer may have an altered sympathovagal balance leaving them susceptible to stress induced cardiometabolic effects of acute stress. We assessed sympathetic and parasympathetic balance during laboratory assessment in 100 premenopausal women (n=100) in good health (by self-report, physical exam, and blood screens), 50 with family histories of breast cancer (FH+), and 50 without (FH-). All participants signed informed consent and completed a laboratory-based experimental assessment, which included baseline (30 min), stressor (15 min), and recovery (10 min) periods, with heart rate variability analysis of the time domain continuously recorded. The stressor was the Trier Social Stress Test (TSST), a well-validated social stressor that includes...
speech preparation (5 min) and presentation (5 min), and completing math problems orally (5 min) for a live evaluator while being videotaped. Repeated measures ANOVA showed significant differences between the two groups across the five study periods (Wilks’s Lambda = 2.5, p<.05). The FH+ women had higher autonomic reactivity as indexed by the heart rate variability ratio LF/HF during the speech preparation and recovery periods (p<.05). There were no significant differences in HR or respiration rates across study periods (p>.05). Age and BMI were controlled in these analyses. The higher levels of autonomic reactivity in FH+ women suggest that these women may be more sympathetically reactive to impending stressful situations and less able to inhibit sympathetic arousal post-stressor, perhaps as a result of insufficient parasympathetic response. The potential utility of behavioral interventions to reduce autonomic reactivity to daily stressors should be considered for women at high risk for breast cancer.

317) Abstract 509
COLD AT HEART: VAGALLY MEDIATED HEART RATE VARIABILITY PREDICTS COLD PRESSOR TASK PERFORMANCE - PRELIMINARY DATA
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Background: Individuals differ widely in their perceptions of pain. Furthermore, the nervous system has been implicated as a possible determinant of individual differences in pain sensitivity. However, to date few studies have examined the association between HRV and pain in the cold pressor task (CPT).

Method: In an ongoing randomized controlled trial we examine vagally-mediated HRV in a 15 minute baseline-stress-recovery period in healthy volunteers as indexed by the root mean squared successive differences (rMSSD in ms) as predictor of CPT performance indexed by pain threshold and pain tolerance (in sec). After inclusion in the trial subjects are randomly assigned by permuted-block randomization and get allocated to a 4° or 6°Celsius group. Within this repeated measures design subjects participate twice with a two weeks interval in all measures applied, addressing the test re-test reliability. HRV is measured for 15 minutes (5 minutes each sitting on a chair, standing, sitting on a chair). Cold pressor pain sensitivity is assessed by immersing the non-dominant hand of subjects up to the wrist in a tank with circulating water.

Results: By the time of the abstract submission 10 subjects (4°C n = 5; 6°C n = 5; age 24±4 years) completed the first measurement. rMSSD during baseline (pearsons r = .800; p = .005, stress (r = .657; p = .039) and recovery period (r = .909; p < .001) is correlated with pain tolerance in all subjects, independent of the group allocation. There is no such correlation between pain threshold and rMSSD. By now, there is too less data to investigate possible difference between the groups and the reliability of the results, such as the predictability of test performance within the two weeks interval.

Conclusion/Discussion: This randomized controlled trial has the potential to contribute further needed information on the association between vagally mediated HRV and the pain of with innocuous stimuli. By the time of the poster presentation, data from about 50 subjects that completed the test protocol are expected. 318) Abstract 602
USING ESTABLISHED PREDICTORS OF POST-TRAUMATIC STRESS TO EXPLAIN VARIATIONS IN RECOVERY OUTCOMES AMONG ORTHOPAEDIC PATIENTS
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When post-traumatic stress (PTS) accompanies painful conditions, patients are at greater risk for poor outcomes. Prior research suggests that PTS can be predicted by factors such as gender, history of psychiatric diagnosis, pain, and cardiovascular reactivity. We examined whether these risk factors could predict recovery outcomes following 1) hip fracture and 2) total knee replacement surgery.

Study 1: Data were abstracted from the medical records of 136 patients (31 males, 105 females) undergoing surgical repair of a hip fracture (Summa Health System, Akron, OH). Acute recovery was assessed by ambulation (FH) on the first post-operative day and the degree of assistance required to change position (e.g., supine to sitting). PTS risk was assessed by summing the number of previously identified predictive factors: female gender, co-morbid depression, peritraumatic heart rate (>94 bpm), and pain (rating of 9 or 10). Patients with a greater PTS risk score required greater assistance (β=.245, p<.011) and achieved less ambulation (β=−.270, p=.014) during in-hospital physical therapy sessions. Although limited by reliance on medical records, results suggest that patients with a greater risk for PTS fair worse during the acute post-operative period.

Study 2: Participants were 110 patients (35 males, 75 females) undergoing unilateral total knee replacement (Summa Health System, Akron, OH). Based upon data abstracted from patients’ medical records, PTS risk (similar to Study 1) was derived from female gender, peritraumatic heart rate (r=94 bpm), and pain (rating of 9 or 10) two days after surgery, patients completed the CESD to assess in-hospital depressive symptoms. Three months following surgery, patients completed the IES and WOMAC to assess PTS symptoms and recovery outcomes, respectively. Patients with a greater PTS risk score reported more symptoms of PTS (β=.217, p=.035), more severe pain and greater functional limitations (β =.206, p=.028) three months following surgery. In summary, PTS risk (based on routinely collected medical data) can identify patients most likely to suffer negative physical and mental health outcomes following orthopaedic surgery.

319) Abstract 641
MILD-TO-MODERATE CHILDHOOD ABUSE SCORES ARE ASSOCIATED WITH AN INCREASED INTERLEUKIN-6 RESPONSE TO REPEATED ACUTE PSYCHOSOCIAL STRESS IN HEALTHY ADULTS
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Rationale: It has been shown that childhood abuse is related to poor health outcomes later in life, specifically via increased cortisol and inflammatory responses to stress. However, little is known about mild-to-moderate ranges of childhood abuse and its impact on these systems. Further, less is known about how this range of childhood abuse affects the inflammatory response to repeated acute psychosocial stress, a situation that is common in everyday life. Methods: A sample of healthy adults (n=49, mean BMI =24.3 kg/m2), of both genders (female n= 27, male n= 22) ranging from ages 18-64 provided self-ratings of childhood experiences using the Childhood Trauma Questionnaire (CTQ). CTQ scores were in the low to moderate range (M=7.4, range: 5 to 13; maximum possible score = 25). All participants were exposed to a standardized psychosocial stress paradigm (Trier Social Stress Test, TSST) once every day on two consecutive days. Plasma samples for assessment of interleukin-6 (IL-6) were taken repeatedly before and after each stressor. Results: Repeated measures ANOVA revealed significant increases of IL-6 on both days (time effect: F =6.03; p<.05), with no significant interaction between baseline and treatment (F =.01; p>.05) and no significant difference between baseline and treatment (F =.01; p>.05).

Conclusions: These findings allow the cautious speculation that, as a group, even people with low to moderate levels of childhood abuse may have difficulty in regulating inflammatory responses to repeated stress exposure. This group might therefore be prone to recurring stressors without adaptation, exposing them to higher cumulative concentrations of inflammatory mediators. It remains to be tested if these higher inflammatory responses are antecedents of declines in health.
GOOD FOOD—GOOD MOOD AMONG ACC/AHA STAGE B ASYMPTOMATIC HEART FAILURE PATIENTS
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Depression is one of the most robust psychosocial predictors of morbidity and premature mortality among patients with symptomatic heart failure (HF), with an incidence ranging from 11% to 45%, depending on HF severity. In this study we examined depressive symptoms and behavioral and biological correlates in “stage B patients”, who are asymptomatic by the definition of the American College of Cardiology / American Heart Association but at high risk for developing symptomatic (Stage C) HF. 148 men and women [mean age 65.8 years (SD=9.4; range 30 to 91); mean body mass index (BMI) 30.14 kg/m2 (SD=4.7; range 22 to 42); mean left ventricular ejection fraction (LVEF) 65.8% (SD = 8.8; range 45 to 85)] were split into two groups by their Beck Depression Inventory (BDI) depression symptom ratings with ≥ 10 as the cut-off point. BDI total scores ranged from 0 to 37; mean 7.8 (SD=7.0). 41 (27.7%) of patients scored ≥10, indicating potentially clinically relevant depressive symptoms. In the groups there was a significant difference of the means (p=0.01) of the Fruit/Vegetable/Fiber Screener, which assesses average weekly intake of fruit, vegetables and fiber over the last year in the patient’s diet. People with lower BDI scores had a higher intake of fruit, vegetables and fiber (mean = 18.4, SD = 7.3) than people with higher BDI scores (mean = 15.1, SD = 6.0), suggesting better mood in those who eat better. In the regression analysis for the higher BDI group confirmed diet as an independent predictor of the BDI, after controlling for age, gender and BMI in the final model: F(1,36) = 5.493, p = 0.025; R² = 0.136. Diet did not predict BDI scores in the lower BDI group. Interestingly, when we examined possible correlations of diet to biomarkers, either inflammatory (IL-6, TNF-α) or cardiovascular (ST2, BNP), there was no significant relationship. These results suggest that healthy eating habits and diet habits affect mood in HF patients, such that poorer mood is associated with a poorer diet. However, in this group of patients this relationship did not appear to be linked to general inflammation or HF severity.

SPIRITUALITY AND DEPRESSIVE SYMPTOMATOLOGY IN ACC/AHA STAGE B ASYMPTOMATIC HEART FAILURE PATIENTS
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Introduction Depression negatively affects prognosis in Heart Failure (HF). However, little is known about depressive symptomatology in asymptomatic stage B HF patients or factors that may decrease the burden of depressive symptomatology in this population. In other clinical groups, religiosity and spirituality ratings are negatively correlated with depressive symptomatology. Some studies have found that meaning/peace may mediate the relationship between religiosity and depression. Our research group found that approximately 28% of stage B HF patients scored ≥10 on the Beck Depression Inventory (BDI), indicating potentially clinically relevant depressive symptoms. Hence, we sought to determine the relative effect of two different constructs of spirituality, faith and meaning/peace on depressive symptomatology in this group. Methods In this sample of 178 men and women [age 66.4 SD=9.9; body mass index (BMI) 30.09 kg/m2 (SD=4.82); left ventricular ejection fraction (LVEF) 65.7% (SD = 8.35)] the BDI was used to assess depression symptoms, and the Functional Assessment of Chronic Illness Therapy Spiritual Well-Being Scale (FACT-Tsp) was used to assess meaning/peace and faith. Correlation coefficients between each FACT-Tsp subscale and BDI score were calculated. Following the Baron & Kenny guidelines, mediation was determined with a series of 4 multiple regression analyses with meaning/peace and faith along with the covariates age, gender, BMI, LVEF, and depressive symptoms and BDI score. Results There was a significant negative association between faith (r=0.241, p=0.003) and meaning/peace (r= -0.671, p<0.001) and BDI score. The meaning/peace subscale satisfied the criteria for mediating the relationship between faith and BDI score. In the fourth regression model faith was no longer significant when meaning/peace was added to the equation; final model: faith B: = .048, p=.256; meaning/peace: B = -.748, p<.001, indicating that meaning/peace mediated the relationship between faith and BDI score. Conclusions These results suggest that faith may exert its effect on depression through meaning and peace and that meaning and peace may be associated with reduced depression in stage B patients. Therefore, interventions aimed at increasing meaning and peace in patients’ lives may be a potential treatment target for depressed mood in this population.
The validity of the MICCI was tested using a large national sample of cancer caregivers (N = 774, 63% female, mean age 54). Caregivers were asked whether or not they had ever received medical care for each of the 40 conditions that are both physical and psychological morbidities. Self-reported demographics and physical and mental functioning (PCS and MCS, respectively, measured using the MOS SF) were also assessed. Caregivers reported an average of 4.5 morbid conditions (SD = 6.3). Logistic regression revealed that the presence of each condition was predicted by demographic and MOS SF scores, establishing the validity of the MICCI. For example, known demographic risk factors predicted specific conditions, such as older age (for 12 conditions, p < .05) and male gender (for 13 conditions, p < .05). MOS SF PCS predicted presence of 35 conditions with stronger association with physical morbidities, while the MOS SF MCS predicted psychological morbidities more strongly. Criterion validity was also established by the total count of morbidities of the MICCI weighted by the Charlson Index algorithm significantly predicted by the MOS SF PCS and MCS functioning scores (PCS 95% CI: 0.96-0.98; MCS: 0.97-0.99).

Results suggest that the MICCI, fairly comprehensive yet easy and brief self-administered tool, is a valid measure for medical morbidities of family caregivers of chronic illnesses. Prospective longitudinal studies investigating the sensitivity of the MICCI detecting the impact of important factors, such as caregiving stress, are warranted in future studies.

### 324) Abstract 269

**THE NEURAL SUBSTRATES OF THE EMOTIONAL AUTOBIOGRAPHICAL MEMORY RETRIEVAL AND ITS RELATION TO ADAPTIVE COPING**

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Emotional intensity fades down along with the time. It has been considered this is one of the adaptive coping mechanisms (Walker 2009). Meanwhile, some studies showed the disruption of the emotional memory systems in depression (Haas 2008). Here, we investigated the neural substrates of the emotional autobiographical memory (AM) and its relation to the depression using functional magnetic resonance imaging (fMRI).

Twenty six healthy volunteers (mean age = 20.6) participated in this study. Ten positive and ten negative autobiographical events were collected from 30-day web-based diary. Subjects were asked to rate the emotional intensity and make brief and specific titles for each event. About 1.5 months after the diary, first memory retrieval task (T1) cued by event titles was conducted during fMRI scanning. Subjects were asked to retrieve the event as vividly as possible and rate the emotional intensity. Furthermore, 8 months after the diary, fifteen subjects (mean age = 20.9) participated again to the same retrieval experiment (T2). Beck depression inventory II (BDI-II) was used to assess the depressive state.

fMRI results showed that, at the time of T1, positive and negative event retrieval activated the same brain regions including hippocampus, medial prefrontal cortex and prefrontus, the regions frequently reported in the AM study, p < .001, k > 10. Meanwhile, positive and negative events showed different brain activity at the time of T2. Particularly, the hippocampal activity for the reconstruction of the event, showed significant activity only in the negative events, p < .001, k > 10. These results indicate the negative events are more accessible than positive ones even after 8 months passed. As opposed to our expectation, correlation analysis showed individuals with higher BDI score exhibited marginally lower activity of the left hippocampus during negative event retrieval, p = .08, r = -.46. This may reflect a compensatory mechanism in depressed people, such as suppression to avoid facing the aversive events.

### 325) Abstract 416

**PROBLEM-FOCUSED COPING STYLES PREDICT BETTER FUNCTIONAL AND SYMPTOM STATUS IN HEART FAILURE PATIENTS**

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Background: Coping styles have been linked to a variety of physical and psychological health outcomes. In patients with heart failure (HF), there are frequent exacerbations in symptoms, functional status, and risk factors. We hypothesized that the use of problem focused coping strategies would promote improved health outcomes over time in HF patients. Methods: In the ongoing BETREHeart study, 150 patients (113 males; mean age = 56.9 + 11.4 years) with HF (ejection fraction (EF) ≤ 40; mean = 23.1 + 7.5%) completed psychosocial and clinical health questionnaires at baseline and at 3 months. Coping styles were measured using the COPE and Brief COPE questionnaires. Coping scales were z-scored and combined to create two separate coping categories: Problem Focused (PF) and Emotion Focused (EF). Results: Problem Focused Coping was associated with fewer overall symptoms (KCCQ Overall Summary Score (KCCQOS)), and greater distance walked (6MWT) at baseline and 3 months (Baseline: KCCQOS model R2=0.20, β = 0.40, p < .001; 6MWT model R2=0.27, β = 0.30, p = .002; 3-Month: KCCQOS model R2=0.20, β = 0.29, p = .004; 6MWT model R2=0.32, β = 0.25, p = .01). Cox regression analyses revealed that Problem-Focused Coping styles were marginally associated with decreased likelihood of all-cause and HF hospitalizations (HR: 0.92, 95% CI: 0.83-1.01, p = .088; HR: 0.88, 95% CI: 0.76-1.03, p = .10, respectively). When adjusted for other risk factors depression and anxiety, problem focused coping was significantly predictive of decreased likelihood of HF hospitalization (HR: 0.85, 95%CI 0.73-1.01, p = 0.04) and of distance walked (6MWT Baseline: R2=0.27, β = 0.30, p = .01; 3-month: R2=0.33, β = 0.21, p = .06) but no longer predictive of symptoms or all-cause hospitalization. Conclusions: Independent of standard medical risk factors, problem focused coping styles are associated with fewer reported HF symptoms, better functional status, and decreased likelihood of HF hospitalizations during 36-month follow-up. In contrast, use of emotion focused coping tended to be associated with poorer outcomes. Problem focused coping styles are associated with better functional status and decreased HF hospitalizations even controlling for depression and anxiety.

### 326) Abstract 564

**REFLECTIVE RUMINATION MEDIATES THE RELATIONSHIP BETWEEN HEART RATE VARIABILITY AND PERCEIVED ETHNIC DISCRIMINATION**

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Research suggests that perceived ethnic discrimination (PED) can present harmful physiological and psychological effects in ethnic minorities. Researchers have both examined the negative effects of PED on cardiovascular health and connected PED to depressive symptoms in minorities. Furthermore, recent studies found that anger and brooding rumination mediates the relationship between PED and depressive symptoms. However, the relationship between PED and reflective rumination, or the analytical and problem solving thought process, on physical and mental health has not been examined. Health disparities exist in cardiovascular disease such that minorities have a higher risk for prevalence and mortality. The present study examines the relationship between the PED, reflective rumination, and heart rate variability (HRV), an index of cardiovascular and emotional flexibility. 64 minority participants underwent a baseline period, cognitive task, recovery period, and answered a set of self-report questionnaires.
327) Abstract 737

STRESS, SOCIAL SUPPORT AND CORONARY DISEASE IN SWEDISH MEN AND WOMEN. THE SEPHIA STRESS STUDY
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Introduction Early research on stress and coronary disease, has been focused on men and men’s work, whereas in women, family issues have been considered to be stressful. Family stress – but not work stress – has increased the risk of a recurrent cardiac event in female patients hospitalized for an acute myocardial infarction (MI). We now aimed at describing psychosocial stress from both work and family in today’s men and women patients, while controlling for relevant behavioral and medical confounders. We hypothesized that family stress would remain relevant for women’s cardiovascular health after an acute MI and that this association would be stronger in women than in men. As more women of today are working full time, we also considered stress at work to be relevant in women.

Method We used standardized measures of job stress (Karasek/Theorell/Siegrist), family stress and support (questions about family structure and dyadic relationships, about harmony, about confiding and about help during illness) (Orth-Gomer) in a random half of the cardiology clinics in Sweden. Each cardiology clinic, during a similar length of time, recruited patients under age 75, hospitalized for an acute MI. Patients were offered to participate in a low cost coronary prevention program, run by cardiology nurses. In addition to standard risk factors they also answered a comprehensive psychosocial questionnaire. Results A total of 1986 patients were included, 24.4 % of whom were women. All patients had responded to questions on the psychosocial situation during the past year. If they had stopped working they were asked to report on their latest year of work. Work stress (high work demand, low work control, low work reward) was found in 18.1% of men and 28.3% of women (p< 0.001). Women were more often living alone (men 24.0 %, women 33.8 %, p<0.001), they were more often single – widowed, divorced or never married, (men:23.7 % women 35.7 % (p< 0.001), and tended to have more family problems and lower family social support than men. In addition, today’s women report more job stress, suggesting an increased total stress burden in women patients.

328) Abstract 684

QUALITY OF LIFE IN INFLAMMATORY BOWEL DISEASE PATIENTS PRESENTING WITH SYMPTOMS SUGGESTIVE OF IRRITABLE BOWEL SYNDROME
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Backgound and aim. Patients with inflammatory bowel diseases (IBD) may present abdominal pain and disordered bowel movements, symptoms suggesting irritable bowel syndrome. These symptoms may impair quality of lif (QoL). We look for the QoL in IBD with symptoms mimicking IBS and compared this with a group of IBS patients. Methods. We used the IBS-QoL questionnaire validated in Romania. This questionnaire has 34 items, with 8 subscales and item responses graded on 5 point scale. Items are: DY – Dysphoria, IN – Interference with activity, BI – Body Image, FA- Food avoidance, HW- Health worry,SR- Social reaction, SX- Sexual relations, RL- Relationship. We investigated 30 IBD pts, 44.2±15.5 yrs. From these, 15 had M.Crohm (8 F, 7M), mean age 45.7 yrs and 15 had Ulcerative colitis (UC)(8 F, 7M) mean age 42.6 yrs. Results are displayed in the table 1. In IBD, the most impaired scales were HW and FA (scores <50/100). No differences existed between MC and UC. Other items presented score >70/100. In IBS, scores were lower than in IBD for DY (48 ± 26, respectively 70 ± 23; p<0,001), IN (50 ± 25, respectively 60 ± 24, p=0,05), SR (57 ± 25, respectively 82 ± 18, p<0,001), HW (34 ± 12, respectively 48 ± 25, p=0,01). Globally QoL was lower in IBS than in IBD (51 ± 21, respectively 67 ± 17, p<0,001). Conclusions. The IBS QoL assesses the impairment of QoL also in IBD pts, mainly for the items HW and FA. Total score of QoL is lower in IBS than in IBD suggest the mood changes in IBS.

<table>
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329) Abstract 460

ASSOCIATION OF TRAIT DOMINANCE WITH TELOMERE LENGTH
Carolyne E. Baron, BA, Timothy W. Smith, PhD, Psychology, Richard M. Cawthon, MD, PhD, Human Genetics, Bert N. Uchino, PhD, Psychology, Kathleen C. Light, PhD, Anesthesiology, University of Utah, Salt Lake City, UT

High levels of trait dominance are associated with increased risk of CHD and earlier mortality. Telomere length (TL) is a marker of cellular aging, and shorter telomeres are associated with increased mortality and cardiovascular risk. To examine cellular aging as a mechanism linking trait dominance and these health outcomes, we tested the first order and interactive effects of age, sex, and trait dominance as predictors of TL in a sample consisting of women (N = 62) and men (N = 87) aged 48 to 77 years old. TL was determined from peripheral blood mononuclear cells via quantitative polymerase chain reaction. As expected, older participants had shorter TL, b = -0.17, t(101) = -3.56, p = .001. Also, the age x gender x dominance interaction was significant b = .006, t(101) = 2.27, p = .025. Age was inversely related to TL for both men, r(87) = -3.5, p = .001, and women, r(62) = -2.8, p = .022. To explicate the 3-way interaction, we formed groups based on gender and median splits on age and dominance. Trait dominance was unrelated to TL among men. However, among older women, high trait dominance participants had shorter TL than low dominance participants (M = .77 vs. .97, SE = .06), t(141) = 2.25, p = .026. Further, among high dominant women, older participants had shorter TL than younger participants (M = .77 vs. 1.12, SE = .06 vs. .09), t(141) = 3.86, p <.001. Similar results were obtained when missing data was replaced via multiple imputation. Overall, there was an expected inverse association of age and TL, which was significant in both men and women. Further, trait dominance moderated this age effect among women, but not men. Specifically, among women high dominance was associated with a stronger inverse association between age and TL, and high dominance was associated with shorter TL in the older – but not younger - group. These findings suggest that trait dominance is related to TL, and could contribute to the health effects of this personality characteristic. However, the findings also point to an interesting gender difference in which dominance may be associated with greater cellular again among women, but not men.
Clinical samples, but the relation between depressive symptoms and independent risk factors for cardiac mortality in clinical and non-psychological risk factors have been studied to further explain CHD. However, traditional risk factors associated with CHD, such as hypertension, diabetes mellitus, and obesity disproportionately affect African Americans. Heart rate variability (HRV) is often used as an independent predictor of CHD risk and mortality. In addition, psychological risk factors have been studied to further explain CHD. Studies have suggested that decreased HRV and depression are independent risk factors for cardiac mortality in clinical and non-clinical samples, but the relation between depressive symptoms and HRV is less clear. To date, there is very little research that has explored the association between HRV and depressive symptomatology in African Americans. This research is critical to further investigate the discrepancy that exists between African Americans and other ethnicities with respect to CHD. Objective: The current study examined the association between HRV and depressive symptomatology in a community-sample of African Americans. Method: The study included a community-based sample of 77 African Americans with a mean age of 48.4 (SD = 11.7). Participants completed the Beck Depression Inventory-II (BDI-II). A five-minute resting baseline measurement of HRV was also obtained. Results: After adjusting for demographic and physiological covariates, the BDI-II total score was positively associated with HRV (Beta = .325, p < .01). Using the BDI-II subscales, the Somatic subscale was positively associated with HRV levels. Conclusions: These findings suggest that depressive symptoms in African Americans are linked to increased HRV. Moreover, the somatization of emotional experiences in African Americans may play a vital role in cardiac outcomes. Future research needs to explore these findings because the assessment of depressive symptoms in African Americans may be necessary for those at greater risk for CHD.

The fragility of older adults' sleep can render them particularly vulnerable to the deleterious effects of stress on sleep. Although a number of psychosocial and health-related resources have been shown to protect against other consequences of stress, it is unknown whether these same resources are helpful in the context of sleep. The purpose of the present study was to examine the extent to which psychosocial and health-related resources might moderate the relationship between stress and sleep in older adults. It was hypothesized that high levels of resources would buffer against stress-related decline in sleep duration and quality in an individual and physiological variability in sleep. Participants included 198 men and women (age 73±7 years) enrolled in the Health Coaching Project on sleep health (N=20677). Questionnaires were administered to evaluate psychological stress and resiliency resources including coping, social support, and mental and physical health. Sleep data were estimated using 2 weeks of actigraphy (total sleep time (TST), wake after sleep onset, sleep latency (SL), sleep efficiency (SE), and fragmentation) and daily sleep diaries (subjective sleep quality). Sleep values were averaged across 2 weeks, and intra-individual variability was estimated with the individual standard deviation. A composite variable was created to estimate the collective value of resiliency resources (coping, social support, mental and physical health). Moderation was tested in hierarchical linear regression. After controlling for gender and age, significant stress x resources interactions were present for average TST and intra-individual variability in subjective sleep quality, SL, SE, and sleep fragmentation (p < .05). These findings suggest that psychological and health-related factors do influence the effects of stress on sleep in older adults. Improved understanding of the value of such resources is critical to effective health promotion efforts in older adults.

The pain, depression, and fatigue symptom cluster is an important outcome of SCI rehabilitation, and is a common risk factor for these symptoms. Little is known about the physiological mechanisms linking loneliness to the symptom cluster; immune dysregulation is a promising candidate. Latent herpesvirus reactivation, which is reflected by elevated herpesvirus antibody titers, provides a window into immune dysregulation. Cytomegalovirus (CMV) and Epstein-Barr virus (EBV) are two common herpesviruses. Methods: Participants were 200 breast cancer survivors who were 2 months to 3 years post-treatment at the time of the study. They completed questionnaires and provided a blood sample that was assayed for CMV and EBV antibody titers. Results: Lonelier participants experienced more pain, depression, and fatigue than their more socially connected counterparts. Contrary to expectations, EBV antibody titers were not associated with either loneliness or the symptom cluster. However, lonelier participants also had higher CMV antibody titers which, in turn, were associated with higher levels of the pain, depression, and fatigue symptom cluster. We
found partial evidence that the relationship between loneliness and the symptom cluster was mediated by CMV antibody titers; people who were lonelier had higher symptom cluster scores than those who were less lonely, and this was partially explained by elevated CMV antibody titers. We also found partial support that the association between loneliness and CMV antibody titers was mediated by the symptom cluster; lonelier people had higher CMV antibody titers than their more socially connected counterparts, and this was partially explained by higher symptom cluster scores. Conclusions: The pain, depression, and fatigue symptom cluster is a notable clinical problem, especially among cancer survivors. Accordingly, understanding the risk factors for these symptoms is important. The current study suggests that loneliness enhances risk for immune dysregulation and the pain, depression, and fatigue symptom cluster. The present data also provide a glimpse into the pathways through which loneliness may impact health.

334) Abstract 230
EMOTIONAL AND HEMODYNAMIC REACTIVITY TO SOCIAL CHALLENGE IN INDIVIDUALS WITH PSYCHOPATHIC TENDENCIES
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Background Psychopathic tendencies are characterized by stress immunity, low empathy and blunted emotional responses. It is unknown whether these characteristics of psychopathy are accompanied by an altered physiological stress response. This study examined the association between psychopathic tendencies and the emotional and physiological response to stress.

Methods Young adults (N=163; mean age 19.7±2.2; 77% women) underwent the Trier Social Stress Test (TSST), during which heart rate (HR) and blood pressure (SBP, DBP) were measured. Psychopathic tendencies were evaluated using the abbreviated Personality Styles Inventory (75th percentile cut-off to indicate high psychopathy levels). Emotional reactivity was assessed using self-report 7-point Likert scales.

Results Individuals with high psychopathic tendencies displayed lower levels of emotions: ‘tension’ (F(1,160)=5.64, p=0.019), ‘stressed’ (F(1,160)=4.24, p=0.041) and ‘uneasiness’ (F(1,160)=6.25, p=0.013) during the TSST. Individuals with high psychopathic tendencies showed decreases in feelings of ‘uneasiness’ during the speech task, compared to those with low psychopathic tendencies (interaction F(2,320)=5.70, p=0.004). Physiological measures increased during the TSST (p-values<0.01) but responses did not differ between groups (p-values>0.70). The 'stress immunity' subscale was associated with higher SBP (F(1,118)=5.42, p=0.022) and DBP (F(1,117)=5.42, p=0.022) levels. Participants scoring high on stress immunity showed a DBP increase during speech preparation, whereas those scoring low on stress immunity showed a decrease (interaction F(4,468)=2.41, p=0.048).

Discussion Psychopathic tendencies were associated with lower self-reported emotional stress to social challenge, while physiological responses were not similarly attenuated. The cardiovascular consequences of perceived stress-immunity may be of particular interest for additional research in cardiovascular behavioral medicine.

335) Abstract 83
CO-ACTIVATION OF THE SYMPATHETIC AND PARASYMPATHETIC NERVOUS SYSTEM IN IMPLANTABLE CARDEOVERTER-DEFIBRILLATOR PATIENTS WITH POSTTRAUMATIC STRESS
This abstract was withdrawn.

336) Abstract 110
PLACEBO ANALGESIA IN THE DENTAL CLINIC: POSITIVE INFORMATION ABOUT TREATMENT REDUCES PAIN IN DENTAL PATIENTS
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Background: Information about the effectiveness of treatment has been found to reduce pain, termed placebo analgesia. It was investigated whether information that suggested that minimal pain would be experienced during filling therapy, could reduce the pain associated with that procedure. All patients received the same amount of anaesthesia and similar procedures during filling therapy. It was predicted that extended information should reduce pain, and that the reduction in pain should be associated with a reduction in stress.

Methods: 44 patients (24 females, 17-68 yrs) going through composite restoration therapy with anaesthesia in a molar or premolar, participated. The design was a 2 Information (Extended, Standard) by 4 Test mixed design. Patients were randomized to two groups; The Standard Info group (N=22) received information that was short but informative about the pain they might experience under and after treatment. Words like pain, sensitivity and unpleasant were used. The Extended Info group received information that and focused on the positive effects. The Fear of Pain Questionnaire III was administrated. Subjective pain intensity and pain unpleasantness, and stress were recorded by numerical rating scales before, during, immediately after, and 15 minutes after treatment. The patients were all given local anaesthesia in the form of xylocain dental adrenalin 2% + 12.5 microg/ml adrenalin.

Results: Pain was 2.6 points lower in the Extended Info group compared to the Standard Info group during treatment (p = .033). There were no differences in pain levels in the other Tests. Extended Info reduced stress slightly. Low tension before treatment correlated with lower pain during treatment (p = .004). High fear of pain correlated with high stress prior to treatment (p = .002).

Conclusions: Providing positive information about the anaesthetic and the dental procedure reduced pain compared to standard information. Subjects high in fear of pain displayed the highest stress prior to the dental procedure, and high stress prior to the dental procedure correlated with high pain during the procedure. The information partly reduced pain by reducing stress prior to the dental procedure. The magnitude of the analgesic effect of the information was about 2.6 points on an 11-point numerical rating scale, clinically significant.

Taken together the study shows that providing information that underscores the effectiveness of the painkiller, informs the patient that the damage is small, and that informs the patient that he/she has control of the situation, reduces pain induced by the dental procedure.

337) Abstract 655
TIME TRENDS OF CHILDRENS AUTONOMIC NERVOUS SYSTEM ACTIVITY
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Background: Recent studies indicate that changes in autonomic nervous system (ANS) activity are associated with behavioural problems as well as overweight in children. Given the rise of these health problems, we aimed to investigate the potential existence of parallel time trends in children’s ANS activity.

Method: ANS parameters of a current sample of children were compared with a historical reference sample (200 children, 0-15 years (Massin et al., 1997)). Children were recruited between January 2008
and April 2012 via a south German paediatric cardiology outpatient clinic after referral for a 24-hour Holter ECG as healthy study controls or to rule out cardiac arrhythmias. We recruited 156 healthy children (mean age 8.55 years ranging from 0 to 15, 48.1 % boys). Exclusion criteria were acute and chronic disease, medication, arrhythmias, psychiatric and psychosomatic disease. Main outcome measures were time (rMSSD & SDNN) and frequency domain (High and Low Frequency normalized) heart rate variability measures using 24-hour ECGs. Differences in mean values over 24-hours between the current and historical sample were examined within five age categories using parametric as well as non-parametric tests and age-adjusted linear regression models. 24-hour profiles were compared using graphical methods.

Results: Compared to the historical sample, we observe with linear regression models in all age groups a significantly decreased vagal tone (e.g. rMSSD for all age groups P<0.01) and increased sympathetic activity (e.g. LnHu for all age groups P<0.01) in today’s children. Measures of both ANS branches are positively related to age, with vagal tone negatively related to BMI.

Conclusions: Our results indicate substantial changes in children’s autonomic regulation capacity in the last 15 years. The role of the ANS in emerging psychosomatic childhood health problems like obesity and behavioural problems deserves more in-depth evaluation.

338) Abstract 260
VAGAL TONE IS MORE STRONGLY ASSOCIATED WITH SELF-RATED HEALTH THAN ARE OTHER FREQUENTLY USED BIOMARKERS
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Background: Self-rated health (SRH) has been consistently associated with morbidity and mortality. However the underlying mechanisms remain poorly understood. Importantly, no data exist on the associations between SRH and autonomic nervous system (ANS) function as indexed by heart rate variability (HRV).

Methods: A total of 2509 employees (age 18-65) underwent medical examination and 24-hour ambulatory heart rate (HR) recording while on their normal work routine. Pearson’s correlation coefficients of SRH were computed between every variable of ANS function and HR against every other biomarker using one sample Olkin’s Z. Logistic regressions on poor SRH were adjusted for demographics, lifestyle, work stress, and metabolic syndrome.

Results: After adjustment poor SRH was negatively associated with measures of HRV comparing the highest vs. lowest tertile of primarily vagally mediated HRV (e.g. rMSSD odds ratio (OR), 0.63 [95% CI, 0.44–0.91]; P=0.01) and both sympathetic and parasympathetic mediated HRV (e.g. SDRR OR, 0.71 [95% CI, 0.51–0.99]; P=0.046). Poor SRH was positively associated with inflammatory markers (CRP>5 mg/L, OR, 1.6 [95% CI, 1.00–2.55]; P=0.049) and glucose levels (HbA1C >6.5% OR, 3.13 [95% CI, 1.57–6.24]; P<0.001). No association was found with any blood pressure or blood lipid measures. In both unadjusted and adjusted linear models Pearson’s correlation strength were significantly higher between continuous SRH with ANS measures compared to SRH with inflammatory markers, blood lipids and glucose levels.

Conclusion: This is the first study that investigated the association of ANS function with SRH. We show that a global measure of SRH is associated with HRV. We were able to compare the association strength of traditional biomarkers with ANS function measures and showed that all measures of ANS function were significantly more strongly associated with SRH than any other of the assessed biomarkers e.g. inflammation, in a healthy working population. The current study supports the hypothesis, that the extent of brain – body communication, as indexed by HRV, is associated with SRH.

339) Abstract 76
POTENTIAL IMPACT OF PROPOFOL AFTER MOTOR VEHICLE ACCIDENT ON LATER SYMPTOMS OF POSTTRAUMATIC STRESS DISORDER
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Introduction: Critically injured patients are at risk of developing posttraumatic stress disorder (PTSD). Propofol was recently reported to enhance fear memory consolidation retrospectively. Thus, we investigated here whether administration of propofol within 72 h of a motor vehicle accident (MVA) affects the subsequent development of PTSD symptoms. Methods: We examined data obtained from a prospective cohort study of MVA-related injured patients, admitted to the intensive care unit of a general hospital. We investigated the effect of propofol administration within 72 h of MVA on outcome. Primary outcome was diagnosis of full or partial PTSD as determined by the Clinician-Administered PTSD Scale (CAPS) at 6 months. Secondary outcomes were diagnosis of full or partial PTSD at 1 month and CAPS score indicating PTSD at 1 and 6 months. Multivariate analysis was conducted adjusting for being female, age, injury severity score, and administration of ketamine or midazolam within 72 h of MVA.

Results: Among 300 patients recruited, propofol administration showed a higher risk for full or partial PTSD as determined by CAPS at 6 months and at 1 month in the multivariate logistic regression. Multivariate regression analysis showed a trend toward adverse effects of propofol on PTSD symptom development at 6 months after MVA, but not at 1 month after MVA. Conclusions: These findings suggest that using propofol in the acute phase after MVA might be associated with the development of PTSD symptoms 6 months later.
340) Abstract 354
Differential Sex Patterns of Habitual Sleep Duration and Cardiovascular Reactivity in Healthy Older Adults
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Both short and long habitual sleep duration have been associated with increased risk of cardiovascular disease (CVD) morbidity and mortality. However, biological mechanisms remain uncertain. A proposed mechanism is increased autonomic responses to stress. Cardiovascular reactivity to mental stress (CVR), an indirect index of autonomic response to acute stressful stimuli, has been associated with increased risk for CVD. However, habitual sleep duration and CVR remains little studied, and nonlinear relations have not been explored directly. Here we examined nonlinear relations of sleep duration with CVR among 131 community-dwelling, older adults (aged 55 to 81 years; 50% men; 90% White) free of major medical co-morbidities (e.g., diabetes, CVD), stroke, and dementia. During a psychophysiological protocol, participants completed a fixed series of resting baseline and task periods (anger recall, role-play designed to induce anger, and mental arithmetic with harassment). Systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) changes from baseline were calculated for each task. Habitual sleep duration was obtained from participants’ completed Medical Outcomes Study Sleep Scale. Sex-stratified mixed-effects regression models examined the relation of sleep duration and CVR, with adjustment for age, body mass index, hypertension supportive medication use, depressive symptoms, and sleep apnea symptoms. Both linear and quadratic terms were included for sleep duration, and backwards elimination was conducted. Results revealed differential relations between sleep duration and CVR patterns for men and women. For men, results revealed significant quadratic association between sleep duration and both SBP reactivity (b=2.85, t(57)=2.28, p=.024) and DBP reactivity (b=1.26, t(56)=2.32, p=.024). In general, men with lesser and greater sleep duration had greater SBP and HR reactivity. For women, results revealed significant linear associations between sleep duration and both SBP reactivity (b=2.68, t(59)=2.42, p=.018) and DBP reactivity (b=1.10, t(59)=2.37, p=.021), where women with greater sleep duration had greater SBP and DBP reactivity. CVR may be a mechanism through which habitual sleep duration differentially affects CVD risk in men and women.

341) Abstract 398
ASSOCIATIONS OF TOPICAL TREATMENT MOTIVATION AND PERCEIVED SUPPORT WITH QUALITY OF LIFE AND PSYCHOLOGICAL DISTRESS IN PATIENTS WITH ATOPIC DERMATITIS
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Introduction: Patient adherence to topical medication is a common cause of minimal or lack of response to drugs and is related to poor health outcomes in patient with atopic dermatitis (AD). According to Self-determination theory, patients’ autonomous self-regulation of medication use and perceived autonomy supportive style are important to facilitate patients’ health behavior. Although the previous literature indicates that more autonomous regulations enhance not only behavioral persistence but also psychological distress, AD patients’ motivation for drug-taking behavior has not been characterized. This study examined the association of treatment motivation (autonomous versus controlled) and autonomy support with quality of life and psychological distress in AD patients.
Method: Participants were twenty adult AD patients (40.0% female; mean age 30.0±8.4 years), who had mild to severe AD. They obtained medication use and perceived autonomy supportive style are important to facilitate patients’ health behavior. Although the previous literature indicates that more autonomous regulations enhance not only behavioral persistence but also psychological distress, AD patients’ motivation for drug-taking behavior has not been characterized. This study examined the association of treatment motivation (autonomous versus controlled) and autonomy support with quality of life and psychological distress in AD patients. The medication use and perceived autonomy supportive style are important to facilitate patients’ health behavior. Although the previous literature indicates that more autonomous regulations enhance not only behavioral persistence but also psychological distress, AD patients’ motivation for drug-taking behavior has not been characterized. This study examined the association of treatment motivation (autonomous versus controlled) and autonomy support with quality of life and psychological distress in AD patients. The treatment Self-Regulation Questionnaire (TSRQ), 2) the Health Care Climate Questionnaire (HCCQ) which assessed patients’ perceived autonomy support, 3) Dermatology Life Quality Index (DLQI), 4) Hospital Anxiety and Depression Scale (HADS). Results: Results showed negative correlations of autonomous self-regulation and perceived autonomy support with QOL (r=−.55, −.61) and depression (r=−.40, −.46). Controlled self-regulation was not associated. Along with previous study, autonomous self-regulation and perceived support are correlated (r=.44). Conclusions: These findings revealed that the existence of a unique relationship about self-regulation for topical medications in AD patients, which contradicted to previous study. Autonomous relevance variables would potentially influence drive reduction for treatment, and otherwise, would be more likely be stimulated by lower QOL. Additionally, physician’s autonomy support which plays enhancing patients’ adherence attitude may be inhibitory factor for depression. Our results reinforce the notion that evaluating perceptions of disease severity and psychological distress to provide optimal medication treatment. It is necessary to examine effective interventions by patient-physician communication to improve medication adherence.

342) Abstract 99
RELATIONS OF CHILDHOOD STRESS WITH DIET, SLEEP, SCREEN TIME AND OBESITY: THE CHIBS SURVEY
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Background: Stress has been hypothesized to be involved in obesity development and ill health. Apart from a direct pathway, stress may indirectly facilitate obesity by influencing other lifestyle factors: stressed persons may consume more comfort foods, may have a more sedentary behaviour and may suffer from sleep problems. Methods 523 Belgian 5-10y old children participated in the baseline ChiBS survey (Children’s Body composition and Stress). The following variables were used as covariates but not as dependent child: psychosocial stress (negative events, emotions, behavioural problems, salivary cortisol), stress-related lifestyle factors (emotional eating, sweet food, fat food and snack consumption frequency; screen exposure time and sleep duration) and obesity parameters (BMI z-score, waist to height ratio (WHR)). Using adjusted linear regression analyses, the relation of stress with lifestyle factors and adiposity and the possible moderating or mediating role of lifestyle in the stress-adiposity relation was tested. Results Relations were seen between stress and lifestyle. (1) Problems, emotions and events were related to more emotional eating; and problems were related to higher fat and sweet food consumption. (2) Problems were related to higher and happiness to lower screen time. (3) Problems were related to shorter and happiness to longer sleep duration. Furthermore, stress was related to adiposity as negative events were positively and happiness was negatively associated with BMI and WHR. Peer problems and WHR were also positively related in girls. Lifestyle factors were no mediators but moderators in stress – body composition relationships. Conclusion Childhood stress was associated with lifestyle: more emotional eating, unhealthier dietary pattern, more sedentary behaviour and shorter sleep. Stress was also related to overall and central adiposity measures with the Somer’s D statistic. Thus, stress could be a vulnerability factor in stress-induced adiposity, creating a perspective for multi-factorial obesity prevention, targeting stress and lifestyle factors in parallel. The results also stress the value of positive emotions for health.

343) Abstract 81
SLEEP AND NIGHTLY ORAL DRYNESS AS POTENTIAL THERAPEUTIC TARGETS TO REDUCE FATIGUE IN SJÖGREN’S SYNDROME
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Fatigue is a major issue in patients with Sjögren’s syndrome, a chronic autoimmune disease affecting the exocrine glands. Fatigue is closely related to disease activity variables. Poor sleep and frequent nightly awakenings due to symptoms may play a role in fatigue, but this was studied only in small groups of patients. Aim of the present study was to identify the prevalence of sleeping problems in Sjögren’s patients compared with control participants, and to examine relations of sleeping problems with fatigue and nightly oral dryness.

Methods: Three-hundred patients with primary Sjögren’s syndrome and 100 demographically matched control participants (mean age 57 years, 93% female) completed questionnaires on sleep (Sleep-50 insomnia subscale), nightly awakenings due to oral dryness (100mm Visual Analogue Scale), and five dimensions of fatigue (MFI).

Results: Of the Sjögren’s patients, 34% fulfilled the criteria for clinical insomnia, compared with 26% of the matched control participants (p<.001). Small to medium correlations (corrected for age and gender) were shown between insomnia and all dimensions of fatigue in the Sjögren’s group as well as in the control group (p≤.05). Multiple regression analysis showed that physical fatigue and mental fatigue were not associated with nightly oral dryness in patients with high levels of insomnia, whereas patients with low levels of insomnia were severely fatigued only in case of high nightly dryness (p≤.05; Figure 1).

Conclusion: About one-third of the Sjögren’s patients (as compared to one-fourth of control participants) had severe sleeping problems that were correlated with fatigue and nightly dryness. This suggests that sleeping problems and nightly dryness are potential targets to reduce fatigue. Supported by the Dutch Arthritis Association.
and Clinical Psychology, Uniformed Services University, Bethesda, MD. C. Noel Bairey Merz, MD, Medicine, Cedars-Sinai, LA, CA

Background: Women with persistent angina, myocardial ischemia, and no obstructive coronary artery disease often have microvascular coronary dysfunction (MCD). While women frequently have mental stress-related angina, whether peripheral vasoreactivity during acute mental stress can be used for detection of MCD is unknown.

Methods: 24 women (16 with MCD diagnosed by invasive coronary reactivity testing, and 8 healthy women with no cardiac risk factors and normal maximal exercise treadmill test) underwent mental stress testing (MST) via a standardized protocol. Subjects underwent 4 min anger recall task, 4 min mental arithmetic, and 3 min forehead cold pressor (COP) test. Peripheral vascular response was assessed by pulse arterial tonometry (PAT) (EndoPAT, Itamar®). Reactive hyperemia index (RHI), measure of endothelial function, was calculated before (RHI-1) and after (RHI-2) completion of MST. Ratio of stress to rest pulse amplitude was also calculated for each task. Two sample t-test was used for analysis.

Results: Demographics for women with MCD and healthy women are shown in Table 1. There was no significant change in endothelial function post MST based on RHI-1 vs. RHI-2 (Table 1). A comparison of individual tasks showed that MCD subjects had a significantly lower stress PAT ratio compared to controls during the mental arithmetic (0.67 ± 0.3 vs. 0.93 ± 0.3, p=0.044); stress PAT ratio during anger recall and COP were not statistically significant between the two groups (Figure).

Conclusions: Women with MCD demonstrate a trend toward greater peripheral vasoreactivity to mental stress arithmetic compared to groups (Figure).

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>MCD Group (n = 16)</th>
<th>Healthy Women (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>54 ± 10</td>
<td>51 ± 10</td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td>27 ± 7</td>
<td>26 ± 5</td>
</tr>
<tr>
<td><strong>Systolic BP (mm Hg)</strong></td>
<td>116 ± 15</td>
<td>116 ± 8</td>
</tr>
<tr>
<td><strong>Diastolic BP (mm Hg)</strong></td>
<td>68 ± 9</td>
<td>65 ± 17</td>
</tr>
<tr>
<td><strong>Before MST (RHI-1)</strong></td>
<td>2.6 ± 0.7</td>
<td>2.6 ± 0.9</td>
</tr>
<tr>
<td><strong>After MST (RHI-2)</strong></td>
<td>2.5 ± 0.8</td>
<td>2.5 ± 0.8</td>
</tr>
</tbody>
</table>

347) Abstract 289

**EFFECTS OF A 12-WEEK QIGONG INTERVENTION ON FATIGUE AND GLOBAL DISTRESS IN SENIOR PROSTATE CANCER SURVIVORS AND THEIR FAMILY MEMBERS**

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Background: Prostate cancer is the most common cancer among men, with the majority diagnosed older than 65 years of age. Fatigue is a frequently reported symptom and is associated with impairments in quality of life and distress. Moreover, as a cancer diagnosis is also a family experience, family members often experience distress at levels similar to the survivor’s and are at risk for declines in their own wellbeing. Exercise interventions have shown benefits for improving cancer-related fatigue and distress. Mind-body exercise, which incorporates physical activity and stress-reduction aspects, may also be beneficial for senior prostate cancer survivors and their family members. The purpose of this randomized controlled trial was to examine a 12-week Qigong intervention in fatigued senior prostate cancer survivors and their family members for improving fatigue and distress.

Methods: Fatigued senior prostate cancer survivors and their family members (FM) n= 20; Age M= 68.30, SD=10.07 were randomized to 12 weeks of Qigong or Stretching classes (two 60-minute classes/week). The FACIT-Fatigue and Brief Symptom Inventory-18 were completed at baseline and one week post-intervention. The Qigong intervention utilized eccentric eccentric movement patterns to enhance muscle performance and balance. The stretching classes consisted of light stretching exercises. The study groups were compared on their change (post-baseline) in fatigue and distress (Global Severity Index, GSI) with independent t-tests and Wilcoxon tests for skewed data. Results: At baseline, the study groups did not differ significantly on the FACIT-Fatigue and the BSI-18 (p>0.05). The Qigong group’s change from baseline to post-intervention in these indices was significantly larger than the Stretching group’s change, indicating improvements in fatigue (p=0.01) and distress (p=0.02). Separate analyses for survivors and FM also indicated significant improvements in fatigue and distress for survivors in the Qigong group (p<0.05), and trend improvements for the FM. Conclusion: Our findings suggest that Qigong is effective in improving physical and mental health in senior prostate cancer survivors and their family members. Future, larger definitive trials are needed to replicate these findings in older survivors of various cancers and their family members.

348) Abstract 315

**QUALITY OF LIFE AND DEPRESSIVE SYMPTOMS OF HYPERSONNIA PATIENTS**

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The patients with hypersomnia are often falsely thought of as lazy people and they may have social disadvantages. We have studied the quality of life (QOL) and depressive symptoms of the patients with narcolepsy or idiopathic hypersomnia (IHS). The subjects were 116 patients hospitalized for polysomnography and multiple sleep latency test from October 2007 to December 2011 in order to examine their hypersomnia fully, who answered a self-administered questionnaire, SF-36, and had a semistructured interview by the Japanese version of Structured Interview Guide for the Hamilton Depression Rating Scale. We analyzed data of 5 narcolepsy with cataplexy, 13 narcolepsy without cataplexy, 6 IHS with long sleep time, and 29 IHS without long sleep time patients. Although IHS without long sleep time patients were older than narcolepsy without cataplexy or IHS with long sleep time patients, there were no significant difference in body height, body weight, or Epworth sleepiness scale score among the 4 groups.
Narcolepsy with cataplexy patients showed lower physical role functioning (26.2 ± 22.4), general health perceptions (35.1 ± 9.1), and emotional role functioning (31.1 ± 21.0) as compared to the general population. Multiple comparisons of 4 groups showed narcolepsy with cataplexy patients had lower general health perceptions than narcolepsy without cataplexy patients (35.1 vs 53.6, p<0.05). There were no significant differences in Hamilton Depression Scale scores among the 4 groups. Cataplexy may decrease QOL of narcolepsy patients.

349) Abstract 454
CANCER-SPECIFIC DISTRESS, COPING, AND HEALTH BEHAVIORS IN LUNG CANCER PATIENTS
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Lung cancer patients experience high levels of psychological distress, and combine emotion-focused and problem-focused coping strategies. Associations of distress with poor health behavior are well documented in other populations, and salient in lung cancer. Cancer-related distress may be related to poor diet, poor compliance with treatment plans, smoking, and self-medication with drugs or alcohol. Associations of distress with health behavior may be alleviated among those using problem- versus emotion-focused coping strategies. We hypothesized that cancer patients with greater cancer-specific distress would report poorer health behavior (health service utilization, smoking, diet), and that relationships would be mediated by coping style.
Sixty-two patients with lung cancer were recruited from a cancer treatment center, local physicians, and newspaper advertisements. Patient's psychological distress, coping, and health behaviors were measured via self-report. Age, cancer stage and income were adjusted in multiple comparisons of 4 groups. Cataplexy may decrease QOL of narcolepsy patients.

350) Abstract 150
AERobic EXerCISE does not alter resting CARdioVascular SYMPATHETIC FUNCTION in HEALTHy SUBJECTS
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OBJECTIVE: Exercise has widely-documented cardioprotective effects, but the mechanisms behind these effects are still not entirely known. Previously, we demonstrated that aerobic training, in contrast to strength training, lowered resting heart rate and increased cardiac vagal regulation and that these changes were reversed by sedentary deconditioning. In this study, we focus on the sympathetic nervous system, and test the hypothesis that in healthy subjects an aerobic training program would lower levels of cardiovascular sympathetic activity in rest and that deconditioning would reverse this effect.
METHODS: We conducted a randomized controlled trial contrasting the effects of aerobic versus strength training on indices of cardiac (pre-ejection period [PEP] and low-frequency band pressure variability, LF-BPV) sympathetic regulation in 149 young, healthy and sedentary adults. Subjects were studied before and after conditioning, as well as after 4 weeks of sedentary deconditioning.
RESULTS: Aerobic capacity increased in response to conditioning and decreased after deconditioning in the aerobic, but not the strength, training group. Contrary to prediction, there was no differential effect of training on either PEP or LF BPV.
CONCLUSIONS: These findings, from a large randomized controlled trial using an intent-to-treat design, show that moderate aerobic exercise training has no effect on resting state cardiovascular indices of PEP and LF BPV. These results indicate that in healthy, young adults, the cardioprotective effects of exercise training are unlikely to be mediated by changes in resting sympathetic activity.

351) Abstract 379
A PROSPECTIVE STUDY OF VOLUNTEERISM AND HYPERTENSION RISK AMONG OLDER ADULTS
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Epidemiological studies have consistently linked volunteerism to lower all-cause mortality among older adults. Few studies, however, have focused specifically on how volunteerism might be associated with cardiovascular outcomes, despite the fact that cardiovascular disease is the leading cause of death among older adults. Here we examined the association between volunteerism and development of hypertension, a risk factor for cardiovascular disease, cardiovascular mortality, and stroke in a representative sample of U.S. adults 51 and older. Participants provided data during the 2006 and 2010 waves of the Health and Retirement Study, a longitudinal panel survey of community-dwelling older adults. Volunteerism and blood pressure were measured at baseline and again four years later. Analyses exclude individuals hypertensive at baseline and control for baseline age, race, sex, education, systolic/diastolic blood pressure, and major chronic illnesses. Those who had volunteered at least 200 hours in the 12 months prior to baseline were less likely to develop hypertension (OR=0.60; 95% CI: 0.40-0.90) than non-volunteers over the four-year follow-up period. There was no association between volunteerism and hypertension risk at lower levels of volunteer participation. Volunteerizing at least 200 hours was also associated with lower increases in psychological well-being (B=0.09; β=0.05; p=.006) and physical activity (B=0.21; β=0.05; p=.04) compared to non-volunteers; however, these factors did not explain the association of volunteerism with hypertension risk.

352) Abstract 362
WHY SLEEP DEPRIVATION RISK US OBESITY? AN FMRI STUDY
Ruri Katsunuma, MRes, Kentaro Oba, MS, Yuki Motomura, MS, Yuri Terasawa, MA, Kyoko Nakazaki, PhD, Yasuko Katayose, PhD, Shingo Kitamura, PhD, Akiko Hida, PhD, Yoshita Moriguchi, MD, PhD, Kazuo Mishima, MD, PhD, Psychophysiology, National Center of Neurology and Psychiatry, Kodaira, Tokyo, Japan
Many studies have shown the risk of obesity by sleep deprivation, though its neural basis is still undercover. This prior study has implied the involvement of reward system with food intake using functional magnetic resonance imaging (fMRI). Seven healthy male subjects (mean±SD age = 22.6±2) were recruited. After the detail explanation of the experiment, they gave a written consent and performed the experiment. They were consistently examined in the sleep lab in our institute on the first day (BASE), after nine days of sufficient twelve hours sleep (SS9), then one night of total sleep deprivation (TSD), to see how the modulation of sleep effects their brain activity related to food drive. During the period of experiment, room lights in the lab, subjects sleep time, temperature and food intake (calorie, amount and time) were strictly controlled. We created images of three conditions; high calorie food, low calorie food, and non-food. Each condition contained 12 items separated into two fMRI sessions. The task in the MRI scanner for the subjects was to see the images and rate how much they desire the target. Each scan was done before the meal. For the analysis of the imaging data, SPM8 was used. Hemodynamic responses in each subject to high vs. low calorie food were further entered into the 2x2x2 (GROUP = BASE vs TSD) x (SEX=MALE, FEMALE) x (Hunger = HUNGER, NO HUNGER) contrast and voxel-based multiple comparison correction. Statistical threshold of alpha was .001. Results show lower activation...
of orbitofrontal cortex (OFC) and ventral tegmental area (VTA), in SS9 compared to BASE, T(13)=3.85, p<.001. Results also demonstrated the importance of higher VTA and hypothalamic activation, in TSD and SS9, T(13)=3.01, p=.005. These results provide evidence that sufficient sleep decreases the urge toward high calorie food, as the OFC and VTA are known to respond to salient rewarding stimuli. The result also suggests that an extreme sleep loss alters the hypothalamus activation, which is well-known as the center of the controlling appetite through hormonal regulation. In conclusion, sleep sufficiency is important to regulate the urge to food though rewarding system in one's brain, and may be a clue to clarify the reason why the sleep deficiency is a risk factor of obesity.

353) Abstract 467
APPLICATION OF HEALTH BELIEF MODEL TO GENETIC TESTING FOR CANCER SUSCEPTIBILITY: A LITERATURE REVIEW
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Background: The Health Belief Model (HBM) is a conceptual framework used in health research to predict factors influencing an individual’s decision-making regarding engagement in a health-related behavior which is defined as any action taken by the individual to prevent a health threat. In the context of oncology, the high potential mortality indicates a major health threat. This is particularly relevant to hereditary cancers, which account for approximately 5% to 10% of all cancer cases. Individuals at risk of developing hereditary cancers can determine their carrier status by undergoing genetic testing. Identified carriers can benefit from screening programs for early detection of the disease. However, given the potential positive and negative impacts of genetic testing, decision-making for undergoing the test is a complex process for individuals. Many researchers have tried to use the HBM to better understand factors involved in this process. By conducting a review of the literature, we aim to summarize the factors influencing decision-making for genetic testing in hereditary cancers.
Method: Medline and PsycINFO databases were searched using the following keywords: subject heading “Health Belief Model” “Attitude” “Genetic testing” and “Cancer”. Our search was limited to full-text, English-language articles that applied the HBM or some components of the model to decision making for genetic susceptibility to cancer.

Results: Seventy-two articles met inclusion criteria on initial searching. Of these, eleven articles were retained based on the relevance of the abstract. Five articles addressed genetic testing for breast/ovarian cancer, 4 for colorectal cancer, 1 for prostate cancer and 1 for cancer in general. All of these studies showed that different dimensions of the HBM were significant predictors of taking genetic testing. Several studies also revealed that some other factors such as cancer worry, cancer family history, level of education and physician recommendation were significantly associated with taking the test. Fear of stigma and concerns about financial issues were among the perceived barriers for genetic testing.

Conclusion: The HBM is a useful framework to identify factors influencing individuals’ engagement in health-related behaviors. Applying this model in the context of genetic testing for cancer provides genetic counselors and other health professionals with a better understanding of these factors and guide interventions aimed at helping at risk individuals in making an informed decision.

354) Abstract 563
THE ROLE OF NEEDLE FEAR, ANXIETY AND PAIN IN PREDICTING VASOVAGAL REACTIONS IN BLOOD DONORS
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Vasovagal reactions (VVRs) involve unpleasant symptoms such as dizziness, light-headedness, and fainting, and are relatively common in blood donation and other medical settings. Several factors predict VVRs in blood donors, such as fear, anxiety and pain. However, the mechanisms and relative importance of such constructs are unclear. The goal of the current study was to examine the interplay between these different factors and their ability to predict VVRs in blood donors. As part of a larger trial assessing the effectiveness of a muscle tension technique called Applied Tension (AT) in reducing VVRs, 274 donors completed several questionnaires. Anxiety was measured both before and shortly after donation, using the Spielberger State-Trait Anxiety Inventory (STAI). Participants indicated the amount of pain they experienced during donation on a continuous rating scale. They also completed the Medical Fears Survey. An objective index of VVR was obtained, based on whether or not the nurse on site had to intervene by elevating the donor's feet and applying a cold compress on their forehead (standard protocol). After controlling for age, sex and number of previous donations, regression analyses revealed that pre-donation anxiety and needle fear both significantly predicted donation pain (p=.001 and p=.001, respectively); and pain during donation was significantly associated with greater likelihood of experiencing a VVR (p= .036). However, the association between pain and VVR became non-significant when pre-donation anxiety was added to the model, and also when needle fear was added to the model. Interestingly, when the effects of pain, pre-donation anxiety and during-donation anxiety were analyzed together, only anxiety during donation predicted VVR (OR= 1.25, p=.034). These findings suggest that blood donors' initial level of anxiety and fear of needles influence the amount of pain they experience during donation. However, those who experience the most anxiety were the most likely to have a VVR, not those reporting the most pain. Results will be discussed in terms of implications for future research on decreasing VVRs during blood donation.

355) Abstract 731
DO REM CHARACTERISTICS PREDICT CARDIOVASCULAR RESPONSES TO DAILY STRESS?
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Introduction: Epidemiological studies show that individuals who exhibit large increases in blood pressure during psychological stress are at heightened risk for developing primary hypertension. Increased REM (Rapid Eye Movement) sleep and decreased REM latency are markers of vulnerability to depression, which is among the negative affect constellation linked to CV risk. The current study examines the association between REM and stress responses using field data that include momentary assessment of demand, social conflict and ambulatory blood pressure (ABP), alongside REM measures.
Methods: The Heart Strategies Concentrating on Risk Evaluation study is a multi-ethnic cohort of healthy middle-aged adults. As part of the ancillary SleepSCORE study, participants underwent two nights of polysomnography (n=224; 52% male, 41% Black). They also completed electronic self-report assessments at the time of ABP monitoring throughout two days. Hierarchical linear models examined whether sleepers with greater %REM or shorter REM latency exhibited a stronger relationship between momentary stress and cardiovascular responses (systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate across two days), than those with less %REM, or longer REM latency, respectively. Covariates included posture, gender, race, age, and body mass index. Perceived demand was the sum of the response to two 6-point Likert scale items asking whether the mental and physical activity in the ten minutes preceding BP measurement required working hard and working fast. Social conflict was the sum of responses to having an unpleasant interaction and being treated badly.

Results: Greater %REM significantly predicted higher SBP (p =.035). A significant interactive effect (p =.004) of conflict and %REM was found whereby those with higher %REM had a stronger SBP response to increased social conflict than those with lower %REM. No other significant effects were obtained.

Conclusion: This analysis suggests that persons with greater REM sleep are more SBP responsive to social conflict than those with less REM sleep. These findings raise the possibility that REM sleep may play a role in the development of hypertension.
A CANCER SYMPTOM CLUSTER IS ASSOCIATED WITH SUBJECTIVE SOCIAL STATUS AMONG BLACK BREAST CANCER PATIENTS
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Evidence suggests that certain symptoms and sequelae of cancer treatment frequently co-occur (i.e., symptom clusters; most often includes depressive symptoms, pain, sleep disturbances, and fatigue). Symptom clusters diminish health-related quality of life and represent a significant burden to the health care system. Because studies have shown that lower socioeconomic status (SES) is associated with increased cancer recurrence, mortality and poorer quality of life, we examined the relationship between SES and clustered symptom burden. As part of a larger stress management intervention trial, we collected baseline assessments for 115 Black breast cancer patients (stage 0-IV) within 0-12 months of the end of active treatment. In confirmatory factor analysis, depressive symptoms (Center for Epidemiologic Studies Depression Scale), typical pain rating, subjective social status sub-scale, and fatigue (Fatigue Intensity Subscale of the Fatigue Symptom Inventory) all loaded onto a symptom cluster latent factor at p<.001. In a structural equation model, participant ratings on the MacArthur Scale of Subjective Social Status predicted the latent symptom cluster factor (standardized path coefficient = 0.27; z = -2.82; p<.01) such that those who reported lower perceived social status also reported greater symptoms, even after controlling for cancer stage and objective indicators of SES (income and years of education; Chi-Square=24.52, CFI=0.99, Root Mean Square Error of Approximation=0.02, and Standardized Root Mean Square Residual=0.04 indicating good model fit). Income was also significantly associated with clustered symptoms (standardized path coefficient = 0.21; z = -2.14, p<.04) such that those with lower income reported fewer clustered symptoms, but education was not significantly associated with clustered symptoms. These findings suggest the need to consider cancer symptom management from a holistic approach with the understanding that perceived SES may be contributing to these clustered symptoms independent of medical factors such as cancer stage and objective indicators of SES.

A CANCER SYMPTOM CLUSTER IS ASSOCIATED WITH SUBJECTIVE SOCIAL STATUS AMONG BLACK BREAST CANCER PATIENTS (Continued)

NEURAL SIGNATURES ASSOCIATED WITH PATIENT-REPORTED SYMPTOMS IN CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY (CIPN)
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Background: CIPN is a common consequence of cancer treatment, is a dose-limiting toxicity for chemotherapy, and may severely decrease a patient’s quality of life. Neuroimaging techniques have revealed evidence of a pain matrix in both acute and chronic pain conditions; however, neuropathy often also involves non-pain states such as numbness and loss of dexterity. Here we examine neurophysiological mechanisms and patient reported outcomes to better understand the patient’s physical and emotional experience of CIPN as it relates directly to brain activity. Methods: Patients with CIPN (N=28; mean age 63 years; 86% female) completed baseline questionnaires and underwent an EEG. We examined cortical activity of patients compared to healthy controls using a prospective database, and used relative power measures to determine the highest percentage of activity across bandwidths in regions of interest (ROIs). We then compared ROIs with measures assessing pain severity (Brief Pain Inventory), quality and intensity of neuropathic pain (Pain Quality Assessment Scale), and psychological symptoms (Brief Symptom Inventory). Correlational analyses determined the association between cerebral activity and symptom measures. Results: our results demonstrated a decrease in relative power across the somatosensory, parietal, and frontal cortices with maximal activity along the left hemispheric somatosensory and parietal ROIs. 23 of 28 patients also had a concomitant increase in beta activity (13-21HZ). Physical symptoms were associated with activity in the frontal, sensory motor, and parietal cortices (p<.05) while psychological distress was associated with activity in the frontal cortex (anxiety, pain interference) and sensory motor cortex (depression, global severity), (p<.05) suggesting overlapping areas between physical and psychological processing of neuropathic symptoms. Conclusions: Patients with CIPN demonstrate predictable patterns of cortical activity such that the conscious perception of neuropathy may be equally as important as peripheral tissue damage. ROIs for both psychological and physical pain may be similar; and chemotherapy may have distinct electrophysiologic correlates within the pain matrix.

DEVELOPMENT AND VALIDATION OF THE CARDIAC SURGERY PATIENT EXPECTATIONS QUESTIONNAIRE (C-SPEQ)
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Background: Variability in recovery and outcomes following cardiac surgery has been noted, which may be related to emotional and psychosocial aspects that are not adequately or routinely captured. Patient expectations may provide valuable information regarding discrepancies in post-surgical outcomes. Preliminary evidence suggests that expectations have an impact on physical health status, but a suitable measure of expectations for cardiac surgery patients has not been developed. The purpose of this study was to adapt The Future Expectations Regarding Life with Heart Disease Scale to the cardiac surgery patient population.
Methods: This study was observational with both prospective and qualitative data collection. A total of 99 patients awaiting non-emergent cardiac surgery were enrolled. The first 7 participants completed a 1-on-1 cognitive interview before the questionnaire was finalized. The remaining 92 patients completed a packet of questionnaires at...
baseline, including the adapted measure developed via cognitive interviewing: Cardiac Surgery Patient Expectations Questionnaire (C-SPEQ).

Results: The final C-SPEQ was 20 questions each assessed on a 5-point scale. Mean C-SPEQ total score was 39.4 ± 9.02, median score was 40, and scores were normally distributed (Shapiro-Wilk, *p* = 0.33). Higher score indicated more negative expectations regarding cardiac surgery. A Cronbach’s alpha of 0.86 indicated strong internal consistency for the C-SPEQ. Deletion of any item did not improve the Cronbach’s alpha and in exploratory factor analysis all items had strong factor loading on a single factor. Strong construct validity for the C-SPEQ was demonstrated via Pearson correlations in the appropriate directions with the LOT-R for optimism (*r* = −0.58, *p* < 0.001), ISEL scales for social support (*r* = 0.39, *p* < 0.01; *r* = 0.25, *p* = 0.02; *r* = 0.42, *p* < 0.001; *r* = −0.62, *p* = 0.01), PSS for stress (*r* = 0.48, *p* < 0.001), CES-D for depression (*r* = 0.47, *p* < 0.001), and STAI for state (*r* = 0.50, *p* < 0.001) and trait (*r* = 0.54, *p* < 0.001) anxiety.

Conclusions: Adaptation of a patient expectation questionnaire to the cardiac surgery population was successful with acceptable reliability and validity. Further qualitative work may provide adaptations for other surgical groups (i.e., O-SPEQ for orthopedic surgery). An ongoing study at our institution is examining the impact of the C-SPEQ on 1-year clinical and psychosocial outcomes following cardiac surgery. Results of this work may indicate that pre-surgical interventions and education could help to prepare patients and improve outcomes after cardiac surgery.

360) Abstract 254 PERSONALITY AS A PREDICTOR OF BIOPSYCHOSOCIAL OUTCOMES IN WOMEN WITH NON-METASTATIC ENDOMETRIAL CANCER

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Background: Personality traits, such as low neuroticism, high extraversion and, high openness to experience, are characteristic of individuals with positive adaptation in the face of adversity. Among individuals with cancer, these traits are associated with better quality of life (QOL) and lower pain. However, few studies have examined personality as a predictor of biopsychosocial outcomes in gynecologic cancers. This study examines relations between personality and (a) perceived stress/mood, (b) pain/cancer-related QOL, and (c) cortisol among women undergoing surgery for endometrial cancer (EC).

Methods: 51 women (Age M=61.25yrs,SD=9.02yrs) with EC completed measures of personality, stress/mood, and pain/QOL and collected salivary cortisol samples pre- and post-surgery. Data were analyzed using multiple hierarchical regressions.

Results: Greater neuroticism was associated with greater depression (Preop β = .326, *p* < .05), guilt (Preop β = .477, *p* < .001; Postop β = .529, *p* < .001), anger (Preop β = .525, *p* < .001; Postop β = .485, *p* < .001), stress (Preop β = .442, *p* < .001; Postop β = .463, *p* < .01), anxiety (Preop β = .249, *p* < .05) and pain (Postop β = .468, *p* < .001), and greater openness was associated with more positive outcomes, which was mostly all in the expected direction. However, greater extraversion was associated with a more abnormal cortisol slope (Postop β = .279, *p* = .074). Although this was in the unexpected direction, the relationship was marginal.

Discussion: Although based on a small sample, these findings support the hypothesis that personality traits may predict perisurgical biopsychosocial outcomes in EC. Future research should examine whether interventions modifying cognitions/behaviors among individuals with high neuroticism and low openness can promote positive outcomes in this population.

361) Abstract 770 SUBJECTIVE SOCIAL STATUS AND THE STRESS RESPONSE SYSTEM IN CHILDREN AND ADOLESCENTS

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Subjective social status (SSS) is posited to underlie the graded association between socioeconomic status (SES) and health. SSS is closely tied to stress processes. In animals, subordinate rank in dominance hierarchies is associated with dysregulation of the stress response system including elevated basal cortisol levels, a sluggish stress-response, and delayed recovery from stress (Sapolsky, 2004). In adults, lower SSS is associated with higher resting heart rate and elevated cortisol awakening response, even after controlling for objective measures of SES, such as education, income, occupation. In youth, findings are less consistent. The aim of the present study was to examine this association in children and adolescents. Participants (N = 200; 45% female) from the Healthy Heart Project were grade-stratified into children (Grades 3-6; n = 74; M = 10.59 years) and adolescents (Grades 7-11; n = 126; M = 13.94 years). Youth completed the Subjective Social Status Scale-Youth Version (society, school ladders; Goodman et al., 2001) and parents reported household income and education level. For autonomic nervous system activity, heart rate variability (HRV) was derived from 24 hr ambulatory monitoring. For HPA-axis activity, cortisol was derived from 6 saliva samples collected each day for 2 weekdays. Partial correlation analyses controlled for sex, age, recording duration, and objective SES (household income, parent education). Children’s rating of higher status in society was correlated with lower LF/HF Ratio (r = −.276). Adolescents’ rating of higher status in society was correlated with lower LF/HF Ratio (r = −.206). No remaining associations were significant. These findings provide limited support for the hypothesis that SSS is associated with the stress response system as few associations were significantly related. The observation that the cortisol awakening response is associated with SSS in children, but not adolescents, is consistent with findings in adults. Previous research has not considered HRV. Future research should examine the association between SSS and the stress response system over the life-course to determine how and when it develops.

362) Abstract 700 ACUTE EFFECTS OF TAI CHI EXERCISE ON AUTONOMIC ACTIVITY AND EFFECTIVE STATES

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Purpose: The purpose of the current study was to test the immediate effects of Tai Chi exercise on the autonomic nervous system, mood, and subjective state. We hypothesized Tai Chi would increase parasympathetic activity, increase ratings of positive mood, and reduce ratings of negative mood and fatigue as compared to guided stretching.

Methods: The sample included 20 adults (13 women and 7 men with mean age 49.8 +/- 16.11 years) who had been practicing Tai Chi for a mean of 7.91 years. Participants visited the laboratory twice and completed a Tai Chi exercise during one visit and a guided stretching exercise during the other (exercise performance order was counterbalanced). Pre-ejection period, heart rate variability, mood, and fatigue were measured before and after each exercise.

Results: Compared to the guided stretching exercise, participants' sympathetic activity (indexed by preejection period) was significantly reduced after the performance of Tai Chi (*p* < .05). There was no change in pre-ejection period following the guided stretching task. In contrast, Tai Chi did not have a significant effect on RMSSD, a heart rate variability-based estimate of parasympathetic activity. Neither exercise produced notable changes in mood. A significant effect of time on fatigue was found, with fatigue decreasing from baseline to post exercise assessment regardless of exercise performance.

Conclusions: When measured immediately after performance, Tai Chi appeared to reduce sympathetic activity but had no effect on parasympathetic activity. Future research should appear to reduce sympathetic activity, increase parasympathetic activity, increase ratings of positive mood, and reduce ratings of negative mood and fatigue as compared to guided stretching.
Objectives: Differences in psychosocial risk factors of cardiovascular disease among diagnostic groups referred to cardiac rehabilitation programs have rarely been investigated. The objective of this study was to compare two groups of patients with a primary diagnosis of either peripheral arterial disease (PAD) or coronary artery disease (CAD) on psychosocial factors (depression, anxiety, positive and negative affect, health-related quality of life) before outpatient cardiac rehabilitation and on changes in these psychosocial factors during the rehabilitation program. Methods: We examined 520 patients with CAD and 69 patients with PAD and matched them using propensity scores in two groups of 63 patients each considering age and physical functioning. Outcome measures were the Hospital Anxiety and Depression Scale (HADS), the Global Mood Scale (GMS) measuring positive and negative affect, and the SF-36 Health Survey measuring health-related quality of life (QoL). ANCOVA and Repeated Measure ANOVA with adjustments for age, gender, and body mass index were used to analyze differences in psychosocial factors between patient groups at baseline and at 14 weeks after surgery. At baseline, quality of life had significantly higher levels of negative affect, and lower levels of QoL in terms of role-physical, vitality, social functioning, role-emotional, physical and mental sum score relative to PAD patients (all p-values <0.05). Over time, patients with CAD showed a greater reduction in depressive symptoms than patients with PAD (p=0.04). Except for the mental health sum score, the same pattern was found for all SF-36 scores, reversing that patients with CAD had greater improvements in health-related QoL than patients with PAD (all p-values<0.05).

Conclusions: Our findings suggest that patients with PAD differ in terms of changes in psychosocial outcome during cardiac rehabilitation from patients with CAD. Especially with regard to depressive symptoms and physical aspects of health-related QoL, patients with PAD show smaller improvements than patients with CAD, even though CAD patients reported higher levels of negative affect. This pattern was consistent across several domains assessed and the methods used; and identify practices that are associated with participants’ confidence in the predictive ability of the evaluations conducted. An online survey was used to gather data regarding current practices in pre-SCS psychological evaluations from psychologists (44.9% female) completed the survey. All but four were licensed at the doctoral level, with the remainder in the process of completing doctoral training or licensure. Clinical interviews were used by all participants in the pre-SCS psychological evaluation process, with 65 (94%) using psychological tests. Participants provided information for the following areas: psychological assessment methods used, such as interviews and types of psychological tests administered; psychological issues assessed, both in the domains of psychiatric disorders and in other psychosocial and behavioral issues; issues of greatest concern when formulating recommendations for approval, delay, or denial for surgery; types of pre-SCS recommendations most typically provided; and overall percentages of patients for whom recommendations for approval, delay, or denial of implantation are made. Sixty-nine psychologists (44.9% female) completed the survey. All but four were licensed at the doctoral level, with the remainder in the process of completing doctoral training or licensure. Clinical interviews were used by all participants in the pre-SCS psychological evaluation process, with 65 (94%) using psychological tests. Participants indicated a relatively high degree of confidence in the ability of their psychological evaluations to identify patients who are unlikely to have a positive outcome, on a scale of 0–10 (M = 7.80, SD = 1.17, Mdn = 8.00, n = 62). Hypothesis testing did not reveal any significant associations between evaluator confidence and either the number of evaluations conducted or the numbers of issues assessed. Information is reported related to the psychological issues assessed; pre-SCS recommendations, indications and contraindications; training; and other issues. Our data provide insight into practices, beliefs, and recommendations of practitioners that may be of value in continued efforts to optimize the content, evolution, and promulgation of resources used in the psychological assessment, treatment, and preparation of candidates for SCS.

365) Abstract 284

CARDIOVASCULAR REACTIVITY TO LABORATORY-INDUCED MENTAL STRESS IN PATIENTS UNDERGOING SURGERY FOR ATRIAL FIBRILLATION

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Atrial fibrillation (AF) is the most commonly clinically significant cardiac arrhythmia, causing problems with speed and pattern of heartbeat. Prolonged periods of AF can result due to pounding, irregular heartbeat, shortness of breath, tiredness, dizziness or fainting, and chest pain. AF increases the risk for other cardiac problems and stroke. The Cox-Maze surgical procedure creates scar tissue in the heart to block transmission of abnormal electrical signals. Increased cardiovascular reactivity (CR) to stress contributes significantly to risk for cardiovascular disease development. However, little is known about CR to stress in patients with AF. This pilot study is the first known report of pre and post-surgery reactivity to laboratory induced mental stress (MS) in patients with AF. The purpose of this investigation was to characterize the differences in CR between pre-surgery and post-surgery measurements. At Visit1 (1.0 ± 0.9 weeks before surgery) and again at Visit2 (16.8 ± 4.3 weeks after surgery) heart rate (HR), systolic (SBP) and diastolic (DBP) blood pressure were collected at rest and during MS (anger recall and mental arithmetic). The four patients had a mean age of 65.0 ± 3.7 with 1 (25%) female patient. SBP and DBP were significantly higher during the mental stress tasks as compared to resting values at Visit1 (see Table). At Visit2, the same pattern of results was observed (see Table). Testing the magnitude of these hemodynamic changes (comparing Visit2 to Visit1), no statistically significant differences were found. Therefore, the mental stress tasks elicited consistent CR from Visit1 to Visit2. This may suggest that the magnitude of CR is not dependent on the presence of AF.

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<td>BP (mmHg)</td>
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<td>SBP</td>
<td>103.8 (9.1)</td>
<td>137.8* (10.1)</td>
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<td>BP (mmHg)</td>
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<td>SBP</td>
<td>111.6 (8.0)</td>
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<tr>
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<tr>
<td>HR</td>
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<td>* p &lt; 0.05 between Rest and MS</td>
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Psychological stress may contribute to the development of low-grade fever in a patient with chronic fatigue syndrome: A case report

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Objective: Low-grade fever is a common symptom in patients with chronic fatigue syndrome (CFS). However, the mechanisms responsible for its development are poorly understood. The objective of this study is to investigate if psychological stress contributes to low-grade fever in a patient with CFS.

Methods: A 26-year-old woman with CFS was admitted to our hospital. She had been recording her axillary temperature regularly and found it was especially high when she felt stress. To assess how psychological stress affects temperature and to investigate the possible mechanisms for this hyperthermia, we conducted a 60-min stress interview and observed the following parameters: axillary temperature, fingertip temperature, systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), plasma catecholamine levels, and serum levels of interleukin-1β and interleukin-6 (pyretic cytokines) and tumor necrosis factor-α and interleukin-10 (antipyrctic cytokines).

Results: Her axillary temperature at baseline was 37.2°C, increasing to 38.2°C by the end of the interview. In contrast, her fingertip temperature decreased during the interview. Her HR, SBP, DBP, and plasma levels of noradrenaline and adrenaline increased during the interview; there were no significant changes in either pyretic or antipyrctic cytokines during or after the interview.

Conclusions: A stress interview induced a 1.0°C increase in axillary temperature in a CFS patient. Negative emotion-associated sympathetic activation, rather than pyretic cytokine production, contributed to the increase in temperature induced by the stress interview. This case report suggests that psychological stress may contribute to the development or the exacerbation of low-grade fever in some CFS patients.

Perception of asthma symptoms during a histamine challenge test: Comparison of obese and overweight vs. normal weight individuals

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Rationale: Asthma and Obesity are both associated with respiratory discomfort. Therefore we studied the association of lung function and dyspnea during a histamine challenge test in individuals with asthma that were either overweight or obese (OOA) or had a normal weight (NWA).

Methods: Participants were 18 OOA (BMI >25 kg/m²) and 42 NWA (BMI <25 kg/m²) participants. All participants were newly-diagnosed asthma patients. Participants did not differ in baseline lung function or the concentration of histamine that was needed to obtain a 20% decrease in lung function. Multi-level analysis (controlling for gender, age, NA, and baseline lung function) showed that OOA participants had a steeper increase in dyspnea for a similar decrease in lung function compared with NWA participants. These steeper slopes were found both for ratings of symptom intensity (P<.0086) and symptom unpleasantness (P=.01).

Conclusions: Perception of respiratory symptoms during a histamine challenge test is different obese and overweight compared to normal weight individuals with asthma. Similar levels of increases in bronchostriction affect obese individuals more strongly. This effect may in part explain asthma outcomes in obese individuals. This group may benefit from interventions that impact the perception of respiratory symptoms.

DAILY HASSLES INCREASE EXHALED NITRIC OXIDE AND DECREASE LUNG FUNCTION IN ASTHMA: A LONGITUDINAL STUDY

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The fraction of exhaled nitric oxide (FeNO) has been used as a marker of airway inflammatory activity in asthma. Hand-held devices have recently been introduced, which allow ambulatory monitoring of FeNO in patients’ daily life. We used this technique to examine the longitudinal association between daily hassles and FeNO across two months. Stress and negative affect have been linked to changes in airway inflammation before, but findings have varied for various types of stressors and longitudinal studies are missing. In this study, 20 asthma patients performed daily measurements of FeNO and spirometric lung function (forced expiratory volume in the 1st second, FEV1) in the evening and in addition performed bi-weekly ratings of daily hassles for the past two weeks. We used multilevel modeling to study the longitudinal association between daily hassles and FeNO assessment on the same day and on following days. Controlling for medication intake (bronchodilator use and change in maintenance medication), more daily hassles significantly (p<.05) predicted higher FeNO values averaged across the following two days. More daily hassles also predicted marginally (p<.10) higher FeNO values averaged for the same day and the following day. At the same time, FEV1 averaged for the current and following day was significantly (p<.05) lower with more daily hassles, and was marginally (p<.10) lower for the average of the current and the following two days. Averages of FeNO and FEV1 values including up to 8 additional days were not systematically affected by the preceding daily hassles report. FEV1 change was not mediated by changes in FeNO. Thus, daily hassles prospectively compromise both aspects of airway health, nitric oxide and lung function, in asthma.
370) Abstract 325
SERUM CYSTATIN C IS USEFUL FOR ESTIMATING RENAL FUNCTION OF ANOREXIA NERVOSA WHILE CONSIDERING THYROID FUNCTION
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Background: Renal abnormality has been reported as one of the medical complications of eating disorders, up to 70% patients are known to be comorbid. However, renal function in anorexia nervosa is underestimated, because creatinine-based glomerular filtration rate (GFR) is influenced by their severe decreased muscular mass. Plasma Cystatin C (Cys C) has the possibility to be a better marker for renal failure in these patients for its independency of gender, weight, height and age. Besides, Cys C has some limitation that affected by some endocrine hormones. The object of this study is to investigate the usefulness of Cys C in the evaluation of renal function in anorectics.

Objects and Method: Objects were anorexia nervosa patients who met the Diagnostic and Statistical Manual of Mental Disorders IV-TR criteria and were hospitalized in St. Luke's International Hospital from 2009 to 2011. Laboratory tests, including Cys C, creatinine and endocrine hormones, and 24-hour urine collection for creatinine and urea clearance, "true GFR" were measured. Indirect calorimetry was done for evaluation for their metabolic states. We compared "true GFR" to these factors by using the Pearson product-moment correlation coefficient.

Results: Thirteen women (mean age 30.0+/- 14.0, BMI=13.6+/-4.98 kg/m2) were eligible analysis. Average of Cys C was 1.07+/- 0.85mg/dl, and serum creatinine was 0.93+/-0.59mg/dl. "True GFR" was 60.0+/-37.6 ml/min. Both Cys C and serum creatinine correlated with "true GFR" (r=Cys C (r=0.874, p<0.01) and 1/creatinine (r=0.872, p<0.01)). More, we found that Cys C had a significant correlation with free thyroxin concentrate (r=0.66, P<0.05) , but it was not related to BMI and basal metabolism.

Discussion and Conclusion: Cys C, which is not influenced by body weight or muscle mass, could be a good maker of renal function in anorexia nervosa patients without thyroid function abnormality.

371) Abstract 713
USING FOOD IN RESPONSE TO STRESS AND GLUCOREGULATION: THE MEDIATING ROLE OF BODY WEIGHT DISTRIBUTION
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Guided by concepts from models of stress and coping, this study tested the extent to which using food in response to stress is associated with glucoregulation, and further, whether this relationship is mediated by body weight distribution. Participants were 1255 adults in the Midlife in the US study (MIDUS II). Glucose metabolism was characterized by fasting glucose, insulin, insulin resistance, and glycosylated hemoglobin (HbA1c). We investigated whether using food in response to stress was associated with higher nondiabetic glycemic control and higher odds of having diabetes. Additionally, we tested whether these relationships were mediated by body mass index (BMI) and waist-to-hip ratio (WHR). Results indicated that using food in response to stress was associated with significantly higher levels of glucose, insulin, insulin resistance, and HbA1c and higher risk for having diabetes in multivariate analyses adjusted for an extensive set of sociodemographic and health variables. Evidence from models that tested mediation effects showed that BMI and WHR explained, in part, the relationship between food in response to stress and glucoregulation. Findings contribute to the growing literature on the relationships among psychosocial factors, obesity, and diabetes. This study has important implications: choosing food is only one of many available choices in stressful situations, and focusing on people who use food as a coping strategy might be one way to intervene at the psychosocial underpinnings of obesity and diabetes.

372) Abstract 701
AUTISTIC TRAITS AFFECT NEURAL CORRELATES OF VISUOSPATIAL PERSPECTIVE TAKING
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It has been well known that individuals with Autism Spectrum Disorders (ASD) show deficits in perspective taking (PT). Taking a third-person perspective (3PP) has been associated with the precuneus, the inferior parietal cortex, the medial posterior cortex and the prefrontal cortex (Dochs et al.,2010). One interesting question here is whether they show deficits even in lower level of PT, such as 'visuospatial' perspective taking (VPT). To address this question, we used functional magnetic resonance imaging (fMRI) to investigate whether the brain activity in precuneus correlates with autistic traits.

Participants were 20 right-handed college students and completed Autism Spectrum Quotient (AQ). The task was an adapted version of the VPT task. Participants observed a stereoscopic image of three mountains on the screen and were required to change their viewpoint as indicated by the marker around three mountains. The viewpoint angular difference degree, i.e. different between participant’s viewpoint and required new viewpoint (3PP), was angle 0°, 45°, 90°, 135° or 180°(8 viewpoints). The response time (RT) was measured by pressing the button when participants visualized the layout of the objects from the required viewpoint (3PP). After a short delay, participants viewed the picture from one of 8 viewpoints and were required to answer whether it matches their maintained image from the required viewpoint.

As a result, the RT in VPT differed between viewpoint angles, F(4, 52) = 12.67, p<.001, and the post hoc analysis indicates that participants took more RT at angle 45° and 135° than at 180° (p<.05).

The RT were also different between high and low AQ groups F(1,13) = 10.04, p<0.01, such that high AQ group took more RT than low AQ group. The result suggests that the task required more cognitive load in autistic people.

We thought that PT process from 3PP was induced more strongly in angle 45° and 135° than in other angle conditions. To identify the activated brain regions during VPT, we compared hemodynamic responses to taking perspectives from angle 45°/135° vs. 0°/90°/180°. As expected, we found significant activations in the precuneus, as well as inferior parietal lobule, p<.001(unc.), cluster size=10 voxels. Finally, the contrast estimates of the brain activation in the precuneus positively correlated with the AQ score, r(18) = 0.52, p<0.05.

The results suggest that individuals with high autistic trait, who are well known as having difficulty in PT of other’s mental states, also show difficulty in VPT.

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PSYCHOLOGICAL DISTRESS, BUT NOT STRESS PHYSIOLOGY, IS ASSOCIATED WITH QUALITY OF LIFE IN PRE-SURGICAL BREAST CANCER PATIENTS
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Circadian, endocrine, and immune disruption have been linked with poor quality of life (QOL) among breast cancer survivors and patients with advanced disease. Circadian psychoneuromimune relationships have rarely been examined in newly-diagnosed patients, moreover, few such data exist among ethnic minorities. We hypothesized associations of circadian rest/activity rhythm, diurnal salivary cortisol profiles, psychological distress, and serum cytokines with QOL in pre-surgical breast cancer patients. We explored these associations across racial/ethnic subgroups. Fifty-seven pre-surgical patients contributed rest-activity and salivary cortisol data at home over 3 days. Cancer-specific distress and mood disturbance were measured via self-report. Cytokine profiles were analyzed using quantitative electrochemiluminescent arrays. Health-
related QOL was measured via self-report. Age and cancer stage were
adjusted in a series of exploratory hierarchical linear regressions on the
hypothesized relationships. These analyses were replicated within
subsamples of African-Americans (n=21) and Non-Hispanic Whites
(n=33). For significant results, tertiary analyses tested the subscales of
the IES, POMS, and FACT-B.
No actigraphic or biological measures were related to QOL. However,
pre-surgical patients with greater cancer specific distress and mood
disturbance also reported significantly poorer QOL (p<.001). These
findings persisted among both ethnic subgroups. Three QOL
relationships distinguished the subsamples: among Non-Hispanic
Whites, greater cancer-specific distress was related to poorer physical
well-being (p<.02) as well as breast cancer specific quality of life
(p<.005). Among African-Americans, greater mood disturbance was
related to poorer social and family well-being (p<.001).
These exploratory analyses suggest a future hypothesis that, among
pre-surgical breast cancer patients, psychological distress, rather than
physiological dysregulation, may explain decrements in QOL during
the acutely stressful pre-surgical period. Moreover, physical well-being
and breast cancer concerns may be especially relevant to Non-Hispanic
Whites; while social and family support may be particularly salient to
well-being among African-American patients.
How to Cite your Abstract

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