70th Annual Scientific Meeting
March 14 - 17, 2012

“Symptoms and Patient Reported Outcomes”

Meeting Abstracts

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

**Wednesday, March 14**

9:30-4:30 Preconference Workshop: Acceptance and Commitment Therapy and Mindfulness in Psychosomatic Medicine
11:00-4:00 APS Council Meeting
1:30-4:30 Preconference Workshop: Assessing Life Stress Using Interview and Computer-Based Methods
5:00-7:30 Opening Session/Distinguished Scientist Award/Citation Poster Session (p. A12-A18) and Reception
7:30-8:30 Student Mixer

**Thursday, March 15**

8:00-9:00 Plenary Session: Neuroendocrinology of Stress and Psychosomatic Disorders
9:00-9:45 Data Blitz
10:00-11:15 Invited Symposium: Sleep and Fatigue
Symposium 759: The Restless Mind: Default Mode of Operation or Risk Factor for Health? (p. A2-A3)
Paper Session: Life Course Adversity and Health (p. A86-A87)
11:30-1:00 Lunch on your own/Roundtable Lunches/Committee Meetings
1:00-2:15 Symposium 1086: Systems Approaches to Symptoms Assessment (p. A3-A4)
Symposium 925: Psychosocial Factors in Asthma Control: Stress, Cognition and Lifestyle (p. A4-A5)
Paper Session: Physical Activity (p. A88-A89)
Paper Session: Personality, Emotion and Cardiovascular Outcomes (p. A90-A91)
2:30-3:45 Invited Symposium: Unfair Treatment, Socio-economic Status and Health
Paper Session: Innovative Interventions (p. A91-A92)
Paper Session: Cortisol and the HPA Axis: Causes and Consequences (p. A93-A94)
4:00-5:00 Plenary Session: The Molecular Effects of Social Isolation on Breast Cancer Biology
5:15-6:30 Poster Session 1 (p. A19-A41)
6:45-8:00 Mentor-Mentee Reception

**Friday, March 16**

7:00-8:00 Breakfast Roundtable/Meeting
8:00-9:00 Plenary Session: Learning, Plasticity and Pain: Implications for Treatment
9:00-9:45 Data Blitz
10:00-11:15 Interactive Session: Does Your Heart Know Best? … on the Future of Psychosomatic Cardiac Medicine
Symposium 971: Peter Sifneos Memorial Symposium on Alexithymia (p. A7-A8)
Paper Session: Inflammation (p. A94-A95)
Paper Session: Cellular and Cognitive Aging (p. A95-A96)
11:30-1:00 Lunch on your own/Roundtable Lunches/Committee Meetings
1:00-2:15 Invited Address: What Can We Learn From What People Say about Their Health: Self-Rated Health, Morbidity and Mortality
Symposium 882: New Developments in Noninvasive Stress Markers: From Prenatal to Late Adult Periods (p. A8-A9)
Paper Session: Depression, Anxiety and Cardiac Health (p. A97-A98)
2:30-3:45 Invited Symposium: Somatic Symptom Disorders in DSM-V
Paper Session: Central and Molecular Mechanisms of Pain (p. A98-A99)
Paper Session: Stress (p. A99-A100)
4:00-5:00 Plenary Session: 20 Years In and Out of Chronic Fatigue
5:15-6:30 Poster Session 2 (p. A42-A62)
7:00 Past Leaders Dinner

**Saturday, March 17**

7:00-8:00 Committee Meetings
8:00-9:00 APS Members Meeting
9:00-9:45 Data Blitz
10:00-11:15 Award Presentations
Patricia R. Barchas Award Talk
Paul D. MacLean Award Talk
11:30-1:00 Lunch on your own/Roundtable Lunches/Committee Meetings
1:00-2:15 Award Presentation and Memorial Session
Herbert E. Weiner Award Talk
Robert Ader Memorial
2:30-3:45 Interactive Session: Pathways to Prevention: A Debate on Depression and Coronary Disease
Paper Session: Sleep and Fatigue (p. A100-A101)
Paper Session: Cancer (p. A101-A103)
4:00-5:00 Presidential Address: Sleep Disturbance and Inflammation: Biobehavioral Targets for Depression Prevention
5:00-6:15 Poster Session 3 (p. A63-A85)
7:00 Dinner and Entertainment
SYMPOSIUM 759

THE RESTLESS MIND: DEFAULT MODE OF OPERATION OR RISK FACTOR FOR HEALTH?

Cristina Ottaviani, PhD, Psychology, Sapienza University of Rome, Rome, Italy, Brandon Gillie, BA, Psychology, Ohio State University, Columbus, Ohio, Jonathan Smallwood, PhD, Social Neuroscience, Max Planck Institute for Human and Cognitive Brain Sciences, Leipzig, Germany, Jos F. Brosschot, PhD, Institute of Psychology, Leiden University, Leiden, The Netherlands, Julian F. Thayer, PhD, Psychology, Ohio State University, Columbus, Ohio

During the last decade, mind wandering has been defined as “the brain’s default mode of operation”. Considering the pervasiveness of this mental process in our lives, mind wandering has been hypothesized to serve several adaptive functions (e.g., maintain a optimal level of arousal). It is a common experience, however, that this process can become maladaptive, and take the form of negative and repetitive intrusive thoughts (i.e., rumination and worry). In the past decades, both rumination and worry have been associated with a number of established risk factors for health. The question is: when (and why) does mind wandering become functional or dysfunctional? This talk highlights some of the most intriguing approaches aimed at unveiling the side effects of mind wandering at both psychological (onset and maintenance of psychopathology) and physiological levels (somatization and risk for health). Among the contributions are: the temporal focus that individuals adopt as a possible trigger for the productive vs unproductive forms of mind wandering; the ability to interfere with the process (i.e., inhibition) as a critical feature for the association between mind wandering and well established risk factors for health; the extent to which mind wandering is conscious as a relevant factor in its health consequences; and prospective data on the association between lower heart rate variability at baseline and persistent worry, which may place individuals at risk for anxiety and the related ill health effects. Taken together, this work illustrates how conscious and unconscious thoughts may become maladaptive and plausibly mediate the relationship between psychopathology and increased cardiovascular mortality. Therapeutic implications will be discussed.

Individual Abstract Number: 875

THE COST AND BENEFITS OF ESCAPING THE HERE AND NOW

Jonathan Smallwood, PhD, Social Neuroscience, Max Planck Institute for Human and Cognitive Brain Sciences, Leipzig, Germany

The restless nature of the human mind creates a paradox for how the cost and benefits of cognition to the health and well being of an individual can be understood. Mind wandering can be both a productive mental operation and lapse that can cause error; internal thoughts can provide a source of inspiration when the environment lacks interest while ruminations can be a source of stress and unhappiness. This talk will present a theoretical framework in which one difference between the productive and unproductive forms of mind wandering is suggested to be the temporal focus that different individuals adopt. In support of this claim, studies will be presented that demonstrate that mind wandering about the future is adaptive: future thought is associated with better self-memory (Experiment 1, r = .29, p < .05) as well as a larger working memory capacity (Experiment 2, r = .36, p < .05). By contrast, mind wandering about the past is usually maladaptive, especially with respect to the emotional well being of the individual. Consistent with this claim, the induction of negative mood, especially in individuals with a tendency towards depression, can lead mind wandering to focus on the past (Experiment 3, p < .01) and is also associated with impaired sustained attention compared to the induction of a positive mood (Experiment 4, p < .01). This talk will consider how understanding the specific temporal focus when the mind wanders has an important bearing on the psychological, health and emotional well being of the individual and may ultimately inform our understanding of when spontaneous thought is an adaptive experience and when it is not.

Individual Abstract Number: 891

FLEXIBILITY AS THE KEY FOR SOMATIC HEALTH: FROM MIND WANDERING TO PERSEVERATIVE COGNITION

Cristina Ottaviani, PhD, Alessandro Couyoumdjian, PhD, Psychology, Sapienza University of Rome, Rome, Italy

It is now recognized that healthy systems are characterized by flexible responsivity rather than static levels. We hypothesized that mind wandering fails to serve its adaptive function, and turns into a risk factor for health whenever it becomes a rigid and inflexible pattern (i.e., perseverative cognition). Specifically, we tested if an increase in cognitive rigidity (inhibitory deficit) during mind wandering was associated with higher levels of autonomic inflexibility, assessed by heart rate variability (HRV). Thirty participants (mean age 25.5 (5.5) years) were engaged in two recall tasks designed to draw their attention to a neutral topic and a personally relevant negative episode, respectively. After each recall task, participants performed a 20-min tracking task while ECG was continuously recorded. At random intervals, probes interrupted the task to inquire about subjects’ thoughts. For each probe, participants were asked to characterize the ongoing conscious experience they had just prior to the probe (on task, rumination, worry, mind wandering, distracted by external stimuli) and to specify the level of intrusiveness and their efforts to inhibit these thoughts. Both objective (error rates, reaction times) and subjective measures of inhibitory functions were obtained. Results suggested distinct inhibitory (F = 19.8; p = .002 for intrusiveness, F = 18.8; p = .002 for efforts to inhibit, and F = 8.00; p = .004 for errors) and autonomic (F = 4.75; p = .01) patterns among the different cognitive states. Rumination and worry were associated with the highest intrusiveness, efforts to inhibit, and the least HRV, which indicates lower levels of cardiac vagal tone. In contrast, mind wandering and worry showed the most HRV variability, thus indicating flexible responsivity. There are several conditions in which prefrontal inhibition is tuned down, making individuals vulnerable to perseverative cognition, such as chronic stress or psychopathology. As a consequence, the individual is unable to inhibit the inappropriate response and this makes an otherwise adaptive mechanism a risk factor for psychological and somatic health.

Individual Abstract Number: 892

SUBLIMINALLY INDUCED STRESS INCREASES CARDIOVASCULAR ACTIVITY

Jos F. Brosschot, PhD, Institute of Psychology, Leiden University, Leiden, The Netherlands, M Quirin, PhD, Institute of Psychology, University of Osnabrueck, Osnabrueck, Germany, Bart Verkuij, PhD, Institute of Psychology, Leiden University, Leiden, The Netherlands Objective: To test whether subliminally presented stressful stimuli increase cardiovascular (CV) activity, and whether these effects are mediated by implicit stressful affect. If ‘unconscious’ stress can influence health-relevant physiological activity it would support a theoretically expected role for ‘unconscious’ cognition in the stress-health link. A few studies suggested CV effects of subliminal stressful stimuli, but did not test whether the effects were due to implicit stressful affect. Methods: Following Hull et al. (JPSP 83:406-24), in 67 students, the words ‘angry’ (n=34) and ‘relaxed’ (n=33) were subliminally presented 100 times, while systolic (SBP) and diastolic (DBP) BP and interbeat interval (IBI) were measured, as was explicit affect, and implicit affect (happiness, anger, anxiety, sadness) by the implicit positive and negative affect test (IAPANAT). Results: The anger provocation increased SBP (F(2,195)=7.68, p<.001), DBP (7.14 mmHg, F(2,195)=23.49, p<.001), and IBI (0.026, F(3,195)=3.27, p<.05), as well as implicit anger (t(65)=6.84, p<.001) and they decreased implicit happiness (t(65)=4.09, p<.001), but did not change explicit affect. Implicit affect was correlated with CV-changes, and when – using regression analysis – implicit effect was controlled for, the amount of variance in CV-change dropped 75% for DBP and 69% for IBI, but not for SBP. These drops were mainly due to a decrease in implicit happiness, and to a lesser degree to increase in implicit anger. Conclusion: A subliminal negative emotional stimulus can increase CV activity, and this increase is mediated by implicit affect, specifically by a decrease in positive affect. These results lend support to the hypothesis that unconscious stress-related cognition has (prolonged) physiological consequences in real life, and may therefore be relevant for health.
Anxiety is a risk factor for cardiovascular disease mortality and morbidity. Cross-sectional reports demonstrate that low heart-rate variability (HRV) is associated with higher levels of anxiety. Furthermore, individuals with low HRV are often characterized by inflexible patterns of maladaptive self-regulatory behavior, such as worry. Thus, “autonomically rigid” individuals tend to maintain anxiety through worry. The current study examined whether HRV measured at baseline prospectively predicts changes in anxiety and whether these changes were mediated by worry. Our sample included 75 undergraduates (M = 18.7 years, SD = 1.3). Participants completed the Depression, Anxiety, and Stress Scales (DASS) and Penn State Worry Questionnaire (PSWQ) at three visits spaced 2 weeks apart. At the initial visit, high frequency (HF) HRV values were obtained from a 10-minute resting period. After accounting for gender, age, trait negative affect, and previous session levels of anxiety, HF-HRV predicted change in anxiety from session 1 to 2 (B = -2.62, p = .010) and from session 2 to 3 (B = 2.81, p = .05), such that greater session to session increases in anxiety. Controlling for the difference in worry from session 1 to 2 attenuated the predictive effect of HF-HRV (B = -1.19, p = .146), suggesting mediation. Mediation results were confirmed through the bootstrapping resampling procedure (Hayes 2008) (95% C.I. -3.01 to -1.21) and the Freedman-Schatzkin Test (I7 = -1.72, p = .05). These results suggest that having lower HRV at baseline is associated with persistent worry which may place individuals at risk for anxiety and the related ill health effects.

Symposium 1086
SYSTEMS APPROACHES TO SYMPTOMS ASSESSMENT
Shamin Jais, Ph.D., Brain, Mind & Healing/Psychiatry & Behavioral Medicine, Samueli Institute/University of California San Diego, Corona Del Mar, CA, Kirstin Aschbacher, Ph.D., Psychiatry/Brain, Mind & Healing, University of California San Francisco/Samueli Institute, San Francisco, CA, Herman van Wietmarschen, Ph.D., Sino-Dutch Centre for Preventive and Personalized Medicine, Leiden University, Leiden, The Netherlands, Jan van der Greef, Ph.D. (Microbiology), Analytical Biosciences/Sino-Dutch center for Preventive and Personalized Medicine/TNO, Leiden University, Leiden, Netherlands, John Ives, Ph.D. (Molecular Biology, Brain, Mind & Healing, Samueli Institute, Alexandria, VA
Recent studies have indicated that certain symptoms (such as fatigue, sleep disturbance, and depression) often cluster together, both within disease populations, as well as within the general population. However, the clustering of symptoms, and the physiological processes that underlie these symptom clusters, do not appear to be singular. For example, hypothalamic-pituitary-adrenal axis function in certain disorders (e.g., major depression, post-traumatic stress disorder, and chronic fatigue) have been reported to be both hypoactive and hyperactive in similar samples of patients. Also, subtyping within a particular disease often occurs based on the presence of certain symptom clusters or areas where symptoms manifest (e.g., rheumatoid arthritis). These findings suggest that systems-based approaches may map symptom clusters onto bioinformatically-defined phenotypes within individual persons may provide novel information, compared to the less high throughput approaches that are often used for data analysis (e.g., pre-post assessments of plasma levels of a particular biomarker). Systems approaches are advantageous in that they may 1) more effectively capture the dynamics and steady state of the organism and thus provide a novel indicator of allostatic processes in action, and 2) examine the organism’s biological “signatures” from a greater breadth and depth than can be afforded by singular measures. The purpose of this symposium is to introduce APS conference attendees to systems-based analytical approaches that have been successfully used to identify symptom clusters and elucidate physiological dynamics than singular, non-systems-based approaches. The chair will first provide an overview and background of the concept of systems-based approaches, audience members, as well as briefly describe the specific approaches that will be presented by the speakers (i.e., HPA dynamic systems modeling and -omics approaches). Speaker #1 will describe a specific HPA dynamic systems model that was examined in more commonly used markers of HPA function) for patients with chronic fatigue as well as fibromyalgia. Speaker #2 will describe the metabolomics approach that was utilized to separate specific symptom clusters within a rheumatoid arthritis population. Speaker #3 will discuss the potential utility of systems-based approaches for personalized preventative strategies. The discussant will invite audience discussion and questions for the panel on the utility of these and other systems-based approaches for understanding both disease and wellness trajectories.

Individual Abstract Number: 1087
COMPLEX SYSTEMS APPROACHES TO STRESS-AROUSAL & PSYCHOBIOLOGICAL DATA
Kirstin Aschbacher, Ph.D., Psychiatry/Brain, Mind & Healing, University of California San Francisco/Samueli Institute, San Francisco, CA
Stress arousal is inherently a dynamic process. Hence, it is likely that the dynamics of stress arousal systems encode critical information are needed to understand how stress “gets under the skin.” Existing methods for understanding stress-arousal systems and their dynamics are nonetheless, limited. Dynamic systems modeling is a powerful alternative, which can provide more integrative indicators of key stress-arousal systems such as the Hypothalamic-Pituitary-Adrenal (HPA) axis and the Autonomic Nervous System (ANS), both at rest and in response to stimuli (e.g., acute stress tasks or pharmacologic challenge.) For example, we provide empirical data of HPA system activity from 36 patients with functional somatic disorders (i.e., fatigue/distress syndrome, fibromyalgia (FM)) and 36 matched healthy controls. Blood plasma was assayed for cortisol and ACTH every 10 minutes for 24 hours. A dynamic model HPA was contrasted with a cortisol slope model in terms of goodness of fit, ability to explain somatic symptoms, and the capacity to differentiate patients or (symptomatically defined subgroups), from matched healthy controls. Model parameter estimates were calculated for each individual (i.e., have substantial limitations) and used as an outcome in group-level analyses. The data reveal several observations about the dynamic systems-derived parameters 1) they provide a better fit for the raw data, 2) some parameters are significantly correlated with age, and, among patients, with somatic symptoms, and 3) they significantly differentiate patient subgroups from controls better than slopes or means. The group difference comparisons suggest a pattern of “high gain” HPA activity among FM and CFS patients. To the extent that the steady state gain of the HPA dynamics is increased, this promotes greater cortisol secretion relative to ACTH, which in turn is associated with significant declines in somatic symptoms. Although speculative, the anti-inflammatory functions of cortisol could potentially account for the finding that HPA system dynamics facilitating greater cortisol secretion (relative to ACTH) were associated with fewer somatic symptoms. Future studies of this nature should include both HPA and inflammatory cytokine data to evaluate this possibility empirically. In conclusion, dynamic systems approaches provide novel theoretical and quantitative tools, which may help researchers better define the complex relations between stress arousal systems and symptoms of mental and physical health.

Individual Abstract Number: 1090
SUB-TYPING OF RHEUMATIC DISEASES BASED ON METABOLOMICS PROFILING
Herman van Wietmarschen, Ph.D., Sino-Dutch Centre for Preventive and Personalized Medicine, Leiden University, Leiden, Amsterdam, The Netherlands
Background: The future of personalized medicine depends on advanced diagnostic tools. Systems diagnosis is a new approach which aims to combine symptom information from patient interviews by physicians with high throughput biological data such as metabolomics, to characterize relevant diagnostic sub-groups. In our previous work, two sub-groups of rheumatoid arthritis (RA) patients were studied based on symptom profiles and validated with systems biology techniques. In this study the two sub-groups of RA patients were studied in more detail using a systems diagnosis questionnaire, clinical chemistry measurements and metabolomics approaches. Methods: In this study 39 patients with rheumatoid arthritis were characterized using a
systems diagnosis questionnaire containing 57 questions based on Chinese and Western medicine symptoms. A Chinese doctor classified each RA patient in one of two sub-groups, labeled, “RA Cold” and “RA Heat.” Clinical chemistry was measured and urine and blood samples were taken for metabolomics measurements. Categorical principal component analysis was used to investigate whether a clustering of symptom patterns, clinical parameters and metabolite profiles would significantly differentiate the two sub-groups of RA patients. Discriminant Analysis based on Partial Least Squares was used to analyze the metabolomics data. Results: Two sets of symptoms were found to be closely related to either the RA Cold or the RA Heat group of patients. In addition a number of distinguishing clinical parameters were found. Metabolomics analysis resulted in a model that was able to classify 85% of the patients correctly into the Cold or Heat group. Conclusions: This study shows that systems diagnosis methods are able to characterize sub-groups of RA patients. In addition the study shows how different data sets can be merged into one analysis allowing interpretation of relationships between the various types of data.

Individual Abstract Number: 1089
SYSTEMS APPROACHES TO PERSONALIZED WELLNESS
Jan van der Greef, Ph.D. (Microbiology), Analytical Biosciences/Sino-Dutch Center for Preventive and Personalized Medicine/TNO, Leiden University, Leiden, Netherlands, Netherlands

In recent decades various scientific domains, ranging from physics to biology to public health, have been increasingly focused on a systems-based view. A key contribution of this approach is a focus on the interconnectivity of systems and the study of the organizing principles, realizing that new properties emerge at different levels of complexity. Omics-techniques have contributed enormously in recent years to gathering large datasets and the various systems of disease management, linking patient symptom clusters to bioinformatically-derived -omics constructs requires bridging different levels of psychobiological organization, which raises multiple challenges of measurement, temporal scale, and model validation. In addition it becomes evident that measuring and afterwards evaluating data can become much less effective if a systems-based design is lacking. The latter is challenging as there is a time dependence in the development of disease management and not in the domain of stress-related phenomena. One way in which current diagnostic principles may be further refined is to increase the degree to which diagnoses can be personalized. Certain forms of traditional medicine (e.g., Chinese medicine) suggest that a holistic and personalized approach is key for both diagnosis and intervention for diseases or support of health. These concepts dovetail with systems approaches for health assessment. The Sino-Dutch Center for Preventive and Personalized Medicine has the objective to enhance scientific evidence for personalized diagnosis and intervention using cutting-edge scientific tools (system-based metabolomics) and integrating these with both Eastern and Western concepts of symptom clusters. It connects practice-based evidence with science-based evidence and examples will be discussed on new diagnostic insights as well as new intervention opportunities. In this presentation, we will present data from recent studies in order to identify latent biological structure, integrated with symptom assessment from both Eastern medical systems (Chinese Medicine) and Western concepts and systems to help create a “health space” for individualized assessment. The benefits and limitations to this approach as well as the importance of a broader mapping of systems besides the biochemical level will be addressed.

Symposium 925
PSYCHOSOCIAL FACTORS IN ASTHMA CONTROL: STRESS, COGNITION AND LIFESTYLE
Thomas Ritz, Ph.D., Psychology, Southern Methodist University, Dallas, TX, Kostas N. Priftis, PhD, Pediatrics, University of Athens, Medical School, Chaidari, Athens, Greece, Ana F. Trueba, MA, Psychology, Southern Methodist University, Dallas, TX, Omer Van den Bergh, PhD, Department of Psychology, University of Leuven, Leuven, -, Belgium, Michael B. Anthracopoulos, MD, Respiratory Unit, Paediatrics, University Hospital of Patras, School of Medicine, Rion, Patras, Greece, George P. Chrousos, MD, 1st Dept of Pediatrics, University of Athens Medical School, Chaidari, Athens, Greece

Psychosocial factors are known to impact asthma pathogenesis, pathophysiology and management on many levels. Priming of the immune system through prenatal and early life stressors and other psychosocial challenges in interaction with genetic predispositions can initiate the development of allergic inflammation and asthma. Psychosocial stress may confer further autonomic, endocrine, and immune dysregulation that increases the likelihood of asthma exacerbations. Asthma management can be complicated by maladaptive cognitions that interfere with adequate self-medication and health care use. Life style factors such as diet and physical activity may further affect asthma pathophysiology and reduce control over the disease. The contributions to this symposium will provide examples for these major pathways through which psychosocial factors impact asthma control. Individual presentations will review mechanisms of allergic immune dysregulation, examine the role of academic stress on airway inflammation and infection, explore the impact of catastrophizing cognitions on asthma control, and elucidate the role of physical exercise and obesity in affecting airway reactivity to exercise. A full understanding of psychosocial factors in asthma will depend on the integration of multiple levels of influence across the physiological, behavioral, cognitive and social domains and their interaction.

Individual Abstract Number: 995
STRESS AND INFLAMMATORY PATHWAYS INTERACTION IN ASTHMA
Kostas N. Priftis, PhD, Pediatrics, University of Athens, Medical School, Chaidari, Athens, Greece, Kostas Doouroz, PhD, Pediatrics, University of Athens, Medical School, Chaidari, Athens, -, Greece, Anastasios Papadimitriou, PhD, 3rd Dept of Pediatrics, Athens University Medical School, Chaidari, Athens, -, Greece, Polyseni Nteloulou, PhD, 3rd Dept of Pediatrics, Athens University Medical School, Chaidari, Athens, -, Greece, George P. Chrousos, -, 1st Dept of Pediatrics, University of Athens Medical School, Chaidari, Athens, Greece

The stress system coordinates adaptive responses of the organism to stressors of any kind; inappropriate responsiveness may account for a variety of disorders. Asthma and allergy is characterized by a dysregulation of the pro-inflammatory versus anti-inflammatory Th1 versus Th2 cytokine balance. The development of these conditions primarily depends on the genetic and epigenetic vulnerability of the individual, and the duration and timing of the stressful events. A number of factors, including psychosocial stress, viral infection, other environmental, and allergy may influence the stress response and result in immune response dysregulation leading to asthma. There is also good evidence that genes involved in the stress and inflammatory response may affect asthma expression. Current evidence indicates that the stress-asthma relationship is causal. An increased risk of childhood asthma among children exposed to chronic distress has been demonstrated. After continuous prolonged or intermittent stimulation, in chronic stress, HPA axis activity is suppressed and its anti-inflammatory effect is reduced. On the other hand, production of certain allergic inflammation-related cytokines may blunt the response of the HPA axis to both inflammation and stress, contributing to the aggravation of allergic inflammation. Thus, chronic allergic inflammation may result suboptimal response to stress leading to further insufficient adaptation, possibly to asthma exacerbation. A series of recent findings have formed the basis for the fetal programming of asthma hypothesis, which proposes that stress experienced during pregnancy may potentiate an increased vulnerability of the immune system towards autoimmune and allergic disease asthma in later life. How stress influences clinical phenotypes expression may vary, based on timing of exposure (prenatal, early postnatal, cumulative), individual genetic susceptibility, and other environmental exposures. Further studies are needed to elucidate the potential role of these determinants.

Individual Abstract Number: 969
AIRWAY INFLAMMATION DURING EXAM STRESS: A RISK FACTOR FOR AIRWAY INFECTIONS AND REMODELING?
Ana F. Trueba, MA, Psychology, Southern Methodist University, Dallas, TX, Eva Oberdorster, PhD, Biology, Southern Methodist University, Dallas, Texas, Pia D. Vogel, PhD, Biology, Thomas Ritz, PhD, Psychology, Southern Methodist University, Dallas, TX

Psychological stress can affect asthma severity and incidence rates of respiratory infections. The extent of differences in stress-induced
immune alterations and ensuing respiratory infections between healthy individuals and those with allergies and/or asthma is unknown. Using Enzyme-Linked Immunoassays (ELISAs), we measured changes in vascular endothelial growth factor (VEGF), interferon gamma (IFN-gamma), and interleukin-4 (IL-4) in saliva (S) and exhaled breath condensate (EBC) during final exam week (stress period) compared to mid-quarter (non-stress period) in 44 participants (23 healthy participants and 21 allergic rhinitis, 7 of these had additional asthma). Samples were collected once on a non-stress day and twice during final exams, one day before and one day after a major final exam. Analyses examined the extent to which VEGF and IFN-gamma changes were moderated by atopy. Results showed higher stress (p < 0.01) and cold symptoms during final examinations in all participants compared to mid-quarter (p < 0.05). Controlling for cold symptoms, S-IFN-gamma decreased and EBC-VEGF increased (p < 0.01) during stress compared to non-stress periods. EBC-IFN-gamma remained stable and then decreased in allergic individuals throughout the stress period, whereas in healthy individuals EBC-IFN-gamma increased at the beginning of stress and subsequently decreased (p < 0.05). Allergic individuals showed S-VEGF increases throughout the final exam period, whereas in healthy individuals S-VEGF increased first and then dropped towards the end of the stress period, although this was only a trend (p < 0.10). The subgroup of asthmatic patients resembled individuals with allergic rhinitis in S-IFN-gamma reductions, but were more similar to healthy individuals in S-VEGF changes. Allergic individuals reported more cold symptoms than healthy individuals during all time periods (p < 0.01). In summary, elevated levels of S-VEGF and EBC-IFN-gamma differentially predicted cold symptoms in healthy and allergic individuals independently of stress vs. non-stress periods. IL-4 levels were below the assay detection limit in both S and EBC. Participants experienced increases in 8 cytokines in immune parameters that suggests an increased vulnerability to infection. However, prediction of cold symptoms by VEGF and IFN-gamma levels was stress-independent. Because VEGF is also involved in airway remodeling in asthma, prolonged stress periods may exacerbate airway remodeling in asthma patients.

Individual Abstract Number: 933

PROSPECTIVE ASSOCIATION BETWEEN ASTHMA-SPECIFIC CATASTROPHIZING AND ASThma CONTROL

Omer Van den Bergh, PhD, Department of Psychology, University of Leuven, Leuven, Belgium, Thomas Janssens, PhD, Sibylle Petersen, PhD, Ilse Van Diest, PhD, Department of Psychology, Geert Verleden, MD, PhD, Faculty of Medicine, University of Leuven, Leuven, County/State, Belgium

Although clinical trials have shown that asthma can be controlled, real-world asthma control is still surprisingly low. Previous studies have shown that higher levels of negative affectivity and asthma-specific catastrophizing are associated with higher levels of asthma symptoms and a greater probability of poor asthma control. However, the prospective association between asthma-specific catastrophizing and asthma control has not been studied. Participants were recruited at an outpatient asthma clinic. Asthma symptoms, asthma control and asthma-specific catastrophizing was measured at baseline and at six month follow-up. Asthma-specific catastrophizing was measured using the Catastrophizing about Asthma Scale (CAS) and the Breathlessness Beliefs Questionnaire. Consistent with previous studies, cross-sectional analyses of baseline and follow-up data showed that higher levels of asthma-specific catastrophizing were associated with higher levels of asthma symptoms and lower asthma control. However, longitudinal analyses show that higher baseline levels of asthma-specific catastrophizing predicted lower levels of asthma control and an increase in asthma symptoms 6 months later, whereas baseline asthma symptoms and asthma control did not predict asthma-specific catastrophizing 6 months later. These results were independent of baseline lung function (FEV1) and asthma severity. This is the first study that shows a prospective association between asthma-specific catastrophizing and asthma control. Asthma-specific catastrophizing is an important predictor of future asthma control, which may be explained by its influence on asthma symptom perception. Interventions aimed at the reduction of asthma-specific catastrophizing may have the potential to improve asthma control.

Individual Abstract Number: 1203

PHYSICAL ACTIVITY, OVERWEIGHT/OBESITY, AND EXERCISE INDUCED BRONCHOCONSTRICTION: FINDINGS OF THE PANACEA STUDY

Michael B. Anthracopoulos, MD, Respiratory Unit, Paediatrics, University Hospital of Patras, School of Medicine, Rion, Patras, Greece, Sotirios Foucas, MD, Respiratory Unit, Paediatrics, School of Medicine, University Hospital of Patras, Rion, Patras, Greece, Markos Papadopoulos, MD, Third Department of Paediatrics, Attikon Hospital, Athens University Medical School, Athens, Greece, George Antonogeorgos, MD, Nutrition - Dietetics, Harokopio University, Athens, Greece, Anastasios Papadimtriou, MD, Third Department of Paediatrics, Attikon Hospital, Athens University Medical School, Athens, Greece, Demosthenes B. Panagiotakos, MD, Nutrition Dietetics, Harokopio University, Athens, Greece, Polyxeni Nicolaidou, MD, Kostas N. Priftis, PhD, Third Department of Paediatrics, Attikon Hospital, Athens University Medical School, Athens, Greece

In the context of the Physical Activity, Nutrition and Asthma in Children Examined in Athens (PANACEA) study we investigated for the first time an urban population sample of schoolchildren the association between physical activity and exercise induced bronchoconstriction (EIB) taking into account potential confounders such as asthma symptoms and overweight/obesity. Children aged 10-12 years answered validated questionnaires on physical activity (Physical Activity and Lifestyle Questionnaire) and asthma symptoms (ISAAC questionnaire), and were categorized according to their body mass index (BMI). EIB (FEV1 decrease from baseline ≥12%) was assessed by a standardized free running exercise challenge test (ECT). Six hundred and seven children completed the ECT. There were no differences among asthma groups (diagnosed asthma, asthma related symptoms not diagnosed as asthma, no asthma related symptoms) regarding total daily energy expenditure and time spent in mild or moderate intensity activities. Only overweight/obese EIB-positive children had shorter duration of vigorous activity as compared to their EIB-negative or non-overweight/obese EIB-positive peers. Total daily energy expenditure and duration of mild and moderate intensity activity were negatively associated with EIB independently of BMI status or asthma-related symptoms. We conclude that increased levels of physical activity are associated with EIB irrespectively of BMI status and asthma-related symptoms. Longitudinal studies are needed to confirm the negative impact of sedentary lifestyle on the development of EIB suggested by these findings.

Symposium 818

WHAT ARE BONDS MADE OF? GENETICS, OXYTOCIN AND NEURAL ACTIVATION IN INTIMATE RELATIONSHIPS

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Relationships with family members have long been known to affect health and disease—in the form of social support, instrumental support, a source of significant life stress and of significant meaning. New scientific methods have created the opportunity to investigate the physiological mechanisms underlying individual’s relationship bonds, including genetic predispositions and experimental designs administering neuropeptides. The objective of this symposium is to review the empirical data utilizing these new methods to understand how family relationships may impact health. This will be done through the lens of relationships across the lifespan, starting with romantic interest, followed by couple’s conflict and father/child relationships, and ending with spousal bereavement in older adults. The first paper reports on the impact of serotonin polymorphisms on endocrine and neural activation in men viewing a woman of romantic interest. The second paper uses an experimental design to test the effect of oxytocin vs. placebo administration during couples’ conflict discussions on autonomic reactivity. The third paper also compares oxytocin vs. placebo, but administered during neuroimaging of fathers viewing photos of their own child. The fourth paper demonstrates the relationship between oxytocin receptor genetic
polymorphisms and attachment style in older adult couples, and asks whether severity of the grief experience in widowhood is linked to oxytocin. Collectively, these papers highlight the latest methods for measuring the mechanisms involved in intimate relationships, in real time and at the microbiological level. Through this group of papers, it becomes clear that the distress and emotion experienced in relationships is at the intersection of neurobiology and stress, and that understanding these mechanisms may help to explain the role of psychosocial processes on health.

Individual Abstract Number: 1044
NEURAL AND PHYSIOLOGICAL RESPONSES TO A FAVORITE PERSON AND MODULATION OF THOSE RESPONSES BY A GENETIC FACTOR
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Background: Romantic love is an affective state which is characterized by a strong positive emotion and excitation. Though it is easily imagined that the brain can cause and modulate a set of physiological responses in such a state, mechanisms underlying the phenomena are not fully understood. In this study, we examined the functional association of the brain and body in male participants during elicitation of romantic love-like feelings by viewing a favorite woman. Furthermore, we investigated whether a genetic factor which has been linked with emotional and stress reactivity, the serotonin transporter gene-linked polymorphic region (5HTTLPR) can modulate the brain-body association accompanying the feelings. Methods: Ten heterosexual men with double copies of the short allele (SS) of the 5HTTLPR and 10 heterosexual men with at least one copy of the long allele of the 5HTTLPR viewed a video film of a favorite woman and a neutral film for 2 minutes respectively. Their cerebral blood flows were recorded by 15O-PET and cardiovascular (heart rate and blood pressure), endocrine (cortisol, dopamine, epinephrine, and norepinephrine in blood), and immune (proportions of natural killer (NK) cells in blood) indices were measured during viewing the films. Results: The film of favorite women elicited affectively positive feelings, increases of heart rate, dopamine, and NK cells, but unchanged levels of cortisol and norepinephrine in blood. Furthermore, activation of the brain and body were correlated with changes of NK cells only in the SS men. Conclusions: Romantic love can evoke physiological excitation, which has a different profile from stress responses. Emotion-related brain regions mediate such physiological responses. The short allele of the 5HTTLPR is linked with stronger reactivity of the brain and body accompanying the feelings.

Individual Abstract Number: 1045
EFFECTS OF INTRANASAL OXYTOCIN ON AUTONOMIC ACTIVATION AND EMOTIONAL AROUSAL DURING COUPLE CONFLICT
Beate Ditzen, PhD, Psychology, University of Zurich, Zurich, CH, Switzerland, Urs M. Nater, PhD, Psychology, University of Marburg, Marburg, Hesse, Germany, Ulrike Ehler, PhD, Psychology, University of Zurich, Zurich, Switzerland, Markus Heinrichs, PhD, Psychology, Freiburg University, Freiburg, Baden-Württemberg, Germany
Background: Unhappy couple relationships are associated with impaired individual health, an effect which is thought to be mediated by ongoing couple conflicts. Little is known, however, about the underlying mechanisms regulating psychological stress, and particularly autonomic nervous system (ANS) reactivity, during negative couple interaction. In this study, we tested the effects of intranasal oxytocin on ANS reactivity and emotional arousal during couple conflict in a standardized laboratory paradigm. Methods: In a double-blind, placebo-controlled study design, 47 heterosexual couples (total N = 94) received oxytocin or placebo intranasally prior to a standardized instructed couple conflict discussion in the laboratory. The conflict session was videotaped, salivary alpha-amylase (sAA), a measure of ANS activity, and emotional arousal were repeatedly measured during the experiment. Results: Oxytocin significantly reduced sAA during couple conflict in women, whereas men showed increases in sAA levels (sex * group interaction effect: B = −49.36, t = −2.68, p = .009) which were related to augmented emotional arousal (r = .286, p = .028) and more positive behavior (r = .291, p = .026) during the conflict. Conclusions: Our results imply sex-specific effects of oxytocin on ANS reactivity to negative couple interaction, with the neuropeptide reducing autonomic and emotional arousal in women while increasing it in men.

Individual Abstract Number: 1052
SALIENCE-RELATED NEURAL ACTIVATION AND CONNECTIVITY TO OWN AND UNFAMILIAR CHILDREN IS MODULATED BY INTRANASAL OXYTOCIN IN FATHERS
Harald Gündel, MD, Christiane Waller, MD/PhD, Psychosomatic Medicine, University of Ulm, Ulm, Baden-Württemberg, Germany, Dina M. Schardt, PhD, Institute of Diagnostic and Interventional Neuroradiology, Hannover Medical School, Hannover, Niedersachsen, Germany, Markus Heinrichs, Professor, Psychology, Albert-Ludwigs-Universität, Freiburg i. Br., Baden-Württemberg, Germany
Background: Oxytocin (OT) is a neuropeptide that is involved in complex behaviors such as trust, attachment or parental caretaking. Neurally, maternal attachment is known to activate reward-related brain regions. Within the basal ganglia, the globus pallidus (GP) is a key region in maternal love. The present work investigated the effects of intranasally administered OT on the neural correlates of attachment in fathers. Methods: Twenty-one fathers of a kindergarten child (3-6 yrs) participated in a within-subject functional magnetic resonance imaging study. Fathers viewed pictures of their own child (OC), a familiar child (FC) and an unfamiliar child (uFC) after intranasal application of either 24 IU OT or placebo. Results: The perception of OC pictures elicited activation in the left GP. Further areas associated with perception of the familiar child and the functional connectivity between the GP and the hippocampus and ventral tegmental area. The administration of OT attenuated activation in the left GP, as well as left GP functional connectivity in response to the OC and uFC. Further signal attenuations and modulations of GP coupling related to OT were observed for the uFC in regions associated with reward, and face processing including the GP, middle and superior temporal cortex, and hippocampus. Conclusions: In summary, the GP and other regions of the basal ganglia, and functional connectivity changes induced by OT in the present study suggest that the neuropeptide is effective in reducing neural responses to salient (emotional or novel) stimuli and that OT plays a key role in the orchestration of neural responses associated with human parental attachment. Thus the present results suggest that attenuated responses in associated with the primary processing of socially salient cues underlie the enhancing effects of OT on social interaction. OT may be effective in paving the way for positive social interactions by reducing the general apprehension with strangers, and thereby facilitating prosocial tendencies such as empathy and theory of mind.

Individual Abstract Number: 1051
A POLYMORPHISM IN THE OXYTOCIN RECEPTOR GENE IS LINKED TO AVOIDANT ATTACHMENT
Mary-Frances O’Connor, PhD, Psychology, University of Arizona, Tucson, AZ, Christian R. Schultz-Florey, MD/PhD Student, Medicine, Hannover Medical School, Hannover, Niedersachsen, Germany, Michael R. Irwin, MD, Cousins Center for PNI, Otto Martinez, PhD, Microbiology, Immunology & Molecular Genetics, UCLA, Los Angeles, CA
Background: The course of bereavement is influenced by attachment style, with insecurely attached individuals being at higher risk for complicated grief disorder. Individual differences in social behavior and pair bonding among animal species are caused by differences in OXTR expression. We hypothesized that genotype frequencies for rs53576 and rs2254298 would be associated with adult attachment styles and would be different between complicated grief and non-complicated grief. Method: A total of 82 older adults (age 61 to 83) were recruited by advertisement and by direct mailing to citizens in the appropriate age range. Forty-eight were widowed; on average they had experienced the death of their spouse or partner in the past 2 years. As a comparison, 34 non-bereaved married control subjects were also evaluated. Participants answered a self-report attachment questionnaire. TaqMan SNP genotyping assays were run on peripheral blood mononuclear cells. Results: OXTR rs53576 and rs2254298 A allele carriers showed significantly higher scores on the Avoidant attachment style (A = 0.022) on the Avoidant attachment style. Linear regression models
showed that the association between the attachment style and genotype was slightly increased by adding ethnicity to the model (β = 0.355, p = 0.016). Neither of the two investigated OXTR SNPs was associated with complicated grief severity. Conclusion: OXTR rs2254298 A carriers showed higher avoidant attachment, converging with results which found this genotype to be linked with lower levels of prosocial temperament. Consistent with prior research, we did not find an association between the OXTR SNP rs53576 and attachment style.

Symposium 971

THE PETER SIFNEOS MEMORIAL SYMPOSIUM ON ALEXITHYMIA

Steven E. Locke, MD, Steven E. Locke, MD, Psychiatry, Massachusetts General Hospital at Harvard Medical School, Wayland, MA, Thomas Sulsow, Ph.D., Psychosomatic Medicine, University of Leipzig, Leipzig, Saxony, Germany, Richard D. Lane, M.D., Ph.D., Psychiatry, Richard D. Lane, M.D., Ph.D., Psychiatry, Psychology and Neuroscience, University of Arizona, Tucson, AZ, Michael C. Sharpe, MD, Psychiatry, University of Oxford, UK, Oxford, England, UK

Peter E. Sifneos, MD. Professor Emeritus of Psychiatry at Harvard Medical School, died on December 9, 2008, at the age of 88. He was an internationally renowned pioneer in the areas of short-term psychotherapy and psychosomatic medicine. Dr Sifneos’s interest in psychosomatic medicine started when he observed while treating patients with so-called psychosomatic illness that they often had an inability to find the appropriate words to describe their feelings. In 1972, he introduced the term alexithymia from the Greek a for lack, lexis for word, and thymos for emotion, meaning lack of words for emotion – or alexithymia. The existing preliminary data support the relationship of automatic and controlled emotion processing in alexithymia. Neurobiological factors underlying alexithymia are important for understanding the mechanisms underlying the propensity for adverse physical disease outcomes. Research on alexithymia has provided some support for the concept but has failed to demonstrate an association with physical disease. It is the primary theme of this paper that this failure is due to limitations in the way alexithymia is conceptualized and measured. The name alexithymia itself suggests an impairment in affective labeling that in the extreme form would constitute alexithymia. It is proposed here that alexithymia is more appropriately conceptualized as an affective recognition and experiential deficit that in the extreme form constitutes an agnosia. The latter term was coined by the neurologist Sigmund Freud in 1891. A new type of agnosia, consisting of an impairment in the ability to know or mentally represent emotional states, will be described. It is proposed that the concept of “affective agnosia” advances the theoretical clarity, empirical measurement and clinical relevance of what is now studied based on behavioral methods (e.g., emotional Stroop, and sequential affective priming tasks) and neuroimaging (fMRI, PET) studies investigating automatic processing of emotional information (i.e. originating outside of the body) as a function of alexithymia will be reviewed. In all, the existing preliminary data support the hypothesis of an automatic hyperresponsiveness to emotion stimuli in alexithymia. Neurobiological factors underlying the relationship of automatic and controlled emotion processing in alexithymia. Future studies on alexithymia combining tasks that measure automatic and controlled emotion processing will yield new insights into the coupling of deficits at different processing levels.

Individual Abstract Number: 1225

PETER E. SIFNEOS, MD: A MODERN GREEK HERO

Steven E. Locke, MD, Psychiatry, Massachusetts General Hospital at Harvard Medical School, Wayland, MA

Born on the Greek Island of Lesbos in 1920, Dr. Peter Sifneos escaped Nazi-occupied France during World War II to complete his studies at Harvard Medical School and the Massachusetts General Hospital. His work and writing constitute a creative and significant contribution to the field. Dr. Sifneos’s interest in psychosomatic medicine started early in his career when treating patients with so-called “psychosomatic” illness. He observed that they often had an inability to find the appropriate words to describe their feelings. He completed his psychiatry residency and worked at McLean and Massachusetts General Hospital. He completed his psychoanalytic training at the Boston Psychoanalytic Institute. He served as director of the outpatient psychiatric service of the Massachusetts General Hospital until 1968, when he joined the staff of the Beth Israel Hospital as Associate Director of Psychiatry under the stewardship of the chair, Dr John Nemiah, editor of the American Journal of Psychiatry. During his years at Beth Israel Hospital, Dr. Sifneos developed a focused, brief psychotherapy training that he called Short Term Anxiety Provoking Psychotherapy (STAPP). His innovative approach evolved in the late 1960s and early 70s in the throes of the hegemony of long-term, non-directive psychoanalytic treatment. His insatiable curiosity, indomitable courage and tenacious persistence was reflected in his becoming a pioneer in two important innovations in psychiatric treatment: first, his evidence-based method for brief psychotherapy and, second, the alexithymia construct he championed emerged as an alternative to the dominant psychoanalytic formulations of the origins of psychosomatic disorders popular in that era.

Individual Abstract Number: 973

AUTOMATIC EMOTION PROCESSING IN ALEXITHYMIA: A REVIEW OF NEUROPSYCHOLOGICAL FINDINGS

Thomas Sulsow, Ph.D., Psychosomatic Medicine, University of Leipzig, Leipzig, Saxony, Germany

During the last decades several neuropsychological models for alexithymia have been proposed. It has been postulated, for example, that alexithymia can be caused by discrimination between limbic and neocortical areas, impaired interhemispheric communication, dysfunction of the right hemisphere, or deficiency in the activation of the anterior cingulate cortex. Previous experimental research on cognitive emotional processing in alexithymia has been focused primarily on controlled or explicit processes. In this context, the study of automatic or implicit emotion processing has been neglected. This is surprising because automatic and controlled processes are involuntarily elicited and emerge without conscious effort. The effortless production of responses in basal emotion processing systems of the brain appears to provide an important basis of information for higher processing systems. In case neocortical emotion processing areas receive only poor input from the limbic, visual and somatosensory system recognition, differentiation, and mental representation of emotional responses should be hampered. In this contribution, the hypothesis is stated that “alexithymics” exhibit a dysregulation in automatic emotional processing tasks that are based on emotional Stroop, and sequential affective priming tasks. Automatic emotion processing in alexithymia is hypothesized to be reviewed. All in all, the existing preliminary data support the hypothesis of an automatic hyperresponsiveness to emotion stimuli in alexithymia. Neurobiological factors underlying the relationship of automatic and controlled emotion processing in alexithymia. Future studies on alexithymia combining tasks that measure automatic and controlled emotion processing will yield new insights into the coupling of deficits at different processing levels.

Individual Abstract Number: 1097

RECONCEPTUALIZING ALEXITHYMIA AS AN AFFECTIVE AGNOSIA

Richard D. Lane, M.D., Ph.D., Psychiatry, Psychology and Neuroscience, University of Arizona, Tucson, AZ

Alexithymia is a construct created in 1972 that aimed to define an impairment in affective development that was thought to contribute to the propensity for adverse physical disease outcomes. Research on alexithymia has provided some support for the concept but has failed to demonstrate an association with physical disease. It is the primary thesis of this paper that this failure is due to limitations in the way alexithymia is conceptualized and measured. The name alexithymia itself suggests an impairment in affective labeling that in the extreme form would constitute alexithymia. It is proposed here that alexithymia is more appropriately conceptualized as an affective recognition and experiential deficit that in the extreme form constitutes an agnosia. The latter term was coined by the neurologist Sigmund Freud in 1891. A new type of agnosia, consisting of an impairment in the ability to know or mentally represent emotional states, will be described. It is proposed that the concept of “affective agnosia” advances the theoretical clarity, empirical measurement and clinical relevance of what is now studied based on behavioral methods (e.g., emotional Stroop, and sequential affective priming tasks) and neuroimaging (fMRI, PET) studies investigating automatic processing of external emotional information (i.e. originating outside of the body) as a function of alexithymia will be reviewed. In all, the existing preliminary data support the hypothesis of an automatic hyperresponsiveness to emotion stimuli in alexithymia. Neurobiological factors underlying the relationship of automatic and controlled emotion processing in alexithymia. Future studies on alexithymia combining tasks that measure automatic and controlled emotion processing will yield new insights into the coupling of deficits at different processing levels.
hypotheses and other brainstem structures. Recasting the conceptualization and measurement of affective processing deficits upon this foundation has important implications for research, particularly on the relationship between emotion processing deficits and physical disease outcomes. Reframing alexithymia in this way also highlights that established techniques in clinical practice that promote mental representation of emotion, such as dialectical behavior therapy, are readily available for the treatment of this condition.

Symposium 882

NEW DEVELOPMENTS IN NONINVASIVE STRESS MARKERS: FROM PRENATAL TO LATE ADULT PERIODS

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Background: Dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis is assumed to play a role in the pathogenesis of bipolar disorder (BD). However conflicting results have been reported when saliva or serum was used to measure cortisol levels. Measuring serum or saliva is limited to one time point. A recently developed method is to measure cortisol in scalp hair, with one cm of scalp hair representing cortisol levels of one month. Our aim is to determine whether there are differences in long-term hair cortisol levels between BD patients and healthy individuals and whether there are associations between hair cortisol and disease characteristics. Methods: A cross-sectional study involving 100 outpatients with BD and 195 healthy controls. We cut 3 cm segments of hair to measure cortisol levels. Results: Elevated hair cortisol levels (22.13 versus 34.67 pg/mg hair; p=0.019) were found in BD patients (n=20) compared to healthy controls (n=20) (22.13 versus 34.67 pg/mg hair; p=0.021), with exclusion of panic disorder, which was associated with decreased cortisol levels (22.13 versus 34.67 pg/mg hair; p=0.019). No association was found between evening salivary and scalp hair cortisol levels in BD patients. Conclusions: Our results support the hypothesis that dysregulation of the HPA-axis plays a role in a subgroup of patients with BD. There may be differences in pathogenesis of younger and older BD suggesting two different disease entities.

Individual Abstract Number: 924

SPLITTING HAIRS OF MONKEYS AND MEN

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Hypothesis: Hair is a useful repository of information regarding the activity of the hypothalamic pituitary adrenal axis over the past 3-4 months. The hypothesis is that hair cortisol will be described as well as its characteristics in anxiety disorders including PTSD. Information regarding the heritability of hair cortisol, sex and aging influences, its association with behavioral phenotypes such as novelty seeking in nonhuman primates will be described. Novel imaging techniques using 3-dimensional ultrasonography of fetal adrenal glands will be discussed in the context of prenatal maternal distress and fetal cortisol at birth. Bipolar disorder presents a clinical situation in which hair cortisol has been useful for distinguishing specific subgroups of BD patients. The relevance of these markers will be tied to other long term markers of chronic stress by our discussant.

Individual Abstract Number: 1103

LONG TERM CORTISOL IN BIPOLAR DISORDER: ASSOCIATIONS WITH AGE OF ONSET AND PSYCHIATRIC COMORBIDITY

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Results: Hair cortisol levels were not statistically different in BD patients compared to healthy controls (31.84 versus 28.18 pg/mg hair; p=0.233) and were not associated with the disease state at the moment of sample collection (p=0.978). In the subgroup of patients with age of onset ≥30 years, hair cortisol levels were significantly elevated compared to age of onset <30 years and healthy controls (p=0.004). Psychiatric comorbidity was associated with elevated cortisol levels (44.87 versus 31.41 pg/mg hair; p=0.021), with exclusion of panic disorder, which was associated with decreased cortisol levels (22.13 versus 34.67 pg/mg hair; p=0.019). No association was found between evening salivary and scalp hair cortisol levels in BD patients. Conclusions: Our results support the hypothesis that dysregulation of the HPA-axis plays a role in a subgroup of patients with BD. There may be differences in pathogenesis of younger and older BD suggesting two different disease entities.

Individual Abstract Number: 1183

FUNDAMENTAL INFORMATION ON HAIR CORTISOL LEVELS: STATE AND TRAIT COMPONENTS AND RELATIONSHIP WITH SOCIODEMOGRAPHIC AND HAIR-RELATED VARIABLES

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The analysis of cortisol in hair constitutes a promising new method for the retrospective assessment of integrated cortisol secretion over long periods of time. Whilst evidence showing the great potential of this method is accumulating, to date only scarce information on
fundamental characteristics of hair cortisol levels are available. Here, it is of special interest to investigate the implicit assumption that hair cortisol concentrations (HCC) exhibit a high level of intraindividual stability and to examine associations of HCC with sociodemographic and hair-related variables. Besides some novel validating evidence, results of four independent studies will be presented: Patterns of intraindividual stability of hair cortisol were investigated by assessing HCC alongside psychosocial measures at two sampling points one-year apart (N = 45; study I) and at three sampling points occurring at two-month intervals each (N = 64; study II). In addition, hair samples and information on sociodemographic and hair-related characteristics were obtained from 360 participants covering a wide range of ages (1 to 91 years; study III). And an additional investigation into the effect of natural hair colour on HCC was carried out in individuals with extreme hair colours (N = 69; study IV). Across studies I and II findings consistently reveal strong test-retest associations for HCC (‘r’ between 0.68 to 0.79, ‘p’< 0.001). Structural equation modelling applied to data of study II show that single HCC assessments comprise a strong trait component, explaining between 59-82% of variance. Findings of studies III and IV reveal elevated HCC in male compared to female participants as well as in young children and the elderly; however, no influences of natural hair colour, frequency of hair washing, use of oral contraceptives or smoking status were seen. The present findings suggest a high degree of intraindividual stability and robustness to a range of potential confounding influences. Whilst sex and age should be controlled for in hair cortisol research, overall the findings highlight the utility of this method for obtaining valid trait estimates of long-term cortisol secretion.

Individual Abstract Number: 1213
FETAL ADRENAL GLAND ULTRASOUND: NON-INVASIVE PERINATAL STRESS ASSESSMENT

M. Camille Hoffman, M.D., Obstetrics & Gynecology, Kimberly D’Anna-Hernandez, PhD, Psychology, Randal G. Ross, M.D., Psychiatry, John Hobbins, M.D., Obstetrics & Gynecology, Mark Laudenslager, PhD, Psychology, University of Colorado School of Medicine, Denver, CO

Stress during pregnancy has been associated with numerous adverse maternal and child outcomes including preterm birth, low birth weight, and adverse programming of the offspring. Pregnancy stress and the HPA-axis of pregnant women can be measured using saliva or hair cortisol. Measurement of stress in the human fetus remains a challenge. The fetal adrenal gland has been successfully imaged using obstetric ultrasound. Enlarged fetal adrenal glands, which produce sex hormone precursors as well as cortisol, have been associated with an increased risk of premature birth. Studies determining whether fetal adrenal gland enlargement is a noninvasive ultrasound marker of fetal stress will be described. Mother-child pairs in the third trimester underwent an obstetric ultrasound of the fetal adrenal gland. Within 48 hours of delivery, the newborns underwent retroperitoneal ultrasound of the neonatal adrenal gland. Two-dimensional and 3D ultrasound techniques were used to determine the dimension(s) most correlated with fetal cortisol and overall adrenal gland volume. Fetal adrenal gland area ranged from 186 to 398mm2 for gestational ages 35-40 weeks, mean 288mm2, SD 101. Three-dimensional adrenal gland volumes were also recorded. Hair was cut from a different group of newborns, matched for gestational age, to determine fetal hair cortisol levels. Hair cortisol ranged from 121-271 pg/mg, mean 171pg/mg, SD 53. There was a strong correlation between gestational age and adrenal gland area, r=0.84, p=0.01. Changes in cortisol (fetal) hair cortisol, conjunction with ultrasound measurements of the fetal and neonatal adrenal gland as well as with birth weight and gestational age at delivery. These studies provide information on the feasibility of obstetric ultrasound of the fetal adrenal gland as an indicator of fetal stress. They also provide information on the relationship between fetal adrenal size and fetal cortisol status at delivery based on neonatal hair.

Symposium 811
THE CORTISOL AWAKENING RESPONSE: ORIGINS AND SIGNIFICANCE

Angela Clow, PhD, Psychology, University of Westminster, London, England, UK, Stefan Wuest, PhD, Institute of Experimental Psychology, University of Regensburg, Regensburg, Germany, Tobias Stalder, PhD, Biological Psychology, Technische Universität Dresden, Dresden, Saxony, Germany, Emma K. Adam, PhD, Emma K. Adam, Human Development and Social Policy, Northwestern University, Evanston, IL, Phil Evans, PhD, Angela Clow, PhD, Psychology, University of Westminster, London, England, UK

The cortisol awakening response (CAR) is a discrete, complex and distinctive part of the cortisol circadian cycle. Differing patterns of the CAR have been associated with numerous variables related to stress, cognitive function, physical and mental health as well as state situational variables such as light and time of awakening. However the literature is inconsistent and difficult to interpret as there is no consensus on the origins and physiological roles of the CAR. This makes it difficult to use CAR data as a meaningful biomarker of central processes and evaluate the significance of aberrant patterns in terms of downstream consequences for health. This symposium seeks to address and discuss these questions. The first presentation will overview current knowledge about heritability of the CAR highlighting its potential as a significant intermediate phenotype in studies on the genetic basis of stress-related diseases. The second presentation will address the question of ontogeny with new data of its presence in infants providing new insight into the physiology of the CAR. The third talk examines the CAR’s ability to predict psychopathology over a 4-year follow up in young adults, showing that it represents a time-limited predictor of onset of depression in HCC of depressed individuals. The final talk will present evidence that timing and relative magnitude of the CAR together explained a substantial portion of the variance in executive functioning among older adults. Taken together these talks will highlight the complexity of the CAR but point to its strong potential as a measure in psychosomatic research. Discussions will also include consideration of the interaction between state and trait factors, measurement considerations and future directions for research.

Individual Abstract Number: 887
GENETICS OF THE CORTISOL AWAKENING RESPONSE

Stefan Wuest, PhD, Institute of Experimental Psychology, University of Regensburg, Regensburg, Germany

Over the last decade the cortisol awakening response (CAR) was found to be associated with numerous variables related to stress and health and it has been established as a useful marker of hypothalamus-pituitary-adrenal axis activity. Although findings are far from being fully consistent, the CAR is increasingly recognized as a potentially significant intermediate phenotype in studies on the genetic basis of stress-related diseases. In addition to this usage as an easy to measure marker in psychiatric genetics the CAR itself can be regarded as a complex phenotype whose neural basis is only poorly understood. Gene variants can be used as tools in experimental studies for the discovery of the neural and neuroendocrine mechanisms mediating the CAR. In my presentation I will give an overview on what we currently know about genetic factors influencing the cortisol awakening response. Quantitative genetic studies - consistently documenting a significant heritability of the CAR - as well as first evidence suggesting gene-environment effects and molecular genetic findings on the association between several sequence variants and the CAR will be discussed.

Individual Abstract Number: 887

Tobias Stalder, PhD, Damaris Baumlmer, Dipl.-Psych., Christiane Berndt, Dipl.-Psych., Biological Psychology, Technische Universität Dresden, Dresden, Saxony, Germany, Matthias Kliegel, Dr, Developmental Psychology, University of Geneva, Genève, Switzerland, Clemens Kirschbaum, Dr, Biological Psychology, Technische Universität Dresden, Dresden, Saxony, Germany

The cortisol awakening response (CAR) presents a discrete aspect of the circadian cortisol rhythm and is frequently used as a measure in psychosomatic research. Despite increasing evidence on alterations of the CAR have been associated with numerous variables related to stress, cognitive function, physical and mental health as well as state situational variables such as light and time of awakening. However the literature is inconsistent and difficult to interpret as there is no consensus on the origins and physiological roles of the CAR. This makes it difficult to use CAR data as a meaningful biomarker of central processes and evaluate the significance of aberrant patterns in terms of downstream consequences for health. This symposium seeks to address and discuss these questions. The first presentation will overview current knowledge about heritability of the CAR highlighting its potential as a significant intermediate phenotype in studies on the genetic basis of stress-related diseases. The second presentation will address the question of ontogeny with new data of its presence in infants providing new insight into the physiology of the CAR. The third talk examines the CAR’s ability to predict psychopathology over a 4-year follow up in young adults, showing that it represents a time-limited predictor of onset of depression in HCC of depressed individuals. The final talk will present evidence that timing and relative magnitude of the CAR together explained a substantial portion of the variance in executive functioning among older adults. Taken together these talks will highlight the complexity of the CAR but point to its strong potential as a measure in psychosomatic research. Discussions will also include consideration of the interaction between state and trait factors, measurement considerations and future directions for research.
the curve ground; AUCG) and different infant development-related parameters were seen (age: r = -0.41, p = .02; weight: r = -0.39, p < .001, height: r = -0.32, p < .001). Regarding sleep-related variables, positive association between the AUCG and the parent-reported frequency of infant daytime sleeping was seen (r = .49, p = .004) which however lost statistical significance when anthropometric development-related measures were controlled for (p > .20). Overall, the results highlight the remarkably early development of a significant CAR and tentatively suggest that cortisol output following awakening may be even more pronounced in very young infants. In addition to this study, current data from an ongoing research project which examined CAR-associations with a range of sleep-related parameters in a sample of 429 adult participants will also be presented. The current results on the ontogeny of the CAR and associations with sleep-related variables add to current knowledge regarding fundamental aspects of the CAR and inform its use in future clinical research.

**Individual Abstract Number: 888**

The cortisol awakening response is a prospective predictor of major depressive disorder and anxiety disorders

Emma K. Adam, PhD, Human Development and Social Policy, Northwestern University, Evanston, IL; Leah D. Doane, PhD, Psychology, Arizona State University, Tempe, Arizona; Suzanne Voelkle-Schallhorn, PhD, Psychology, Northwestern University, Evanston, Illinois

The cortisol awakening response (CAR) has recently been shown to predict major depressive episodes over a one-year period (Adam et al., 2010). It is unknown whether this effect: a) is stable over longer periods of time, b) is independent of prospective stressful life events, c) differs between first onsets and recurrences, and d) is specific to major depressive episode disorder or also predicts anxiety disorders (including generalized anxiety disorder, social phobia, specific phobia, obsessive compulsive disorder, and panic disorder). A total of 270 older adolescents (mean age 17.06 at cortisol measurement) from the Youth Emotion Project completed baseline diagnostic and life stress interviews, questionnaires, and a three-day cortisol sampling protocol measuring the cortisol awakening response and the diurnal cortisol rhythm, and filled out their annual follow-up interviews. Forty-two new episodes of major depression were diagnosed during the follow-up period, and 14 new onsets of anxiety disorders. Non-proportional person-month survival analyses revealed that a higher CAR significantly predicts new depressive episodes over the follow-up period (simple main effect of CAR: HR = 2.03, 95% CI = [1.26, 3.25], p = 0.033). However, the CAR’s ability to predict depressive episodes significantly decays over time, with prediction no longer significant after 2.5 years (CAR x Time interaction: HR = 0.97, 95% CI = [0.95, 0.99], p = 0.012). These effects persisted after controlling other predictors of depression (neuroticism, prospective stressful life events, anxiety disorders at baseline; life stress and negative affect at time of cortisol measurement). Elevations in the CAR did not appear to increase vulnerability to prospective major stressful life events; however, they predicted depressive recurrences more strongly than first onsets (CAR x MDE History interaction: HR = 3.19, 95% CI = [1.14, 8.95], p < .05). Finally, CAR does not appear to be specific to MDE onsets. For n = 14 first ever anxiety disorder onsets, the CAR (HR = 3.05, 95% CI = [1.32, 7.02], p = 0.009) significantly predicted onset, but this effect degraded with time (CAR x Time interaction: HR = 0.56, 95% CI = [0.33, 0.95], p = 0.033). These effects remained significant after covarying baseline depression or a prospective onset of depression. Simple models were observed for anxiety onsets (n = 8 first ever anxiety disorders). In conclusion, the cortisol awakening response represents a time-limited vulnerability factor for onsets of depressive episodes and anxiety onsets, particularly social phobia.

**Individual Abstract Number: 1060**

THE CORTISOL AWAKENING RESPONSE AND COGNITION IN OLDER AGE: FILLING IN THE DETAIL

Phil Evans, PhD, Psychology, Frank Hucklebridge, PhD, Human and Health Sciences, Catherine Loveday, PhD, Angela Clow, PhD, Psychology, University of Westminster, London, England, UK

Changes in the pattern of the cortisol awakening response (CAR) have been reportedly associated with older age and such changes may be linked to changes in cognitive performance. However methodological issues around compliance, in regard to careful timing of cortisol measures over the diurnal cycle, suggest caution in drawing firm conclusions. Drawing on data from our own laboratory, where cortisol profiles and cognitive performance and compliance were carefully assessed in a sample of 50 older participants, aged 60-91 years (mean = 74y), this presentation will highlight some strong associations between cortisol and cognitive performance measures. In particular, analyses of data will be presented which demonstrate how a relatively pure measure of executive functioning, controlling for individual differences in simple processing speed, is very strongly associated with key aspects of cortisol secretion in the first 45 minutes following awakening. Executive functioning was assessed as time taken to complete Form B of the standard Trail-making Test expressed as a ratio of time taken to complete the simpler Trail-A form of the test. Cortisol measures that were significantly predictive of superior executive functioning in a regression analysis were: earlier peaking and greater magnitude of the CAR. Together these measures explained fully a third of the variance in our measure of executive functioning (R² = 0.33; F=11.65; p<0.001). Relatively simple processing speed as assessed by trail-making Form A alone was not at all related to the magnitude of the CAR, although faster speed was weakly associated with later timing of the peak (R² =0.08; F=4.11; p=0.048). We conclude that, with careful control, CAR period measures of cortisol may be strongly and perhaps specifically associated with those domains of cognitive functioning which seem to depend most on the integrity of structures such as the hippocampus and pre-frontal cortex.

**Symposium 894**

STRESS AND PAIN: BIOBEHAVIOURAL MECHANISMS AND CLINICAL IMPLICATIONS

Magne Arve Flaten, PhD, Psychology, University of Tromsø, Tromsø, Norway; Motohiro Nakajima, PhD, Medical School, University of Minnesota, Duluth, Minnesota; Arne S. Finset, PhD, Faculty of Medicine, University of Oslo, Oslo, Norway; Susan S. Girdler, PhD, Psychiatry, University of North Carolina, Chapel Hill, North Carolina; Peter S. Lyby, Cand. Psychol., Psychology, University of Tromsø, Tromsø, Norway; Mustafa Al’Abbi, PhD, Medical School, University of Minnesota, Duluth, Minnesota

Stress is defined as a challenge that activates psychological and physiological reactions to deal with that challenge, as a reaction to signs that an aversive event is about to occur, or as a reaction to aversive events in the past. Within the context of the defense reaction, these forms of stress may act through different stress-responsive mechanisms to affect pain. The present symposium presents four different psychobiological approaches to the study of how stress affects pain. Across studies, stress and pain were either experimentally induced or were studied within their natural context. In the first presentation, the association of chronic smoking with dysregulation in endogenous stress and pain regulation was investigated using cardiovascular, hormonal, and affect measures. In the second presentation the association between reported clinical pain and electrophysiological response in an arranged medical interview that involved female patients with the fibromyalgia syndrome and without alexithymia was investigated. In the third presentation, ethnic disparities in pain was investigated by assessing pain sensitivity, biological pain regulatory factors and psychosocial predictors of pain sensitivity, including adverse life events, ethnic discrimination and coping, in pain-free African Americans and non-Hispanic Whites. In the fourth presentation, the effect of experimentally induced pain on placebo analgesic efficacy was investigated. Experimental heat pain was applied, and the effect of information that a painkiller had administered on psychological and psychophysiological reactions was recorded. The studies indicate a complicated pattern of associations between pain and stress, and suggest multiple moderating and mediating factors.

**Individual Abstract Number: 895**

DIMINISHED ADRENOCORTICAL AND CARDIOVASCULAR STRESS RESPONSES AND ENHANCED PAIN PERCEPTION IN DEPENDENT SMOKERS

Motohiro Nakajima, PhD, Mustafa Al’Abbi, PhD, Medical School, University of Minnesota, Duluth, Minnesota

Acute nicotine administration is associated with increased cardiovascular activity and pain threshold. However, whether chronic smoking is associated with dysregulation in endogenous stress and pain...
regulations has not been systematically examined. Demographically matched dependent smokers who were interested in cessation (n=37) and nonsmokers (n=37) completed two laboratory sessions that took place approximately two weeks apart. Smokers were able to smoke regularly prior to the first session (ad lib session) but were required to refrain from smoking for 48 hours before the second session (abstinent session). Smoking status was confirmed biochemically. Nonsmokers completed the same protocol twice. During each session, following a 20 min baseline period, participants completed the hand cold pressor task twice, once after acute stress and once after rest. This was followed by a 40 min recovery period. The order of stress and rest was counterbalanced. Cardiovascular (systolic and diastolic blood pressure; SBP, DBP, heart rate; HR), hormonal (cortisol, adrenocorticotropic hormone; ACTH), pain (tolerance time, McGill Pain Questionnaire; MPQ), and affect measures were assessed throughout the session. The results indicated that, in both sessions, smokers exhibited attenuated BP responses to stress relative to nonsmokers (p<.05). Blunted HR and cortisol responses were observed among smokers in the ad libitum session (p<.05). Abstinent smokers showed decreased pain tolerance time and increased MPQ score after stress, while nonsmokers showed the opposite (p<.05). Abstinent smokers reported greater distress than nonsmokers (p<.05). We also found that cortisol and ACTH levels during stress were positively associated with pain tolerance time, and cortisol and ACTH levels during stress was inversely related to MPQ during the first session (p<.05). These results suggest that chronic smoking may be associated with alterations in neurophysiological stress reactivity, which may be linked to enhanced pain perception (i.e., lack of stress-induced analgesia). It is possible that the heightened pain sensitivity may contribute to increased sensitivity to withdrawal symptoms and to smoking relapse.

Individual Abstract Number: 896

INVERSE RELATIONSHIP BETWEEN REPORTED PAIN AND ELECTRODERMAL ACTIVATION IN AN ARRANGED MEDICAL INTERVIEW WITH FIBROMYALGIA PATIENTS

Arnefin Finsen, PhD, Tonje Lauritzen, MA, Erik Holt, BA, Faculty of Medicine, University of Oslo, Oslo, Oslo, Norway

Background and aim: Induced pain was used to produce increased electrodermal activation (EDA) in experimental contexts. However, the findings on the associations between reported pain levels in chronic pain patients and EDA are inconsistent. In the present study we evaluated the association between reported pain and EDA response in an arranged medical interview. Methods: Female patients with the fibromyalgia syndrome (FMS; n=48) with and without alexithymia participated in a clinical interview in a randomized 2x2 design, in which emotional communication was manipulated by the interviewer (empathic attention vs. inattention to patient’s expression of emotion and emotional vs. neutral content of the interview). Pain as measured by a Numeric Rating Scale (NRS) was assessed at three different times: before, during and after the interview respectively. Pain scores were dichotomized into low (NRS ≤5) and high pain. Electrodermal activity (EDA) was measured before (baseline) and during two separate parts of the interview using the Biopac MP150 system. A repeated measures ANOVA design was applied to study the effect of pain, alexithymia and the experimental manipulation on EDA measures. Results: There was a main effect of pain on EDA level. Patients who reported high pain displayed lower mean EDA level (p <.01) and lower EDA increase from baseline through the interview (p <.005). There was a three-ways alexithymia x pain x experimental attention to emotion interaction effect indicating higher EDA level (p <.05) and a greater use of alexithymia in low-pain alexithymia patients in the attention to emotion condition (p <.005). Conclusion: In this sample of FMS patients there was an inverse relationship between reported pain and tonic EDA activation. The findings will be discussed in light of research on the heterogeneity of psychophysiological stress responses in FMS patients (Thieme & Turk, 2006).

Individual Abstract Number: 968

ETHNIC DIFFERENCES IN BIOPSYCHOSOCIAL PREDICTORS OF PAIN SENSITIVITY

Susan S. Girdler, PhD, Psychiatry, University of North Carolina, Chapel Hill, North Carolina, Adamas Bunevicius, MD, Psychiatry, Matthew Boehm, BA, Jane Leserman, PhD, Psychology, University of North Carolina, Chapel Hill, North Carolina, African Americans (AA) have more clinical pain and greater sensitivity to experimental pain than non-Hispanic Whites (NHW), though little is known about underlying biopsychosocial factors. We studied biological pain regulatory factors (plasma cortisol, beta-endorphin (B-end), and norepinephrine (NE) and psychosocial predictors of pain in 119 AAs (54% female) and 116 NHWs (47% female) who were pain-free, 18—50 years old and matched for SES. We assessed abuse history, negative life events, ethnic discrimination, and coping. Plasma cortisol, B-end and NE were sampled following extended rest that preceded cold pressor pain testing (tolerance, intensity and unpleasantness) and the temporal summation of heat pain test (indexing central sensitization of pain processing). Compared with NHWs, AAs had lower cold pressor tolerance, greater intensity and unpleasantness ratings (p <.001), and greater central sensitization (p <.05). More AAs had a history of childhood sexual abuse (CSA) (23% vs. 12%, p <.05) and AAs reported more negative life events (p <.05), discrimination (p <.05), lower cortisol (p<.05), and a greater use of alcohol, denial, behavioral disengagement, and religious coping strategies (p < .05). Multiple regression showed for AAs that lower cortisol and NE predicted lower cold pain tolerance (R2 = .08, p<.05); CSA, lower cortisol and NE, and more discrimination predicted greater pain intensity (R2=.25, p<.001); and CSA, lower cortisol and NE, and greater denial predicted greater pain unpleasantness (R2 = .27, p<.001). For NHWs, greater B-end levels and less behavioral disengagement predicted greater cold pressor tolerance (R2 = .12, p<.05) related to NE, but higher NE was related to lower pain intensity (R2 =.16, p<.05); and greater NE and fewer negative life events predicted reduced central sensitization (R2 = .08, p<.05). For AAs, a history of CSA and lower cortisol and NE levels, especially when combined with discrimination and coping, predicted greater pain sensitivity. For NHWs, higher B-end levels, especially when combined with higher NE and fewer negative life events, predicted less pain sensitivity. This suggests ethnic differences in biopsychosocial predictors of pain.

Individual Abstract Number: 897

EXPERIMENTAL INDUCTION OF FEAR REDUCES PLACEBO ANALGESIA

Peter S. Lyby, Cand. Psychol., Per M. Aslaksen, PhD, Magne Arve Flaten, PhD, Psychology, University of Tromsø, Tromsø, Norway

Background: Previous research has suggested that individuals high in fear of pain show smaller placebo analgesic responses. To test the hypothesis that fear or negative emotions reduce placebo analgesia, fear was induced by the anticipation of electric shock prior to the administration of placebo capsules together with information that they contained a powerful painkiller. This condition was compared to a condition where placebo analgesia was induced but without the induction of fear, and a natural history control condition. Methods: Thirty-three subjects participated in a 3 Condition (Natural History, Placebo, Placebo + Fear) x 3 Test (Pre-test, Post-test 1, Post-test 2) within-subject design, tested on three separate days. Heat pain was induced by a thermode placed on the lower left arm. Measures of fear were fear of pain, measured by the Fear of Pain Questionnaire (FPQ-III); a self-report measure that assessed the effectiveness of the fear induction procedure, and fear-potentiated startle. Results: The threat of shock was successful in inducing fear and fear-potentiated startle. Threat of shock did not modulate pain. In the pain intensity data, there was a trend towards a placebo analgesic effect. This trend was abolished by induced fear, and was most pronounced in subjects who were highest in the three measures of fear. A placebo effect was observed in the startle data. This effect was abolished by induced fear, and was strongest amongst high FOP-subjects. The trend towards a placebo effect in the pain intensity data was predicted by the corresponding placebo effect in startle. Conclusion: Information that a painkiller had been administrated reduced fear, as indexed by reduced startle reflexes in the Placebo condition. Fear abolished placebo analgesia in the Placebo + Fear condition, and this effect was strongest in subjects who had high scores on measures of fear.
1) Abstract 942

**PSYCHOSOCIAL CONTAGION OF VASOVAGAL SYMPTOMS IN BLOOD DONORS**

Saharnez Balezgh, B. Sc., Psychology, McGill University, Montreal, Quebec, Canada; Crystal D. Holly, PhD, Epidemiology, McGill University Health Center, Montreal, Quebec, Canada; Philippe T. Gilchrist, M. Sc., Blaine Ditto, PhD, Psychology, McGill University, Montreal, Quebec, Canada

There are a number of dramatic historical examples of psychosocial contagion of physical symptoms. The belief that observation of physical symptoms in someone may lead to similar symptoms in others is especially widespread in the blood collection community since the procedure is not usually private. Beds are often close together and it is easy to observe vasovagal reactions and the treatment of other donors. However, there is little empirical documentation of contagion. As part of two recent trials of the muscle tensing technique Applied Tension (AT) on vasovagal symptoms, bedside research assistants recorded discreetly whether or not it was possible, from the vantage point of the donor, to see another donor having a reaction. They also recorded whether or not corticosteroids to patients due to concerns of putative or required treatment for a reaction. Donor ratings of relaxation immediately before and after and blood withdrawal were obtained. Sample 1 is a new study of 911 donors assigned randomly to either a no treatment control condition or one of two slightly different AT conditions. Sample 2 (Ditto et al., 2007, 2009) consists of 1209 donors assigned randomly to either a no treatment control condition or one of five treatment conditions. Preliminary analyses determined potential covariates, e.g., age, that might be associated with likelihood of seeing a reaction. In Sample 1, after controlling for covariates, being able to see another donor react increased the likelihood of reporting symptoms oneself, OR=1.68; p=0.040, and being treated by the nurse for symptoms, OR=1.72, p=0.016. Donors who may have seen others react also rated themselves as less relaxed, F(1,876)=4.14, p=0.042. Sample 2 also controlled for the Miller Behavioral Style Scale, measuring their propensity to adopt a monitoring or blunting coping style, which was found to moderate the results. Being able to see another donor react had a more negative impact on blunders, as indicated by significant interaction effects on report of vasovagal symptoms, OR=0.90, p=0.018, and need for treatment, OR=0.93, p=0.027. It cannot be determined if participants actually saw or paid attention to the donors who reacted (e.g., conscious or unconscious processing), but the large samples appear to have allowed observation of a subtle psychological influence on symptoms.

3) Abstract 937

**FINANCIAL STRAIN RELATES TO DECREASED LEVELS OF ADIPOLECTIN IN MIDDLE-AGED WOMEN**

Susan A. Everson-Rose, PhD, MPH, Kimberly M. Henderson, BA, Cari J. Clark, ScD, MPH, Medicine, Qi Wang, MS, Clinical and Translational Science Institute, Honglei Guo, PhD, Clinical and Translational Science Institute of Wisconsin, University of Minnesota, Minneapolis, MN; Peter Mancuso, PhD, Environmental Health Sciences, University of Michigan School of Public Health, Ann Arbor, MI; Howard M. Kravitz, DO, MPH, Psychiatry and Preventive Medicine, Rush University Medical Center, Chicago, IL.

Chronic stress is significantly linked to metabolic dysregulation, but less is known about mechanisms underlying this relationship. Accumulating evidence suggests chronic stress is closely linked to inflammatory processes. Very few studies have examined whether chronic stress is associated with adiponectin, an abundant anti-inflammatory hormone secreted by adipocytes. This study examined the cross-sectional association between financial strain, an important chronic stressor often related to socioeconomic position and with known affective, behavioral, endocrine and autonomic correlates, and circulating levels of adiponectin in a healthy cohort of women at midlife. Participants were 581 women (38.7% African American; 61.3% Caucasian; mean age, 45.6 ± 2.5 years) from the Study of Women’s Health Across the Nation (SWAN). Financial strain was measured by one question at the SWAN baseline examination: “How hard is it for you to pay for basics?” Women who reported that it was somewhat or very hard to pay for basics (N=194; 33.4%) were considered to have high financial strain. Baseline level of circulating adiponectin was determined from stored serum specimens assayed in duplicate using a commercially available enzyme linked immunosorbent assay. Adiponectin values were log-transformed for analyses due to skewness. In a linear regression model adjusted for age, race, study site, and menstrual bleeding status, women with high financial strain had a 13.9% (95% CI, 6.6% to 20.6%) lower median adiponectin level than women with no financial strain (p<0.0003). Further adjustment for smoking, alcohol consumption, diet, body mass index, physical activity, and depressive symptoms, this association was only slightly attenuated (12.3% (95% CI, 5.0% to 19.1%) lower median adiponectin for high versus low strain group) and remained highly significant (p<0.001). This study of middle-aged African American and Caucasian women highlights a relationship between financial strain and circulating adiponectin, which may provide insight into the inflammatory consequences of chronic stress on metabolic dysregulation. [Supported by NIH/DHHS grants AG040738, HL091290, AG012505, AG012546, MH59770, AG17719.]

4) Abstract 1019

**THREAT APPRAISALS PREDICT CORTISOL RESPONSES TO AN ACUTE PSYCHOSOCIAL STRESSOR IN LOW BUT NOT HIGH SUBJECTIVE SOCIAL STATUS INDIVIDUALS**

Alexander S. Fiksdal, BA, June A. He, BA, Julius Johnson, BA Candidate, Psychology, Brandeis University, Waltham, MA; Kirsten René, MA, Brandeis, Psychology, Waltham, MA; Myriam V. Thoma, PhD, Nicolas Rohleder, PhD, Psychology, Brandeis University, Waltham, MA

Corticosteroid therapy resulted in a reduction in gene expression for a variety of inflammatory mediators (e.g. pro-inflammatory cytokines, chemokines, adhesion molecules) at all time points, indicating that corticosteroids had physiological effects in this study. In conclusion, corticosteroid administration did not alter oral mucosal healing rates despite obvious reductions in tissue inflammation. These results suggest that clinicians should not be hesitant to administer corticosteroids in dental surgery for fear of immunosuppressive effects in healthy adults. The implications of these findings are discussed in the context of stress. Supported by NIH R21 DE018161.
Rationale: While a substantial body of research has demonstrated robust relationships between subjective social status (SSS) and general health, the exact mechanisms involved remain unclear. Maladaptive stress responses have been implicated in the pathogenesis of a variety of disorders, and may shed light on the SSS-health relationship as well. Hypothalamus-pituitary-adrenal (HPA) axis activity to psychosocial stress is of particular interest. Previous research indicates that SSS may be positively associated with HPA reactivity, but no studies have addressed exposure to repeated stress. We set out in the current study to test cognitive appraisal and SSS as predictors of cortisol reactivity to repeated psychosocial stress.

Methods: Twenty-six participants (11 women, 15 men; mean age=21.96 yrs.) were exposed to the Trier Social Stress Test (TSST) twice on consecutive days. Primary and secondary appraisal processes were assessed immediately prior to each TSST. Salivary cortisol was measured 1 minute prior, and 1, 10, 30, 60, and 120 minutes post TSST. SSS relative to US and community was assessed using MacArthur Ladders.

Results: Both TSSTs induced marked HPA activation (p < .001), with lower responses to second exposure (p = .002). Community, but not US, SSS was inversely related with HPA axis stress responses (TSST1: trend, r = .35, p = .08; TSST2: r = .59, p = .002). Further regression analyses revealed a significant interaction of threat appraisals and SSS predicting HPA responses to the second, but not the first, TSST (beta = .478; p = .011).

Conclusions: In summary, in low but not high SSS individuals, threat appraisals were positively related with cortisol reactivity upon repeated exposure. These findings indicate that lower SSS individuals may be more vulnerable to stress, which might be one factor contributing to higher morbidity related to low subjective social status. Future research should investigate possible long-term health consequences associated with these relationships.

5) Abstract 1127

LEFT VENTRICULAR WALL STRESS AND SYSTOLIC FUNCTION IN DEPRESSIVE SUBJECTS WITH PRIMARY HYPERTENSION

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Objective: The objective of the study was to determine whether major depression is associated with left ventricular dysfunction in hypertensive subjects in absence of any other cardiovascular disease.

Methods: A case-control study including 34 depressive subjects and 34 matched controls was performed. Major depression diagnosis was performed by a trained psychiatrist using DSM-IV criteria. None of the patients had history of any major cardiovascular illness other than hypertension. A complete two-dimensional echocardiogram was performed on each subject. Left ventricular (LV) posterior wall and septal thickness along with internal dimensions were measured in the long-axis M-mode plane at end systole and end diastole. Meridional end-systolic wall stress was calculated using data obtained by averaging three consecutive cardiac cycles. All measurements were performed by 2 observers blinded to the patient data. All subjects gave written informed consent before entering the study. Results: The mean age of the depressed patients was 57.7±8.8 years, whereas the controls were 58.0±9.0 years. There were 31 women (91%) in each group. No significant differences were found in blood pressure values or in the length of time since hypertension was diagnosed (9.0±6.7 vs 9.0±6.3 years). Depressive subjects had significantly larger LV end-diastolic volumes (113.7±27.8 vs 102.7±21.6 ml, p=0.04), left atrial area index (16.5±3.1 vs 14.8±3.17, p=0.01) and end-systolic wall stress (83.0±30.0 vs 66.7±26.9 g/cm², p=0.01) than those in the control group. There were no significant differences between the groups in ventricular mass and chamber dimensions (table 1). Conclusions: Major depression is associated with an increase in end-systolic wall stress in hypertensive subjects. This relationship might result in a left ventricular hypertrophy as a compensatory response to a sustained increased afterload, and ultimately might lead to heart failure and increased mortality, however further studies are needed to confirm this hypothesis.

Table 1. LV measures of mass and chamber dimensions of depressive and normal hypertensive subjects

<table>
<thead>
<tr>
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<th>Depressive subjects n=34</th>
<th>Controls n=34</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV end-diastolic diameter (cm)</td>
<td>4.81±0.64</td>
<td>4.68±0.42</td>
<td>0.07</td>
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<tr>
<td>LV end-systolic diameter (cm)</td>
<td>3.06±0.62</td>
<td>2.86±0.44</td>
<td>0.07</td>
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<td>LV posterior wall thickness-diastole (cm)</td>
<td>0.78±0.22</td>
<td>0.79±0.12</td>
<td>0.74</td>
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<td>LV posterior wall thickness-systole (cm)</td>
<td>1.25±0.29</td>
<td>1.16±0.23</td>
<td>0.28</td>
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<tr>
<td>Interventricular septum-systole (cm)</td>
<td>1.24±0.24</td>
<td>1.16±0.33</td>
<td>0.93</td>
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<tr>
<td>Interventricular septum-diastole (cm)</td>
<td>0.85±0.16</td>
<td>0.84±0.23</td>
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</tbody>
</table>

6) Abstract 773

HISTORY OF CHILDHOOD ABUSE AND INFLAMMATORY RESPONSE TO DAILY STRESSORS

Jean-Philippe Gouin, PhD, Psychology, Concordia University, Montreal, QC, Canada, Ronald Glaser, PhD, William Malarkey, MD, Institute for Behavioral Medicine Research, The Ohio State University, Columbus, OH, David Beversdorf, MD, Psychological Sciences, University of Missouri, Missouri, MO, Janice Kiecolt-Glaser, PhD, Institute for Behavioral Medicine Research, The Ohio State University, Columbus, OH

Childhood abuse has been associated with greater morbidity and earlier mortality in adulthood. Prior studies have shown that individuals with a history of early life abuse have exaggerated physiological stress responses to laboratory stressors. In this study, we tested the hypothesis that individuals who experienced childhood abuse would display an enhanced inflammatory response to naturally occurring daily stressors. Participants were 42 family dementia caregivers and 68 noncaregiving controls with a mean age of 65.01 (SD = 13.16). The occurrence of daily stressors in the past 24 hours was assessed using the Daily Inventory of Stressful Events. The presence of a history of childhood abuse was evaluated with the Childhood Trauma Questionnaire. Blood samples analyzed with enzyme-linked immunosorbent assay provided information on circulating interleukin-6 (IL-6). In this sample, 41.8% of the participants reported a childhood history of emotional, physical, or sexual abuse. Participants who had a history of abuse were no more likely to experience multiple stressors in the past 24 hours than their counterparts without an abuse history, c² (1) = 1.95, p = .16. Individuals with a history of abuse had higher IL-6 levels than participants without such history, B = 0.08, p = .02. Individuals who experienced multiples stressors in the past 24 hours had marginally higher IL-6 levels than participants who reported none or only one stressor, B = 0.07, p = .06. The interaction between daily stressors and childhood abuse history was a significant predictor of the IL-6 response, B = 0.16, p = .026. Individuals with a history of abuse displayed a greater IL-6 responses to the occurrence of multiple daily stressors than their counterparts without a history of childhood adversity. The three-way interaction among early abuse, daily stressors, and caregiving status did not significantly predict IL-6 levels, B = -0.20, p = .18. These findings suggest that the enhanced IL-6 response to daily stressors may be a physiological mechanism through which early abuse leads to poor health outcomes in adulthood.

7) Abstract 862

ANXIETY IS ASSOCIATED WITH PROGNOSIS IN PATIENTS WITH AN IMPLANTABLE CARDIOVERTER DEFIBRILLATOR

Mirjana Halibovic, MSc, Susanne S. Pedersen, PhD, Krista C. van den Broek, PhD, Medical Psychology and Neuropsychology, Tilburg University, Tilburg, The Netherlands, The Netherlands, Dominic A.
8) Abstract 1126

A MEASURE OF GLOBAL LEISURE ACTIVITY PREDICTS INFLAMMATORY RESPONSES TO STRESS INDEPENDENTLY OF PHYSICAL ACTIVITY

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Rationale: Exposure to stress results in the secretion of stress hormones via the sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenal (HPA) axis. This response communicates an imminent threat to the individual. Increases of peripheral inflammatory mediators are a recently described consequence of this response. Higher rates of inflammatory cytokines, such as interleukin (IL)-6, have been linked to increased risk for cardiovascular disease and mortality. Current research interested in leisure as a buffer against stress effects on health has largely focused on enjoyable activities of a physical nature. This study investigates the modulatory effects of leisure as a global measure.

Methods: Twenty-two healthy participants (14 males, 8 females; mean BMI=24.28; mean age=21.86) were administered a measure of engagement in leisure activities, i.e. the Pittsburgh Enjoyable Activity Questionnaire (PEAT). The participants were then exposed to the Trier Social Stress Test (TSST). IL-6 was measured one minute before as well as 30 minutes, and two hours after stress.

Results: Analysis showed an IL-6 response to stress (time effect: F=7.29; p=.003), as expected. Further analysis revealed a relationship between self-reports on the PEAT and participants’ IL-6 responses (time*PEAT interaction; F=4.424; p=.020). A significant negative correlation between participants’ increase in IL-6 and their PEAT score (r=-.49; p=.039) supported this result. Additional correlational analysis showed no relationship between PAQ scores and IL-6 (all p>-.33).

Conclusions: These findings indicate that leisure activities are related to potentially adaptive acute stress responses, characterized by lower increases of peripheral inflammatory mediators. This is in line with the assumption of engaging in enjoyable leisure activities as a buffer against stress effects on health as a global construct, is more predictive when including all enjoyed activities. Future analysis will explore the role of cortisol and glucocorticoid sensitivity in this system.

9) Abstract 1001

GENDER DIFFERENCES IN THE ASSOCIATION OF DEPRESSIVE MOOD WITH CANCER AND CARDIOVASCULAR MORTALITY

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Background: Depressive mood has been associated with all-cause mortality in both men and women. This study aimed at exploring gender differences in the association between depressive mood and specific causes of mortality as well as factors that may account for it, including education, marital status, social support, health behaviors, and chronic diseases.

Methods: A population-based survey including 6,043 subjects (2,892 men and 3,151 women) was conducted in 1996 in the north-east of France with a questionnaire covering education, marital status, social support, health behaviors (smoking status, alcohol consumption, body mass index), and chronic diseases. Depressive mood was measured using the Duke Health Profile questionnaire. Cox regression models were used to examine its association with subsequent natural all-cause mortality, and cardiovascular and cancer mortality.

Results: During a follow-up of 12.5 years, 406 men and 303 women died from a natural cause. Adjusting for all covariates, depressive mood predicted natural mortality in both men [Hazard Ratio (HR) = 1.30; 95% confidence interval (CI): 1.00-1.69] and women (HR=1.37; 95% CI: 1.06-1.77). However, this association was significant for cardiovascular mortality in men (HR=1.65; 95% CI: 1.00-2.65) whereas it was significant for cancer mortality in women (HR=1.71; 95% CI: 1.11-2.64).

Limitations: Data were self-reported and the response rate was low.

Discussion: Preventive strategies aiming at reducing the increased mortality associated with depressive mood should take gender into account. Depressed men may warrant a better screening for cardiovascular risk factors and diseases, whereas depressed women may benefit from better cancer prevention measures.

10) Abstract 1210

A COMPARISON OF RELAXATION TECHNIQUES ON BLOOD PRESSURE REACTIVITY AND RECOVERY, ASSESSING THE ROLE OF ANGER COPING STYLE

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This study examines the relationship of anger coping style and relaxation techniques on cardiovascular recovery and cardiovascular reactivity in blood pressure (BP). A total of 89 participants were involved in the study. They were medical students from Eastern Virginia Medical School who were asked to abstain from taking medications that affected their blood pressure, as well as caffeine and alcohol prior to participating in the study. The participants were asked to rate their anger (baseline) and complete a math task with harassment for 6 minutes (the stressor), and participate in one of three
recovery conditions (a standard control, diaphragmatic breathing or mantra recitation) for 10 minutes. Psychosocial scales were also completed throughout the study. Participants were compensated $25. It was hypothesized that diaphragmatic breathing will show the greatest reduction in BP during the recovery period. Additionally, those individuals with high Anger-In and Anger-Out coping style scores will exhibit greater cardiovascular reactivity and slower recovery, putting them at increased risk for developing hypertension. Our hypothesis was supported, planned (apriori) simple contrasts and multiple regression analyses revealed a significant effect for Diaphragmatic breathing on diastolic blood pressure (DBP) during the recovery period, F (2, 87) = 3.19, p < .05, meaning Diaphragmatic breathing demonstrated the greatest reduction in blood pressure in comparison to the standard control and mantra recitation. There was also a significant positive relation among individuals with higher BP reactivity comparing baseline systolic BP (SBP) and recovery SBP r = .40, p <.001 and recovery SBP and diastolic BP (DBP) reactivity, r = .30, p < .05. Additionally, higher DBP during the stressor is positively correlated with higher SBP reactivity (r = .64, p <.001) and DBP reactivity (r = .66, p < .001). SBP during the stressor is positively correlated to SBP reactivity (r = .73, p < .001) and DBP reactivity (r = .56, p <.001). A multiple regression analysis using DBP from the diaphragmatic breathing condition and Anger In approached significance F(1, 17) = 3.90, p = .06. These results indicate that higher SBP and DBP reactivity are at a higher risk of developing cardiovascular disease because they exhibit elevated blood pressure readings during a stressor. Further, diaphragmatic breathing assisted the most for DBP recovery. This information can be useful when treating individuals with hypertension, especially those individuals with hypertension who suppress their anger. Relaxation techniques should be considered as an adjunctive treatment of high blood pressure along with hypertensive medication, if not in lieu of such medication.

11) Abstract 1218

REPORTED DAILY MEMORY FAILURES ARE ASSOCIATED WITH HIGHER CORTISOL PRODUCTION IN YOUNGER AND OLDER ADULTS
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Everyday memory failures represent an important clinical and functional outcome in older adults. Few studies, however, have assessed daily reports of memory failures. Among those that have, none have linked these reports to biological markers related to neurocognitive function. The current study examined the association between end of day reports of daily memory failures and cortisol production. As higher cortisol levels are associated with poorer memory in lab settings, we hypothesized that more memory failures would be reported on days with greater cortisol production. A sample of 167 community dwelling adults (Mage = 49, SD = 17, 52% Male) completed 7 consecutive end of day assessments of both retrospective and prospective memory failures. Each day participants also supplied 8 saliva samples for cortisol analysis: (1) at waking, (2) 30 minutes post waking, (3-6) pseudo-random times throughout day approximately 2 hours apart, and (7) at bedtime. Daily cortisol production was calculated as the total area under the curve (AUC) for each individual for the day; where the 30 minute samples were used to estimate the baseline level of cortisol. Separate multilevel models revealed that on days with higher AUCs, individuals reported experiencing more retrospective and prospective memory failures. Each day par

12) Abstract 1020

NEURAL RESPONSES TO SOCIAL REJECTION AND SUBSEQUENT REWARD: IMPLICATIONS FOR STRESS-RELATED HEALTH BEHAVIORS
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Social rejection is a potent stressor that is associated with a number of negative physical and mental health outcomes (Murphy et al., 2011; Slavich et al., 2009). However, the ways in which people cope with rejection, and how an experience of rejection alters responses to tasks that may help improve negative mood, remain largely unknown. Recent research suggests that, following social rejection, individuals have an increased desire for money—perhaps because the rewarding value of money serves to ameliorate some of the pain of social exclusion (Zhou et al., 2009). In the present study, we examined this relationship between neural responses to rejection and subsequent neural responses to reward. Specifically, we hypothesized that greater activity in pain-related regions (dorsal anterior cingulate cortex [dACC] and anterior insula [AI]) during social rejection would be related to greater activity in a reward-related neural region (ventral striatum [VS]) during a monetary reward task. To test this hypothesis, 15 young adults (8 females) were scanned using fMRI while they completed two tasks: Faces and ball-tossing. Subjects were excluded if they showed greater activity in VS during reward anticipation (t = .44, p < .05). Results also demonstrated a marginally significant, positive correlation between neural activity in the AI during social exclusion and left VS activity during reward anticipation (t = .36, p = .09). In other words, individuals who showed greater activity in pain-related neural regions during social exclusion showed subsequently greater activity in reward processing neural regions during reward anticipation. These results suggest that the incentive value of rewards may be increased following social rejection. They may also provide a neurocognitive account for increasing negative health behaviors, such as substance use and food intake, following social stress and rejection.

13) Abstract 874

AUTONOMIC ACTIVITY AND REACTIVITY MEASURED BY SALIVARY ALPHA-AMYLASE IS INFLUENCED BY COPY NUMBER VARIATIONS OF THE AMY1 GENE
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Background: Salivary alpha-amylase (sAA) is used extensively as a marker of the autonomic nervous system. While it is known that sAA gene (AMY1) copy number variation (CNV) correlates with its expression, there are no reports on the impact of AMY1 gene dosage on inter-individual differences in basal and stress-related sAA activity. Methods: Baseline sAA morning profile and awakening response (AAR) at 0, 30, 45 and 60 minutes after awakening were determined for 613 subjects. Stress reactivity in sAA was determined in a subset of 41 healthy subjects undergoing the Trier Social Stress Test (TSST). AAR and CNV was determined using whole blood DNA and quantitative PCR. CNV was calculated based on absolute quantification using a 2-fold standard curve ranging from 40ng to 0.625ng per reaction of Coriell DNA NA07919 reported to have 2 copies of AMY1/cell. Results: sAA1 CNV ranged from 1 to 15 diploid copies/cell. Subjects were classified into eight CNV groups for association with sAA morning profile and AAR. AMY1 CNV showed a positive gene dosage response with sAA morning profile (p=0.003). AAR (r=0.070), AUC total (ps<0.001), and AUC increase of the morning profile (p=0.003). Subjects in the stress reactivity study were classified into three CNV groups. Subjects with higher copies of AMY1 exhibited higher sAA reactivity (p=0.021) and higher AUC total (p=0.023). Conclusion: AMY1 CNV is identified as a key genetic determinant of inter-individual differences in basal and reactive levels of sAA. Past and future studies using sAA as a marker of ANS should be interpreted in the light of the contribution of this heritable genetic variation.
14) Abstract 761

BECK DEPRESSION INVENTORY II: DETERMINATION OF CUT-OFF SCORES IN CORONARY ARTERY DISEASE (CAD) PATIENTS

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Background: The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) is one of the most popular instruments to screen for depression in CAD patients. Though several studies have been conducted to assess the psychometric properties of the BDI, no studies have examined whether the optimal cut-off score in a sample of CAD patients. Thus, the aim of the present study was to determine the cut-off scores of the BDI-II in a sample of tertiary care CAD patients. The possible difference on the sensitivity (se) and specificity (sp) of various level of score was also verified according to sex, level of education, and smoking status. Methods: A sample of 750 adult CAD patients (mean age 60 yrs, 31% women) completed the BDI-II and underwent the PRIME-MD – a standardized structured interview, considered as the comparison standard for determining diagnosis of major depressive disorder (MDD). Receiver operating characteristics (ROC) curve analyses was conducted to determine optimum cut-off scores. These scores were determined according to (i) the highest sum of sensitivity and specificity and (ii) the lowest difference between both. Results: From the total sample, 42 patients were diagnosed with MDD according to the PRIME-MD. The ROC curve analysis revealed a moderate area under curve of .849 (95%CL .791 to .905) and an optimum cut-off score of 12 (se = 74%, sp = 76%) for the total sample. The analyses also indicated different cut-off scores according to sex, level of education, and smoking status. More specifically, the optimum cut-off scores were 13 in women (se = 73%, sp = 75%) and 12 in men (se = 74%, sp = 80%). In patients with high level of education (≥ 12 years), the optimum cut-off was 11 (se = 82%, sp = 79%), compared to 12 (se = 70%, sp = 70%) in patients with low level of education (< 11years). As for smoking status, a higher cut-off score was associated to current smokers (16+; se = 87%, sp = 87%) relative to non-smokers (se = 82%, sp = 73%). Conclusions: The present study suggests that BDI-II has moderate screening performance in tertiary care CAD patients. Sex, level of education, and smoking status affect the classification accuracy of the original recommended cut-off score. Taken as a whole, these data highlight the importance of validating assessment tools in the population of interest.

15) Abstract 828

CUMULATIVE STRESS EXPERIENCE AND ALLOSTATIC LOAD IN ADULTHOOD

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Allostatic load, an index of dysregulation across multiple physiological systems in the body, is hypothesized to develop as a result of chronic stress and experience leading to wear and tear on bodily systems that carry out allostatic processes. However, there have been few empirical examinations of this central tenet of the allostatic load framework. The current study examines levels of allostatic load (AL) as a function of cumulative stress experience across multiple life domains. Methods: Data come from 1255 participants (56.8% female, mean age = 54.5 years) from the Biomarker Substudy of the Study of Midlife in the U.S. A cumulative stress index was constructed from multiple indices assessing work, financial, relationship, neighborhood, and family stress, stressful life events, discrimination, perceived inequality, and early life stressors. AL was calculated as the sum of 7 biological subsystem risk indices (cardiovascular, metabolic-glucose, metabolic-lipids, inflammatory, sympathetic nervous system, parasympathetic nervous system, hypothalamic-pituitary-adrenal), with subsystem risk scores representing the percent (0-100%) of various subsystem biomarker indicators which fell into high risk quartiles (possible AL score range = 0-7). Results: Greater levels of cumulative life stress were associated with higher AL levels (age-adjusted B = 17, p < .001; age-, gender-, race-, education-adjusted B = 13, p < .001). Additional models indicated that health status, health behavior, and psychological (depressed and anxious mood, perceived stress) covariates accounted for a small proportion of the association between greater life stress experience and higher AL in adulthood. The difference in AL levels between those in the lowest versus highest cumulative stress score quartiles was equal in magnitude to a 10-year age difference in AL. Conclusion: Consistent with the hypothesis that AL develops as a result of stressor experience, greater stress experience across multiple life domains was associated with greater AL in adulthood. This association was independent of other sociodemographic factors, but health and psychosocial factors partially mediated the link between stressor experience and AL levels.

16) DECREASED REGIONAL GRAY MATTER VOLUME IN THE PREFRONTAL CORTEX PREDICTS A TENDENCY FOR PTSD SYMPTOMS IN HEALTHY SURVIVORS OF THE GREAT EAST JAPAN EARTHQUAKE

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A magnitude 9.0 earthquake hit Japan on March 11, 2011. The northeastern coast was widely destroyed by the devastating tsunami triggered by this earthquake. Many survivors, even those without postraumatic stress disorder (PTSD), needed psychological support (Furukawa 2011). Reduced regional gray matter volume (rGMV) in several brain regions including the anterior cingulate cortex (ACC) and the orbitofrontal cortex (OFC) were reported in patients with PTSD (Yamasue 2003, Hakamata 2007, Woodward 2009, Eckart 2011) and also in normal subjects after the stressful life events (Papagni 2011). However, controversy exists over the nature and source of the structural alteration caused by PTSD (Kasai 2008). The aim of this study was to identify the structural alterations as (1) vulnerability factors and (2) acquired signs of PTSD symptoms in healthy survivors. Luckily, we had collected much structural MRI data from a group of healthy adolescents before the quake (Pre) and we recruited 42 subjects (M/F = 33/9, Age = 21 ± 1.7 y.o.) from this group to examine their structural MRIs 3 to 4 months after the quake (Post). We also assessed their PTSD symptoms using the clinician-administered PTSD scale (CAPS) structural interview. We applied an optimized method of voxel-based morphometry (VBM) and performed regression analyses employing, as explanatory variables, (1) Pre rGMV and (2) Post-Pre rGMV and, as independent variables, CAPS total scores. We found the CAPS scores negatively associated with Pre rGMV in the ACC, and negatively associated with Post-Pre rGMV in the left OFC. The results suggest that the reduced rGMV in the ACC and the decreased rGMV in the OFC are the vulnerability factors and the acquired signs of PTSD symptoms in healthy survivors, respectively. The findings provide further evidence that the ACC and the OFC, which are involved in attention, fear conditioning, and emotional regulation, play an important role in the pathogenesis of PTSD.

17) Abstract 831

OBJECTIVE EVALUATION OF HYPERACTIVITY IN OUTPATIENTS WITH ANOREXIA NERVOSA

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Hyperactivity has been considered as one of the significant symptoms in patients with anorexia nervosa (AN). However, hyperactivity has been assessed by subjectively recalled data such as a questionnaire or a
self report in most previous studies. Only few studies evaluated hyperactivity in AN patients using objective methods such as an actigraph, while the results were not consistent among them. The problems in those studies are that they did not assess the caloric expenditure by physical activity or long-term physical activity. Therefore, the aim of the present study was to evaluate the physical activity in AN patients objectively using two types of accelerometers, was Mini motion logger and Lifecorder-EX, for 14 days continuously as an ecological momentary assessment (EMA) technique. Participants were female restricting-type AN (AN-R) patients (N=15, 24±6.5 years 15.2±1.4kg/m² ), female binge-eating/purging-type AN (AN-BP) patients (N=13, 28.2±6.3 years 15.8±1.7kg/m²) and healthy women (N=12, 22.4±1.9 years 19.7±1.4kg/m²). All patients were diagnosed according to the Diagnostic Statistical Manual of Mental Disorders 4th edition (DSM-IV). The participants were asked to wear Mini motion logger on their wrist and Lifecorder-EX on their waist for consecutive 14 days through 24 hours excepting water activity in the daily life. Daily physical activity counts and energy expenditure were calculated by Mini motion logger and Lifecorder-EX, respectively. Group differences in the two physical activity variables were assessed by multilevel analysis among the three groups. Scheffe's post hoc tests for multiple comparisons were used. Energy expenditure in AN-R patients (40.0±0.65kcal/kg/day) was significantly higher than that in controls (37.9±0.72kcal/kg/day; p = 0.01). Energy expenditure in AN-BP patients tended to be higher than that in controls (p = 0.096). In conclusion, the present study objectively showed that AN patients, especially AN-R patients, might have hyperactivity.

18) Abstract 1125

FASTING GLUCOSE IS ASSOCIATED WITH SUBCLINICAL CEREBROVASCULAR DISEASE AMONG NON-DIABETIC OLDER ADULTS

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Diabetes shows well-established relations to stroke and subclinical cerebrovascular disease in older adults. However, little is known about the associations of fasting glucose levels and glucose intolerance to subtle brain pathology among non-diabetics. Here we examined relations of fasting glucose and glucose ingestion response to subclinical cerebrovascular disease and brain atrophy. We also explored how these associations may vary as a function of age, sex, and education. Participants were 172 non-diabetic, non-demented, and stroke-free older adults (mean age = 66.46 (6.98); M education = 16.30 years (SD = 2.96); 58% male). An oral glucose tolerance test was administered with blood sampled at baseline and 30, 60, 90, and 120 minutes post-glucose ingestion. Magnetic resonance imaging (MRI) was performed on a 1.5T Phillips scanner. MRIs were rated blindly by a neuroradiologist for markers of subclinical cerebrovascular disease (SCD) including periventricular and deep white matter hyperintensities, number of silent infarcts, and markers of brain atrophy (BA) including ventricular enlargement and sulcal widening. We used a set of summary variables (SCD, BA) that served as primary outcome variables. Fasting plasma glucose, 120 minute post-ingestion glucose levels, area-under-the-curve (AUC) measures, and their respective interactions with age, sex, and education were examined in separate multiple regression analyses. Adjustment variables included age, education, sex, systolic blood pressure, anti-hypertensives, and total cholesterol. Results showed a significant positive association between fasting glucose and degree of SCD (β = .264, p < .05). In addition, a significant interaction of fasting glucose and education (β = -.267, p < .05) suggested that this association was stronger for subjects with less than 12 years of education as compared to 12 or more years. AUC and 120 minute glucose values were unrelated to MRI outcomes. Findings suggest that higher fasting glucose, even among non-diabetics, may enhance the course of SCD in older adults. Higher levels of education may help to buffer this association.

19) Abstract 981

MUTANT STAT1 TRANSCRIPTION FACTOR WITH IMPAIRED DIMER STABILITY USED IN THE STUDY OF INTERFERON-INDUCED DEPRESSION

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It is known that patients treated with interferon frequently develop depressive symptoms, which can hardly be distinguished from other causes of depression. Interferons signal predominantly through STAT1 (signal transducer and activator of transcription), which becomes phosphorylated on a single tyrosine residue and enters the nucleus as transcriptionally active phospho-dimers. In this study we have characterized a point mutant in the STAT1 linker domain, which upon stimulation of cells with interferon showed a significantly reduced level of tyrosine phosphorylation as compared to the wild-type molecule. Impaired tyrosine phosphorylation of the K525A mutant was also detected after stimulation of cells with epidermal growth factor and, moreover, was confirmed by in vitro assays using either recombinant JAK2 or activated EGF receptor kinase. However, treatment of cells with the potent tyrosine phosphatase blocker vanadate completely rescued its defective phosphorylation phenotype and fully restored interferon-induced gene transcription. We found no correlation between the dissociation rate from specific DNA-binding sites between mutant and wild-type STAT1, demonstrating that the mutant had normal DNA-binding kinetics. Further experiments demonstrated that the mutant was principally able to dimerize, but the stability of the reciprocal phosphotyrosine-SH2 interactions within the STAT1 dimer was critically weakened. These findings support the conclusion that the characterized linker domain mutant displayed hyperactive dephosphorylation as its causative defect in interferon signaling. Taken together, we have identified a substitution mutant in the STAT1 linker domain with decreased dimer stability that showed remarkably reduced gene expression. Thus, this mutant appears as a valuable tool in the context of interferon-induced depression, which will probably allow deciphering the contribution of different interferon signal pathways on the neurobiology of depression.

20) Abstract 1080

RELATIONSHIP BETWEEN RESTING HEART RATE VARIABILITY AND HEART RATE RECOVERY FOLLOWING MENTAL AND PHYSICAL STRESS: DATA FROM THE HEALTHY AGING IN NEIGHBORHOODS OF DIVERSITY ACROSS THE LIFE SPAN (HANDLS) STUDY

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Both vagally-mediated heart rate variability (HRV) and heart rate recovery (HRR) following exercise have been identified as independent predictors of cardiovascular morbidity and mortality. However, to date, few studies have examined the relationship between resting HRV and HRR from either a physiological challenge or a psychological stressor. Using data from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study, we examined the relationship between resting HRV and HRR in (n > 700) participants selected for socioeconomic and demographic representativeness from twelve neighborhoods in Baltimore, Maryland. HRV was recorded during a pre-stressor baseline and HRR was calculated as the level of HR during the 5-minute recovery following a physical (i.e. Orthostatic) and psychological (i.e. Anger Recall) stressor. After controlling for HR during the respective stressors, HRV was positively correlated with HR recovery for both anger recall (psychological) and orthostasis (physiological), (r = -.23, p < .001). This suggests that individuals with higher HRV at baseline exhibited a faster recovery in heart rate, following both stressors. The magnitude of this association is similar to that found between HRV and HRR from exercise. Evidence from longitudinal investigations has shown that HRR from exercise is associated with a greater risk of all-cause mortality. Few studies have evaluated HRR following psychological stress. Our results
suggest that both simple orthostatic challenge and autobiographical recall may be useful, ecological paradigms to assess HRR in the physical and psychological domains.

21) Abstract 986

INCREASES IN VASCULAR ENDOTHELIAL GROWTH FACTOR IN THE AIRWAYS AND SALIVA ARE RELATED TO GREATER SEVERITY OF COLD SYMPTOMS DURING FINAL EXAM STRESS

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Psychological stress can increase the likelihood of respiratory infections, but the exact mechanisms behind this relationship remain unclear. Vascular endothelial growth factor (VEGF) can increase the permeability of mucosal surfaces, induce the growth of blood vessels, and bolster healthy immune processes by increasing the recruitment of immune cells. However, it can also cause remodeling of the airway epithelia and at very high levels could potentially facilitate infiltration of infectious agents by causing hyperpermeability and disrupting the airway epithelial barrier. In this study, we collected VEGF from saliva and exhaled breath condensate (EBC) in 44 participants (23 healthy individuals, after four-death condensate (EBC) in 44 participants (23 healthy individuals, 21 individuals with allergic rhinitis) during a final exam period and during a non-stress mid-semester period. We determined VEGF concentrations using Enzyme-Linked Immunoassay (ELIA). We used multi-level modeling for statistical analyses and found that participants reported more stress (p<.001), had more severe cold symptoms (p<.001), and had higher levels of VEGF in EBC during the final exam period as compared to mid-semester(p<.001). EBC and salivary VEGF interacted such that increases in salivary VEGF during final exams were related to greater severity of cold symptoms when EBC VEGF concentrations were high (p < .05). Similarly, increases in EBC VEGF led to higher severity of cold symptoms at high salivary VEGF concentrations (p<.001). In contrast, at lower concentrations of EBC VEGF, increases in salivary VEGF were related to a decrease in cold symptom severity (p<.05). Comparing low-stress and high-stress times, in participants with elevated EBC VEGF, increases in salivary VEGF concentrations were associated with an even greater increase in cold symptoms during final exams compared to the non-stress period (p<.05). These findings were upheld when controlling for allergic condition and gender. This suggests that salivary and exhaled breath VEGF concentrations interact such that high levels of both facilitate the development of cold symptoms and this VEGF-facilitated increase in cold severity is more pronounced in periods of psychological stress.

22) Abstract 953

EFFECTS OF A MINDFULNESS-BASED PSYCHOLOGICAL INTERVENTION IN PATIENTS WITH DIABETES HAVING EMOTIONAL DISTRESS: THE DIAMOND RANDOMIZED CONTROLLED TRIAL

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Background: Approximately 20-40% of outpatients with diabetes experience elevated levels of emotional distress, varying from disease-specific distress to general symptoms of anxiety and depression. The patient’s emotional well-being is related to other unfavorable outcomes, like reduced quality of life, sub-optimal self-care, impaired glycemic control, higher risk of complications, and increased mortality rates. The purpose of this study is to test the effectiveness of a mindfulness-based psychological intervention with regard to (1) reducing emotional distress; and (2) improving quality of life, positive affect, and life satisfaction.

Methods: The Diabetes and Mindfulness study (DiaMind) is a randomized controlled trial. So far, 77 diabetic patients with low scores on WHO-5 well-being index have been recruited from outpatient diabetes clinics. They were randomized to a mindfulness group or a waiting list control group. Assessments included the Perceived Stress Scale (PSS), Hospital Anxiety and Depression Scale (HADS), Profiles of Mood States (POMS), Problem Areas in Diabetes survey (PAID), the Satisfaction with Life Scale, and SF-12 at baseline, after four weeks, post intervention, and at 6 months follow-up. Group differences were analyzed with a mixed models repeated measures analysis. The analyses were based on intention-to-treat. The study is registered in the Dutch Trial Register (No. NTR2145).

Results: Compared to the control group, the mindfulness intervention was more effective in reducing perceived stress (pooled t (72) = -2.03, p = .042, partial η² = .06) and depressive symptoms (pooled t (72) = -2.06, p = .041, partial η² = .06), while a trend was found for improvement in anxiety (pooled t (72) = -1.66, p = .098, partial η² = .04). In addition, the mindfulness intervention was more effective in improving the mental component of quality of life (pooled t (72) = 2.09, p = .037, partial η² = .06), vigor (pooled t (72) = 2.04, p = .042, partial η² = .06), and life satisfaction (pooled t (72) = 2.20, p = .028, partial η² = .06). There were no effects of the mindfulness intervention on diabetes related distress and the physical component of quality of life (both p > .10).

Conclusions: The mindfulness intervention is effective in reducing perceived stress and depressive symptoms and improving quality of life, vigor and general life satisfaction in adults with diabetes. The intervention does not affect physical quality of life or diabetes specific problems. Results of this study can contribute to a better care for patients with diabetes combined with decreased levels of emotional well-being.

23) Abstract 1065

MENTATION TYPE AND CONSTRUAL LEVEL DIFFERENTIALLY PREDICT BLOOD PRESSURE AND ANXIETY IN RESPONSE TO STRESSOR-FOCUSED RUMINATION

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Mental rehearsal of past stressors through rumination may prolong and reactivate physiological stress responses and lead to distress. Type of rumination (mental imagery or verbal thought) and level of construal (abstract or concrete processing) used during stressor-focused rumination may shape the physiological and affective responses. For example, worry and trauma research shows that verbal self-talk can inhibit cardiovascular activation, whereas imagery enhances it (e.g., Borkovec et al., 1993; Pitman et al., 1987). In addition, abstract construals (evaluative or “why” thoughts) about negative events lead to more distress and anxiety than concrete construals (detail-oriented “what” thoughts; Watkins, 2008). The current study tested whether blood pressure (BP) and anxiety responses to stressor-focused rumination differ by mentation type and construal level using a 2 (mental imagery or verbal thought) x 2 (abstract or concrete processing) design. Healthy undergraduates (N = 136; 50% male) performed a speech stressor and then completed a guided rumination task in one of four randomly assigned conditions: concrete imagery, abstract imagery, concrete verbal thought, or abstract verbal thought. State anxiety was assessed after a pre-stressor relaxation task, as well as post-stressor and post-recall. Continuous non-invasive BP was measured during each 3-minute task and averaged. Concrete stressor-focused rumination led to mean increases in systolic and diastolic BP relative to relaxation, whereas rumination with abstract construals led to decreases in BP, t > 2.83, ps < .01. Systolic BP increases were greater in the concrete imagery condition relative to the other three conditions, t(112) = 2.22, p < .05. Participants in the abstract conditions had greater increases in anxiety following stressor-focused rumination compared to the concrete conditions, t(127) = 2.00, p < .05. Anxiety increases were greatest in the abstract verbal thought condition, t(127) = 2.16, p < .05. Results suggest that the immediate physiological and psychological consequences of stressor-focused rumination depend upon level of construal and mentation type.
Exploring the Relationship Between Schizotypy and Well-Being in a Student Population

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Schizotypy is a personality dimension characterised by schizophreniform-like symptoms present in the general population. Extreme schizotypy levels are related with higher risk of psychosis. Abnormal mood levels are also related with high schizotypy levels and schizophrenia. Less is known about the extent to which the broader concept of wellbeing is related with schizotypy. This study aimed to explore the relationships between wellbeing and schizotypy with the cognitive, social, and disorganised behavioural aspects of schizotypy.

Methods: Students (N=150; M±SD=23.5±11.1) completed a questionnaire consisting of Ryff’s wellbeing and the meaning in life (eudemonic wellbeing), the centre for epidemiologic studies depression, and perceived stress (illbeing) scales, and the schizotypal personality questionnaire. Schizotypy scores ranged from 1-63 (M=23.5±11.1). Measures of wellbeing and illbeing loaded strongly onto 1 factor and was used to explore associations with schizotypy. In the full sample associations between wellbeing and the social (r=.41, p<.001) and disorganised behavioural (r=.18, p<.001) aspects of schizotypy, but not the cognitive aspects (r=-.14, p>.005) were found. To explore the relationship between wellbeing and extreme schizotypy groups, the top ('at risk') and bottom (low risk) 10% were identified (N=34). Associations were found between wellbeing and the social (r=-.54, p<.001) and disorganised behavioural (r=-.44, p<.005) aspects as well as the cognitive aspect of schizotypy (r=.40, p<.005).

In the main sample lower wellbeing was related with only social and disorganised behavioural aspects of schizotypy. While in the extreme groups, there were negative relationships between wellbeing and all aspects of schizotypy. Results indicate that wellbeing is strongly related with schizotypy. The observed relationship with cognitive aspects within the extreme groups leads to an interesting discussion as to whether wellbeing is predictive of low wellbeing or whether low wellbeing exacerbates schizotypy in susceptible individuals. More investigation is required to untangle the nature of the relationship between schizotypy and wellbeing.

Airway Exhaled Nitric Oxide Increases Due to Acute Stress Are Attenuated in Depressive Mood - Evidence for Innate Immune System Suppression?

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Exhaled nitric oxide (eNO) is commonly interpreted as an indicator of airway inflammatory status in respiratory disease. It is produced by nitric oxide synthase activity in a variety of cells including neural, endothelial, epithelial, and inflammatory cells such as eosinophils. We recently found that eNO was elevated following acute stress induction in the laboratory in both asthma patients and healthy individuals. Because of the quick onset of these changes, we considered an origin of these eNO increases independent of allergic inflammation. The airway epithelium secretes nitric oxide as an innate defense mechanism against pathogens and an increase in nitric oxide secretion would be in line with other findings that suggest a strengthening of immune defenses in states of acute stress. On the other hand, because chronic stress and psychopathology are known to lead to a deterioration of immune defense, we expected that they would also dampen the eNO increases observed in acute stress, implying a greater vulnerability of the airways to infections agents. We therefore examined the association of eNO increases following the Trier Social Stress Test with ratings of acute negative affect, chronic stress measured by the Perceived Stress Scale, as well as anxious and depressed mood measured by the Hospital Anxiety and Depression Scale in a total 80 participants (39 asthma patients and 41 healthy controls). Levels of eNO before and after the stressor were measured repeatedly using a hand-held chemiluminescence analyzer. Levels of eNO were significantly increased immediately after stress-induction, patters of change were similar in healthy individuals and asthma patients with our without corticosteroid treatment. Independent of age, gender and asthma status, stronger depressive mood in the past week was associated with an attenuated eNO increase following acute stress (p=.003), whereas acute negative affect, chronic stress, the interaction of acute negative affect and chronic stress, or anxious mood were not associated with eNO change. Thus, depressive mood appears to affect an aspect of the innate immune response of the airways and thus may increase the susceptibility to infection.
ANTIBODIES TO THE HEAT SHOCK PROTEIN 60 (ANTI-HSP60) INCREASE IN WOMEN BUT NOT IN MEN IN RESPONSE TO DIVORCE OR SEPARATION
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We previously documented an association between levels of anti-Hsp60 and psychosocial measures of stress, in patients with coronary artery disease, in patients who underwent the distress of surgery after bone trauma, in women after divorce or separation and in women with PTSD. This is a case-control observational study matched by gender in which a quantitative variable such as Anti-Hsp60 was measured in a group of 35 individuals 18 to 60 years old, 12 were divorced/separated (7 were women and 5 were men), 8 were women with Chronic PTSD, 15 were healthy non divorced/separated (controls). Results/Conclusions: Women who divorced or separated the previous year had a significant higher serum concentration of Anti-Hsp60 than controls (P<0.01). Men who divorced or separated the previous year nor women with Chronic PTSD had significant higher serum concentration of Anti-Hsp60 than controls (P<0.05). We conclude in this preliminary research that this increase of circulating antibodies to Hsp60 in women but not in men could mean a more severe psychological stress suffered by women after divorce/separation. Confirmation of these observations in a larger study would suggest an immunological response to psychological stress mediated by Anti-Hsp60.

28 Abstract 826

EFFECTS OF STRESS-HEMOCENTRICATION ON THE COAGULATION CASCADE
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Objective: When examining acute stress effects on coagulation responses, the Dill and Costill correction (DCC) has been used to arithmetically adjust for stress-induced plasma volume (PV) shifts, but has limitations when examining time dependent or functional coagulation assays. Two plasma reconstitution techniques for correcting PV shifts on coagulation changes were compared to the DCC. Method: Blood was collected from 40 men at the end of a 20-minute baseline period, a 6-minute mental arithmetic stressor and a 20-minute recovery period. For the reconstitution techniques, stress plasma was reconstituted with baseline plasma or physiological saline equal to the amount of plasma lost during stress. Results: PV decreased significantly from baseline to stress, but returned to baseline levels at recovery. Uncorrected activated partial thromboplastin time (APTT) decreased, whereas Factor VII clotting activity (FVII:C), FVIII:C, prothrombin time (PT%), and fibrinogen (Fib) increased significantly from baseline to stress. The DCC produced a significantly greater decrease in APTT during stress compared to uncorrected APTT, whereas FVII:C, PT%, and Fibrinogen concentration were not significantly different from baseline after DCC. After saline or physiological saline reconstitution, PT%, FVII:C, and Fib concentration were no longer significantly different from baseline. After plasma reconstitution, Fib was not significantly different from baseline, whereas FVII:C, APTT and PT% were unchanged. FVIIIC remained elevated after each correction. With the exception FVIIIC, coagulation parameters returned to baseline levels at recovery. Conclusion: Saline reconstitution appears to be a more biologically relevant correction method when examining hemoconcentration effects on clotting time and clotting activity, whereas the plasma reconstitution method and DCC do not seem appropriate. With the exception of FVIIIC, hemoconcentration appears to account for the changes in the coagulation parameters. FVIIIC survived all correction methods suggesting actual activation of the intrinsic pathway of the coagulation system. Stress-induced changes in coagulation are a result of both hemoconcentration and actual activation of the coagulation system.

THE EFFECT OF MINDFULNESS-BASED STRESS REDUCTION ON AMBULATORY BLOOD PRESSURE (THE HARMONY STUDY)
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Various lifestyle modifications have been identified that lower BP and reduce the risk of developing cardiovascular disease. Hypertension Analysis of stress Reduction using Mindfulness meditatiON and Yoga (HARMONY) is a RCT pilot study designed to evaluate the feasibility and safety of Mindfulness Based Stress Reduction (MBSR) as an alternative treatment for lowering BP in people with stage 1 unmedicated hypertension. Preliminary information suggests that MBSR leads to lower blood pressure; however, MBSR has not yet been rigorously evaluated as a treatment for hypertension. 24-HR ambulatory blood pressure (ABP) measurement was used to determine eligibility. Measured ABP was 135±18/80±9 mmHg. After the 1 year intervention no differences were identified from baseline to stress. The MBSR group showed a significant drop over time from POST to CLOSE for awake ABP (sbp, 22mmHg; dpb, 6mmHg; ABP, 15mmHg) and nighttime ABP (sbp, 10mmHg; dpb, 6mmHg). In the analysis over time with 3 levels (PRE, POST and CLOSE) for the treatment and control groups there was a significant drop over time from POST to CLOSE for awake ABP (sbp, 22mmHg; dpb, 6mmHg; ABP, 15mmHg) and nighttime ABP (sbp, 10mmHg; dpb, 6mmHg). It is unclear whether MBSR contributed to the drop in ABP by closeout time since both groups received MBSR. At presentation, lifestyle and MBSR-related factors will be available to further examine whether there is an association between MBSR and ABP

LONG LASTING EFFECTS OF SMOKING: BREAST CANCER SURVIVORS’ INFLAMMATORY RESPONSES TO ACUTE STRESS DIFFER BY SMOKING HISTORY
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Cigarette smoking continues to be the most preventable cause of illness and death, especially in the development, treatment, and prognosis of cancer. Some data suggest that even years after smokers quit, inflammation may be elevated compared to people who have never smoked. Inflammation can also be enhanced by stress. This study assessed neuroendocrine and inflammatory responses to stress in breast cancer survivors who formerly smoked compared to their counterparts who had never smoked. Participants included 97 women (age, 51.2 ± 9.4 years) who had completed treatment for stage 0-IIIA breast cancer within the past three years and were at least two months post surgery, radiation or chemotherapy, whichever occurred last. Cortisol and interleukin-6 (IL-6) were evaluated in response to a standardized stressor.
RESILIENCE TRAINING FOR MAYO CLINIC RESIDENTS AND THEIR PATIENTS

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Resilience is the ability to adapt to, respond to and recover from current and potential life stressors. Resilience involves psychoneuroimmunology, neuroendocrinology, neuroplasticity, gene-environment interplay, stress management and effective emotional processing and emotion regulation. Conventional medical therapies are primarily directed at the pathology of disease; however, increasing evidence suggests simply treating pathology without focusing on strategies that facilitate resilience is the patient is associated with greater morbidity and health care utilization. By training resilience skills to medical students and residents, we expect to improve the effectiveness of their doctor-patient interactions and provide tools and coping skills for the learners and their patients.

Using funds from a grant from the APS SIG, we developed video learning modules in which professional actors portrayed “real world” doctor-patient encounters to demonstrate interactions that do or do not exemplify a resilience focus to the treatment plan. These video vignettes are to be used in medical school and residency training as stimulus for discussion and learning. The learners are part of a larger curriculum, consisting of initial didactic sessions introducing the definition and concepts of resiliency, with a review of the neuroscience of stress, emotional processing and neuroplasticity. The learners will also be trained in and participate actively in mindfulness-based meditation and HeartMath® techniques. We will utilize validated instruments to measure symptoms of physical stress, psychological health, resilience, emotional competencies, organizational climate and work performance and job satisfaction, productivity, empathy and social support. We will assess the learner’s perceived ability to incorporate resilience techniques in his/her patients and their perceived value of resilience interventions in their own lives and for their patients. This novel curriculum is designed to imbue psychiatric learning into the core medicine curriculum and encourage the model of integrated medicine and psychiatry. Our early experience with the program has been encouraging, with substantial buy-in from both the internal medicine and neurology residency training programs. We expect that our outcome data will validate the expansion of this curriculum to other residency training programs and medical schools.

CHILD SEXUAL ABUSE HISTORY PREDICTS GREATER WEEKLY DRINKING AND SMOKING OVER PREGNANCY

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Pregnant women with a history of childhood sexual abuse (CSA) have more maternal and infant complications including preterm birth and are also more likely to smoke and drink during pregnancy than women without abuse histories. Therefore, these risky health behaviors may serve as mechanisms linking CSA history to pregnancy complications. However, previous studies 1) have not included biochemical verification of substance use, 2) have not examined patterns of use, and 3) have not compared history of CSA to history of non-sexual child abuse (CA).

Participants were 116 pregnant mothers (ages 18-40, Mage=25, SD=5) from diverse ethnic (52% minority) and economic backgrounds (Mincome=$20-29K/yr) who completed a larger study of maternal smoking and fetal and infant behavior. 21% reported a history of CSA, 43% reported CA, and 36% reported no abuse (NA). Timeline Followback (TLFB) interviews were completed during third trimester and postpartum to ascertain daily cigarette and alcohol use 3 months before conception, over pregnancy, and 30 days post-delivery. Smoking status was verified by saliva and meconium cotinine and CO levels. 41% of the sample smoked, 23% quit during pregnancy, and 36% were non-smokers.

Controlling for maternal race and breastfeeding status, ANCOVAs revealed that women with CSA histories drank more in the preconception period (F’s>2.5, p’s<.05) and weeks 1-5 of pregnancy (F’s>3.9, p’s<.05) compared to CA and NA women (See Figure 1A). Both CSA and CA women smoked more than NA women in the preconception period (F’s>4.0, p’s<.05), weeks 1-8 and 19-26 of pregnancy (F’s>2.66, p’s<.05), and in the postpartum period (F’s>2.7, p’s<.05) (See Figure 1B). GEE models will further clarify these patterns.

In this study, women with CSA histories were at increased risk of alcohol and tobacco use, suggesting that 1) healthcare providers should screen for child abuse history in pregnant women, and 2) substance use interventions should be targeted in the 1st and 3rd trimesters for at-risk pregnant women. Such interventions may help to reduce maternal and infant complications in at-risk women.

Figure 1

A. Daily alcoholic drinks

B. Daily cigarettes

No abuse | Child abuse: non-sexual | Child sexual abuse

0 5 10 15 20
Number of drinks

0 5 10 15 20
Number of cigarettes

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33) Abstract 1212

CHRONIC STRESS IS ASSOCIATED WITH CORTISOL AND INTERLEUKIN-6 ADAPTATION TO REPEATED ACUTE STRESS

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Chronic social stress is statistically related to disease, but pathophysiological mechanisms are not completely understood. Habitation in response to repeated stress is considered an adaptive response, and non-habitation is thought to have adverse health implications. Previous studies showed influence of chronic stress on acute stress responses, but less is known about how this influence acts in repeated stress situations. We recruited n=23 healthy individuals (10 women, 13 men; mean age=22.4 yrs.; mean BMI=23.6 kg/m2) and exposed them to the Trier Social Stress Test (TSST) twice. Plasma interleukin-6 (IL-6) and salivary cortisol were measured repeatedly until 2 hours after stress. Chronic stress at different episodes during the life span was assessed by self report, using the Trier Inventory for Chronic Stress (TICS) and the Childhood Trauma Questionnaire (CTQ). The Life stress questionnaire (LSQ) was also applied, but since participants were young and most of them were stable long-term relationships, we only used the subscales asking about parents and self. Participants showed increases of cortisol and IL-6 (both p’s < 0.01) in response to first-time stress exposure. After second exposure, cortisol responses habituated (p=0.009) while IL-6 responses showed sensitization (p=0.047). Chronic stress (TICS subscales “work overload”, “excessive demands at work”; “performance pressure at work”) was associated with less efficient habituation of the HPA axis (r=-0.474, p=0.026; r=-0.466, p=0.025; r=-0.442, p=0.034, resp.). Total TICS score correlated significantly with IL-6 response on day 2 (r=0.461, p=0.035). LSQ subscale “parents” correlated significantly with cortisol increase on day 2 (r=0.387; p=0.046). LSQ subscale of “self” and CTQ showed no significant relationship with cortisol and IL-6 response. In summary, our results show that chronic stress is related to maladaptive acute stress response pattern. Peripheral inflammation, which is in line with the assumption of higher disease susceptibility in chronically stressed individuals. LSQ self scale was not significantly correlated with acute stress response, but the subscale tested about major stress events, which were seldom encountered by our participants. Similarly, early life trauma was not found associated with acute stress response patterns, but exposure to early trauma was low in this sample.

34) Abstract 1232

DEPRESSIVE SYMPTOMS AND HEALTH BEHAVIOR IN UNCONTROLLED HYPERTENSIVES

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Depression has considerable support as a risk factor for hypertension and for blood pressure (BP) remaining uncontrolled even when treated. However, the pathways for depression’s effect on hypertension are not well understood. One proposed mechanism is health behavior, including poor medication adherence, diet, physical activity, alcohol intake, and sleep. An unanswered question is the extent to which health behavior may account for part of the relationship between depression and BP. A total of 154 treated, but uncontrolled hypertensives were assessed with Ambulatory BP Monitoring (ABPM) and completed the Beck Depression Inventory, Hospital Anxiety and Depression Scale (HADS), Pittsburgh Sleep Quality Index (PSQI), health behavior questions from the BRFSS, and Morisky Medication Adherence Scale (MAS), at the baseline visit of a behavioral RCT for hypertension. Bivariate correlations were examined, as well as linear regression modeling of the waking ABPM average systolic BP (SBP). In bivariate correlations, systolic BP was significantly related to depression (BDI r=0.19, p=.01; HADS-D r=0.30, p<0.001), sleep disturbance (PSQI r=0.21, p=.01), and measuring BP at home (r=.33, p=.001). Moderately high correlations (r=0.3–0.6) were found between BP and depressive symptoms (BDI and HADS-D). Medication adherence, BMI, alcohol intake, physical activity, and smoking were not related to SBP, though most were significantly related to depressive symptoms. In multivariate regression analysis, (R-squared= .30), depressive symptoms became non-significant (p=0.07) and only sleep disturbance (p=.008) and age (p=.01) remained significant predictors of systolic BP. These findings suggest that: 1) health behaviors that affect BP are strongly related to depressive symptoms; and 2) the relationship between depressive symptoms and systolic BP may be mediated by sleep disturbance. Further research is needed to fully understand the relationships among these variables.

35) Abstract 1048

PERSONALITY AND HORMONE THERAPY USE AMONG POSTMENOPAUSAL WOMEN: RESULTS FROM THE FRENCH GAZEL COHORT STUDY

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Background: Seeking for medical treatment may partially account for the association between personality and health outcomes. In the context of menopause, the Women’s Health Initiative Study, published in 2002, suggested that hormone therapy could increase the risk of coronary heart disease and cancer. Our study aimed to examine the association between depressive mood, Type A personality (sense of time urgency and competitiveness) or hostility, and hormone therapy use after menopause.

Methods: The French GAZEL cohort was set up in 1989 among employees of the French national gas and electricity company. In 1993, questionnaires were mailed to measure depressive mood (CESD scale), Type A personality (Bortner’s scale) and hostility (Buss & Durkee’s Hostility Inventory). Additional data from up to 6 mailed questionnaires – at inclusion (in 1990) and every 3 years – were used to determine the date of menopause and the use of hormone therapy. The association between personality and hormone therapy was measured by the Relative Index of Inequality (RII) computed through binary logistic regression.

Results: Among women of GAZEL who completed the personality questionnaires before menopause, 1,865 reached natural menopause during the study, including 945 who used hormone therapy within one year after menopause and 920 who did not. Adjusting for all potential confounders, including menopause symptoms and expectations about treatment, hormone therapy use was associated with Type A personality (RII=1.71, 95% confidence interval =1.20–2.49, p=0.003), but neither with depressive mood, nor with total hostility or hostility components. Hormone therapy use decreased after the WHI publication to the same extent in Type A as in Type B (non Type A) individuals.

Conclusion: Type A personality may be associated with seeking hormone therapy after menopause, regardless of other predictors of hormone therapy prescription, including vascular and breast cancer risk factors. Beyond the context of menopause, these results may suggest a model of how personality may affect health outcome through seeking specific medical treatments.

36) Abstract 778

USING ESTABLISHED PREDICTORS OF POST-TRAUMATIC STRESS TO EXPLAIN VARIATIONS IN RECOVERY OUTCOMES AMONG ORTHOPAEDIC PATIENTS

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Using established predictors of post-traumatic stress to explain variations in recovery outcomes among orthopaedic patients...
Prior research has identified a variety of predictors for the development of post-traumatic stress (PTS), including gender, psychiatric diagnosis, pain, and cardiovascular reactivity. The following studies examined whether these risk factors account for variability in recovery outcomes among two types of orthopaedic patients: 1) hip fracture and 2) total knee replacement. Study 1: Data were abstracted from the medical records of 136 patients (31 males, 105 females) undergoing surgical repair for hip fracture (Summa Health System, Akron, OH). Acute recovery was assessed by ambulation (feet) on the first post-operative day and 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 peritraumatic pain (rating of a 9 or 10). Patients with a greater PTS risk score required greater assistance (ß=.245, p=.011) and displayed reduced ambulation (ß=.270, p=.014) during in-hospital physical therapy sessions. Although limited by our reliance on medical records, our 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 TKR (Summa Health System, Akron, OH). Based upon data abstracted from patients’ medical records, PTS risk (similar to Study 1) was derived from: female gender, in-hospital CES-D19, peritraumatic heart rate (>94 bpm), and peritraumatic pain (rating of a 9 or 10). Three-month follow-up surveys completed the CES and WOMAC to assess their symptoms of PTS and recovery outcomes, respectively. Analyses revealed that patients with a greater PTS risk score reported more symptoms of PTS (ß=.217, p=.053), more severe pain and greater functional limitations (ß=.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 surgery.

37) Abstract 766

EARLY LIFE SOCIOECONOMIC STATUS AND DIURNAL CORTISOL AMONG MID-LIFE ADULTS: ADOLESCENCE AS A CRITICAL PERIOD FOR HPA PROGRAMMING

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Lower childhood socioeconomic status (CSES) is associated with poorer adult health, including higher rates of mortality. In many studies these relationships are independent of adult SES, and the mechanisms by which CSES affects adult health remain unclear. In this study we examine the association between CSES and diurnal levels of salivary cortisol, a marker of hypothalamic pituitary adrenal (HPA) axis activation, as a potential pathway by which CSES "gets under the skin" to effect health in later life. We also examined several potential mediators including physical activity, sleep, social support, perceived stress and depression, which might contribute to associations between CSES and adult cortisol levels. A community sample of 96 relatively healthy participants (59% female, 94% white, mean age 50) collected saliva samples 4 times a day over 6 non-consecutive days to obtain diurnal cortisol levels based on area under the curve (AUC) calculations. The following study measured salivary cortisol assessing each year of childhood (1-18 years) and included parental home and vehicle ownership and number of bedrooms per child in the home. CSES was divided into early childhood (1-6 yrs), middle childhood (7-12 yrs) and adolescence (13-18 yrs). Covariates included age, sex, race, BMI, and adult SES. Linear regression analyses showed no associations between cortisol and early or middle CSES. However, adolescent SES was a significant predictor of adult AUC cortisol (ß= 3.09, p = .02). Cortisol levels were elevated across the day among individuals who fell in the lowest tertile of adolescent SES when compared with those in the higher adolescent SES groups. Adolescent SES predicting adult cortisol remained relatively unchanged with the inclusion of potential mediators, with the exception of social support, which showed a trend towards an association with adult cortisol and reduced the association between adolescent SES and adult cortisol (though the association remained significant). This study provides evidence that adolescent SES is associated with an increase in overall daily cortisol in middle age, with those in the lower SES group exhibiting higher levels of diurnal cortisol. These findings give initial evidence that adolescence may be a critical period for the HPA axis.

38) Abstract 928

ATTACHMENT STYLE CONTRIBUTES TO THE OUTCOME OF A MULTIMODAL LIFESTYLE INTERVENTION IN OBESE PATIENTS

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Background and Aim: Reduced the association between adolescent SES and cortisol by 9% in healthy and diseased adults. If this association is independent of adult SES, and the mechanisms by which CSES affects adult health remain unclear. Although psychological factors have been suggested to modify therapeutic effects, specifically the implications of attachment styles and the patient-therapist relationship have not been examined in detail yet. Methods: This study included 44 obese patients who participated in a one-year multimodal weight-reduction program. Attachment style was assessed by the Adult Attachment Protocol Rating (AAPR) and its relation to a one-year weight reduction program was studied. The patient-therapist-relationship was assessed using the Helping Alliance Questionnaire. Results: Patients loose 6.3% of there baseline BMI(38.3) Attachment style was secure in 68% of participants and insecure (preoccupied and dismissing) in 32%. Interestingly a significantly higher weight-reduction was found in securely (SAI) compared to insecurely attached individuals (UAI, ps < 0.05). This estimation correlated positively also to the quality of helping alliance (p=0.004). Conclusions: The frequency of insecure attachment in obese individuals was comparable to that of the normal population. Our data suggest a greater weight-reduction for SAI than for UAI, and the patient-therapist relationship was rated more positively. The conclusion can be drawn that beside other factors like BMI, age, gender, psychiatric and somatic co-morbidity, the attachment style play a role in a interdisciplinary treatment program of obesity and has an influence on the effort to lose weight.

39) Abstract 913

TRAJECTORIES OF DEPRESSIVE SYMPTOMS AND SUBSEQUENT INFLAMMATION: A LATENT CLASS APPROACH

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Background: Some evidence suggests that depression is associated with subsequent inflammation in healthy and diseased adults. If this association already exists earlier in life, this could make adolescents vulnerable for cardiac disease in adulthood. We therefore set out to evaluate the trajectories of depression in adolescence and their relationship to subsequent levels of high sensitive C-reactive protein (hsCRP). Methods: 1212 Dutch adolescents from the Tracking Adolescents’ Individual Lives Survey (TRAILS) were followed between the age of 11 and 18. Three assessments of the Youth Self Report took place to evaluate depressive symptoms. Blood was collected during the third assessment. Results: Longitudinal latent class analyses revealed that adolescents clustered in three clusters based on three symptom scales (cognitive, somatic & total scale scores).
ANOVA showed that levels of hsCRP were significantly different between the eight clusters of depression (p=.018), somatic symptoms (p=.039), and cognitive symptoms (p=.042). Post hoc analyses revealed that adolescents who experienced moderate depressive symptoms over the course of the 5-year follow-up had higher levels of hsCRP compared to those who only experienced moderate depressive symptoms at assessment three (mean difference 1.44±1.12). Adolescents suffering from systematically more severe somatic symptoms over time had higher levels of hsCRP than those who had only little somatic symptoms (mean difference 1.78±1.19). Finally, adolescents who persistently experienced moderate cognitive symptoms had significant higher levels of subsequent hsCRP (mean difference 1.34±1.09) compared to those who experienced little cognitive symptoms over time. Mean differences became non-significant after adjusting for age, gender, socio-economic status, BMI and smoking. Conclusion: hsCRP was significantly higher in adolescents who persistently experienced moderate symptoms of depression, moderate cognitive, or severe somatic symptoms of depression. However, additional adjustments made our findings non-significant, suggesting that already in early adolescence depression in combination with demographic characteristics and health behaviors affects levels of inflammation.

40) Abstract 1170
ACUTE CORONARY SYNDROME-INDUCED POSTTRAUMATIC STRESS DISORDER: A META-ANALYTIC REVIEW OF PREVALENCE, ASSOCIATION WITH CLINICAL OUTCOMES, AND INTERVENTION EFFECTS
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Objective: Acute coronary syndromes (ACS; myocardial infarction or unstable angina) can induce posttraumatic stress disorder (PTSD), and ACS-induced PTSD may increase patients’ risk for subsequent cardiac events and mortality. We conducted a systematic review and meta-analysis to determine the (1) prevalence of ACS-induced PTSD? (2) association between ACS-induced PTSD and adverse clinical outcomes? (3) effects of interventions on ACS-induced PTSD.
Methods: Articles were identified by searching Ovid MEDLINE, PsycINFO and Scopus, and through manual search of reference lists. Observational cohort studies that assessed PTSD with specific reference to an ACS event at least 1 month prior to the PTS assessment were included. ACS-induced PTSD prevalence estimates and associations with clinical outcomes, as well as studycharacteristics, were extracted.
Results: We identified 48 potentially relevant articles, of which 24 met our criteria (total n= 2383). Meta-analyses yielded an aggregated prevalence estimate for ACS-induced PTSD of .12 (95% CI=.09 - .16) in a random effects model. Individual study prevalence estimates varied widely (.00- .32), with significant heterogeneity in estimates explained by the use of a screening instrument [16 studies, prevalence= .16 (95% CI= [ .13 -.20]) versus a clinical interview [8 studies, prevalence=.04 (95% CI=.03 - .05)]. The aggregated point estimate for the magnitude of the relationship between ACS-induced PTSD and clinical outcomes (i.e., mortality and/or ACS recurrence) across the 3 studies that met our criteria (total n= 609) suggested a 2.02 (95% CI= 1.69 – 2.37) times increased risk of adverse clinical outcome for patients with clinically significant PTSD symptoms. Only 1 study demonstrated the effectiveness of PTSD treatment in ACS patients.
Conclusions: This meta-analysis suggests that ACS-induced PTSD is moderately prevalent, and that it is associated with increased risk for recurrent cardiac events and mortality. More research is needed to determine whether PTSD treatment offsets risk for adverse clinical outcome.

41) Abstract 745
INFLUENCE OF A SUGGESTIVE PLACEBO INTERVENTION ON PSYCHOPHYSIOLOGICAL RESPONSE TO SOCIAL STRESS
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The placebo response is believed to be partially mediated by reductions of stress and negative emotions. In the present study, we applied one of the most prominent laboratory stress paradigms to test the hypothesis that placebo administration combined with specific suggestions would attenuate the psychological, neuroendocrine and autonomic stress response. Healthy male subjects with elevated levels of anxiety were randomly assigned to receive either placebo (n=24), no treatment (n=24), or active medication (herbal drug, n=6) before participating in the Trier Social Stress Test (TSST). The primary comparison was planned between the placebo and the no-treatment group, while the active medication group was introduced in order to not deceive the participants. Subjects were told, truthfully, that they would take part in a study on the “effects of an anxiolytic intervention on the stress response”, and that they would either receive placebo, active medication or no treatment. The likelihood to be in either group was not disclosed. We suggested that the drug tested in the study was expected to make the participants feel more relaxed, calm, concentrated and alert while facing the stressor. Besides psychometric assessments before and after the TSST, we measured salivary cortisol reflecting activation of the hypothalamus-pituitary-adrenal axis, salivary alpha-amylase reflecting activation of the sympathetic-adrenal-medullary axis, and heart rate variability reflecting parasympathetic activation. Subjects in the placebo group showed an increase in subjective alertness during stress, while alertness decreased in the no-treatment controls (p<0.001). Significant time effects were observed for state anxiety, mood and calmness (all p<0.01), we could however not detect group differences between subjects receiving placebo and no treatment. Similarly, the TSST induced significant increases in salivary cortisol and salivary alpha-amylase as well as a decrease in heart rate variability. Again, responses in the placebo and the no-treatment group were not significantly different. In summary, we found that the suggestive placebo intervention increased subjective alertness, but we could not confirm our hypothesis that the intervention would attenuate the neuroendocrine and autonomic stress response. This may be due to the high potential of the stressor to elicit the placebo response, and the comparatively weak effect of mere suggestions on primarily unconscious physiological functions.
42) Abstract 1058

APPLICATION OF A COMPUTERIZED ECOLOGICAL MOMENTARY ASSESSMENT TECHNIQUE IN CANCER PATIENTS RECEIVING HOME HOSPICE CARE

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Pain in cancer patients cannot be always controlled because the assessment of pain is difficult, which usually relies on patients’ recall. In addition, cancer pain has been reported to be associated. Therefore, the aim of the present study was to evaluate pain and psychosocial factors in a natural environment by collecting real-time data using a computerized ecological momentary assessment (cEMA). Subjects were terminal cancer patients receiving home hospice care. Inclusion criteria were suffering from cancer pain, taking analgesics, and not having a current or history of cognitive impairment or psychiatric disorders. They were asked to record instances of symptoms of pain (physical, emotional, cognitive, and functional), physical and mental health functioning over the long-term. Pain in cancer patients cannot be always controlled because the assessment of pain is difficult, which usually relies on patients’ recall. In addition, cancer pain has been reported to be associated. Therefore, the aim of the present study was to evaluate pain and psychosocial factors in a natural environment by collecting real-time data using a computerized ecological momentary assessment (cEMA). Subjects were terminal cancer patients receiving home hospice care. Inclusion criteria were suffering from cancer pain, taking analgesics, and not having a current or history of cognitive impairment or psychiatric disorders. They were asked to record instances of symptoms of pain (physical, emotional, cognitive, and functional), physical and mental health functioning over the long-term.

43) Abstract 967

DAY-TO-DAY PAIN COMMUNICATION AND SPOUSE RESPONSES IN OSTEOARTHRITIS

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Research on chronic pain populations has demonstrated the importance of spouse responses for patients’ experience of pain. However, little attention has been given to the day-to-day effects of verbal and nonverbal pain communication on spouse responses. It was hypothesized from a pain communication perspective that verbal disclosure would relate to more empathic and fewer punishing responses and that the negative effects of daily nonverbal pain communication on spouse responses would be reduced on days when patients also verbally expressed pain. In a 22-day dyadic diary study, 144 knee osteoarthritis patients and their spouses reported daily on patient pain, verbal and nonverbal pain expressions (spouse report), spouse empathic and punishing responses (patient report), and both partners’ negative affect. In partial support of our hypotheses, on days when patients disclosed more, they reported spouse responses as more empathic, controlling for daily negative affect and patient pain (β=−.38, S.E.=.05, p<.0001). A nonverbal X verbal interaction (β=−.20, S.E.=.08, p<.05) showed that on days when patients verbally disclosed and nonverbally displayed pain more, spouses responded more empathically; however, on days when patients disclosed less, spouses responded less empathically regardless of the level of nonverbal display. Contrary to our hypothesis, pain communication was not related to day-to-day changes in spouse responses beyond reports of pain and negative affect, and no interaction was found. Results show that verbal and nonverbal pain expressions may together send a consonant message of distress that elicits empathic responses. However, without the clarity of verbal disclosure, nonverbal displays may frustrate or confuse spouses, decreasing empathic responses. These patterns implicate pain communication as a unique contributor to the cycle of patients’ everyday pain experience.

44) Abstract 1137

IS MEDICALLY-CERTIFIED SICKNESS ABSENCE RELATED TO A LONG-TERM REDUCTION OF PHYSICAL AND MENTAL HEALTH FUNCTIONING? AN 18-YEAR FOLLOW-UP IN THE WHITEHALL II STUDY

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Background: Medically-certified sickness absence is a marker of increased risk for disability pension and pre-mature mortality, but the extent to which sickness absence predicts future health functioning remains unclear.

Objectives: To examine if sickness absence is related to limitations in physical and mental health functioning over the long-term.

Methods: Sickness absence records of 5,070 civil servants participating in the Whitehall II study were collected for a 3-year period preceding a questionnaire survey in 1991-1993. Surveys on functioning were repeated every 2-3 years up to 2007-2009. Growth curve models of the trajectories of SF-36 physical and mental health functioning were fitted using mixed modelling over the 18-year period for older and younger men and women separately.

Results: On average, physical functioning deteriorated over time, especially after the age of 70, whereas mental functioning improved. Physical health functioning was lower in the participants who had taken one or more medically certified (>7 days) sickness absences during the 3-year period, and this was seen in both younger and older men and women. These differences remained virtually unchanged during the whole 18-year follow-up, but in women, physical health was lower over the whole follow-up among those who had taken medically-certified sickness absence, although this difference was less pronounced than for physical health.

Conclusion: Lower health functioning among employees who take medically-certified sickness absence, especially in physical terms, persists over a long time period. This could represent the link between sickness absence, future ill-health, disability pension, and mortality.

45) Abstract 819

FATIGUE REDUCTION IN PULMONARY HYPERTENSION: A PRELIMINARY REPORT ON A NIH EXERCISE TRIAL

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Pulmonary hypertension is characterized by elevation of pulmonary arterial pressure and pulmonary vascular resistance. Diagnosis often occurs after the disease has already progressed to an advanced stage due to delays in seeking medical treatment or incomplete evaluation of nonspecific symptoms. Persistent, excessive fatigue is one of the most debilitating, yet unstudied, symptoms of PH. The present study examined the severity of fatigue in patients who have PH and the potential effectiveness of an aerobic exercise training program for reversing this symptom. Patients with PH enrolled in the “NIH Exercise Therapy for Advanced Lung Disease Trial” in the Washington, DC metropolitan area were recruited for this study (n=9; age: 54.6±14.2; 78% female). Age-matched healthy controls (n=7; age: 48.3±9.7; 100% female) were recruited via local advertisements. All participants filled in the Fatigue Severity Scale (FSS) upon entry into the study. The subjects with PH repeated the FSS following a 10-week aerobic exercise training
46) Abstract 833

MEDICAL STUDENT SYNDROME: FACT OR FICTION?
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Background: It is widely believed by medical practitioners that medical students develop hypochondriacal concerns and symptoms relating to diseases they are studying, a phenomenon labelled ‘Medical Student Syndrome’. However, the evidence that the syndrome exists and particularly that it contributes to an increased number of consultations (as typical hypochondriasis does) is weak. The present study investigates this phenomenon in terms of differences between medical and non-medical students in help-seeking behaviour.

Design: Quantitative, cross-sectional survey.

Participants: Medical students (n=103), non-medical science student controls (n=103), and law student controls (n=78), all third-year undergraduates, were recruited from three London universities.

Main Outcome Measures: Help-seeking behaviour was measured using the ‘Health Anxiety Questionnaire’ Reassurance-Seeking-Behaviour subscale; a new ‘HHSB’ scoring-system, identifying participants who had health concerns that were disproportionate to the diseases diagnosed; number of doctors’ visits made since beginning university.

Results: No significant differences were found between medical students and either control group in any of the main outcome variables.

Conclusions and Implications: These findings reject the notion that medical students, more so than other students, seek medical advice for hypochondriacal health concerns. They are pertinent to clinicians due to the potentially negative consequences of incorrectly assuming medical students to behave in this way, including cursory evaluations and disintegration of the doctor-patient relationship.

47) Abstract 917

DO PSYCHOSOCIAL RISK FACTORS DIFFER BETWEEN DIFFERENT GROUPS OF CARDIOVASCULAR DISEASE PATIENTS ENTERING OUTPATIENT CARDIAC REHABILITATION?
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Background: It is widely believed by medical practitioners that medical students are more likely to seek medical advice for hypochondriacal health concerns than other students. They are pertinent to clinicians due to the potentially negative consequences of incorrectly assuming medical students to behave in this way, including cursory evaluations and disintegration of the doctor-patient relationship.

Method: We examined 548 CHD patients, 105 CHF patients, and 79 PAD patients who completed the Hospital Anxiety and Depression Scale, the cynical hostility subscale of the Minnesota Multiphasic Personality Inventory-2, the short form of the Maastricht Vital Exhuastion Questionnaire, the type D personality questionnaire, and the positive mood scale of the Global Mood Scale. Differences in psychosocial factors between patient groups were adjusted for sociodemographic factors, previous myocardial infarction, traditional cardiovascular risk factors, and medication.

Results: Relative to patients with PAD, those with CHD and those with CHF both showed more depressive symptoms (p-values <0.043), greater vital exhaustion (p-values <0.001), and fewer positive affect (p-values <0.014). The effect sizes of these differences were clinically relevant (Cohen’s d between 0.26 and 0.41). There were no significant differences in psychosocial risk factors between CHD and CHF patients.

Conclusions: The profile of psychosocial risk factors for CVD revealed clinically relevant variability between different diagnostic groups of CVD patients. Patients with distinct cardiac diagnosis might additionally benefit from comprehensive cardiac rehabilitation if the program includes psychosocial risk factor specific interventions.

48) Abstract 852

HEART RATE VARIABILITY DURING INDUCED THERMAL PAIN IS RELATED TO SOMATIC HEALTH COMPLAINTS AND PAIN TOLERANCE IN YOUNG FEMALES
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Purpose: Pain and other somatic complaints are extremely prevalent and are responsible for a large part of both human suffering and health care costs. These symptoms have been suggested to be partly determined by individual differences in parasympathetic (vagal) control, indexed by heart rate variability (HRV). Yet, evidence from experimental studies is still relatively scarce. The current study was set up to test the hypothesis that HRV is related to pain perception and to the reporting of somatic complaints.

Subjects/Methods: Thirty-three students from Leiden University engaged in a baseline measurement and a cold pressor task (CPT) during which HRV was measured. Pain perception was operationalized as pain threshold (when participants first reported to experience pain during the CPT) and pain tolerance (time that participants were able to keep their hands into the ice-water after indicating that they had experienced pain). Severity, duration and number of somatic complaints during the past month were measured with the Subjective Health Complaints questionnaire.

Results: Spearman correlations showed no associations between baseline measures of HRV and the reporting of pain or somatic complaints. Yet, pain tolerance (r = .43, p = .02) as well as severity of SHCs (r = .37, p = 0.03) and duration of SHCs (r = .35, p = .04) were all significantly associated with rMSSD during the CPT. The same correlations were observed for high frequency power during the CPT.

Conclusion: Pain tolerance and somatic complaints were associated with individual differences in HRV during a painful experience. The maximum level of pain that a person is able to tolerate - pain tolerance - and the severity and duration of somatic complaints are likely to represent the more affective components of symptom reports. The current findings are consistent with a more general role of the vagus - as indexed by HRV - in modulating individual reactions to internal and external threat.

49) Abstract 789

PHYSICAL ACTIVITY AND PHYSICAL ACTIVITY COGNITIONS ARE POTENTIAL FACTORS MAINTAINING FATIGUE IN PRIMARY SJÖGREN’S SYNDROME
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Introduction: Fatigue is a prevalent and debilitating problem in the systemic autoimmune disorder Sjögren’s syndrome. It has been suggested that physical activity and cognitions about physical activity can influence fatigue. The aim of this study was to examine fatigue, physical activity and physical activity cognitions in patients with Sjögren’s syndrome and the associations of physical activity and physical activity cognitions with fatigue.

Methods: In 300 patients with primary Sjögren’s syndrome and 100 demographically matched people from the general population (mean age 57, 93% female), fatigue (five dimensions of the ‘Multidimensional Fatigue Inventory’ and physical activity (three dimensions of the ‘International Physical Activity Questionnaire’) were assessed. The physical activity cognitions ‘activity avoidance’ and ‘somatic focus’ of the ‘Tampa Scale of Kinesiophobia’ were assessed in the Sjögren’s group only. Multiple regression analyses were the primary analyses.

Results: Sjögren’s patients had higher scores on all five fatigue dimensions (p<.001) and lower scores on moderate and vigorous intensity activity and physical activity cognitions ‘activity avoidance’ and ‘somatic focus’ of the group only. Multiple regression analyses were the primary analyses. Results showed that smoking correlated positively with WBC (r=0.42, p<0.01), CRP (r=0.09, p<0.05) and fibrinogen (r=0.08, p<0.05), and negatively with HRV (r=-0.09, p<0.05) and Reward (r=-0.11, p<0.05). No significant correlations were found between smoking and Effort. We further explored the association between smoking and Reward, finding some evidence for the mediating role of fibrinogen and HRV. These results extend our previous findings of the mediating role of inflammation and HRV on the relationship between depression and smoking. Importantly, it appears that low Rewards are associated with greater smoking. The present results suggest that positive emotions linked to rewards at work may protect employees from smoking with associated beneficial effects on their physical and mental health.

Conclusion: Fatigue is prevalent and severe in patients with primary Sjögren’s syndrome and physical activity is low as compared to people from the general population. Both physical activity and physical activity cognitions, and particularly the combination of physical activity and physical activity cognitions are associated with fatigue. These results suggest that fatigue in patients with Sjögren’s syndrome might be reduced by targeting both physical activity and physical activity cognitions. This suggestion requires verification in clinical experimental studies.
52) Abstract 825
DEPRESSIVE SYMPTOMS MODERATE THE COVARIATION OF MARITAL DISTRESS WITH FIVE-YEAR ENDOCRINE/IMMUNITY TRAJECTORIES IN BREAST CANCER PATIENTS
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Background: Recovering cancer patients with marital distress have worse psychological and health outcomes up to 5 years post-diagnosis (Yang & Schuler, 2009). Endocrine/immune responses may link marital distress with psychological and health outcomes (Kiecolt-Glaser et al., 2010). Further, depressive symptoms have been shown to influence with both marital distress (Pruchno et al., 2009) and endocrine/immune responses in cancer patients (Miller et al., 2008). The research tests depressive symptoms as a moderator of the relationship between marital distress and endocrine/immune responses in breast cancer patients. Method: Patients (N=100) with Stage II/III breast cancer were assessed at diagnosis, reassessed at 4, 8, and 12 months, then every months for the next 4 years. The average patient was middle-aged (M=48.6), Caucasian, and college-educated. Serum samples were collected for endocrine [cortisol, ACTH, epinephrine (EPI), norepinephrine (NEPI)] and immune [blastogenic response to PHA/Con A, NK cell cytotoxicity (NKCC)] assays. Self-reported marital distress (DAS) classified patients into distressed (n=28) and non-distressed (n=72) marriage groups. Mixed-effects modeling compared the groups’ endocrine/immune trajectories. Control variables were retained as appropriate. Time-varying depressive symptom reports (CES-D) were entered as moderator terms. Results: In the marital distress with heightened depressive symptoms, ACTH was significantly lower at diagnosis compared to all other patients and showed a significantly different trajectory, with gradual increase across follow-up whereas ACTH decreased for other patients (ps<.009). Also, the 4-month distressed with heightened depressive symptoms showed a significantly different NKCC trajectory, with sharply decreasing NKCC across follow-up whereas NKCC was stable or increased slightly for other patients (p<.017). Effects for cortisol, EPI, NEPI, and PHA/Con A were non-significant (ps>.234). Conclusions: Consistent with prior data, decreased immunity was observed in patients with depressive symptoms. Moreover, results suggest that combined depressive symptoms and marital distress may be linked with long-term HPA axis dysregulation.

53) Abstract 710
US-JAPAN COMPARISON OF BEHAVIORAL MEDICINE TRAINING FOR MEDICAL STUDENTS AND RESIDENTS IN FAMILY MEDICINE IN JAPAN COMPARISON OF MARITAL DISTRESS WITH FIVE-YEAR ENDOCRINE/IMMUNITY TRAJECTORIES IN BREAST CANCER PATIENTS

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Objective: Individualized patient care is the standard of care in Behavioral medicine. The approach is based on each patients’ background. In a globalized society, attention to psycho-social and cultural backgrounds is critical. This research compares the content and experiences of the Behavioral medicine training for Family medicine students and residents in US and Japanese University hospitals.

Method: The content and experiences of Behavioral medicine education, as well as related documents, were examined and compared. The US and the Japanese participants were from large Family Medicine departments of universities.

Result: We found that the Japanese national health insurance system payment structure creates incentives for the Japanese physician to carry out many roles similar to those of the clinical psychologist. In addition, Japanese physicians have few chances to consult to mental health providers (not physicians). Therefore, the Japanese clinical trainee must learn psychology in more detail than the American trained physician. Japanese medical students tend to have didactic teaching compared to problem based teaching, such that they have theoretical and factual knowledge, but have little opportunities for practical application. Training in social problems such as drug abuse was less developed in Japan than in the United States. Within the Japanese medical system, alcohol and drug abuse is managed in Psychiatry. In contrast, US trainees tend to learn how to support the drug dependent patient. The same is true for domestic violence, and since this is increasing in Japan. The influence of Japanese culture and character makes the disclosure of emotional distress less likely. Many Japanese feel that it is shameful to talk about their distress to his/her family or friends. This creates training needs for the Japanese physicians about other, non-verbal ways to understand their patients’ distress. In addition, individual therapy is more common in Japan compared with group or couples therapy in the US. Finally, Japanese patients tend to have closer relationship with their physician, and the Japanese physician tends to have closer level of support for their patients.

Conclusion: Each nation’s behavioral medicine care is greatly influenced by their overall health care system features. Since it is necessary for training systems to match the characteristics and needs of the patients, more general and standardized behavioral medicine training is necessary globally.

54) Abstract 849
DAILY LIFE ASSOCIATIONS IN GOAL-BASED APPRAISALS, EMOTIONS, AND CORTISOL: EVIDENCE FROM A LIFESPAN SAMPLE

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We examine if daily life situations that are appraised as interfering with age-related goals elicit affective and biological stress reactions as measured by salivary cortisol. Given age-related changes in emotion regulation and physiological functioning we expect older adults to display less negative affect but greater cortisol secretion when goal progress is low. The daily life processes regarding goal-based appraisals, cortisol, emotions, and depressive symptoms may accumulate over time to impact long-term health risks. Methods: We use 10 day time-sampling information from 185 participants aged 20-81 years to investigate goal-based appraisals and their relation to emotions and salivary cortisol in an ecologically valid daily-life context. Participants completed short electronic diaries on goal-relevant activities and emotions and provided saliva samples 7 times a day. We also assessed several control variables (e.g., BMI, cigarettes per day). Results: We use a within-persons approach to investigate intra-individual variability across days in study. Multilevel models show that the goal-relevance of daily life activities is associated with concurrent emotional experiences and stress hormone secretion. Participants displayed increased daily irritation (p < .01) and a trend of increased cortisol secretion (p = .06) on days with less successful goal pursuit. Overall, older adults reported more goal progress (p < .05), less irritation (p < .01), and displayed higher daily total cortisol outputs (p < .01) than younger adults. Preliminary results suggest that older adults showed stronger stress response trends (greater daily cortisol outputs) on days that were characterized by problems with goal pursuit (p = .066). Hence, older adults were more successful in pursuing their goals, but they appeared to be more negatively affected in terms of stress hormone secretion when problems occurred. Further analyses will examine the association between specific day-to-day processes and cortisol. These findings are in accord with previous work indicating losses in functional capacities among older adults and demonstrate that studying how individuals interpret specific situations based on their age-related goals better allows us to understand individual differences in daily stress responses.

55) Abstract 1067
EFFECTIVENESS OF E-THERAPY SKILL TRAINING IN INPATIENTS WITH ANOREXIA NERVOSA, PTSD OR PERSONALITY DISORDERS

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60) Abstract 1146

COGNITIVE IMPACT OF EARLY LIFE ADVERSITY

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Participants (n = 391, 225 women) were enrolled in the Oklahoma Family Health Patterns Project, a long-term study on risk for substance abuse. Here we examined the cognitive impact of early life adversity in healthy young adults, 18 – 30 years of age. Lifetime adversity was extracted using items on the Diagnostic Interview Schedule chosen to be closely similar to the life events assessed retrospectively in the studies by Caspi. Physical or Sexual Adversity was documented by three items, while Emotional Adversity was documented by two items. This allowed each person to be assigned an adversity score ranging from 0 (no adverse events) to a maximum of 5. Chi-square analyses found that individuals with a family history of substance dependence (X² = 69.53, p < .0001) and women (X² = 6.63 p = .04) experienced significantly more early life adversity. Cognitive function was assessed from Shipley Mental Age score and interference scores from the Stroop. Behavioral impulsivity was measured using part a tendency to choose smaller immediate rewards on a delay discounting task. Subjects were grouped into 0, 1, or 1 reported adverse events and compared using ANOVA. Shipley Mental Age was significantly lower among individuals who had experienced two or more adverse life events (F = 5.40, p = .02). In terms of cognitive performance, two or more early adverse life events led to significantly higher Stroop interference scores (F = 17.70, p < .0001) and more frequent choosing of smaller, immediate over larger, delayed rewards on the delayed discounting task (F = 10.60, p = .0012). These results suggest that early lifetime adversity may negatively impact various aspects of cognitive functioning and contribute to behavioral impulsivity in adulthood.

57) Abstract 916

THE CONTRIBUTION OF POSITIVE AFFECT TO QUALITY OF LIFE IN PATIENTS WITH CORONARY HEART DISEASE

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Background: Among the known psychosocial risk factors contributing to the development and recurrence of cardiovascular events, comparatively few studies focus on protective factors such as positive affect. We examined the relationship between positive affect and health-related quality of life (QoL), controlling for traditional cardiovascular risk factors, clinical variables and negative affect. We further investigated the role of gender in this relationship given the well-known gender differences in cardiovascular health.

Methods: We assessed 746 patients with coronary heart disease (CHD) before they entered outpatient cardiac rehabilitation. All patients completed the Global Mood scale and the SF-36 Health Survey to assess QoL. Demographical and medical data were obtained from medical examinations as well as from hospital charts.

Results: Positive affect was independently associated with mental (p<0.001) and physical QoL (p<0.001) after controlling for sociodemographic factors, traditional cardiovascular risk factors, disease severity and negative affect. Gender moderated the relationship between positive affect and physical QoL (p=0.09) but not mental QoL (p=0.60). Positive affect was positively associated with physical QoL in men (p<0.001) but not in women (p=0.44). Positive affect further moderated the relationship between male gender and both mental (p=0.011) and physical (p=0.016) QoL.

Conclusions: The health-related QoL of patients with CHD is associated with a person’s level of positive affect, the more positive affect, the better the mental and physical QoL. This relationship was stronger in men than in women, showing that a greater amount of the physical QoL in men can be explained by positive affect than in women.

58) Abstract 1182

SUBJECTIVE COGNITIVE SYMPTOMS AND COGNITIVE FUNCTIONING IN THE SWEDISH WORKING POPULATION

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Otherwise healthy persons in the work force may, at times, experience difficulties in focusing attention, thinking clearly, in remembering adequately and in making decisions in their jobs and elsewhere. We refer to these as cognitive symptoms (CS). The experience of CS is part of several common psychiatric conditions in the population that are all associated to stress. CS in the working population are relatively common, and have also been associated to working conditions. Increasingly intellectual demands in modern work places make immaculate cognitive functioning ever more crucial. The impact of impaired cognitive functioning may be particularly troublesome in terms of debilitating work ability and constituting a risk for labour market exit. However, it is not known to what extent these symptoms are related to objective cognitive functioning in this population. Results from previous studies on the relation between subjective and cognitive functioning are mixed. As of yet, no firm conclusions can be drawn. The aim of the current studies was to test the relation between subjective CS and objective cognitive functioning in detail, using tests that are more sensitive to effects that are caused by stress exposure, rather than using screening tools for detection of more severe cognitive impairments such as dementia.

Method: 233 (116 cases) participants drawn from the general gainfully employed Swedish population and part of the nationally representative Swedish Longitudinal Occupational Survey of Health: SLOSH) with
either a high or a low level of subjective CS were tested on a wide range of tests in different cognitive domains. Cases and controls were matched on demographic factors. Results: Participants with a high degree of CS showed lower cognitive performance on specific cognitive functions while being unaffected on others compared to the controls with a low level of subjective CS. Conclusion: Self-rated CS in the working population is related to poorer ability in executive functions that are required in working-memory tasks.

59) Abstract 1113

VITAL EXHAUSTION IS DIFFERENTIALLY RELATED TO DAILY SALIVARY CORTISOL IN OLDER MEN AND WOMEN

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Background: Vital exhaustion (VE) is characterized by unusual fatigue, loss of mental and physical energy, increased irritability, and a feeling of demoralization and has been discussed as an independent risk factor in coronary artery disease. Regarding pathophysiology, dysregulation of the hypothalamo-pituitary-adrenal (HPA) axis has been demonstrated in younger and middle-aged adults reporting VE. We assessed salivary cortisol profiles in older adults reporting mild, moderate, and severe VE, respectively.

Methods: Seventy-one subjects (37 women, 61.6±7.2 yrs, 26.2±6.8 kg/m², 43 subjects taking antihypertensive drugs [AD]) filled out the Shortened Maastricht Vital Exhaustion Questionnaire and collected saliva samples upon awakening, +30min thereafter, and at 11am, 3pm, and 9pm for the assessment of salivary cortisol.

Results: AD intake did not influence cortisol profiles (F-test, p=0.635) and was therefore not included in the analyses. Twenty-one subjects reported mild VE (16 women), 32 reported moderate VE (17 women), and 17 subjects reported severe VE (4 women). Since men and women were not equally distributed among VE categories, sex was included as a covariate in the following ANOVAs. While all groups showed the typical diurnal profile of cortisol, overall output (area under the curve) was significantly diminished (p<0.008) in severe VE. Descriptively, a dampened cortisol awakening response was found in severely exhausted men while severely exhausted women showed the highest response to awakening.

Discussion: Our results support earlier findings of a relative hypocortisolism in fatigued and exhausted individuals. Importantly, sex slightly impacted our results as it was demonstrated that exhausted older men are more likely to show a reduction in daily variation of cortisol. The relevance of these findings requires further replication and the comparison to overlapping concepts such as burnout or chronic fatigue syndrome.

60) Abstract 955

DAMINE OXIDASE LEVELS IN ANOREXIA NERVOSA

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Anorexia nervosa (AN) patients restrict their food intake. As a result, they have severe malnutrition, which cause many physical complications in AN. Their disturbance of gastrointestinal function is one of physical complication. The gastrointestinal disturbance in AN may contribute to their feeling of fullness provoking feelings of resistance toward refeeding behavior from AN patients. Diamine oxidase (DAO) is an enzyme that catalyzes the oxidation of diamines. It has been suggested that serum DAO activity might be a good marker for intestinal mucosal maturation and integrity. We investigated the gastrointestinal function in AN by serum DAO.

Thirty-four AN inpatients (15 AN restricting type and 19 AN binging or purging type) and 20 healthy controls were involved. Serum DAO activity, the marker of intestinal mucosal integrity, was measured on admission day and day, using a sensitive colorimetric method as reported by Takagi et al. The baseline serum DAO activity levels were AN-R 8.7±3.1 u/ml, AN-BP12 0.2±3.6 u/ml and controls 12.8±3.3 u/ml. There were significant differences between AN-R and controls. The serum DAO activity in AN patients after refeeding was 9.9±3.2 u/ml, while BMI after refeeding changed from 12.5±1.4 kg/m² to 13.7±1.2 kg/m². The serum DAO activity levels in AN-R patients were lower than controls, although there were no significant differences between AN-BP and controls. Because the gastrointestinal tract in AN-BP patients is regularly used due to their binging behavior, the condition of small-intestinal villus and mucosa may be maintained. In contrast, the atrophy of small-intestinal villus in AN-R may occur by the restriction of food intake exposition. The serum DAO activity might be one of marker for gastrointestinal function in AN patients.

61) Abstract 1037

STRESS MANAGEMENT SKILLS INVENTORY (SMSI): PSYCHOMETRIC VALIDATION OF A SHORT MEASURE FOR ASSESSMENT OF PERCEIVED STRESS MANAGEMENT SKILLS

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Background: Adequate assessment of stress management skills in the general population optimally requires a single reliable, valid, and economic instrument. We investigated the psychometric properties of a short questionnaire (Stress Management Skills Inventory, SMSI) for combined assessment of different perceived stress management skills in the general population.

Methods: In three independent samples of non-patient populations intended to represent the general population (total N=332), we determined the factor structure of the SMSI and investigated its measurement invariance in the participant groups and over time. Reliability was tested by estimating test-retest reliability, internal consistency, and item reliabilities. Correlations of the different subscales were estimated in order to evaluate the convergent validity of the SMSI scale. Criterion validity was examined testing the predictive power of the SMSI and its scales with selected criterion variables such as general stress reactivity, irritation, perceived social support, anger-out, anger control, vital exhaustion, as well as task- and emotion-oriented coping styles.

Results: The factor structure of the SMSI consists of five scales reflecting acceptable distinct stress management skills such as cognitive strategies, use of social support, relaxation strategies, anger regulation, and perception of bodily tension. This factor structure was stable across participant groups and over time. Internal consistencies, item reliabilities, and test-retest reliabilities met established statistical requirements. Concerning the validation of the SMSI, convergent validity was also established. Regression analyses testing the predictive power of the SMSI and its scales confirmed associations in the expected directions underlining the criterion validity of the SMSI.

Conclusions: Our findings suggest that the SMSI has good psychometric properties. Therefore, this instrument seems a suitable measure for differential assessment of stress management skills in the general population.

62) Abstract 915

STRESS AS A RISK FACTOR IN CHRONIC FATIGUE - A PROSPECTIVE STUDY IN A SWISS STUDENT POPULATION

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Background: Chronic fatigue (CF) refers to the clinical picture of severe fatigue lasting longer than 6 months, which often cannot be explained by any structural or functional abnormality. Despite high prevalence, no conclusions may be drawn regarding etiology or pathophysiology of CF. Stress has been discussed as a precipitating factor in CF. We examined the role of stress in CF, both cross-sectionally and prospectively in a student population.

Methods: Students from 23 different colleges and universities in Switzerland were recruited. We repeatedly (6 months interval)
administered a questionnaire assessing CF. Multidimensional assessment of stress included: Childhood trauma, emotional instability, emotional stress reactivity, life events (past 12 months), and chronic stress (past 3 months).

Results: A total of 3054 persons (73.4% women; mean age 24.6±5.6 years) completed the questionnaire at the initial assessment; a subsample of 429 participated in the same survey at follow-up and was thus eligible for prospective analyses. In total, 139 (46.6%; 77.0% women) participants fulfilled criteria for CF. This group reported more experiences of childhood trauma (p<.05), higher emotional instability (p<.001) and emotional stress reactivity (p<.001), more life events (p<.01) and higher levels of chronic stress (p<.001) than non-CF individuals. In the prospective subsample, 1.7% (n=7) of initially healthy people reported CF 6 months later. High levels of chronic stress reported during the initial (p<.05) and second assessment (p<.01), and high numbers of life events (p<.05) predicted incidence of CF.

Conclusion: CF is a prevalent condition in young adults. Various aspects of stress are cross-sectionally associated with CF, whereas chronic stress and life events were found to be risk markers of CF. Results point to an early disturbance in the reactivity to stressors and to a high relevance of life events and every-day stressors in the precipitation of CF. Cognitive-behavioral interventions targeting stress management might be useful interventions to prevent development of CF.

63) Abstract 1190

SALIVARY ALPHA AMYLASE (SAA) AS A STRESS BIOMARKER IN MIDDLE-AGED ADULTS: ASSESSING CHANGES IN SAA LEVEL IN RESPONSE TO DIFFERENT TYPES OF LABORATORY STRESSORS AND EVALUATING ASSOCIATIONS WITH PHYSIOLOGIC MARKERS AND SUBJECTIVE STRESS RATINGS

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Background: Salivary alpha amylase (sAA) is an emerging stress biomarker. Previous studies describing sAA stress-related changes reported some inconsistent findings about sAA stress reactivity possibly due to using different stressor tasks, and few studies looked at sAA in adults 50 or older. This study aimed at evaluating changes in sAA after three laboratory stressors of different types in adults over 50 and relating them to subjective stress ratings and several physiologic measures.

Methods: sAA level of 30 adults (mean age = 59, 81% women) was assessed using a portable biosensor (Nipro, Osaka, Japan) prior, during, and after three laboratory stressors: physical stressor that involved completing the Cold Pressor Task, an emotional stressor that included viewing unpleasant pictures from International Affective Picture System, and a mental stressor that involved completing a computerized Montreal Imaging Stressor Task (MIST). sAA and subjective stress ratings were collected at baseline, 30 min after the final stressor onset and after each stressor (5-10 min after each stressor onset). Additionally, simultaneous recordings of several physiologic markers (blood pressure, heart rate variability, and respiration rate) were obtained. ANOVAs were used to compare the within-subjects’ differences on different measures.

Results: While participants rated perceived stress level after all three stressors significantly greater than their baseline stress level (all p's < .001), sAA levels were significantly elevated only after the mental stressor, MIST (p < .05). There was a consistent but non-significant decrease in sAA after the cold pressor (p > .10) and no difference between sAA level after emotional stressor and baseline sAA level (p > .10). The baseline and post-stressor sAA levels were also comparable (p > .10). Relationships among sAA levels, physiologic markers, and subjective stress ratings will be also addressed.

Conclusions: sAA might be useful as a stress biomarker in a population of adults over the age of 50, and it was shown sensitive primarily to the task requiring mental effort with psychosocial judgment component.

64) Abstract 1018

TRAIT RUMINATION IS CORRELATED WITH INITIAL, BUT NOT SUBSEQUENT CORTISOL RESPONSES TO SOCIAL STRESS

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Objective: Rumination, the tendency to dwell on negative thoughts, has been linked to stress physiology and has been suggested to affect mental and physical health. For example, ruminative tendencies have been implicated as a potential precursor of depression. Research has shown that high trait rumination is correlated with elevated cortisol responses to psychosocial stress. However, it has not been addressed if rumination is associated with habituation of cortisol responses to repeated stress.

Methods: Eighteen participants (11 male; 7 female; mean age = 22 yrs.) 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. Participants provided self-reports of trait rumination by agreeing or disagreeing with statements such as ‘I find it hard to get thoughts that have upset me out of my mind’. Participants also provided basic medical data, such as age, gender, height, and weight.

Results: The TSST induced significant changes in cortisol over time (F=13.6; p<.001). Habituation to second time stress exposure was found: cortisol increases were significantly lower on the second day of testing (F=4.69; p<.007). Women showed marginally higher rumination than men (F=3.13; p=.096). Rumination was not associated with a change in cortisol increase from day one to day two (r= -.33, p<.18). However, rumination was inversely correlated with cortisol increase on the first day (r=.50; p<.037), but not the second (r=.28, p=.25). Depressive symptoms were also measured, but not found to be correlated with HPA response or habituation (all p’s>.05).

Conclusions: In contrast to our hypotheses, we did not find evidence for trait rumination playing a role in habituation of HPA axis responses to repeated stress. Furthermore, the relationship of the HPA axis responses on first exposure and trait rumination presented in previous literature involving rumination and TSST exposure. In previous literature, depressive rumination has been correlated with lower cortisol reactivity to stress; however, our findings cannot be explained by depressive symptoms. Future studies will address this inconsistency by measuring changes in state rumination and/or inducing rumination between repeated stressors.

65) Abstract 848

HYPERTENSION ASSOCIATED WITH IMPROVED QUALITY OF LIFE IN GERMAN CHILDREN AND ADOLESCENTS

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While acute emotional distress increases arterial blood pressure (BP), long-term associations between mood, quality of life, and BP are poorly understood. While negative affects may lead to hypertension (HTN) and vice versa, HTN per se may have stress-lowering effects via vagal afferents. We analyzed a large population-based data base (KIGGS) to examine associations of distress and quality of life with hypertension in children and adolescents. All participants of this representative cross-sectional survey received standardized resting BP recordings. HTN was defined as systolic and/or diastolic BP above published age, sex, and height-adjusted 95th percentiles. Participants and parents completed validated psychometric scales for children’s quality of life and distress. Data were available for 7697 participants aged 11-17 years (51% m). HTN was found in 10.7% (12.8% in boys and 8.5% in girls). In boys only, HTN prevalence increased with age (from 6% to 18%). HTN was unrelated to socioeconomic status (SES) but positively associated with body mass index (BMI), school success, consumption of alcohol and daily use of television and computers. In self and parent reports, hypertensives showed worse physical health status. In contrast, both self- and parent reported quality of life were better in hypertensives than in normotensives, even after adjusting for age, sex, BMI and SES (beta=.041 and .038, respectively; both
DEPRESSION AND ANTIDEPRESSANT USE INTERACT TO AFFECT CORTISOL RESPONSES TO STRESS
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Background: Depression has been associated with altered cortisol responses to stress in otherwise healthy individuals. However, this has not been examined in cardiac patients. Furthermore, the potential role of antidepressant use in moderating this relationship has not been explored, despite growing evidence that antidepressants influence the hypothalamic-pituitary-adrenal (HPA) axis.

Methods: 62 cardiac outpatients (mean age=65y) were recruited: 31 as having major depression and 31 controls matched for age, sex and stress test appointment time. Salivary cortisol was measured before, immediately after and 1 hour after the stress test. Participants also completed questionnaires concerning their medication usage. Generalized linear models (GLMs) were used to assess the interaction between depressive status and antidepressant use on cortisol as well as the main effects of depressive status and antidepressant use level. Level of calm, self-reported using a visual analog scale, during the test was included as a covariate in all analyses.

Results: While there were no group differences before or immediately after the stress test, a significant interaction between depressive status and antidepressant use was found on cortisol levels 1 hour following the stress test (F=9.43, p<.003). Among participants taking antidepressants, depressed patients (0.151 (0.039) mg/dl) did not differ from non-depressed patients (0.221 (0.036) mg/dl) in their cortisol levels. However, among patients not taking antidepressants, depressed individuals (0.272 (0.028) mg/dl) exhibited significantly higher cortisol levels than non-depressed individuals (0.141 (0.029) mg/dl). A similar interaction was found for area under the total response curve with respect to ground (AUCg) (F=4.10, p<.05) but not area under the total response curve with respect to increase (AUCi). No main effect of depressive status or antidepressant use on cortisol levels was found. These results suggest that unmedicated depression is associated with elevated cortisol release in response to stress among cardiac outpatients, particularly during the late recovery period. Furthermore, antidepressants may help regulate the HPA axis in depressed individuals even when they fail to improve depressive symptoms.

Introduction: Inflammation and insulin-like growth factor-1 (IGF-1) are associated with increased risk of several forms of cancer. It is unclear whether social factors are directly linked to increased cancer risk in ethnic minority youth. This study examines the relationships between household social position, sociocultural orientation, and cancer-related metabolic risk factors in 33 obese African-American and 71 Latino adolescents. METHODS: Household social position was calculated using the Hollingshead Two-Factor Index of Social Position. Sociocultural orientation was assessed using the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA) questionnaire. Fasting measures of IGF-1 and inflammatory markers (i.e., IL-8, TNF-alpha, MCP-1, leptin, resistin, HGF, NGF, PAI-1, and adiponectin) were collected during an intravenous glucose tolerance test. The relationships between household social position, AHIMSA orientation scales (i.e., assimilation, adaptation, acculturation, marginalization), IGF-1 and inflammatory markers were assessed using partial correlations, controlling for biological and behavioral factors known to influence cancer risk. RESULTS: For African Americans, assimilation (the tendency to replace their own family's cultural orientation with that of mainstream White-American culture) was negatively associated with HGF and NGF (markers of tumor cell proliferation; rs=-0.46, p<0.05 and rs=-0.49, p<0.05, respectively). Household social position was negatively associated with HGF (rs=-0.41, p<0.05). For Latinos, integration (the ability to combine aspects of their own family's culture with aspects of mainstream American culture) was positively associated with PAI-1 (a marker of angiogenesis; rs=0.27, p<0.05). Marginalization (alienation from both cultures) was positively associated with HGF (rs=0.32, p<0.05) and negatively associated with IGF-1 (rs=-0.30, p<0.05) and adiponectin (an insulin sensitizer; rs=-0.33, p<0.05). There were no significant
associations between social factors and IGF-1 in either ethnic group. CONCLUSIONS: Social factors including household social position and sociocultural orientation appear to have unique and distinct roles in cancer-related metabolic risk factors in ethnic minority youth. For African Americans, assimilation and higher household social position was associated with decreased inflammation. For Latinos, integration and marginalization were associated with increased inflammation. Behavioral interventions and public policies are needed to better address the cultural stressors that are associated with increased cancer risk in ethnic minority youth.

69) Abstract 1099

PERCEIVED CONTROL MODERATES THE VASOVAGAL RESPONSE
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Vasovagal reactions (VVR) are a common medical problem, complicating and deterring people from various medical procedures. Unveiling the psychological and physiological mechanisms of VVR remains an important and challenging task. Perceived control reduces different kinds of pain and severity of panic. It was hypothesized that perceived control would similarly reduce vasovagal symptoms of anxiety (e.g., “it scares me when my heart beats rapidly”) predicts increased anxiety and panic, and it was also hypothesized that sensitivity to symptoms of VVR would predict anxiety and VVR. Sixty young adults were presented a stimulus video of a mitral valve surgery, known to trigger VVR in non-medical personnel. Participants were assigned unobtrusively to one of two groups manipulating perceived control. In the control condition, participants were either told they could take a 2-minute break during the video whenever they requested, or the break was assigned (match-paired). VVR were assessed using a well-validated self-report measure (the Blood Donation Reactions Inventory), blood pressure (BP), and high frequency heart rate variability (HF HRV). Anxiety was assessed with the State Anxiety Inventory. Blood-fears on the Medical Fears Survey, age, and sex, known predictors of VVR, were entered as covariates in the analyses. As predicted, participants reported significantly fewer vasovagal symptoms during the perceived control condition (F(1,59) = 4.457, p = .039) while anxiety (F(1,58) = 2.859, p = .097) and distress to symptoms of VVR (F(1,59) = 2.085 p = .155) were unaffected. Perceived control prevented a significant decrease in systolic BP when compared to the no perceived control condition (F(1,59) = 4.821, p = .033). Contrary to the hypotheses, perceived control did not affect HF HRV (F(1,51) = .498, p = .484). A two-way ANCOVA examined the effect of predicted control and high/low endorsement of “it scares me when I feel faint” on symptoms of VVR. There was a significant interaction (F (1,58) = 8.757, p = .005). Main effects analyses showed that those who had a high fear of faint experienced more symptoms of VVR when in the low perceived control condition (p = .011), but when participants had a low fear of faint there were no differences between perceived control on symptoms of VVR (p = .863). Results are discussed in terms of cognition and emotion in VVR.

70) Abstract 1075

ETHNIC DIFFERENCES IN RESTING HEART RATE VARIABILITY: A SEMI-QUANTITATIVE REVIEW
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Ethnic disparities in cardiovascular morbidity and mortality are widely documented in the literature and carry a tremendous economic and quality of life burden for African Americans (AA). Recently, researchers have identified a consistent pattern of decreased parasympathetic (PNS) cardiac modulation in the context of established and emerging risk factors for CVD and stroke. In consideration of the disproportionate CVD risk and disease profile of AA’s, it is plausible that decreased cardiac PNS functioning may partially explain these disparities. To the present work, we briefly assess the available evidence for a reliable ethnic difference in tonic vagally-mediated heart rate variability (HRV). A Pubmed search was conducted yielding (n = 22) studies containing appropriate measures of tonic vagally-mediated HRV and comparing AA’s to European Americans (EA). Standardized effect size, (Cohen’s d), was calculated using a validated algorithm. The results of a semi-quantitative analysis suggest that paradoxically, AA’s have greater vagally-mediated HRV than EA’s (Cohen’s d = .24, 95% C.I. [.12, .35]). These findings suggest that decreased vagally-mediated HRV is not likely to account for the persistent health disparities experienced by AA’s with respect to especially cardiovascular disease risk and burden. That these disparities are present even after accounting for the impact of lifestyle factors underscores the need for continued research addressing these socio-ethnic cardiovascular differences.

71) Abstract 947

SOMATIC AND VISCERAL PAIN SENSITIVITY ARE ASSOCIATED BUT SOMATIC AND VISCERAL PLACEBO ANALGESIA ARE NOT
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Background: Patients with the irritable bowel syndrome (IBS) have been reported to exhibit sensitization to VVR. As sensitization predicts pain thresholds, but the association has never been assessed in healthy volunteers. Placebo analgesia has been reported for somatic and visceral pain but was never compared. Methods: We investigated somatic (heat, cold) and visceral (rectal) pain thresholds in 39 healthy female and male volunteers age 18 to 35 using standard cutaneous thermal stimulation (TSA II, MEDOC, Ramat Yishai, Israel) and barostat-controlled rectal distension (Distender II, G&J, Mississauga, ON, Canada). After standard placebo analgesia procedure (infusion line with i.v. injection of a presumed strong analgesic) the pain threshold assessment was repeated. ANOVA of delta thresholds for heat, cold, and pressure were used to calculate placebo analgesia or nocebo hyperalgesia in the somatic and visceral system, and Pearson’s correlation was used to calculate the association between the somatic and visceral pain sensitivity and placebo analgesia in the same volunteers. Results: Pain thresholds for heat, cold, and rectal pressure were normally distributed and correlated high across all subjects (heat – cold: r=.74, p<.001; heat – pressure: r=.48, p=.003; cold – pressure: r=.32, p=.053) with no gender differences. Placebo analgesia was induced for heat pain (F=16.5, p<.001) with 25/37 subjects (68%) showing increased pain thresholds, but not for cold pain threshold (p=.30). Visceral pain stimulation after the placebo instruction induced (nocebo) hyperalgesia in the somatic and visceral system. Conclusion: While the sensitivity for pain in different organ systems seems to be associated – underscoring the fact the hypersensitivity in IBS may be organ specific – the ability to experience placebo analgesia appears to be dissociated between different systems. (Supported by grant En 50/30 of DFG, FOR 1328)

72) Abstract 1201

REFLECTIONS ON THE HEART: SEX DIFFERENCES IN REFLECTIVE RUMINATION AND HEART RATE VARIABILITY DURING WORRY
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Perseverative cognitions such as worry and rumination are posited to stand at the nexus of somatic disease and psychopathology through mechanisms of cardiac autonomic control; however, nuances by sex have emerged in the recent literature. While research suggests women are more likely to engage in rumination than men and that such rumination mediates observed gender differences in depression, studies have reported higher vagal function—indexed with heart rate variability (HRV)—paradoxically among depressed women compared to non-depressed or male counterparts. The current study adds to this literature. Healthy participants (n=54; 40% female) were instrumented for continuous heart rate monitoring during 5-minute baseline and 5 minutes each of orthostatic challenge, worry induction, free thought,
and respective recovery periods. During worry, participants wrote three current worry topics, were presented with a scripted definition of worry, and were instructed to worry as they normally do about their written content. Rumination was assessed using the Rumination Responses Scale and analyzed with respect to subscale (depressive, brooding, reflective) and total scale score. In women, but not in men, reflective rumination was significantly associated with baseline RMSSD (r=.64, p=.001) and log high frequency (HF) HRV (r=.57, p=.004). During worry, RMSSD and log HF significantly predicted reflective rumination among women (Std. B=1.26, partial r=.64, p=.001), but not among men (partial r=.14, n.s.). Associations were not significant for depressive or brooding rumination for either sex. Results suggest that links between cardiac vagal tone and rumination are present in women but not in men during worry. Findings highlight potential mechanisms in emotion regulation and the importance of attending to sex differences with respect to perseverative cognition and cardiac autonomic control.

73) Abstract 907

DOES PARASYMPATHETIC WITHDRAWAL AFTER STRESS ASSOCIATE WITH TYPE D PERSONALITY IN HEALTHY POPULATION?

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Type D personality consists of two personality traits, negative affectivity (NA) and social inhibition (SI), which has poor prognoses in patients with cardiovascular disease (CVD). This study was emphasized on the pathophysiological mechanism underlying the association between Type D personality and CVD. Moreover, prolonged recovery from stress may underlie the higher risk of CVD. The aim of this study is to explore the association between Type D personality and parasympathetic withdrawal from stress. The participants were 51 (age 51.4 ± 8.8, male: 49%) healthy adults. Type D personality was assessed by Type D Personality Scale-Taiwanese Version with cut point g10 for both NA and SI dimensions. Heart rate variability (HRV) was recorded during baseline (5 minutes), interpersonal task (5 minutes), recovery1 (25 minutes) and recovery2 (20 minutes) stage separately. HRV was performed Fast Fourier Transformation into power density signal. The indicator of parasympathetic activity was provided from high frequency power density (HF). Parasympathetic withdrawal percentage is calculated by subtracting the power density of HF in recovery stage from that of baseline stage, and then divided by that of baseline stage. The result showed that participants had significantly lower HF at stress stage comparing to the other three stages (p < .000), which validated the experiment operation. The results of ANCOVA showed that there were no significant difference in power density of HF between Type D and non-Type D personality group, and no significant difference in parasympathetic withdrawal percentage between Type D and non-Type D personality group, by adjusting for age and gender. However, NA score had significantly positive partial correlation with parasympathetic withdrawal percentage (r =.305, p <.05); and SI score had marginally positive partial correlation with parasympathetic withdrawal percentage (r =.265, p <.07) during recovery1 stage. But the associations were not found during the recovery2 stage. This study failed to support that parasympathetic withdrawal is one of the pathways linking CVD and Type D personality. However, individuals with high NA had more parasympathetic withdrawal even 25 minutes after stress, who might be more prone to the imbalance of autonomic nervous system. Besides, individuals with high SI seem to have lower parasympathetic activity also. We infer that frequent parasympathetic withdrawal manifesting in high NA and high SI individuals might lead to low parasympathetic activity in daily life, which may increase the risk of CVD.

74) Abstract 934

ASSOCIATION OF EMPLOYEES' SLEEP DURATION AND BODY MASS INDEX: EXPLORING POTENTIAL MEDIATING AND CONFOUNDING FACTORS

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Background: Previous work suggests a significant relationship between sleep duration and BMI. Although this association persists when demographic (D), health behavior (HB), and work status (WS) variables were considered, an association is no longer present when physical health (PH) and mental status (MS) variables were added. The extend to which PH versus MS is responsible for explaining this association is unclear. Thus we attempt to explore the influence of PH, MS and vagal tone (HRV) as an index of overall health on the sleep and BMI association.

Methods: Cross-sectional data from the Work Health Check Cohort Study (09/10 in Germany, n=2216) were used. Multivariate models were applied to explore the relationship between self-reported average sleep duration and BMI by sequentially adding blocks of D, HB, WS, PH and MS. PH consist of the following item: Hypertension and Diabetes Mellitus (Based on definition by Alberti 2009), Physical Health Composite Scores (SF12) and Health Composite Scores (SF12). MS consist of Mental Health Composite scores (SF12) and social support (SoS). Results: The relationship between average sleep duration and BMI was significant (BETA(B)=-0.06, p=0.001) when D, HB, WS and PH variables were included. When MS was added, the relationship between sleep duration and BMI persisted (B=0.06, p=0.001), however SoS appeared to be the only relevant MS item. SoS and measures of vaga tone were negatively associated with CVD. When D (B=-0.04, p=0.029; B=0.11, p=0.001). Among the potential confounders, gender had the largest effect on BMI (B=-0.24, p=0.001, followed by snoring every night (B=0.19, p=0.001) and high blood pressure (B=0.18, p=0.001). Self reported sleep quality had no significant association with BMI. The full model accounted for 32% of variance in BMI. Conclusion: We have replicated previous observations that sleep duration and weight are negatively correlated, and have shown that this association is independent of potentially confounding variables, health-related lifestyles, and important co-morbidities. Thus, if a relationship exists between employees' sleep duration and weight, several pathways and potential confounders are involved. Further, we were able to show that social support may be a previously overlooked confounder.

75) Abstract 820

ACUTE LOWERING OF SOCIOECONOMIC STATUS AS A RESULT OF HURRICANE KATRINA IS ASSOCIATED WITH LATER POOR HEALTH AMONG AFRICAN-AMERICANS

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It is well known that low socioeconomic status (SES) is linked with mental and physical health. The long-term health impact of acute changes in SES is less well studied. This study examined the effects of lowering of SES due to Hurricane Katrina on health profiles. Participants were 215 African-Americans (60% female, mean age = 39 years) living in the Greater New Orleans area at the time of Hurricane Katrina and at the time of survey 4 years later. The survey included SES measures (i.e., education, occupational prestige, and residential area coded for neighborhood poverty); acute changes in SES as a result of Hurricane Katrina (i.e., unemployment and blocked access to socioeconomic resources such as money, healthcare, and housing); psychosocial and cultural reserves (i.e., optimism, coping, and perceived stress endurance); and post-Katrina incident health events (i.e., cardiovascular disease (CVD) event; infection; chronic,
unbearable pain; post-traumatic stress disorder (PTSD); and major depression (MD)). Covariates were age, gender, marital status, and for CVD analysis, body mass index and cigarette smoking. Multivariate logistic regression analyses predicting health outcomes also adjusted for significant standard SES indicators. Results showed that acute unemployment was associated with increased odds of experiencing CVD (Exp(B) = 7.21, p < .01), especially among those in more prestigious occupations prior to the hurricane. Acute blocked resources was associated with increased odds of MD (Exp(B) = 2.95, p < .01); PTSD (Exp(B) = 8.27, p < .01); infection (Exp(B) = 1.37, p < .01), and chronic pain (Exp(B) = 2.75, p < .05). Exploratory analyses suggested that reduced psychosocial and cultural reserves in those experiencing acute lowering of SES may mediate these relationships. This study extends the literature to show that experiencing short-term lowering of SES following a natural disaster can create long-term health disparities above and beyond those created by initial SES. These findings suggest that early intervention post-disaster to reduce the likelihood of acute lowering of SES may reduce the health impact of disasters and the long term burden on individuals and society. Supported by HL07560 and Society for the Psychological Study of Social Issues.

76) Abstract 746

SEXUAL MINORITY STRESS AND DISCLOSURE IN RELATION TO DIURNAL CORTISOL, ALLOSTATIC LOAD, AND PSYCHIATRIC SYMPTOMS
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Despite social progress, sexual minorities persistently experience stigmatization and chronic stress. Gay men, lesbians, and bisexuals - particularly those who have not disclosed their sexual orientation to others - are more vulnerable to developing psychiatric disorders. The present investigation of sexual minority stress applied a biopsychosocial approach to determine if stress hormone profiles (diurnal cortisol), physiological dysregulations (allostatic load), and mental health (self-reported symptoms of chronic distress, depression, burnout, and PTSD) would differ (1) among sexual minorities versus heterosexuals and (2) among sexual minorities who had disclosed versus those that had not disclosed completely. Participants included 88 Montreal workers and/or students mean age 25. Diurnal cortisol sampled at five time-points was averaged over two days. Allostatic load indices were based on an algorithm incorporating 20 sub-clinically dysregulated biomarkers representing neuroendocrine, immune/inflammation, metabolic, and cardiovascular functioning. Well-validated questionnaires were also included. Between-group results revealed no differences in diurnal cortisol or mental health between sexual orientations, although perplexingly, heterosexual men had significantly higher allostatic load compared to homosexual/bisexual men. Within-group results revealed that individuals who were ‘closeted’ had significantly higher cortisol levels 30-minutes post awakening and higher burnout symptoms compared to those who had ‘come out’. Moreover, when covarying for personality traits, disclosure corresponded to lower allostatic load levels compared to heterosexual controls. While sexual minorities did not manifest more stress-related problems than heterosexuals in our sample, self-developmental transitions like successfully disclosing completely to ones family and friends functioned as an important milestone that preceded increased psychological distress. These findings underline the role self-acceptance and disclosure has on positive health and well-being for sexual minorities.

77) Abstract 1192

USE OF EPIDEMIOLOGIC DATA TO DETERMINE THE VALUE OF 3 BASIC BEHAVIORAL SCIENCE THEORIES IN THE DESIGN OF A PHYSICAL ACTIVITY INTERVENTION
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The WISHLIT project aims to develop an intervention for improvement in sustained physical activity to reduce visceral fat in women about to undergo menopause. The design phase of WISHLIT sought to determine which of 3 basic behavioral science theories of sustained change should be relied upon to develop the intervention. Constructs of interest were intrinsic motivation (Self-Determination Theory), self-efficacy (Social Cognitive Theory), and social network transmission (Social Network Theory). The association between constructs from the 3 theories was linked to 15 years of history of physical activity. Subjects were 89 randomly selected participants in the Chicago Study of Women’s Health Across the Nation (SWAN) who had been assessed 6 times on physical activity over a 15-year period, using an adapted version of the Kaiser Physical Activity Survey. These participants were categorized as: Sedentary (no physical activity in 4 out of 6 assessments (N=25); Consistent (vigorous physical activity in 4 out of 6 assessments (N=25)); and Sporadic (all remaining participants (N=39)). Intrinsic motivation was assessed with the Treatment Self-Regulation Questionnaire and self-efficacy with the Self-Efficacy and Exercise Habits Survey. To test social network transmission, each woman identified a same-sex friend, who also completed the Kaiser physical activity questionnaire. Nonparametric ANOVA explored the relationship between history of physical activity and motivation, and a Cochran-Armitage trend test was used to test the link between physical activity in women and their friends. Women who were consistently physically active over the past 15 years had higher intrinsic motivation and higher self-efficacy than sporadically active (p<0.001 and p<0.046, respectively) and sedentary women (both p<0.001) and also showed a trend for increased odds of MD (Exp(B) = 2.95, p < .01). Although this study cannot disentangle temporal relationships, it supports a link between all 3 theories and epidemiologic data. Thus, increasing intrinsic motivation and self-efficacy, and promoting transmission within social networks, may be key elements in the design of the WISHLIT intervention. [Supported by NIH/NHLBI grant HL079849 and NIH/DHHS grants NR004061; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495.]

78) Abstract 1026

DAYTIME NAPS INDUCE CORTISOL AWAKENING RESPONSES IN A SLEEP ARCHITECTURE-DEPENDENT MANNER
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Individuals suffering from major depression often show a blunted cortisol awakening response (CAR) to nighttime sleep along with increased daytime napping. In turn, napping has been associated with depressive symptoms. It could be speculated that napping also is followed by a CAR and thus CAR may be a mediator between napping and depressive symptoms. However, so far little evidence exists on whether daytime napping is actually accompanied by a CAR and whether potential responses are sleep architecture-dependent. To address these questions, we assessed: 1) whether naps induce CAR in healthy subjects, and 2) whether pharmacologically altering sleep architecture in the nap would have an effect on CAR. Cortisol was assessed repeatedly in 18 participants (11m; 18-35yrs.) during the first hour (0, 30, 45, 60min) following a full night’s sleep, and two, 90min, morning nap conditions (5mg zolpidem, placebo). Sleep was monitored by EEG.

We found a significant cortisol increase in response to each sleep condition (β=3.28, p<.001). However, placebo naps were associated with a smaller, Zolpidem naps with a more robust CAR compared with night sleep (F=4.22, p=0.06). Zolpidem naps further had less rapid eye movement sleep (REM) (t=1.79, p=0.09) and more slow wave sleep (SWS) (t=2.93, p=0.009) compared with placebo. In accordance with these findings, percent of SWS was positively correlated with maximum cortisol increases following zolpidem naps (SWS%: r=.51, p<.03; S2%: r=.52, p<.04). Whereas percent time spent in Stage 1 sleep was positively correlated with maximum cortisol increases (r=.51, p<.03) in placebo naps.
This is the first study to show a sleep architecture-dependent cortisol awakening response to napping, with greater responses found with more time spent in SWS. Given that major depression has been linked to increased REM density, it will be interesting to see whether patients suffering from depression show the same sleep architecture differences in naps and hence blunted cortisol awakening responses and whether those, in turn, contribute to depressive symptoms.

CHRONIC STRESS AND EMOTION REGULATION: EFFECTS ON THE CORTISOL AWAKENING RESPONSE

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Little research has been conducted on the relationship between emotion regulation and cortisol activity within the context of chronic stress. The current study examines the link between the cortisol awakening response (CAR) and trait emotional suppression among a chronically stressed population (e.g., experiencing repeated natural disasters) with and without probable PTSD. 120 adults from a community recently exposed to a major earthquake and other natural disasters in Yogyakarta, Indonesia were assessed for disaster exposure and PTSD. Fifty individuals identified as having probable PTSD and 68 matched individuals without PTSD completed the Emotion Regulation Questionnaire (Gross & John, 2003) to assess their typical use of emotional suppression. The next morning, they provided 2 saliva samples (one immediately upon awakening and one sample 30 minutes after awakening) to assess the CAR. Consistent with hypotheses, emotional suppression significantly predicted a blunted CAR, with higher scores on suppression associated with lower cortisol awakening responses. Contrary to hypotheses, probable PTSD status was not associated with the CAR. The interaction between probable PTSD status and suppression also predicted the CAR, with participants with probable PTSD and who were high in suppression having the lowest CAR. Emotional suppression may be a factor associated with cortisol dysregulation among those who have experienced repeated natural disasters, which can be viewed as chronically stressful.

THE INTERPLAY OF OCCUPATIONAL FACTORS AND DEPRESSION IN THE RISK OF OCCUPATIONAL INJURY

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Objective: To evaluate the associations between biomechanical, physical, and psychological demands and occupational injury according to depressive symptoms severity.

Methods: 2882 French working people completed a questionnaire covering socio-demographic characteristics, smoking, alcohol consumption, obesity, job, chronic diseases, depressive symptoms, and injuries during the previous 2-year period. Data were analyzed using logistic regression.

Results: Occupational injury strongly related to biomechanical, physical, and psychological demands among depressive-symptoms-free workers (ORs ranging from 1.35 to 3.15). These relationships were stronger among the workers with depressive symptoms without medical treatment (11.9%) and among those with persistent symptoms despite a treatment (1.7%), with ORs up to 12. These associations were partially confounded (up to 33%) by unhealthy behaviours, health status, and chronic diseases.

Conclusions: High occupational demands and depressive symptoms should be early identified and monitored to prevent injury.

ASSOCIATION BETWEEN CARDIAC AUTONOMIC ACTIVATION AND EXPRESSIVE HOSTILITY/ SUPPRESSIVE HOSTILITY, ANGER RUMINATION, AND TYPE D PERSONALITY

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Objective: Expressive hostility and suppressive hostility are important behavioral risk factors related to cardiac autonomic activation in coronary artery disease (CAD), is not clear in healthy adults. Anger rumination is a cognition process and Type D includes the emotional state (negative affectivity) and social interaction (social inhibition) that are related to subjective distress and caused higher psychophysiological activation during or after an anger event. The purpose of present study was to explore how subjective distress related to cardiac autonomic activation.

Method: This study analyzed 73 health adults (27.40% female, mean age = 58.66 ± 12.85) from a database of 1, 263 and 80 CAD patients (14.20% female, mean age = 60.11 ± 10.71). Chinese Hostility Inventory Short Form (expressive hostility and suppressive hostility) and Anger Ruminatiion Inventory, and Type D Scale were administered. The electrocardiogram was measured and transferred to the index of cardiac autonomic activation in the following sequences: baseline, neutral recall task, recovery 1, anger recall task, and recovery 2.

Results: After controlling age, the results of subjective distress revealed the significant positive correlation between anger rumination and negative affectivity, social inhibition, and total score of Type D. There were significant negative correlation between anger rumination and autonomic activation (LF and SDNN) at baseline ; negative correlation between anger rumination and LF during the anger recall task and recovery . The two-way ANOVA showed the interaction effect between expressive hostility/ suppressive hostility and groups in cardiac autonomic activation. The CAD patients with high expressive hostility had higher sympathetic activation (LF/HF ratio) and lower parasympathetic activation (NN50 and pNN50) during the baseline, anger recall task and recovery 2; however, the reverse direction between expressive hostility and sympathetic/ parasympathetic activation in healthy adults. In addition, the CAD patients with high suppressive hostility had lower parasympathetic activation (NN50 and pNN50) during the recovery 2; however, the reverse direction between expressive hostility and parasympathetic activation in healthy adults.

Conclusion: The results indicated that the subjective distress was related to cardiac autonomic activation. For the healthy adults with high expressive hostility or high suppressive hostility may activate lower sympathetic and higher parasympathetic activation during the baseline, anger situation and recovery.
ETHNIC IDENTITY MODERATES EFFECTS OF A COGNITIVE BEHAVIORAL STRESS MANAGEMENT INTERVENTION ON STRESS IN HIV+ LOW-INCOME MINORITY WOMEN
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Ethnic Identity (EI) is associated with lower perceived stress in low-income minority Women Living with HIV (WLWH), in part through greater levels of coping self-efficacy and social support. Given the benefits of cognitive behavioral therapy (CBT) interventions in reducing stress in HIV+ populations, it is important to understand whether EI influences the efficacy of these in reducing stress in WLWH. The present study examined the interactive effects of EI and a group-based Cognitive Behavioral Stress Management (CBSM) intervention on subjective stress over a 6-month period in 93 low-income minority WLWH. We hypothesized that high EI women randomized to CBSM will experience greater reductions in self-reported stress than low EI women randomized to CBSM or a control group. Women were mostly middle-aged, predominantly African-American (87%), on disability (51%), diagnosed with HIV approximately 7.6 years, and earned an average yearly income of $5,000-10,000. Participants completed the Impact of Events Scale (IES) and Perceived Stress Scale (PSS) and were randomized to a 10-week CBSM (i.e. relaxation, CBT) or psychoeducational control group. Women again completed the IES and PSS at 6-month follow-up. Hierarchical regression analyses revealed a significant EI x Intervention (CBSM vs. control) interaction in explaining decreases in IES intrusive thoughts (β = -.496 (.243), p = .04) and perceived stress (β = -.568 (.216), p = .01). Post-hoc analyses indicated that for women with high EI, those in CBSM evidenced greater decreases in perceived stress (β = -.440 (1.83), p = .002) and IES intrusive thoughts (β = -.241 (2.48), p = .05) when compared to women in the control group. For women low in CBSM vs. control was not associated with reduced stress (p's > .05). Findings suggest that women with high EI may benefit more than low EI women from stress management interventions that teach them additional skills to deal with stress. Future research should investigate candidate mediating psychosocial resources that may explain how high EI WLWH derive benefits from CBSM.

INCREASED REGIONAL CEREBRAL CANNABINOID-1 RECEPTOR AVAILABILITY IN FUNCTIONAL DYSPESIA: A [18F]-MK-9470 PET STUDY
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INTRODUCTION: Functional dyspepsia (FD) patients are characterized by abnormal regional cerebral activity in key areas of the ‘pain neuromatrix’. However, it is unknown which neurotransmitter mechanisms underlie these abnormalities. The cannabinoid system is involved in both pain processing, regulation of gastrointestinal function and reward/food intake. We aimed to compare the regional cerebral availability of the cannabinoid-1 (CB1) receptor between FD patients and healthy controls.

METHODS: 12 FD patients (mean age 29.4 ± 10.6, 11 women) with significant weight loss (mean weight loss 13kg) and 12 age-, gender and BMI-matched healthy controls participated in the study; psychiatric co-morbidity and intake of centrally acting medication or recreational drugs were exclusion criteria. Each subject underwent a 30 minute dynamic positron emission tomography scan consisting of 6 frames after slow IV bolus injection with the CB1 receptor-selective radioligand [18F]-MK-9470. Dynamic scan frames were realigned to the first frame to correct for motion using PMOD software. Parametric maps of CB1 availability were constructed using modified standard uptake value (mSUV) values, a reliable estimate of receptor distribution volume. These maps were created using the Neurological Institute space using a previously created CB1 template in PMOD. Whole brain, voxel-based analysis at a significance level of pheight < 0.001 (uncorrected) was used to compare mSUV values between both groups.

RESULTS: Significantly higher CB1 receptor availability was found in FD patients in the following brain regions: insular cortex (anterior and posterior), ACC (perigenual and subgenual), cerebellum, PAG, basal ganglia (including the ventral striatum), hypothalamus and the amygdala.

CONCLUSION: We report the first study demonstrating significant increase in CB1-receptor availability in a large number of regions of the ‘pain neuromatrix’ and the ‘reward circuit’ in FD patients compared to controls. These results may indicate that the abnormal brain activity previously demonstrated using H215O-PET in FD in several of these regions may be due to abnormal functioning of the CB1-receptor system, identifying it as a potential novel target for treatment.

THE EFFECTS OF WORRY, STRESS AND A POSITIVE HEALTH PRIMING INTERVENTION ON SOMATIC COMPLAINTS
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82) Abstract 993
84) Abstract 1057
Somatic complaints are common and form a major burden. Previous studies suggested that such complaints are increased by illness-related memory, for example due to worries about health. In this ambulatory study we tested whether we could decrease somatic complaints through reducing the activation of illness-related memory by a ‘positive health-priming’ intervention. We also tested whether health worry mediated the increase in complaints due to general worry and stress found in other studies. Subjects/Methods: Forty-three students were randomly assigned to the ‘positive health’-group or a control group. The mean age of the participants was 22.72 years (S.D. = 5.66; range 18-50) and 88.8% was female. Using internet measures, participants reported stressors, worry episodes, negative affect, and somatic complaints for a period of 6 days, while each morning performing the priming task. Results: The diary method yielded 214 measurement occasions in the 43 participants. Participants experienced on average 2.82 complaints per day (SD = 2.77) with a mean of 1.03 (SD = 0.50) severity per complaint. The intervention caused a decrease in somatic complaints but only for participants with low trait negative affect or low somatosensory amplification, respectively F[1, 44.875] = 5.832, p(one-tailed)= .010 and F[1, 41.386] = 3.769, p(one-tailed)= .030. Nightly stressors [β = 1.71, p(one-tailed)= .001] and general worry [β = 1.29, p(one-tailed)= .007] both increased somatic complaints at the same day, but only the effect of general worry was mediated by health worry. Conclusion: These findings seem to suggest that positive health-priming might reduce health complaints in certain subgroups, and that general worry may increase health-related worry which in turn causes health complaints.

86) Abstract 838
NEGATIVE LIFE EVENTS, EMOTIONS AND PSYCHOLOGICAL DIFFICULTIES AS DETERMINANTS OF SALIVARY CORTISOL IN CHILDREN
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METHODS: In 382 Belgian children (5 to 11 years old), salivary cortisol samples were collected in the morning (immediately after wake up, 30 minutes after wake up, 60 minutes after wake up) and evening on two consecutive weekdays. Moreover, data on children’s life events during the last year (Coddington Life Events Scale), recent emotions (0 to 10 Likert-scale for happiness, anger, anxiety and sadness) and difficulties over the last six months (Strengths and Difficulties Questionnaire) were collected. Statistical analysis was done separately for boys and girls by multilevel growth curve modelling with adjustments for age, body mass index, socio-economic status and wake up time.

RESULTS: In boys and girls with more negative life events during the last three months, the diurnal cortisol slope was steeper (more decline). Boys with higher self-reported happiness showed lower overall, morning and evening cortisol levels. In contrast, the diurnal slope was steeper (more decline) in boys with emotional difficulties due to higher morning values. In girls, peer difficulties were associated with lower overall and morning cortisol levels. Overall, peer difficulties and happiness had the strongest association with cortisol.

CONCLUSIONS: Children’s salivary cortisol patterns were related to negative life events, emotions and difficulties, although differently in boys and girls. Most findings were in line with the stress hypocortisolism hypothesis, although peer difficulties followed the hypocortisolism hypothesis. Future studies should focus on sex differences, positive emotions and the diurnal cortisol slope.

87) Abstract 1130
ASSOCIATION OF INSIGHT IN PSYCHOTIC MANIC PATIENTS AFTER RESOLUTION OF MANIA WITH QUALITY OF LIFE IN NORTHWEST OF IRAN
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Only few studies have attempted so far to measure any association between insight in patients with bipolar disorder and the quality of life using patient reported outcome measures. This study aimed to find any association between insight and the quality of life in hospitalized patients with psychotic mania after resolution of manic episode in Tabriz University of Medical Sciences Razi Psychiatric Hospital. Using consecutive sampling technique we selected 55 psychotic manic inpatients after resolution of manic episode prior their discharge from the hospital. Iranian version of abridged Scale to Assess Unawareness of Mental Disorder (abridged SUMD) was used for assessing various aspects of insight into illness. Iranian version of 8-item Short-Form Health Survey (SF-8) was used to measure the quality of life. Generally the mean of physical and mental component summary scores of patients that had poor insight were higher in patients who had partial or full insight comparing to patients with partial or full insight but only the following associations were statistically significant: awareness of disorder and mental component of SF-8 (t=2.153, P=.036 ), awareness of delusion and physical component of SF-8 (t=2.135, P=.038) and awareness of thought disorder and mental component of SF-8 (t=1.949, P=.060). This study showed that insight into illness may have a negative effect on the patient reported health and wellbeing. Clinical implications of these findings are discussed.

88) Abstract 720
MULTIPLE INFLAMMATORY BIOMARKERS AS MEDIATORS OF THE ASSOCIATION BETWEEN DEPRESSION, ANXIETY-PSYCHOLOGICAL DISTRESS AND COURSE OF HEALTH STATUS OVER 18 MONTHS IN OUTPATIENTS WITH HEART FAILURE
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Purpose: Depression and anxiety are associated with increased inflammatory activation and poor health status (HS) in heart failure (HF). We tested whether the association between a combined, latent, depression and anxiety factor (‘psychological distress’) and the course of self-reported HS over 18 months was mediated by multiple inflammatory biomarkers. Methods: HF outpatients (n=228, 80% male, mean age 67.0±8.7 years) filled out the Hospital Anxiety and Depression scale (HADS) at inclusion and the Short Form-12 (SF12) and the Kansas City Cardiomyopathy Questionnaire (KCCQ) at inclusion, 6, 12, and 18 months. Blood samples at inclusion were analyzed for interleukin (IL)-6, high sensitive C-reactive protein (hsCRP), tumor necrosis factor (TNF)-α, and α1-antitrypsin (α1AT). A multiple mediator growth model was tested using Structural Equation Modeling. Results: Psychological distress was associated with poorer HS (all scales p<.001), and a deterioration of mental HS (p<.001) in the full mediation model. Significant correlations were found between increased levels of inflammatory biomarkers and poor health status over 18 months. No mediating effects were found for the multiple inflammatory biomarkers on the association between Psychological distress and baseline self-reported HS (i.e. intercept), whereas change in physical HS was significantly mediated by the group of five inflammatory biomarkers (p=.014). Conclusions: Only the association between psychological distress and change in self-reported physical health status was significantly mediated by inflammatory biomarkers. Future research should investigate whether the association between psychological distress and poor health status may be explained by other biological or behavioral factors.
MEMORY IMPAIRMENT IN MASTOCYTOSIS: PREVALENCE AND FEATURES

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Objective. Mastocytosis (M) is a rare disease characterized by mast cells (MC) accumulation in one or several organs. Even though M is usually not a life threatening disease, indolent forms are associated with significant disability in more than 60% of patients. Cognitive complaints (memory, attention) is frequent in M as well as depression. Although depression in this disease have recently been described and suggested a mast-cell direct involvement, studies focusing in mastocytosis-related cognitive impairment (CI) are lacking. Our purpose was to bring for the first time a detailed description of CI in this disease. As depression is frequent in this population, we investigated its relation with these CI controlling for age and educational level.

Participants and methods. Patients (n=57) were recruited in the service of dermatology from 2012 to 2019. Cognitive functioning in auditory memory as well as for working memory and the 17 item Hamilton depression scale. Results. Patients mean age was 45 (SE=11.7). CI was present in 38% (n=22) of patients. Severe CI (n=3) consisted essentially in auditory memory, while moderate CI (n=19) with CI, impaired domains where: attention (working memory) (n=11), auditory memory (immediate) (n=4), visual memory and auditory memory (n=1), visual memory (immediate) (n=1) and working memory and auditory memory (n=5).

In binary logistic regression, CI was not predicted by the presence or level of depression (scores ≥12) (p=.195). When comparing the percentage of depressed patients among groups with or without CI (present (68.2%)/absent (51.4%)), we found no significant difference (p=.212). Taken together, these results show that CI in mastocytosis is common and concerns particularly verbal and attention memory aspects. These CI are moderate in more than 85 % of cases. Although statistically we cannot rule out the presence of a link between depression and CI, the results suggest that alternative explanations should be considered. CI in this disease may be due to specific MC involvement in brain.

90) Abstract 1211

NEUROCOGNITIVE INFLUENCES ON NEGATIVE EATING BEHAVIORS AMONG OBSESE AFRICAN AMERICANS

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Obesity is an epidemic in the United States and disproportionately affects African Americans. It is well documented that poor eating behaviors directly impact weight; however, the neurocognitive correlates of poor eating behaviors among obese individuals are not well understood and have not been adequately examined in this population of African Americans. A better understanding of the neurocognitive processes associated with eating behaviors is necessary to tailor interventions that address unhealthy behaviors that lead to obesity. The aim of the current study was to examine the relations among two domains of executive functioning (cognitive set shifting and inhibition) and eating behaviors. It was hypothesized that poorer cognitive set shifting and inhibition ability would be associated with poorer eating behaviors. Forty-seven participants from a larger study entitled Stress and Psychoneuroimmunological Factors in Renal Health and Disease were analyzed. Participants were severely obese (BMI > 35) and selected from a larger sample of 122 African Americans. The sample was 57.4% female with a mean age of 45.70 (SD = 10.83) and a mean educational attainment of 13 years (SD = 2.05). Participants completed the Wisconsin Card Sorting Test (WCST), the Stroop Color-Word Test (Stroop), and the Eating Behavior Patterns Questionnaire (EBPQ). After controlling for age, sex, and education, multiple regression analyses revealed that snacking on sweets (B = -.327, p < .05) and emotional eating (B = -.339, p < .05) were negatively associated with Stroop Interference Score. No significant findings emerged for the WCST and EBPQ. Findings suggest that certain negative eating behaviors are associated with poorer inhibition among obese African Americans. The neurocognitive underpinnings of disinhibited eating should be further explored in this population to further elucidate the behaviors and mechanisms that lead to obesity.

91) Abstract 1188

SEXUAL FUNCTIONING IS ASSOCIATED WITH ANXIETY AND POOR SLEEP IN PARTNERS OF MEN WITH PROSTATE CANCER

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Sexual impotence is a common side effect in men undergoing treatment for prostate cancer (PC). Although studies have examined the impact of sexual dysfunction on psychological well-being in prostate cancer patients, few studies have examined its effects on their spouses and partners. This study examined whether sexual functioning is associated with mood and sleep disruption in spouses and partners of men with prostate cancer, relative to a control group of women whose mates had no cancer history. Marital satisfaction was also explored as a potential buffer in this relationship. Participants included women whose mates had been diagnosed with PC in the last five years (n=39) and women who were in relationships with men with no diagnosed medical illness (n=26). Women completed a battery of questionnaires assessing their mood (Profile of Mood States-short form), sexual functioning (Female Sexual Function Index), and sleep (Pittsburgh Sleep Quality Index). After controlling for covariates that might impact sexuality in women (age, BMI, thyroid conditions), Multivariate Analyses of Variance revealed that women whose mates had PC were more likely to report being sexually inactive in their current relationship than controls (F1, 41=4.16, p=.05) and having less sexual desire (F1, 41=4.11, p=.05). Hierarchical regression analyses were then conducted to examine whether sexual functioning is associated with psychological distress and sleep disturbance in spouses/partners of men with PC and controls. After controlling for covariates, there was a significant interaction between caregiver status and sexual desire on POMS-Anxiety (R2=.221, p<.01), such that higher sexual desire was associated with increased anxiety in spouses/partners of men with PC, but not in controls. A similar relationship was found between sexual desire and sleep efficiency in spouses/partners of men with PC such that higher levels of sexual desire were associated with worst sleep efficiency, (R2=.204, p<.01). Although we suspected that marital satisfaction would buffer the adverse effects of unfulfilled sexual desire on anxiety and sleep, there was no support for this hypothesis in the data. These findings suggest that unfulfilled sexual desire may be a source of distress in spouses/partners of PC patients. Interventions aimed at helping couples to adjust to changes in their sexual relationship following PC treatment may improve psychological well-being in both patients and partners.

92) Abstract 764

THE NEURAL SUBSTRATES OF POSITIVE EMOTION INDUCTION ASSOCIATED WITH REMOTE AUTOBIOGRAPHICAL MEMORY

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Introduction: When we retrieve our personal past episode (autobiographical memory), we sometimes feel positive emotion, called ‘Nostalgia’. This emotion is induced by various triggers such as negative mood, social interaction and sensory stimuli, and it can regulate our emotional states and bolster self-esteem and social connection (Wildschut et al. 2006, Journal of Personality and Social Psychology, 91, 975-993.). These findings indicate that Nostalgia has important function to promote our mental, and presumably physical, health in our life. In the present study, we aimed to investigate the emotional features and the neural substrate of Nostalgia using functional magnetic resonance imaging (fMRI).

Methods: Before the experiment, we selected pictures that could make undergraduates feel Nostalgia varying at low to high intensity. In the fMRI study, fourteen young female subjects (mean age=22.1±0.6) were scanned during they saw these pictures. After scanning, subjects saw pictures again, and rated various aspects of the picture. Results: Results of the multiple regression analysis showed that the Age of autobiographical memory and the intensity of Happiness were the best predictors for the intensity of Nostalgia. Event-related parametric fMRI analysis (uncorrected, p<0.001) showed that the activities of the perirhinal cortex (PRC) and medial substantia nigra/ventral tegmental area (SN/VTA) were positively correlated with the intensity of Nostalgia.

Discussion: Significant activations in the PRC and SN/VTA indicate that the processing of the recognition memory (PRC) and reward (SN/VTA) is increased as a function of Nostalgia. Considering the fact that the region of SN/VTA is selectively spared from neurodegeneration, the present result may provide a neurological evidence that the Nostalgia is preserved until our later life.

Conclusion: Together, the present results show that the Nostalgia is a positive emotion associated with remote autobiographical memory, and that the recognition memory and reward system are recruited for induction of this emotion.

93) Abstract 1098
THE DAILY CONVERSATIONS OF COUPLES COPING WITH BREAST CANCER: CONTENT AND LINKS TO ADJUSTMENT
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Following recent recommendations for more observational work on couples coping with cancer (Hagedoorn et al., 2008), this study employed an observational, ecological momentary assessment method, the Electronically Activated Recorder (EAR), to investigate how much cancer intrudes upon the daily conversations of couples coping with breast cancer. The EAR records snippets of ambient sounds throughout participants’ normal, daily lives, yielding acoustic information about couples’ lives as they naturally unfold. Fifty-three breast cancer patients and their partners wore the EAR for one weekend, and completed self-reported measures of depressive symptoms, intrusive and avoidant thoughts, and stress at the time of the EAR monitoring and the EAR was as well as at a two-month follow-up. Research assistants coded all sound files for (a) whether participants were engaged in a social interaction, (b) whether the social interaction was cancer-related, and (c) type of conversation (i.e. practical, emotional disclosure). Results revealed that cancer does not frequently come up in the daily conversations of couples coping with breast cancer, and that those conversations that are about cancer tend to be more practical (e.g. discussion of treatment dates and times), rather than emotional (e.g. disclosing feelings about the cancer experience). Furthermore, conversations about topics other than cancer were more predictive of self-reported adjustment to breast cancer than were cancer-related conversations. Our data suggest that the focus of coping research should be expanded to include more mundane, everyday interactions among couples, rather than just those that are cancer-related, in order to more fully understand the role of social interaction in the coping process.

94) Abstract 871
SYMPTOM-SPECIFIC ASSOCIATIONS BETWEEN STRESS AXES FUNCTION AND FUNCTIONAL SOMATIC SYMPTOMS IN ADOLESCENTS. THE TRAILS STUDY.
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Background: Functional somatic symptoms, symptoms for which no organic pathologic basis can be found, are often assumed to be stress-related. We hypothesized that altered activity of the stress axes is associated with specific FSS.

Method: This study is performed in a subsample of TRAILS (Tracking Adolescents’ Individual Lives Survey) consisting of 715 adolescents (mean age: 16.1years, SD=0.6, 51.3% girls). Adolescents’ cortisol levels after awakening and during a social stress task were assessed. Perceived arousal, HR and HRV were assessed in a supine position before, and in sitting position during and after the social stress task. FSS were measured using the Youth Self-Report and pain questions. Based upon a factor analysis, FSS were divided into two clusters, one consisting of headache and gastrointestinal symptoms and the other consisting of overtiredness, dizziness and musculoskeletal pain.

Results: Linear regression analyses revealed that the cluster of headache and gastrointestinal symptoms was related to high perceived arousal (beta=0.09, p=0.04) and low cortisol levels during stress (β=-.09, p=.03), and high HR in supine position before the test (beta=0.11, p=0.01). The symptom cluster of overtiredness, dizziness and musculoskeletal pain was related to high perceived arousal before (beta=0.12, p=0.01) and after (beta=0.12, p<0.008) the stress test, high HR before the test (beta=0.11, p=0.03) and low cortisol levels after awakening (β=-.15, p<.008).

Conclusion: Two clusters of FSS are differentially associated with alterations in stress axes function in adolescents.

95) Abstract 798
SELF-ESTEEM VARIABILITY PREDICTS ARTERIAL STIFFNESS TRAJECTORIES IN HEALTHY ADOLESCENT GIRLS
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Objective. There is mounting evidence that high levels of self-esteem are associated with better health outcomes, particularly in older adults dealing with serious medical illnesses. Research also suggests that self-esteem variability (SEV) is equally, if not more so, relevant to psychosocial health. However, although adolescence is acknowledged as a developmental period during which self-esteem is in a state of flux, little is known about how SEV affects adolescents. Second, no research has yet determined whether SEV is linked to early indicators of disease process, such as vascular function, an early indicator of atherosclerosis and cardiovascular disease. Here we explore the self-esteem of adolescent females over a 2.5-year period, and how it co-variates with trajectories of vascular function assessed over the same timeframe.

Methods. 130 adolescent females completed the Rosenberg Self-Esteem Scale (SEV) every 6 months for 2.5 years. Vascular function was measured three times over the same period, using peripheral artery tonometry. Indices of endothelial function and arterial stiffness were derived from these measurements. Potential demographic (age, socioeconomic status, ethnicity), mood, and health (physical activity, alcohol consumption, waist-to-hip ratio) confounds were assessed. Results. Hierarchical Linear Modeling revealed an association between self-esteem variability and arterial stiffness trajectories, b = 0.9x10^{-3}, SE = 4.4x10^{-3}, p = 0.04. To the extent that their self-esteem fluctuated over the 2.5-year study, participants showed increasing trajectories of arterial stiffness, independent of all considered demographic, mood and health confounds. This association was also independent of participants’ typical, or average, self-esteem over the same period. Self-esteem and SEV did not interact to predict arterial stiffness. Novel, self-esteem and SEV were associated with arterial stiffness trajectories, as opposed to reflective thinking.
that fluctuating self-esteem may accelerate the early stages of atherosclerosis in young women, regardless of whether self-views are generally positive or negative.

96) Abstract 972

PSYCHOLOGICAL STRESS INDUCES HYPERTHERMIA THROUGH ACTIVATION OF THERMOREGULATORY SYMPATHETIC PREMOTOR NEURONS IN THE MEDULLARY RAPHE REGION
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Objective: Psychological stress increases core body temperature in mammals including humans. However, the central circuitry underlying this stress response is poorly understood. Therefore, we sought to identify sympathetic premotor neurons that mediate a hyperthermic response to psychological stress in rats using one-hour social defeat stress. Methods and Results: Changes in abdominal temperature were recorded using telemetry system. Intruder rats that were defeated by a dominant resident conspecific, i.e. socially defeated, exhibited a rapid increase in abdominal temperature by up to 2.0°C. In these rats, we found that expression of Fos, a marker of neuronal activation, was increased in the rostral medullary raphe region centered in the rostral raphe pallidus and adjacent raphe magnus nuclei. In this region, Fos expression was observed in a large population of neurons expressing vesicular glutamate transporter 3 (VGLUT3), which are known as sympathetic premotor neurons controlling non-shivering thermogenesis in brown adipose tissue (BAT) and thermoregulatory constriction of skin blood vessels, and also in a small population of triptophan hydroxylase-positive, serotonergic neurons. Intrapertoneal injection of diazepam, an anxiolytic agent, but not indomethacin, an antipyretic, significantly reduced both the stress-induced hyperthermia and Fos expression in these medullary raphe neuron populations. Furthermore, blockade of β3-adrenoreceptors, which are abundantly expressed in BAT, also attenuated the stress-induced hyperthermia. Conclusions: These results suggest that psychological stress signals activate VGLUT3-expressing medullary raphe sympathetic premotor neurons, which then drive hyperthermic effector responses including BAT thermogenesis through β3-adrenoreceptors, resulting in hyperthermia.

97) Abstract 835

IMPACT OF HYPOCHONDRIASIS ON ASTHMA CONTROL AND HEALTH SERVICE USE IN ADULT ASTHMAICS
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Background: Research indicates that over 50% of asthmatics are poorly controlled, and that a high proportion of patients rely on health services such as emergency departments (ED) (up to 28%) and hospitalizations (up to 7%) in order to manage their asthma. Several psychological factors (e.g., anxiety, depression) have been related to worse asthma control and to higher health service use. Moreover, research has shown that patients with hypochondriasis (i.e., extreme health anxiety) have more difficulties coping with comorbid medical disease. However, little is known about the impact of hypochondriasis on asthma control and health service use. Methods: 212 confirmed adult asthma patients completed a sociodemographic and medical history interview, including questions about health service utilization in the last year. Hypochondriasis was evaluated using the Whiteley Index (WI), and asthma control was evaluated using the Asthma Control Questionnaire (ACQ). Results: After adjusting for age, sex, and dose of inhaled corticosteroids (ICS), general linear model analyses revealed that those with high WI scores (≥44, cutoff for clinical significance) had a higher total number of health service use (B (SE) = 1.349 (0.412), p=.001); a higher number of hospitalizations (B (SE) = 0.256 (0.119), p=.032) and a higher number of ED visits (B (SE) = 1.093 (0.347), p=.004) compared to those with low WI scores (<44). WI scores measured continuously were not associated with increased health service use. WI scores (dichotomized or continuous) were not associated with worse ACQ scores. Conclusions: Findings indicate that hypochondriasis is not associated with worse asthma control but that clinical levels of hypochondriasis are associated with higher use of asthma health services (including ED visits and hospitalizations) among adult asthmatics. The fact that no dose-response relationship was observed suggests that hypochondriasis must reach clinical levels before influencing health service use among asthmatics.

98) Abstract 1207

ASSOCIATION OF SOCIAL FACTORS WITH AFFECT AND DISEASE-RELATED BEHAVIOR IN ADOLESCENTS WITH TYPE 1 DIABETES
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Extensive research has explored the relation of social ties to physical and mental health outcomes in adults. Less is known about these relations during adolescence, especially for those with chronic diseases. We conducted a pilot study to explore relations of pronoun usage, social roles, and affective valence in recall of memorable disease-related events with emotional, social, and diabetes outcomes. During telephone interviews, 21 teens with type 1 diabetes (57.1% Male; Mage = 14.7 SDage = .73) answered three open-ended questions about 1) their earliest memory of having diabetes, 2) the most difficult time they have had with diabetes, and 3) their most memorable diabetes-related experience. Responses were coded for the frequency of the words “we” and “they,” the number of identified social roles, and the affect valence of answers to the “most memorable experience” question. Questionnaires were used to collect information about the teens’ social networks and roles, emotions (happy, sad, angry, anxious), social support, general conflict, diabetes self-disclosure, and diabetes self-care behavior. More frequent usage of “we” pronouns was linked to less sadness (r = -.44, p < .05), anger (r = -.40, p < .10), and anxiety (r = -.43, p < .10). “They” pronoun usage was linked to less diabetes self-disclosure (r = -.39, p < .01). Positive responses to the “most memorable” diabetes-related experience question were associated with larger social networks (r = .37, p = .10) and more happiness (r = .44, p < .05). More social roles indicated in oral responses (r = -.37, p < .10) and more general conflict (r = -.43, p = .05) were linked to worse diabetes self-care, whereas more diabetes-related support (r = .44, p < .05) was related to better self-care behavior. This pilot study suggests a link of social factors and positive affect to positive diabetes-related behavior and positive emotions in a sample of adolescents with diabetes. The frequency with which individuals used the more inclusive pronoun “we” or the more exclusionary pronoun “they” was an indicator of positive or negative outcomes, respectively. These findings suggest that, as with adults, social factors have an important association with emotional outcomes and health behaviors in teens with chronic diseases, and that the composition of social networks and the roles teens play in these networks each may have different implications for health-related outcomes. We will discuss further exploration of these relations, along with their implications for future research.
HEART RATE VARIABILITY IS ASSOCIATED WITH GLYCEMIC STATUS AFTER CONTROLLING FOR COMPONENTS OF THE METABOLIC SYNDROME
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Background: A growing body of literature suggests that low heart rate variability (HRV) is associated with various pathological conditions. Low HRV is suggested as a common pathway to increased morbidity and mortality from a host of conditions, including glycemic disorders and cardiovascular diseases. However, it is not yet known if this association is independent of the association between HRV and components of the metabolic syndrome (MetS). Therefore, we aimed to evaluate the relationship between HRV and glycemic status (FPG) after controlling for MetS in a healthy working cohort.

Methods: Participants were 2441 employees (age 18-65) from one of three sites of an airplane manufacturing plant in southern Germany. All subjects underwent measurement of HRV (via a Holter recording), fasting plasma glucose (FPG), and MetS. The HRV measurements and FPG (e.g. HF PCF= -0.05, p<0.001; SDNN PCC= -0.06, p<0.001). After multivariate adjustment of all other components of metabolic syndrome (triglyceride, blood pressure, waist circumference, high density lipoproteins), history of CVD or hypertension or dyslipidemia, demographic variables, health behavior and inflammation, these associations still persisted (e.g. HF PCF= -0.05, p<0.001; SDNN PCC= -0.06, p<0.001). The full models accounted for 28% of the variation in FPG.

Conclusion: We were able to replicate and extend previous findings that HRV and glycemic status are negatively correlated. In addition we showed that this association is independent of potential confounders, especially all other components of the MetS and inflammation. Thus, it appears that indicators of HRV have an independent association with glycemic status even after multivariate adjustment of important confounders.

A KEY TO THE HEART OF CHD PATIENTS? A RANDOMIZED CONTROLLED TRIAL STUDY PROTOCOL
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Background: Due to demographic change in Germany (low birthrates & ageing population) chronic diseases pose a great challenge of (multiple) chronic diseases. Therefore, interventions might have to be embedded into the medical baseline and offering support/solutions. The primary outcome is change of objective and subjective health status. Intermediate intervention outcomes are loneliness (UCLA loneliness Scale), social support (SSUK), health locus of control (MHLC) and self-efficacy (SWE). Secondary outcomes include post-intervention measures on cardiovascular risk factors (weight, self-reported physical activity smoking, alcohol).

Discussion: This intervention has enormous potential to contribute to the design and development of training courses of efficient CMPs to deal with the future challenge of (multiple) chronic diseases. Therapeutic implications would include a stronger focus on psychosexual factors, especially on social isolation/loneliness, which seems to be a previously overlooked aspect. For future care of chronic illness social interventions might have to be embedded into the medical framework.

THE ASSOCIATION BETWEEN OVERALL ABDOMINAL PAIN BUT NOT SOLE EPIGASTRIC PAIN AND POOR SELF-RATED HEALTH IS EXPLAINED BY DEPRESSIVE SYMPTOMS
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Background: Functional gastrointestinal disorders (FGID) irritable bowel syndrome (IBS) and dyspepsia involve chronic pain without determined organic cause, although psychoneuroimmunological mechanisms have been suggested. We investigated if IBS and dyspepsia were associated to poor self-rated health (SRH) dependent on overall abdominal or sole epigastric pain and if an association between pain and poor SRH was explained by depression or inflammation.

Methods: This analysis is based on 1244 participants attending the medical examination in a population based colonoscopy study, including 164 IBS and 74 dyspepsia cases defined by the RomeII questionnaire. Logistic regression was used to calculate the association between FGID, abdominal (n=220) and epigastric pain (n=312; RomeII questionnaire), depressive symptoms (HADS), C-reactive protein (CRP) and SRH (SF-36; dichotomized good v.s. neither, poor), adjusted for age and gender. Results: Both IBS and dyspepsia were associated with poor SRH. These associations were dependent on abdominal and epigastric pain, respectively. The association between abdominal pain, but not epigastric pain, and poor SRH was in turn explained by depressive symptoms. Higher CRP-levels within normal range were associated with poor SRH, without affecting the associations between FGID and SRH.

Conclusion: Depressive symptoms seem an important link between pain and poor SRH in IBS, but not in dyspepsia. The association between higher CRP-levels and poor SRH lends further support to the notion that inflammatory factors are involved in subjective health perception.

INFLUENCE OF MOTIVATIONAL INTERVIEWING TRAINING ON THERAPEUTIC ALLIANCE IN GLAUCOMA PATIENTS
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104) Abstract 1109

SALT SENSITIVITY IN HEALTHY YOUNG MALES AND THE RISK FOR THE DEVELOPMENT OF ESSENTIAL HYPERTENSION - A SIXTEEN YEARS FOLLOW UP

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Introduction: SALT sensitivity is discussed as responsible for developing severe forms of essential hypertension (EH) and predictive for cardiovascular events in older patients with EH. The aim of this study was to examine whether salt sensitivity also in young healthy men can predict the development of EH in the long run.

Methods: 27 young and healthy medical students (age, t1 m: 25y.; t2 m: 41.3 y., BMI t1(22.7); t2(24.9) had previously been characterized as salt-sensitive (SS, n=12) and salt-resistant (SR, n=15); BP difference in a 1.5h supine position with 60 measurements; deltaMAP>3 mmHg, between a high-salt (1 week) and a low-salt diet (1 week). 16.8 years later 167 subjects (mostly all) got an ambulatory blood pressure measurement (APBM). Results: Salt sensitivity was significantly associated with the SBP outcome after 16.8 years (24h measurement SBP: SS: 127.3; SR:117.6mmHg; p<0.05, and in mean also DBP (SS: 79.9;SR: 78.9 mmHg). There were no differences between SS and SR during ABPM at night. Five (4.16%) of SS subjects and 5 (33.3%) of SR subjects had hypertensive ABPM mean values at day or at night in SBP or DBP. At follow up 2 (16.7%) SS subjects (SR-0) developed a EH (>135 mmHg in the 24h ABPM). These SS subjects had a regular drug intake, but inadequate treatment of their hypertension.

Conclusion: This is an ongoing psychosomatic study and a first evaluation of a small group of subjects. We can present first results of BP course in previous healthy males over a long follow up period. In this special group of physicians we were surprised about the high rate (33.3%) of hypertensive values in the APBM. In this relatively small sample SS seems to have an increasing effect on BP with age and of the development of EH. Further examinations have to show if other factors (like cardiovascular reactivity or anger beside salt sensitivity) are also related to an increased risk for the development of EH.

103) Abstract 1180

PERSONALITY AND TYPE 2 DIABETES IN THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY

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The sample consisted of 10,326 participants (37.3% male, 62.7% female; 32-86 years of age) drawn from the National Health and Nutrition Examination Survey cohort conducted from 1982 through 1984 in the United States. Personality traits assessed were the Neuroticism, Extraversion, Openness to Experiences and the Type A personality. We used four different logistic regression models to predict Type 2 diabetes diagnosis. In the first model, all of the four personality traits significantly contributed to the diabetes diagnosis, with Neuroticism and Type A personality acting as risk (p<0.01), and Extraversion and Openness as protective factors (p<0.05). Odd ratios per standard deviation for risk factors were 1.168 (Neuroticism: 95% CI = 1.090, 1.251) and 1.458 (Type A personality: 95% CI = 1.278, 1.664). For the protective factors they were .850 (Extraversion: 95% CI = .752, .961) and .915 (95% CI = .844, .992). In the second model we controlled for age, sex and ethnicity, which left the Neuroticism as a single significant risk factor (p<0.01) with the odd ratio of 1.178 per standard deviation (95% CI = 1.100, 1.261). The third model was the same as the previous one, with included scores from the Center for Epidemiologic Studies Depression Scale (CES D). This model produced two risk factors (Neuroticism, OR=1.126, 95% CI = 1.045, 1.213, p<0.05; Depression, OR=1.368, 95% CI = 1.163, 1.608, p<0.01) and one protective (Extraversion, OR = 0.868, 95% CI = .759, .993, p<0.05). In the last model we controlled for sex, age, ethnicity and metabolic syndrome related variables (BMI, hypertension and serum cholesterol levels). The only significant (p<0.01) personality risk factor was Neuroticism (OR=1.227, 95% CI = 1.100, 1.368). We concluded that personality traits play significant role both as risk and protective factors for Type 2 diabetes and discussed several possible interpretations of the results.

105) Abstract 876

CHANGES IN ANXIETY DURING GROUP PSYCHOTHERAPY IN DISTRESSED PATIENTS WITH HEART DISEASE

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Anxiety has been identified as prognostic factor in cardiac patients. However, in these patients, little information is available evaluating treatments for anxiety. We therefore offered combined psychodynamic (PD) and cognitive behavioral (CBT) group therapy to 27 patients (21 m, 60 ± 8 y.) with chronic organic, mainly coronary, heart disease and comorbid anxiety and / or depression. Anxiety (Hospital Anxiety and Depression Scale) was analyzed before and after 13 90-minute treatment sessions in gender-mixed groups of 6-7 pts offered biweekly over a 6-month period. Analyses are by intention to treat. Patients attended a mean of 10.3 ± 2.3 group sessions. In post-pre comparison with last observation carried forward for the 4 dropouts, mean anxiety decreased significantly from 10.6 ± 3.4 to 8.4 ± 3.6 (p<0.005). Sex was not a significant moderator of improvement in anxiety. While both genders improved, the effect was only significant in men (p<0.005) with a parallel trend (p=.08) in the small group of 6 women. No effects on changes in anxiety could be observed for age and number of sessions attended. Changes in anxiety were greater in Type D vs. non-Type D patients (-3.2 vs. -1.4; p=.047). All patients perceived the treatment as helpful, with 65% of respondents judging the group as rather or very helpful. Both PD and CBT sessions were equally valued by >90% of patients. While 65% appreciated the balance of PD and CBT sessions, preference for more PD sessions was expressed by 3 and for more CBT sessions by 5 pts. Overall, 22 of 23 respondents reported improvement, which was perceived as pronounced in 56 %. Our combined
psychodynamic and cognitive behavioural group therapy was well-accepted by the patients and went along with significant and clinically relevant improvement in anxiety. Changes in anxiety were similar in men and women and largest in patients with the Type D pattern.

106) Abstract 1032

IS HIGH ACADEMIC PERFORMANCE ACHIEVED AT THE EXPENSE OF PSYCHOSOMATIC SYMPTOMS?
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The purpose of this study is to examine the effects of stress response (including elevated autonomic nervous reaction, emotion reaction and cognition impairment), stress coping patterns (including perfectionism and endurance) and the number of psychosomatic symptom on the academic performance among senior high school students. The first hypothesis of this study is that the academic performance may be decreased and the number of psychosomatic symptom may be enhanced among the students with higher responses of stress. The second hypothesis is that the academic performance of students was negatively associated with the number of psychosomatic symptom they experienced.

The self-report questionnaires including Stress Response Scale, Stress Coping Pattern Scale and Psychosomatic Symptom Checklist had been administered to 44 senior-high students in Taiwan. The academic performance was the average of the six Math scores of the participants in grade 10 during 2010 autumn to 2011 summer. The results of Pearson correlation indicated that the academic performance was positively correlated with perfectionism coping pattern, r = .317, p < .05, and negatively correlated with cognition impairment, r = -.328, p < .05. Furthermore, the number of psychosomatic symptom was significantly correlated with the three types of stress response (elevated autonomic nervous reaction, r = .588, p < .001; emotion reaction, r = .448, p < .01; cognition impairment, r = -.567, p < .001). These results support the first hypothesis. Besides, the result of hierarchical regression indicated that among the three responses of stress, only the elevated autonomic nervous reaction was associated with the number of psychosomatic symptom (β = .379, p < .05). Moreover, the academic performance was negatively associated with the cognition impairment (β = -.600, p < .001), at the meanwhile, positively associated with the number of psychosomatic symptom (β = -.560, p < .001) which fails to support the second hypothesis. The results of this study implied that the perfectionism coping pattern may contribute to high school students’ academic performance. Nevertheless, one of the costs for pursuing the success on academic performance was their physical burden, tolerating psychosomatic symptoms, which might come from the elevated autonomic nervous reaction while they encountered academic stress.

Key words: stress response, stress coping pattern, academic performance, psychosomatic symptom

107) Abstract 979

ACCEPTANCE AND COMMITMENT THERAPY FOR CHRONIC PAIN: PROCESSES OF CHANGE AND RESPONDER ANALYSIS AT 3 YEARS POST TREATMENT
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Acceptance and Commitment Therapy (ACT) is a form of cognitive behavioural therapy. It includes a primary treatment process called psychological flexibility, focuses predominantly on behaviour change rather than symptom reduction, and emphasizes experiential treatment methods. It is developing rapidly as a treatment for chronic pain, with more than eight treatment trials that support its efficacy. There are several studies of treatment outcome and process from trials of ACT for chronic pain, but long term results are unknown. This talk will present findings from a three-year follow-up study in this area. A consecutive sample (N= 171) of adults treated for complex and highly disabling chronic pain were surveyed three years after completion of their three or four week interdisciplinary treatment course of ACT. Responses were received by 65.1%. Bonferroni-corrected tests (alpha =.004) showed significant improvements at 3 years compared to pre-treatment in anxiety, depression, disability, and medical visits, but not in pain (Mean effect d = .76). In process analyses at the three-year follow-up changes in acceptance of pain and values-based action (components of psychological flexibility) combined accounted for significant variance in change in five key outcome measures. They were best at accounting for improvements in anxiety, 61.0%, and depression, 53%, and least good at accounting for variance in medical visits, 11.0%. Reliable change analyses identified that 64.8% of participants were reliably improved in one or more primary domain, including anxiety, depression, or disability. Defining these as “responders,” a set of discriminant function analysis was done to identify significant predictors from baseline measures. Among twelve demographic, outcome, and process measures, none were identified as significant predictors of treatment response. This may suggest that ACT is equally effective regardless of background demographic factors, levels of daily emotional, physical, and social functioning, or initial levels of acceptance of pain or values-based action.

108) Abstract 1156

EXPLORING THE BLOOD VOLUME PULSE AND PULSE TRANSIT TIME DURING THE ANGER RECALL TASK AND RECOVERY IN NORMAL CONTROLS AND CORONARY ARTERY DISEASE PATIENTS
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Objective: Blood volume pulse (BVP) is a non-invasive sensor used to measure the pulse-wave amplitude. BVP amplitude reflects the increasing and decreasing of blood flow that is controlled by the autonomic nervous system (ANS). Pulse transit time (PTT), the interval between the peak of the R-wave on the electrocardiogram and the arrival of the peripheral pulse wave in the finger pad measured by BVP, was used as an indirect marker for ANS activation. The purpose of the present study was to explore the BVP amplitude and PTT related to sympathetic activation during the anger recall task and recovery.

Method: This study recruited 19 normal controls (6 female, mean age = 62.68, SD = 8.69) and 20 CAD patients (4 female, mean age = 61.15, SD = 9.67). All participants filled out the Chinese Hostility Inventory Short Form and measured the BVP by Procomp InfinitiTM with each pulse in the following sequences: baseline, neutral recall task, recovery 1, anger recall task, and recovery 2. The BVP amplitude and PTT were calculated.

Results: The results showed that the PTT at baseline (370.46 ± 57.11 ms and 152.92 ± 66.06 ms respectively), anger recall task (367.00 ± 54.45 ms and 149.94 ± 37.91 ms respectively), and recovery 2 (353.72 ± 88.42 ms and 160.42 ± 63.79 ms respectively) were higher in CAD patients than in normal controls (p < .001). This was a significant main effect of BVP amplitude in different experimental stages (F = 8.322, p < .001); however, there was no interaction effect between group and experimental stages (F = .388, p > .05). The post hoc comparison found that BVP amplitude during the neutral recall task, anger recall task, and recovery was lower than baseline. However, the BVP amplitude change from baseline to recovery 2 showed the significant difference between normal controls and CAD patients (d = 2.23 and d = 4.14; t = 2.159, p < .05).

Conclusions: The present study revealed that blood vessels constricted during the neutral/ anger recall task but went back to the baseline for normal controls; however, the blood vessels constricted after anger recall task and cannot go back to the baseline during the recovery 2 for CAD patients. This study indicated that higher sympathetic activation and slower recovery may relate to the psychopathological mechanisms of CAD.
TRICYCLIC ANTIDEPRESSANTS, AUTONOMIC FUNCTION AND MORTALITY IN PATIENTS WITH CORONARY HEART DISEASE: DATA FROM THE HEART & SOUL STUDY

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Although tricyclic antidepressants (TCAs) are not recommended as first line therapy for depression in patients with coronary heart disease (CHD), they are still occasionally prescribed. Rationales may include resistance to other classes of antidepressants, previous response to TCAs, or treatment continuation after onset of CHD. Although TCAs are an effective treatment for depression, they may worsen cardiovascular prognosis because of autonomic side effects. In the present analysis, we examined potential adverse effects of TCAs on heart rate variability as an index of cardiac parasympathetic activation and TCA effects on plasma and urinary norepinephrine (NE) as a marker of sympathetic activation. The standard deviation of all normal RR intervals (SDNN) as a measure of heart rate variability was calculated from 24h electrocardiographic recordings, and norepinephrine levels were measured in plasma and 24-h-urinary samples according to standard methods. We also calculated hazard ratios for all-cause mortality during follow-up in TCA users vs. non-users. Out of 1024 outpatients with stable CHD, 32 patients (3%) used TCAs, and 992 patients were non-users. All patients were prospectively followed for a mean ± SD of 4.8 ± 1.4 years. TCA use was associated with a higher prevalence of baseline congestive heart failure (p=0.04), diazepam use (melters = 0.006), smoking (p=0.01), and more depressive symptoms as assessed with the Patient Health Questionnaire (p=0.02). TCA users had lower mean heart rate variability (SDNN 99 ± 6.7 vs. 122 ± 1.3; p=0.0004). They had a greater than 3-fold increased risk of being in the highest tertile of urinary NE (OR 3.60, 95% CI, 1.71-7.61; p<0.001) and a greater than 23-fold increased risk of being in the highest tertile of plasma NE (OR 23.15, 95% CI, 5.49-97.67; p<0.001). Adjustment for age, sex, smoking, diabetes, congestive heart failure and depressive symptoms did not significantly change the results. In unadjusted analysis, there was a trend toward increased mortality in TCA users vs. non-users [Hazard ratio (HR) 1.56, 95% CI, 0.92-2.62, p = 0.09]. However, adjustment for the above mentioned covariates attenuated the association (HR 1.45, 95% CI, 0.86-2.45; p=0.17). In summary, we found that TCA use in CHD patients was associated with unfavourable changes in autonomic function. The lack of significant association between TCA use and mortality may be due to the small number of study patients using TCAs.

110) Abstract 974

DARK CHOCOLATE CONSUMPTION BUFFERS PHYSIOLOGICAL STRESS REACTIVITY IN HUMANS

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Background: A growing body of research suggests beneficial health effects of flavanol-rich dark chocolate consumption including anti-inflammatory properties, but underlying mechanisms are unclear. We investigated the effect of acute consumption of dark chocolate on psychobiological stress reactivity. Methods: Medication-free non-smoking apparently healthy men aged between 20 and 50 years (mean SEM) were randomly assigned to either 50g of dark chocolate consisting of dark colored white chocolate (0% cocoa), both, dark and placebo chocolate looked identical. 2h after chocolate ingestion, the placebo (N=34) and chocolate groups underwent an acute standardized psychosocial stress task combining public speaking and mental arithmetic in front of an audience. We measured salivary cortisol as well as binding activity of the inflammatory transcription factor nuclear-factor kappa B (NF-kB) prior to chocolate ingestion, before and several times up to 2h after stress cessation. Results: The chocolate group showed a significantly blunted cortisol stress reactivity as compared to the placebo group (F=6.49, p=0.001) that related to chocolate-induced increases in plasma levels of the flavonol epicatechine (3.7, p<0.023). Potential confounders were controlled. NF-kB analyses were still ongoing at the time of the conference submission deadline. NF-kB results will be presented at the conference. Discussion: Our findings indicate that acute flavanol-rich dark chocolate consumption buffers cortisol stress reactivity. This suggests a potential stress-protective effect of dark chocolate consumption on HPA axis activity.

111) Abstract 1021

CORONARY HEART DISEASE PATIENTS WITH COMORBID DEPRESSION SHOW EXHAUSTED HPA AND SAM-AXIS ACTIVATION DURING ACUTE SOCIAL STRESS

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The presence of major depressive disorder (MDD) in patients with coronary heart disease (CHD) has been demonstrated to increase mortality. There is some evidence that MDD may be caused in part by an inflammatory process. We recently showed that patients with CHD and depression (MDD) have increased plasma corticotropin-releasing hormone (CRH) and decreased plasma cortisol and dehydroepiandrosterone (DHEA) levels relative to MDD matched controls. To further investigate this hypothesis, we studied the relationship between psychobiological stress reactivity and the HPA and SAM axis in patients with CHD and depression compared to controls. The present analysis, we examined potential adverse effects of TCAs on heart rate variability as an index of cardiac parasympathetic activation and TCA effects on plasma and urinary norepinephrine (NE) as a marker of sympathetic activation. The standard deviation of all normal RR intervals (SDNN) as a measure of heart rate variability was calculated from 24h electrocardiographic recordings, and norepinephrine levels were measured in plasma and 24-h-urinary samples according to standard methods. We also calculated hazard ratios for all-cause mortality during follow-up in TCA users vs. non-users. Out of 1024 outpatients with stable CHD, 32 patients (3%) used TCAs, and 992 patients were non-users. All patients were prospectively followed for a mean ± SD of 4.8 ± 1.4 years. TCA use was associated with a higher prevalence of baseline congestive heart failure (p=0.04), diazepam use (melters = 0.006), smoking (p=0.01), and more depressive symptoms as assessed with the Patient Health Questionnaire (p=0.02). TCA users had lower mean heart rate variability (SDNN 99 ± 6.7 vs. 122 ± 1.3; p=0.0004). They had a greater than 3-fold increased risk of being in the highest tertile of urinary NE (OR 3.60, 95% CI, 1.71-7.61; p<0.001) and a greater than 23-fold increased risk of being in the highest tertile of plasma NE (OR 23.15, 95% CI, 5.49-97.67; p<0.001). Adjustment for age, sex, smoking, diabetes, congestive heart failure and depressive symptoms did not significantly change the results. In unadjusted analysis, there was a trend toward increased mortality in TCA users vs. non-users [Hazard ratio (HR) 1.56, 95% CI, 0.92-2.62, p = 0.09]. However, adjustment for the above mentioned covariates attenuated the association (HR 1.45, 95% CI, 0.86-2.45; p=0.17). In summary, we found that TCA use in CHD patients was associated with unfavourable changes in autonomic function. The lack of significant association between TCA use and mortality may be due to the small number of study patients using TCAs.
depression. Schema therapy proposes interventions that aim at altering EMS. In the present study we examined the effect of an integrative psychodynamic therapy without explicit focus on EMS in a sample with major depression. 47 (38 female) patients filled out the Symptom Check List (SCL 90 R) and the Young Schema Questionnaire (YSQ) at the beginning and end of the treatment. Results revealed that EMS were significantly reduced in 3 out of 5 schema domains. Strong endorsement of EMS at the beginning of treatment tended to predict symptom reduction. More importantly, the reduction of symptom distress during treatment was strongly associated with a reduction in EMS of the schema domain Impaired Autonomy/Performance. We discuss that changes in EMS are highly relevant for changes in symptom distress but that EMS can not only be changed by schema therapy but also by other approaches like psychodynamic therapy.

113) Abstract 1005

A HYPOTHESIS-FREE APPROACH TO STUDYING PERSONALITY-MORTALITY ASSOCIATIONS IN THE VIETNAM EXPERIENCE STUDY COHORT

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Personal components such as Conscientiousness are associated with life expectancy. We used a hypothesis-free approach to examine associations between 550 Minnesota Multiphasic Personality Inventory (MMPI) items and longevity in the Vietnam Experience Study cohort. Depending on the analysis, samples included 2022 to 4462 participants followed up for ~15 years. We split the sample into two equal halves. Then, controlling for age and ethnicity, we used proportional hazards (Cox) regressions to test each item’s association with longevity. Eighty-nine items that were significant (p < .01) in both samples were subjected to principal-components analysis, which yielded a Neuroticism/Negative Affect, Somatization, Psychotic/Paranoia, and Antisocial component. Intercorrelations among these components defined a higher-order component that we labeled Personal Disturbance. The components were used in Cox regressions that included potential confounds or mediators (demographics, cognitive ability, health behavior, mental/physical health conditions). Individually, all components were mortality risk factors (ps < .001); hazard ratios (HRs) per standard deviation were 1.55 (Neuroticism/Negative Affect: 95% CI = 1.39, 1.72), 1.66 (Somatization: 95% CI = 1.52, 1.80), 1.44 (Psychotic/Paranoid: 95% CI = 1.32, 1.57), 1.79 (Antisocial: 95% CI = 1.59, 2.01), 1.74 (Personal Disturbance: 95% CI = 1.58, 1.91). Including covariates attenuated associations, though they were still significant (ps < .01). When each lower-order component was entered with Personal Disturbance, Neuroticism/Negative Affect (HR = 0.73; 95% CI = 0.59, 0.92) and Somatization (HR = 1.23; 95% CI = 1.05, 1.44) were significant (ps ≤ .01), though the former was protective. When lower-order components were entered together, Somatization (HR = 1.39; 95% CI = 1.22, 1.58) and Antisocial (HR = 1.36; 95% CI = 1.16, 1.59) were significant (ps < .001). This demonstrated that a hypothesis-free approach identified MMPI-based personality dimensions (Somatization and Personal Disturbance) robustly associated with shorter life. We also show that the effects of other components vary as a function of what other personality predictors are in a model.

114) Abstract 1101

EFFECT OF MBSR AND PSYCHOLOGICAL STATE ON INFLAMMATORY MARKERS IN HIV POSITIVE ADULTS

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Objective: HIV induces a pro-inflammatory response that is linked to increased morbidity and mortality. Stress and depression have been associated with elevated inflammatory markers. We sought to test whether Mindfulness Based Stress Reduction (MBSR) would improve high sensitivity C-reactive protein (hsCRP) and D-dimer in HIV+ adults, and to explore the relationship of psychological stress and mood with these markers.

Methods: We performed a randomized controlled trial of MBSR in HIV+ adults. Measures were obtained at baseline, 3 and 12 months with complete follow-up. Eligibility criteria at enrollment included not being on antiretrovirals and CD4+ T cell count >250 cells/µl. Scales included: Perceived Stress Scale (PSS), Beck Depression Inventory (BDI), Patient Health Questionnaire-9 (PHQ), State Trait Anxiety Inventory (STAI), and Positive and Negative Affect Scale (PANAS+/–).

Results: Of 177 participants, 132 (71 MBSR, 61 control) had complete specimen panels and were eligible for this sub-study. Median baseline CD4+ T-cell count was 459 cells/µl. Most participants were male (97%). MBSR was not associated with differences in hsCRP or D-dimer at 3 or 12 months (p>0.4). hsCRP at baseline was correlated with: PSS (rho 0.22, p=0.01), BDI (rho 0.27, p=0.002), PHQ (rho 0.20, p=0.03), and STAI (rho 0.20, p=0.02). Baseline D-dimer was not significantly correlated with any scale (rho<0.1, p>0.3). No statistically significant correlations existed between change in hsCRP and change in any of the psychological scales over time (rho<0.1, p>0.4). Baseline to 12 months change in D-dimer was correlated with change in: BDI (rho 0.18, p=0.04), STAI (rho 0.22, p=0.01), PANAS+ (rho -0.19, p=0.04).

Conclusions: MBSR was not associated with improvements in hsCRP or D-dimer. Statistically significant correlations between psychological state and hsCRP and D-dimer were in the hypothesized directions, supporting a link between psychological distress and inflammation in the setting of HIV infection. Neither marker showed correlation both at baseline and longitudinally. The longitudinal relationship between D-dimer and psychological states supports the hypothesis that altering these states can influence this biological outcome in HIV.

115) Abstract 776

SYMPTOMS OF DEPRESSION LONGITUDINALLY PREDICT TELOMERE LENGTH, AMONG YOUNGER NOT OLDER ADULTS

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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 cellular ageing. However, although lifetime major depressive disorder is associated with shorter telomeres, less is known about patients’ self-reported depression symptoms. Depression and greater depressive symptomatology are associated with a range of morbidities and mortality, but it is unclear the extent to which they predict markers of healthy ageing. The present study examined participants in the West of Scotland Twenty-07 study across the three age cohorts and five waves of data collection from 1987 to 2009. Participants were aged 37, 57, and 76 years old at the fifth wave. Depressive symptoms were measured using the Hospital Anxiety and Depression Scale at each time point. Telomere length was assessed from blood samples collected at the final wave in 2008-9. Greater depressive symptoms at each time point were associated with shorter telomere length. However, when adjusting for age, there was a significant age cohort x depression interaction; it was only for those in the younger group that greater depressive symptoms were prospectively associated with shorter telomere length. This suggests that depressive symptom reporting in younger groups should be addressed at an early stage to prevent unhealthy cellular ageing.
HYPERCOAGULABILITY, SUBJECTIVE HEALTH, AND PHYSICAL SYMPTOMS: HYPERCOAGULABILITY MANIFESTS IN PHYSICAL SYMPTOMS UNDER THE CONDITION OF ALZHEIMER CAREGIVING STRESS

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Background and Purpose: The chronic stress of caring for a spouse with Alzheimer’s disease can have adverse effects on physical health. Caregivers are at higher risk for physical morbidity and overall mortality, possibly explained by increased hypercoagulability associated with stress. The purpose of this study was to determine if procoagulant fibrin D-dimer was associated with the presence of health symptoms and overall subjective health in older adults. Furthermore, we aimed to examine if caregiver status (caregiver versus non-caregiving control) moderated these relationships.

Methods: One hundred and sixteen elderly Alzheimer caregivers (mean age 74 ± 8 years, 69% female) and fifty-five non-caregiving older adults (mean age 75 ± 6 years, 67% female) participated. Participants indicated the number of 21 health symptoms (e.g., fever, shortness of breath, headache, etc.) they experienced over the past month. They also rated overall subjective health on a scale of 0 = “poor” to 4 = “excellent.” The Pittsburgh Sleep Quality Index and Centers for Epidemiologic Studies-Depression Scale (10-item) was also administered. Fibrin D-dimer concentration was determined in plasma.

Results and Conclusions: Caregivers reported significantly more health symptoms (t = 3.6, p < .001) and poorer subjective health (t = −4.5, p < .001) compared to non-caregivers. Controlling for age, gender, body mass index, sleep quality, depressive symptoms, and number of diagnosed health problems (e.g., hypertension, diabetes, heart failure, etc.), caregiver status significantly moderated the association between D-dimer and number of symptoms (ß = .201, p = .011). Specifically, D-dimer was positively associated with health symptoms in caregivers (ß = .217, p = .022), but not in non-caregivers (ß = −.130, p = .208). Caregiver status did not moderate the association between D-dimer and subjective health; however there were main effects of caregiver status (ß = −.183 p = .009) and D-dimer (ß = −.173, p = .072; marginally significant) on subjective health. In conclusion, our results suggest that D-dimer might have meaningful impact on subjective health independent of relevant covariates. Moreover, previous studies have shown that subjective health is predictive of morbidity and mortality and increased D-dimer might explain some of this link. Notably, higher levels of D-dimer only manifest in physical symptoms in caregivers, not controls, suggesting that chronic stress might play an important role in the phenotypic expression of physical symptoms.

EFFECTIVENESS OF AN ONLINE AFTERCARE PROGRAM

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Purpose: In this study, we take a closer look at the effectiveness of a specific online aftercare program, an intervention designed to help patients maintain/expand on achievements made during rehabilitation. Study design: Patients were randomly assigned to either control (TAU: no aftercare) or intervention group (IG). Within IG, patients were asked to compile a list of 6 goals they wanted to achieve during their first 3 month back home, allocating 2 weeks to focus on the achievement of each goal. These goals were then entered into a web-based portal and after discharge patients were invited (on a bi-weekly basis) to provide feedback on their progress attainment by logging on to the online portal. Over the course of the study all participants were asked to complete 3 sets of questionnaires (admission, discharge, 3-month follow-up) assessing reported symptom severity. The prediction was that the consistent use of the e-health aftercare program would result in a greater reduction in reported symptom severity (such as depression) when compared to the TAU-group. Preliminary results: Up to now, we were able to increase our study sample to 116 participants (IG: N = 65; TAU: N = 57). Between groups, no differences were found with regards to sex, age, education, length of stay, inability to work in the 12 month prior to admission or inability to work at discharge. Equally, no differences were found for depressive symptoms (ADS) at the beginning or end of therapy. But at 3-month follow up, patients using the online aftercare program reported significantly less depressive symptoms (p < 0.05) than did the control group. Thus, our results demonstrate that an e-therapy aftercare intervention can be useful to maintain the effectiveness of psychosomatic rehabilitation.

IMPROVEMENT OF SYMPTOMS, DISTRESS AND QUALITY OF LIFE AFTER A MULTIDISCIPLINARY, MULTIMODAL PSYCHOTHERAPY FOR DEPRESSIVE, ANXIETY, EATING, SOMATOFORM, PERSONALITY AND TRAUMA RELATED DISORDERS

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Patients with severe depression, anxiety, eating, somatization, 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. We assessed the outcomes in terms of symptoms, distress and quality of life for each specific disorder. From 6/2006 until 3/2011 496 patients (mean age 35.4, range 15.1-78.8; 79.6% 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. Symptoms, distress and quality of life were assessed at the beginning and at the end of the treatment with the HADS, IIP, EDI-2 (only patients with eating disorders), SCL-90-R, and SF-36.

Most patients fulfilled the criteria for multiple diagnoses (71.2% a double diagnosis, 30.5% a triple). 39.7% suffered from a depressive disorder as main diagnosis, 9.2% from anxiety disorders, 32.5% from eating disorders, 5.8% from somatization disorders, 5.3% from personality disorders and 6.1% from disorders related to trauma. Overall and for each specific disorder there were significant improvements of the main symptoms such as depression (HADS: p<.05), anxiety (HADS: p<.05), somatization (SCL-90R: p<.05), eating disorder score (EDI-2: p<.05), interpersonal difficulty score (IIP: p<.05), and of distress (GSI of the SCL-90R: p<.05) and quality of life (the physical and mental component summary of the SF-36; p<.05).

The multidisciplinary, multimodal psychotherapeutic treatment achieves a significant improvement as regards symptoms, distress and quality of life.

CLONIDINE TREATMENT OF NIGHTMARES AMONG PATIENTS WITH CO- MORBID PTSD AND TRAUMATIC BRAIN INJURY

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Introduction

In this presentation, we are describing the successful treatment of PTSD associated nightmares in two patients with PTSD.

Case Summaries:

Case 1

A 47-year-old woman presented to the emergency department with a history of PTSD secondary to a motor vehicle accident that occurred 2 years prior. The patient endorsed frequent nightmares, intrusive thoughts, and exaggerated startle response. She was prescribed clonidine 0.1 mg at bedtime, and after 1 week of treatment, her nightmares and intrusive thoughts significantly improved.
Mr. F, a 48 years old man of Bosnian origin developed PTSD symptoms after fighting in the Bosnian war for 15 months. He reported witnessing the loss of his mother, two brothers and a nephew along with friends, neighbors and other relatives. He was treated with venlafaxine XR 225mg po q daily and olanzapine 10mg po q daily without any relieve of his nightmares. He was later started on clonidine 0.1 mg po qhs. Within 2 weeks of starting clonidine, he reported improvement in the severity and duration of his nightmares and improved quality of his sleep.

Case 2
Mr. H is a 33 year old Iraq and Afghanistan wars active military soldier who was involved in several combat scenarios in which several lives were lost. He presented with symptoms of PTSD and TBI including nightmares, flashbacks, and exaggerated startle response as well as avoidant behavior. He was treated with cognitive processing therapy, citalopram 20mg po q daily and clonazepam 1mg po bid pm as well as prazosin 4 mg po qhs for the disturbing nightmares. He was the treated with clonidine 0.1 mg ppo pHS which was gradually titrated up to 0.3mg. The patient’s nightmares symptoms resolved about 2 weeks after initiation of treatment.

Discussion: Clonidine a centrally acting alpha-agonist agent used to treat hypertension stimulates alpha-adrenoceptors in the brain stem. This action results in reduced sympathetic outflow from the central nervous system. We hypothesize that the reason is why clonidine may be more effective in treating nightmares among patients with PTSD when compared with other agents.

Conclusion: Clonidine should be considered as an alternative in the treatment of nightmares among patients with PTSD. However, more controlled clinical studies are needed to determine the specific clinical scenarios where clonidine will be more effective than other agents.

References


120) Abstract 963

RELATIONSHIP BETWEEN BRACHIAL-ANKLE PULSE WAVE VELOCITY AND HEART RATE VARIABILITY IN MAJOR DEPRESSION DISORDER
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Purpose: Depressive symptoms have been identified as risk factors for coronary artery disease (CAD) morbidity and mortality. Recent studies have shown that autonomic dysfunction as well as endothelial dysfunction may play an important role in the mechanism linking depressive disorder to CAD. The purpose of this study is to explore the relationship between autonomic and endothelial functions in depressed patients free of CAD, diabetes mellitus, and other life-threatening conditions. Heart rate variability (HRV) is an index of autonomic response as well as the brachial-ankle pulse wave velocity (baPWV) is an index of endothelial function. Methods: This study included 30 patients with depressive disorder (MDD) (15.38% is male; mean age= 47.9 years old) were enrolled. baPWV was assessed at pre-test. The standard deviation of normal-to-normal beats (SDNN), low frequency (LF) and high frequency (HF) powers, and LF/HF ratios were derived from short-term electrocardiographic recordings by the following sequences: baseline, depressive event recall, recovery, and relaxation. Results: Correlation analysis revealed that the depressive event correlation (r = .56, p < .05) LF during the baseline (r = .57, p < .05), HF during the depressive event recall (r = .57, p < .05), HF during the relaxation (r = .55, p = .05). After controlling the age, body mass index, systolic blood pressure, diastolic blood pressure, heart rate , fasting blood sugar, total cholesterol, triglycerides, and score of Beck Anxiety Inventory, baPWV was negatively correlated with LF during the depressive event recall (r = .96, p < .05). Conclusion: Our preliminary data suggest that autonomic dysregulation during the depressive mood stage may associate with poor endothelial function in MDD patients.

121) Abstract 982

RELATIONSHIPS BETWEEN DEPRESSION, ANXIETY, HEALTH SYMPTOMS AND SEVERAL BIOMARKERS AMONG THOSE WITH AND WITHOUT CORONARY ARTERY DISEASE
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Background: Depression and anxiety are associated with negative health symptoms and the development of several diseases, including diabetes and coronary artery disease (CAD). Potential pathophysiological mechanisms include effects through metabolic, inflammation, and immune dysregulation. Aim: To examine whether depression, anxiety, and health symptoms predicted levels of biomarkers in individuals with and without CAD. Methods: Total cholesterol, LDL cholesterol (LDL-C), HDL cholesterol, C-reactive protein, insulin, homeostatic model assessment (HOMA; marker of insulin resistance), total leukocytes, lymphocytes, and neutrophils were assessed in 118 patients with CAD and 170 individuals without CAD. Depression, anxiety and health symptoms were assessed with the Beck Depression Inventory (BDI-II), the Stait-Trait Anxiety Index (STAI), and the Pennbeaker Inventory of Limbic Linguuidness (PILL), respectively. Adjusting for age and sex, hierarchical linear regression was used to examine whether depression, STAI, and PILL predicted these biomarkers among those with and without CAD. Results: Among those with CAD, PILL was an independent predictor of triglycerides (b = .25, p = .02), insulin (b = .23, p = .04) and HOMA (b = .24, p = .03), whereas BDI-II was an independent predictor of leukocytes (b = .37, p < .001). Among those without CAD, no significant associations emerged. Additionally, STAI had no significant associations. Conclusion: Health symptoms were related to triglycerides, insulin and HOMA in those with CAD but not in those without CAD, suggesting that reporting poorer health symptoms in those with CAD may be due to elevated triglycerides or poor insulin regulation. Depression was related to total leukocytes only in those with CAD, suggesting immune dysregulation as one possible pathway linking depression and CAD.

122) Abstract 1105

MANAGING WRITER’S BLOCK - MEDITATION AS CONTEMPLATIVE INQUIRY
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This exploratory single case study stems from a meditation exercise in contemplative inquiry (CI). The purpose of CI is to deepen understanding of research questions and supervision processes and gain new insights on how to tailor certain problems in the research process. CI consists of relaxation and scanning of body, mind and emotion, setting the mode by focusing on curiosity openness humility, then shifting between focused attention on the topic of inquiry and open awareness- and ending with integration of the contemplation into real life and journaling. The current study aimed at investigating the effects of using a further developed version of CI that aims at utilizing embodied knowledge via performing the meditation in movement, rather than in stillness - in this single case for the purpose of dealing with writer’s block- a common challenge encountered by researchers among others.

Method: A master’s student with writers block was asked to perform body movements reflecting a thesis writing process over time. New embodied knowledge helped the student to continue and develop in the writing process. A video interpretation technique was used to monitor the interpretation of the movement patterns, and texts (that the student
wrote in conjunction with the meditation) were analyzed with a phenomenological method.

Results & Discussion: The results of this research suggest that body movements, when systematically using a "thinking in movement" approach, may be very helpful in a research writing process. Discussions about embodied cognition and embodied mind seems very relevant to the findings.

123) Abstract 989

THE ASSOCIATION BETWEEN PANIC DISORDER, ASTHMA SELF-EFFICACY, AND ASTHMA CONTROL IN ADULT ASTHMIATICS

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BACKGROUND: Panic disorder (PD) has been shown to be one of the most prevalent mental disorders in asthmatics (7-24%). Perceptions of self-efficacy have also been shown to influence the ability to control asthma symptoms in asthmatics. It has been suggested that anxiety and asthma may undermine self-efficacy; though the extent to which PD and self-efficacy interact to influence asthma control remains unknown.

METHODS: A total of 801 patients with physician diagnosed asthma were recruited from the outpatient asthma clinic at Hôpital du Sacré-Cœur de Montréal. Patients underwent a sociodemographic and medical history interview, followed by a brief psychiatric interview (Primary Care Evaluation of Mental Disorders [PRIME-MD]). All completed a battery of questionnaires (Asthma Self-Efficacy Scale [ASES], Asthma Control Questionnaire [ACQ]), and underwent standard spirometry.

RESULTS: General linear model (GLM) analyses adjusting for age, sex and ICS dose revealed a significant association between PD and ASES (β = .34, p < .001) and PD and ACQ (β = .31, p = .027). When associations between PD and ASES and ACQ were examined in the same model, ASES was still associated with ACQ (β = - .008, p < .001) but PD was no longer associated (β = .045, p = .731). GLM analyses also revealed no significant interaction between PD and ASES on ACQ (β = .002, p = .314) after adjustment for covariates.

CONCLUSION: Results indicate that both PD and low asthma self-efficacy are associated with worse asthma control after adjustment for covariates, but that PD is not significantly associated with poor asthma control independently of asthma self-efficacy. These findings suggest that asthma self-efficacy may mediate the association between PD and worse asthma control. Future interventions in asthmatics with PD should consider targeting asthma self-efficacy to improve outcomes.

124) Abstract 1234

COGNITIVE-BEHAVIOR GROUP INTERVENTION IN CORONARY HEART DISEASE PATIENTS AND ITS EFFECT ON AUTONOMIC CONTROL: A CONTROLLED STUDY

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Background & Purpose: The autonomic nervous system (ANS) function plays a role in the progression of coronary artery disease (CAD). The unbalance of ANS can predict the mortality of CAD patients. The purpose of this study is to examine the effect of cognitive – behavior group intervention on autonomic control of patients with CAD.

Method: Thirty-nine CAD patients (average age=58.23, SD=5.89; male =51%) were randomly assigned to two group with blind evaluation. The experimental group (n =19) received CBT group intervention for 8 weeks and the control group (n = 20) continued their normal daily activity. Heart rate variability (HRV) was recorded at baseline and 8 weeks after for all the patients in both groups.

Results & Conclusion: The result of two repeated measure showed that there were significant main effects of Time on low-frequency power density (F=50.396, p=.000) and high-frequency power density (F=104.310, p=.000) indicated that the autonomic nervous system function was changed 8 weeks later even though not accepting psychotherapy; furthermore there were no significant interaction effects on the low-frequency power density (F=.613, p=.0065) and high-frequency power density (F=.517, p=.477). The result of the study indicate that both CBT group intervention and waiting control intervention had effect of changing the autonomic nervous system function.

125) Abstract 926

SOCIAL INTEGRATION AND HEALTH AND WELL-BEING IN CHILDREN AND ADOLESCENTS: A LITERATURE REVIEW

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Social integration (SI), or the degree to which one participates in a wide range of social roles, has repeatedly been found to be associated with adult health and well being. For example, adults who are more socially integrated live longer, are less susceptible to infectious illness. Despite the glut of information in adult populations, little is known about SI and health and well being in children and adolescents. A comprehensive literature review was conducted to answer 2 questions: 1) does SI in children and adolescents show similar relations to health and well being as seen in adults? and 2) are there particular issues that arise from studying SI in this population? A systematic search resulted in 21 articles that met our criteria for measuring SI as based on number of diverse social roles. Of these, 14 were longitudinal and 7 were cross-sectional. None of the studies included children under the age of 9. A majority of the studies (38%) assessed smoking and other risky behaviors. Other outcomes assessed were suicide, depression, violence, and academics. Increased SI was associated with decreased suicides, suicide attempts, suicidal ideations and reports of depression. Children and adolescents who were more socially integrated were less likely to be exposed to violence or be perpetrators of violence against others. High SI youths smoked less and received better grades in school. Issues that arose frequently in the literature included the absence of a uniform and validated SI measure for this population, as well as a lack of research on children under the age of 9. Studies also found differences in the effects of SI by gender, as well as significant impacts of school and home transitions (such as moving to a new town or to a different grade level) on SI and health and well-being. Overall, SI was found to be associated with a number of important outcomes. Future research should include the validation of a child and adolescent specific SI questionnaire that takes into account the importance of gender differences and oft occurring transitions in this specific population.

126) Abstract 931

MARKERS OF VIRUS INFECTION AND SUBSEQUENT DEPRESSION: PROSPECTIVE FINDINGS FROM THE TRACKING ADOLESCENTS' INDIVIDUAL LIVES SURVEY (TRAILS)

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BACKGROUND: Research has linked infectious markers to mental disorders such as schizophrenia, with a possible role for inflammation. Inflammation has also been associated with depression. However, little is known about depression and infectious markers. We therefore set out
to evaluate the cross-sectional and prospective association between markers of virus infection and depression in young adolescents. METHODS: We used data from wave 3 and 4 from the 'Tracking Adolescents' Individual Lives Survey (TRAILS), a Dutch prospective cohort study. Depressive symptoms were assessed using the Youth Self Report (YSR) at wave 3; depression diagnosis was evaluated using CIDI interviews at wave 4. At wave 3, blood was collected to determine the presence of immunoglobulin G (IgG) antibodies in serum to Herpes Simplex Virus 1, Cytomegalovirus, and Epstein Barr Virus. A categorical pathogen burden variable was created to reflect the number of infectious markers present (0= no markers, 1 = 1 markers, 2 = 2 markers, and 3 = 3 markers). RESULTS: A total of 942 healthy adolescents were included (wave 3 age: M=16.18±0.63; wave 4 age: M=18.97±0.55). The mean YSR depression score was 4.00 (SD=3.65, N=711) and 30 adolescents (3.2%) were diagnosed with major or minor depression. Infectious markers were absent in 495 (52.5%) participants while 273 (29.2%) had 1 infectious marker, 140 (14.9%) had 2 infectious markers, and 34 (3.6%) had all 3 infectious markers. Linear regression revealed a non-significant association between pathogen burden and depressive symptoms (β=-0.03, p=0.932). Logistic regression analyses showed no significant association between pathogen burden and subsequent depression diagnosis (OR=1.35, 95%CI: 1.40-43.7, p=0.487). To rule out any masking effects, both analyses were repeated adjusting for demographic and health behavior characteristics. p-values from both analyses did not yield other results. CONCLUSION: We did not find support for an association between markers for infection and depression. This suggests that depression in adolescence is not affected by the presence of infectious agents. However, it could be that the effects of viruses on depression might not come to expression before adulthood.

127) Abstract 715
CITALOPRAM-INDUCED MAJOR DEPRESSION IN A PATIENT WITH PANIC DISORDER: A CASE REPORT
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Citalopram belongs to the class of selective serotonin reuptake inhibitors (SSRIs), designed to powerfully inhibit the reuptake of serotonin and thus leading to a potentiation of serotonergic neurotransmission. Citalopram is effective as antidepressant agent as well as in the treatment of panic disorder. We describe the case of a 31-year-old single female who presented to the Psychosomatic Clinic of the University Hospital Bonn. The patient had no history of mood disorders and had been prescribed citalopram in a dosage of 10 mg for one week followed by an increase of dosage to 20 mg as a medication against panic attacks. At the time of the first interview in our clinic she had taken citalopram for three weeks and she fulfilled DSM-IV criteria for major depression and panic disorder. Case history revealed that she started to suffer from depressive symptoms for the first time in her life two days after the prescription of citalopram 10 mg for panic disorder. Citalopram medication was terminated after 28 days of intake and the patient reported almost immediate recovery from the depressive episode. In conclusion we highlight the importance of adverse side effects in the prescription of SSRIs. We suggest, that the development of depressive symptoms is caused by the activation of presynaptic autoreceptors leading to a decrease of postsynaptic neurotransmission. A mechanism observed in the treatment of panic disorder by SSRIs and often leading to an initial increase of anxiety. In conclusion off-label use of citalopram in panic disorder should be carefully considered and initial dosage should take the potential activation of presynaptic autoreceptors into account.

128) Abstract 868
THE ASSOCIATION BETWEEN TYPE D PERSONALITY AND COAGULATION RATE UNDER INTERPERSONAL CONFLICT STRESS
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Background: Type D personality, the stable tendency to experience negative affectivity (NA) and social inhibition (SI), is associated with poor cardiovascular prognosis and increased mortality. Empirical study showed that blood coagulation was accelerated by acute psychological stress that might contribute to acute coronary syndrome (ACS). Furthermore, hostility trait was associated with higher coagulation response. The purpose of this study is to examine whether Type D personality is associated with hyper-coagulation under interpersonal-conflict stress. Method: Forty-two healthy Taiwanese participants (aged 50.8 ± 8.1 years; 57% female) underwent an interpersonal-conflict task. Type D personality was measured by the Type D personality Scale-14 Taiwanese version. 13 out of 42 participants were assessed as Type D personality with cut point g10 for both NA and SI. Blood coagulation parameter, prothrombin time (PT), was obtained three times (the end of 35-min resting baseline, immediately after a 5-min interpersonal-conflict task, and the end of 45-min recovery period). We used international normalized ratio (INR), which was converted from PT as a coagulation indicator. Results: The result of one-way ANOVA showed that participants had significantly smaller INR at the end of task (F =1.003 ± 0.041) compared to baseline (p = 0.047) (1.015 ± .0049) (F =12.53, p < 0.001), and validated the experiment operation. The result of two-way ANOVA showed there were no significant differences in INR between Type D and non-Type D group during the three stages. However, NA group had significantly smaller INR than non-NA group (F =4.609 p < .05). There was no significant difference between SI and non-SI groups. Moreover, after adjustment with age and gender, NA group showed marginally significantly smaller INR than that of non-NA group (F = 3.878, p = .056). Conclusion: The result of this study failed to support that Type D personality is associated with coagulation response. However, its individual dimension, NA is associated with shorter coagulation time. We inferred that NA might contribute to risk of cardiovascular event through higher coagulation response.

129) Abstract 960
DIURNAL RHYTHMICITY IN EXERCISE INDUCED INFLAMMATORY CYTOKINE PROFILES; IMPLICATIONS FOR THE ETIOLOGY OF OSTEOARTHRITIS
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Immune activity follows a circadian rhythm. Inflammatory T cell type 1 activity characterizes night time sleep with a switch to a T cell type 2 anti-inflammatory cytokine profile following morning awakening and day time physical activity. Osteoarthritis is the most common form of arthritis with cartilage metabolism being sensitive to cytokine signaling. IL-1β and other pro-inflammatory cytokines’ influence cartilage metabolism, thus influencing cartilage homeostasis. Given that cartilage matrix composition is known to alter diurnally, specifically in terms of osmolarity we examined the effect of high impact exercise on the diurnal expression of pro and anti-inflammatory cytokines. In a within-subject balanced cross over design, 14 healthy male participants (age 20-39) underwent a 30 min. treadmill exercise routine at an intensity of 60% VO2 Max, experimental condition being time of day: 8:00am as opposed to 6:00pm. Subjects underwent BODPOD analysis and lower limb anthropometric measurements to standardize factors previously shown to effect joint force magnitude, including thigh circumference, body mass and percentage body fat. Venous blood samples for cytokine measurement (by commercial ELISA) were taken at rest and 0, 2 and 4 hours post exercise. The pro-inflammatory cytokines IL-1β and MCP-1 relative concentration increased post exercise for both day
time conditions peaking immediately post exercise. Morning exercise could be significantly distinguished from evening exercise for both proinflammatory cytokines. Percentage peak increase for IL-10 was: am 20.7% and pm 9.01%. For MCP-1, equivalent increase immediately post exercise was 25.7% and 9.01%. There was a moderate and delayed post exercise response for the anti-inflammatory cytokine IL-10, peaking at 2 hours post exercise - am 8.97%, pm 10.08% that was not distinguished by time of day. These data inform the advisability of evening as opposed to morning impact exercise in terms of cumulative osteoarthritic risk.

130) Abstract 866

THE ASSOCIATION OF PARASYMPATHETIC WITHDRAWAL AFTER STRESS AND CARDIOVASCULAR DISEASE IN SUPPRESSED HOSTILITY BEHAVIOR
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Many studies have indicated that hostility is associated with poor prognosis in patients with cardiovascular disease (CVD), and increases the risk of CVD in the healthy population. Moreover, longer parasympathetic recovery after stress may predict higher risk of CVD both in patients and healthy population. The aim of this study is to investigate the association between hostility and parasympathetic withdrawal after stress. Fifty-one (age 51.4 ± 8.08, female 49%) healthy adults were recruited. Hostility was assessed by Chinese Hostility Inventory-short form, which included four dimensions: hostility cognition, hostility affect, expressed hostility behavior and suppressed hostility behavior. Heart rate variability (HRV) was recorded during baseline (5 minutes), interpersonal task (5 minutes), recovery 1 (25 minutes) and 2 (20 minutes) stage. HRV was performed Fast Fourier Transformation (FFT) into power density signal. The indicator of parasympathetic activity was provided from the power density of high frequency (HF). Parasympathetic withdrawal percentage is calculated by subtracting HF of recovery stage from that of baseline stage, and then divided by that of baseline stage. The result showed that participants had significantly lower HF at the stress stage comparing to baseline, recovery stage 1 and 2 (F = 21.184, p < .000), which validated the experiment operation. The results of partial correlation, by controlling age and gender, showed that hostility total score was positively associated with parasympathetic withdrawal percentage during recovery stage 2 (r = .346, p < .05). Furthermore, suppressed hostility was positively correlated with parasympathetic withdrawal percentage during recovery stage 1 (r = .268, p < .07) and 2 (r = .353, p < .05) among the four hostility dimensions. This study indicates (a) higher hostility is associated with more parasympathetic withdrawal even after 45 minutes following stress, (b) especially in the suppressed hostility out of the four dimensions. Sustained stress response from parasympathetic withdrawal might be one of the pathways influence cardiac autonomic system in high hostility, especially suppressed hostility. We infer that parasympathetic withdrawal might come from rumination after stress in individuals with high suppressed hostility, and frequent parasympathetic withdrawal might then lead to low parasympathetic activity in daily life, which may increase the risk of CVD.

131) Abstract 1025

BODY ESTEEM PREDICTS CORTISOL STRESS RESPONSES, INDEPENDENT OF BMI AND STATE SHAME
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The Social Self Preservation Theory posits that situations that threaten the ‘social self’ elicit shame, and this emotion activates the HPA axis resulting in a cortisol stress response. Body esteem, a measure of how one views one’s own body, may be one predictor of the propensity to respond with shame to stress. The present study thus aimed at assessing whether body esteem is associated with cortisol stress responses and, further, whether this association was mediated by state shame.

To test these hypotheses, 44 participants (21F, 21±2yrs.) were exposed to the Trier Social Stress Test (TSST). Salivary cortisol was assessed at baseline and +1, +10, +30, +50min and a maximum increase index was computed. Body esteem was assessed with the Body Esteem Scale (BES), and state shame with the State Shame and Guilt Scale.

Overall, the TSST was successful in eliciting cortisol stress responses (F=6.85, p=.001) and maximum cortisol increases did not differ by gender (t=1.96, p=.05). Hierarchical regression analysis controlling for BMI revealed a gender-by-BES interaction effect such that females with low body esteem responded less strongly to the stressful event than body esteem, while the opposite was true for males (beta=.44, p=.047). In addition, BES scores significantly predicted shame responses to the TSST independent of gender (beta=.44, p=.002). Interestingly, state shame itself was not correlated with cortisol stress responses (beta=.05, p=.77) and controlling for state shame in the above regression did not affect the gender-dependent BES effect on cortisol stress response (beta=.45, p=.05).

Together, these findings suggest that how one feels about one’s physical appearance, independent of the actual physical appearance itself (BMI), is associated with cortisol stress responses in a gender-dependent manner. Interestingly, though BES and state shame were shown to be correlated, body esteem had unique predictive power that was not accounted for by state shame. Lastly, our findings suggest that potential negative health effects of low body esteem may come about through different stress-related mechanisms for males and females.

132) Abstract 902

CARDIAC AUTONOMIC REGULATION AND CORTISOL PROFILES DURING 48-HOUR ZERO-CALORIE FASTING
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Background: Today fasting is widely used for weight loss, but often inadequate or opposite results reveal that the physiology of fasting and dieting remains poorly understood. Methods: 16 young healthy female volunteers (21.4 ± 2.1 years, BMI 21.6 ± 1.6) underwent a 3-day zero-calorie diet under 24-h medical surveillance at a metabolic unit. Polysomniological (PHQ, EDI, FEV, subjective feeling of hunger) as well as physiological data (heart rate variability (HRV) analysis during resting conditions and head-up tilt test, diurnal saliva cortisol profiles) were measured upon admission, and after 24- and 48-hours of fasting. Results: We observed a consecutive weight loss from Day 1 to Day 3 that resulted in significant body mass index (BMI) reduction across all subjects (p<.0001). Slope of the cortisol day profile revealed significant shift towards lower values from baseline to the end of experiment (p=0.02) (Figure). Resting standard deviation of the normal-to-normal (NN) intervals (SDNN) and root mean square successive difference (RMSSD) showed significant (p<.001) decrease from admission compared to the Day 3 of the experiment with a mild increase after 24 hours that did not reach statistical significance. 48 hours of fasting also induced a significant (p<.001) decrease of mean IBI, SDNN, RMSSD and LFnu power during the experiment, but the values did not reach statistical significance compared to baseline.
the correction for multiple comparisons. Summary: Short term (48 hours) zero-calorie fasting induced parasympathetic withdrawal with simultaneous sympathetic activation and shift in daily cortisol profile. These changes are similar to those obtained under other types of stress-conditions and further studies need to find out how specific they are for fasting.

133) Abstract 921

OPTIMISM AND STRESS: HOW CULTIVATING A POSITIVE VIEW ON THE FUTURE CAN LEAD TOWARDS REDUCED BASAL CORTISOL LEVELS AND A MORE ADAPTIVE CORTISOL RESPONSE IN A SOCIAL STRESS TASK.

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METHODS: In 460 Belgian children (5-10 years old), 5-minute HRV measurements in supine position were undertaken for stress research with Polar chest belts and were manually edited. Raw data was processed with both time- and frequency-domain. Age, time of recording, body composition (body mass index, fat percentage, fat mass, fat free mass and waist-to-height ratio), physical fitness (cardiopulmonary fitness and upper and lower limb muscular fitness) and overall physical activity (accelerometry) were analysed as determinants with correlation and multiple regression stratified by sex.

RESULTS: Mean heart rate was higher in girls, while mean R-R interval, its standard deviation (SDNN), the root mean square of successive differences (RMSSD), low and high frequency power were higher in boys. Mean heart rate showed high correlations with all HRV parameters. In both boys and girls, age was an important determinant for most HRV parameters, although more explicit in girls. Time of recording had only minimal influence and only in boys. In boys, most physical fitness parameters and also physical activity were positive determinants for some parameters, while adiposity markers could barely serve as determinant. In girls, determinants were predominantly seen in the adiposity markers with lower HRV in less favourable body composition. Fat free mass had the largest effect of the adiposity parameters, while 40min sprint time had the largest effect of all physical fitness parameters.

CONCLUSIONS: Sex differences in HRV were already obvious in this young population. Age was a very important determinant in both sexes, while also physical fitness in boys and to a lesser extent fat free mass in girls could determine HRV. In next analyses, the correlation with stress questionnaires will be examined.

135) Abstract 824

TYPE D PERSONALITY IS ASSOCIATED WITH POOR PATIENT PERCEIVED HEALTH IN NON-OBSTRUCTIVE CORONARY ARTERY DISEASE: BASELINE FINDINGS FROM ‘TWIST’ THE TWEESTEDEN MILD STENOSIS COHORT STUDY

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Purpose: To examine whether Type D –distressed- personality is independently associated with patient reported health outcomes such as chest pain, general distress (depressive symptoms, anxiety, fatigue) and general health status, in patients with non-significant coronary artery disease (CAD). Psychosocial factors, including Type D personality, are acknowledged as risk factors for established CAD. However, the significance of these factors for patients with non-obstructive coronary abnormalities is currently unknown. Chest pain has been associated with worse patient perceived health status, but little is known about determinants of patient perceived health status in patients with mild coronary stenosis.

Methods: In total 273 patients (mean age 62 years, SD=10, 49% male) participated in the ‘TWisteden mild SteNosis’ (TWiST) study; a prospective, observational, single-center cohort study. Patients with angiographically confirmed mild coronary stenosis, or a positive calcium score according to computed tomography, but without signs of severe stenosis, were included. Invasive treatment, history of cardiac events, severe psychiatric or life-threatening illness were exclusion factors. Type D personality, disease specific health status (Seattle Angina Questionnaire), emotional distress (Hospital Anxiety and Depression Scale) and generic health status (physical and mental scale of the Short Form 12) were measured at inclusion, and sociodemographic and clinical variables were retrieved.

Results: Patients with Type D personality (30%) had an increased prevalence of chest pain (57%:40%, χ²(1,273) = 6.9, p=.009), and more often used anti-anginal medication (25%:13%, χ²(1,270) = 4.4, p=.037). When adjusted for confounders age, gender, smoking, activity level and varied diet, Type D personality as significantly associated
with patient reported chest pain, angina stability, physical limitations, disease perception, treatment satisfaction, depression, anxiety, fatigue, physical and mental health status, but not with angina frequency. Conclusion: Type D personality was significantly associated with poor patient perceived symptoms in patients with mild coronary abnormalities, which can be hypothesized to be detrimental in the long run. Healthcare workers should be aware of the importance of personality factors in patients with presumed chest pain.

136) Abstract 742

COMPARING HEALTH, WELL-BEING, AND LONGEVITY OUTCOMES
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Although health is known to predict longevity, and health is correlated with subjective well-being, and subjective well-being is associated with longevity, the causal links are not well understood, and are often misinterpreted. This study examined the associations among psychologist-assessed mental health, self-reported health and well-being, health behaviors, diseases, and longevity across five decades in the archival Terman Life-cycle Study (N=1528) by creating and validating measures of the relevant concepts. We collected death certificates to assess longevity. Survival analyses and linear regressions measured associations. Results showed that mental health predicted health and longevity, especially if healthy behaviors were involved; subjective well-being was not by itself directly predictive of longevity, but was associated with having better health at earlier ages. Additionally, when long term patterns of healthy or unhealthy trajectories. To reach the ultimate goal of promoting health and long life, multi-method longitudinal studies of these matters are needed.

137) Abstract 1015

COUNTERFACTUAL THINKING AND QUALITY OF LIFE FOLLOWING RADICAL PROSTATECTOMY
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Counterfactual thinking (CFT) refers to the ability to imagine alternatives to an actual occurrence. Research indicates that this type of “what if” thinking is most likely to occur in response to negative and unexpected situations and may impair an individual’s ability to cope, leading to feelings of regret or guilt. Though this has important implications for coping with an illness or unexpected outcomes after a medical procedure, there is little research on the effects of CFT in medical populations. This study examined the associations of CFT and distress (BSI-Global Severity Index), QOL (SF-36 Physical (PCS) and Mental Component Scales (MCS)) and Prostate Cancer Quality of Life (PCQL which assesses sexual, urinary, and bowel problems) in a sample of 81 men (mean age=61, SD=6.6) who underwent radical prostatectomy (RP) for prostate cancer. Assessments were conducted before and 1 year after RP and analyses control for age, ethnicity, education, baseline PSA, stage of cancer, type of RP surgery (node negative, node positive, nerve sparing, or nerve graft), and baseline QOL and PCQL scores. Multiple regression analyses indicated a positive association of sexual (β=0.41, p<0.001) and urinary (β=0.46, p<0.001) problems with CFT and a negative association of sexual (β=3.34, p<0.001) and urinary (β=3.34, p<0.001) problems with MCS scores. Interestingly, neither sexual nor urinary function was associated with BSI scores (p>0.58), but CFT was associated with both measures of mental health (BSI: β=0.23, p<0.001; MCS: β=0.36, p<0.01). Additionally, when Adjusted for CFT, sexual, and urinary problems were entered into the model, the association between MCS and sexual (β=28, p<0.01) and urinary (β=.19, p<0.05) problems decreased. Importantly, even when controlling for sexual and urinary problems, CFT remained associated with MCS scores (β=.28, p<0.01). These findings suggest CFT partially mediates the effects of urinary and sexual outcomes on mental health, indicating that CFT may be an important and modifiable post-surgical adjustment. Targeting CFT through cognitively based interventions may improve adjustment and QOL for clinically ill populations.

138) Abstract 1165

ANGER RELATED TRAITS ARE ASSOCIATED WITH POLYMORPHISMS IN THE SEROTONIN RECEPTOR 2A (HTR2A) GENE IN WOMEN
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Anger and aggressiveness are known risk factors for heart disease. Anger-related traits and serotonergic activity are partly heritable and correlate inversely. We tested the association between serotonin receptor 2A (HTR2A) gene haplotypes and anger-related traits in 770 individuals (38% male; 45-74 years in age) of European ancestry who participated in the University of Pittsburgh HeartSCORE study were included. Six polymorphisms in HTR2A (rs3125 (3’UTR), rs6314 (exon 3, His452Tyr), intron snps rs9534493, rs956133, rs1928387 and rs6306 (promoter)) were genotyped. SNPs were chosen based on prior research. Associations with anger related traits or two SNPs. Haplotypes were estimated using PHASE and tested for association with self-reported anger (measured using the Cook Medley Hostility Scale (Ho)), after adjusting for age, gender, education, income and use of antidepressant, anti-anxiety and psychotropic medications. We first used MANOVA models with the three Ho subscales – aggressive responding, cynical hostility and hostile attitudes as outcome, present/absence of each haplotype as predictor and all the above covariates. Next each subscale was tested separately, with the same predictor variables and covariates in ANOVA models. Since Ho subscale scores were significantly different between men and women for cynicism and aggressive responding subscales, all analyses were repeated in males and females separately. All snps conformed to Hardy Weinberg equilibrium in the total sample and separately, in each gender. Four haplotypes (Hap1-Hap4) occurred in >5% frequency and were analyzed. In MANOVA models, Ho was associated with one haplotype (Hap4: Wilk’s L=0.988, F=2.744, df3, 687, P=0.042). In ANOVA models the Ho-Aggressive responding subscale (Ho-Agg) associated with Hap1 (F=5.73, df1, P=0.017) and Hap4 (F=7.47, df1, P=0.006). Covariate adjusted mean Ho-Agg scores were lower in individuals carrying Hap1 (P<0.017) and higher in those carrying Hap4 (P<0.006). In gender specific analyses no associations were significant in males. In MANOVA models in females, Ho was associated with Hap4 (Wilk’s L=0.974, F=2.74, df3, 417, P=0.013). In ANOVA models the Ho-Agg scores were associated with presence of Hap1 (F=5.41, df1, P=0.021) and Hap4 (F=9.96, df1, P=0.002) with covariate adjusted Ho-Agg scores higher in Hap1 carriers (P=0.021) and lower in Hap4 carriers (P=0.001). These novel findings support the hypothesis that variations in the HTR2A gene may modify anger and aggression related phenotypes, especially in women. This novel finding warrants further investigation and replication in other cohorts.

139) Abstract 1185

EXISTENTIAL FULFILLMENT BUFFERS CORTISOL IN PATIENTS WITH MODERATE DEPRESSION
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Purpose of study: Concepts like sense of coherence (SOC), optimism, meaning and religion/spirituality may improve health outcomes and buffer stress responses. We wondered whether existential fulfillment, a central concept in existential analytical psychotherapy, could modify cortisol excretion/response in depressed inpatients. Subject sample and statement of method: We investigated 40 inpatients with moderate depression by assessing existential fulfillment (Existence Scale, Orgler/ Langle) and cortisol profiles over the day. The saliva samples were collected directly after awakening, 30/60 minutes thereafter and at 9 am as well as at 3 pm and 8 pm. Summary of results: Existential fulfillment (EF-score) showed a significant inverse association with total cortisol production (area
under the curve, AUC), with cortisol awakening rise/response (CAR) and with cortisol levels 60 minutes after awakening (Cort-60). Results (see table 1) are in line with the stress buffering hypothesis. Keywords: existential fulfillment, cortisol secretion, depression, stress buffering

| Table 1. Shows correlations between measures of existential fulfillment and parameters of cortisol. AUC = area under the curve (total cortisol secretion); CAR = cortisol awakening rise/response = Cort-30 - Cort-0; Cort-0 = cortisol at awakening; Cort-30 = cortisol 30 minutes after awakening, Cort-60 = cortisol 60 minutes after awakening. SD = self-distance; ST = self-transcendence; F = freedom; R = responsibility; P-Factor = sum of SD + ST; E-Factor = sum of F + R; EF-Score = existential fulfillment = sum of P-Factor + E-Factor. |
|-----------------|------|------|------|------|------|------|------|
|                | SD   | ST   | F    | R    | P-Factor | E-Factor | EF-Score |
| AU C           | 0.381 | -    | 0.342 | 0.015 | 0.031    | 0.288    | 0.161     | 0.383     | 0.230     | 0.154     | 0.045     | 0.319     |
| CA R           | 0.343 | -    | 0.405 | 0.030 | 0.010    | 0.292    | 0.167     | 0.416     | 0.364     | 0.144     | 0.008     | 0.414     |
| Cort-0         | 0.018 | -    | 0.087 | 0.013 | 0.873    | 0.090    | 0.158     | 0.013     | 0.088     | 0.590     | 0.248     | 0.058     |
| Cort-30        | 0.331 | -    | 0.354 | 0.037 | 0.025    | 0.383    | 0.150     | 0.315     | 0.375     | 0.092     | 0.027     | 0.339     |
| Cort-60        | 0.441 | -    | 0.484 | 0.004 | 0.002    | 0.304    | 0.148     | 0.506     | 0.230     | 0.153     | 0.016     | 0.379     |

140) Abstract 1220

SHARED NEURAL MECHANISMS FOR PROCESSING PHYSICAL AND SOCIAL WARMTH
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Many of our closest bonds grow out of socially warm exchanges and the warm feelings that stem from being connected with another. Indeed, temperature-related language is often used to describe positive social exchanges (i.e. “warm moment,” “warmhearted”). This linguistic overlap may be paralleled in the body such that social attachments are built upon temperature regulation systems (Panksepp, 1998). That is, physical and social warmth may increase bonds and buffer against negative health outcomes via shared mechanisms. For example, maternal bonds, such as those studied by Harry Harlow, rely on both the physical and social warmth of the mother. Infant macaques preferred to huddle near a warm, cloth mother, and also developed normally with this mother as opposed to a wire mother. Similarly, in humans, maternal warmth in early life can buffer against the negative impact of stress in adulthood (Chen et al., 2011). However, the neural bases of social warmth and potential overlap with physical warmth has not been examined. To test this hypothesis, participants read either socially warm messages (e.g., “I love you for being so thoughtful”) or neutral messages from friends and family (“You have black hair”) while in a fMRI scanner. In a separate run, warm or neutral, room temperature objects were held. After the scan, participants rated how connected they felt during each condition (1-7 scale from “not at all” to “very”). As expected, participants felt more connected after reading the socially warm (M=5.84, SD=9.4) than neutral messages (M=3.49, SD=1.00, p<.001) and interestingly, more connected when holding the warm (M=2.54, SD=1.20) than neutral object (M=1.67, SD=1.23, p=.01). A conjunction analysis, which examines overlapping activations between conditions, of social (social warmth-neutral statements) and physical warmth (warm-neutral object) revealed activations in the ventral striatum and insula, regions associated with processing affectively pleasant or rewarding stimuli. Taken together, these results suggest a common neural mechanism by which physical and social warmth are pleasing and sheds light on one way by which these types of positive exchanges may enhance well-being.

141) Abstract 747

PRE-ClinICAL BURNOUT SYMPTOMS AMONG HEALTHY WORKERS AND STUDENTS ARE CONSISTENTLY ASSOCIATED WITH INCREASED ALLOSTATIC LOAD AND DECREASED MORNING CORTISOL LEVELS
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Chronic stress causes cortisol to strain many biological systems in a measurable process called allostatic load (AL). Using a clinical AL algorithm, we investigated whether burnout could be distinguished from depression that shares similar symptoms but a different biological signature. Concordantly, higher AL was hypothesized to be associated with increased chronic stress, burnout symptoms, and hypocortisolism. These associations were then tested via shared mechanisms. For instance, cortisol diurnal cortisol levels. Study 1 included fifteen neuroendocrine, immune, metabolic, and cardiovascular biomarkers from 30 healthy workers. Study 2 included twenty biomarkers collected from 86 young adults working and/or studying. Biomarker values were transformed into an AL algorithm based on clinical norms and grouped. Diurnal cortisol was measured at five time points (awakening, 30 minutes after awakening, 2:00PM, 4:00PM, and before bedtime) over two days. We also administered questionnaires on chronic stress, burnout, and depression. Results from Study 1 and Study 2 collectively demonstrate that increased AL is associated with increased chronic stress and burnout symptoms. The High AL group demonstrated lower morning cortisol levels compared to the Low AL group (Study 1) and compared to a Medium AL group (Study 2). These findings provide support for the validity of a clinical AL index that is sensitive to physiological recalibrations intermently observed in burnout research. If burnout is indeed characterized by hypocortisolism, then commonly prescribed anti-depressant treatment could be deleterious, as they decrease cortisol. The incorporation of AL algorithms tailored for clinicians and the use of salivary cortisol sampling might prove beneficial in informing refined diagnosis, treatment, and preventative strategies.

142) Abstract 1216

PTSD IS ASSOCIATED WITH NON-ADHERENCE TO MEDICATIONS IN SURVIVORS OF STROKES AND TIA
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Background: There is growing recognition that post-traumatic stress disorder (PTSD) can be triggered by acute medical events such as strokes or transient ischemic attacks (TIAs). Little is known regarding how PTSD might affect patients’ adherence to health behaviors that are important to secondary prevention. We hypothesized that the presence of PTSD after stroke or TIA would be associated with non-adherence to medications even after accounting for depression and other confounders.

Methods: We surveyed 409 participants who were being recruited into a stroke prevention intervention targeted at stroke and TIA survivors in underserved communities in New York City. Participants were eligible if they were at least 40 years old and had at least one stroke or TIA in the previous 5 years. Medication adherence was measured using the 8-item Morisky scale; participants were considered non-adherent if Morisky score was 0-5 and adherent if Morisky score was 6-8. PTSD was assessed at enrollment using the 17-item PTSD Checklist-Specific for stroke (PCL-S); PCL-S score ≥50 is highly specific for PTSD diagnosis and a score ≥25 is commonly used as a PTSD screening cutpoint. Logistic regression was used to test whether stroke/TIA

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related-PTSD was associated with increased risk of medication non-adherence. PTSD symptoms were categorized as few (PCL-S <25), moderate (PCL-S 25-50), and severe (PCL-S ≥50). Covariates for adjusted analyses included age, gender, race, ethnicity, income, stroke disability (modified Rankin score), Charlson comorbidity index, and depressive symptoms (Patient Health Questionnaire-8).

Results: The mean age of participants was 64 years, 62% were women, 44% Black; 39% Hispanic; 29% never completed high school, and 56% earned less than $15,000/year. 16% had severe PTSD symptoms, 50% had moderate symptoms, and 34% had few PTSD symptoms. 48% were non-adherent according to Morisky score. PTSD symptom severity was associated with non-adherence, chi-square p<0.001 (Figure). In the adjusted regression model, there appeared to be a dose-response relationship between increasing PTSD symptom severity and increased odds of non-adherence to medications. As compared to those with PCL-S<25, those with PCL-S 25-50 had 2.0 odds of poor adherence (p=0.03), and those with PCL-S ≥50 had 3.9 the odds of poor adherence (p=0.007). No other predictors, including depression, were significantly associated with non-adherence in the model.

Conclusion: PTSD is common among stroke/TIA survivors and represents a novel psychosocial risk factor for non-adherence to medications in post-stroke/TIA patients. Clinicians should consider screening post-stroke patients for PTSD and should carefully assess for adherence problems among those with elevated PTSD symptoms.

143) Abstract 943

EMOTION REGULATION AND DISTRESS IN LATINA BREAST CANCER PATIENTS
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Background: Coping processes directed toward the management of emotions predict psychological and physical health-related adjustment in individuals with cancer. However, few studies have examined how the relationship between situational coping and dispositional emotional tendencies affects outcomes The aim of the current analysis was to examine the adaptive utility of coping through emotional approach within the context of dispositional emotional expressivity. Emotional approach coping is comprised of two primary components: emotional processing (the deliberate attempt to acknowledge, understand and explore one’s emotions) and emotional expression (the deliberate attempt to verbally or non-verbally communicate one’s emotions).

Dispositional emotional expressivity is comprised of the enduring intensity with which one experiences his/her emotions (i.e. affect intensity) and the extent to which one typically verbally and/or non-verbally expresses his/her negative and positive emotions.

Method: As part of a larger, ongoing project on adjustment and quality of life in Latina breast cancer patients, a sample of women (n = 25) receiving treatment at a UCLA satellite hospital completed standardized assessments via interview format at two time points: within 18 months of diagnosis (Time 1) and three months after the initial assessment (Time 2).

Results: Most women reported a household income of $20,000 or less (78%), did not graduate from high school (54%), and primarily spoke Spanish (85%). Coping through emotional approach predicted improved adjustment over time on measures of depressive symptoms and intrusive thoughts related to breast cancer. In addition, dispositional emotional expressivity moderated the effect of emotional approach coping. At high levels of dispositional emotional expressivity, patients with low cancer-related emotion expression evidenced a significant decline in depressive symptoms, relative to women with low dispositional emotional expressivity (p = .03). Furthermore, at high levels of dispositional emotional expressivity, patients with low cancer-related emotional processing evidenced a significant decline in intrusive thoughts related to breast cancer relative to women with low dispositional emotional expressivity (p = .05).

Conclusion: The present study examined a highly understudied, socioeconomically disadvantaged sample of Latina breast cancer patients. These findings, if replicated in a larger sample, reveal the overall adaptive utility of emotional approach coping and the benefit of experiencing and expressing emotions broadly in the absence of cancer-related emotion processing and expression.

144) Abstract 762

SCREENING PROPERTIES OF THE BECK DEPRESSION INVENTORY-II IN PATIENTS WITH ASTHMA
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Background: The Beck Depression Inventory-II (i.e., BDI-II) is largely used for detecting clinical levels of depression in patient populations. However, no studies have yet investigated the appropriate cut-off score for diagnosing major depressive disorder (MDD) in a population of adults with asthma. Considering the potential confounding effects of overlapping somatic symptoms, the present study aimed to determine the appropriate cut-off score of the BDI-II in a sample of tertiary care asthmatic patients. Methods: A total sample of 668 adult asthma patients (mean age 49 years, 61% women) completed the BDI-II and underwent the PRIME-MD – a standardized, structured, psychiatric interview, which was used as the “comparison standard” for determining diagnoses of MDD. A receiver operating characteristics (ROC) curve was created to represent the relationship between sensitivity and 1-specificity ratios as a function of various cut-off levels. Optimum cut-off was determined as the point with (i) the highest sum of sensitivity and specificity and (ii) the lowest difference between both. The possible sex difference in the sensitivity and specificity of various cut-off scores was also verified. Results: According to PRIME-MD diagnostic criteria, MDD was present in 84 patients (13% of the cohort). For the total sample, the curve was substantially above the random ROC (Area Under the Curve=926; 95%-CI, .899 to .952) and the optimal cut-off score was 13. This cut-off point provided a sensitivity of 86% and a specificity of 84%. Furthermore, a slight sex difference was found in the sensitivity/specificity rates. While in the women, the optimal cut-off score was 14 (sensitivity, 82%; specificity, 83%), the optimal score was 13 in men (sensitivity, 88%; specificity, 89%). Conclusions: The present study demonstrates that BDI-II is a good screening instrument for depression in tertiary care asthmatic patients. Both respiratory disease and sex affect the classification accuracy of the original recommended cut-off score. Scholars and clinicians should be aware of the principle that a screening score established in one population may not be relevant to another.

145) Abstract 1186

CLINICAL TRIALS OF BIOFEEDBACK TREATMENT FOR NEUROPSYCHIATRIC CONDITIONS
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146) Abstract 893

VARIATIONS IN SALIVARY secreted HORMONES AND IMMUNE SUBSTANCES OF MALE UNIVERSITY STUDENTS DURING THEIR FINAL EXAMINATIONS

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A longitudinal prospective study investigating an impact on the immune-endocrine system of male university students who were engaged in their graduation examination was conducted by assessing their salivary secreted hormones and immune substances. Recent developments in molecular analysis techniques have enabled scientists to assess tiny amount of biochemical substances in saliva. It has been revealed that some hormones and immune substances secreted by saliva elevate its level against various acute stressors, such as a mental arithmetic task, vigilance task, and oral presentation. Therefore these hormones and immune substances can be considered as possible biomarkers for mental stress levels. However, studies investigating the association of chronic stress with these salivary secreted biomarkers frequently showed inconsistent results. Such a discrepancy might attribute to the difficulty of the nature of a chronic stress study, i.e. controlling a variety of background factors, duration, and strength of the chronic stresses. We then focused on male university students who were engaged in their graduation examination. The graduation examination of the participants in this study consists of a vital oral defense at the end, followed by a six months of preparation period. Thus the duration or at least the end point of the chronic stress caused by the oral defense would coincide among all participants, were forty six male university final-year students who were engaged in their graduation examination (target) and 23 male university students in their second or third grade (control). With regard to biomarkers, salivary secretory Immunoglobulin A (IgA), cortisol, chromogranin A (CgA), dehydroepiandrosterone (DHEA), DHEA-sulfate (DHEA-S), testosterone (TE), alpha-amylose (AMY) were assessed at seven distinct points in time series: about three months, two months, a month, two weeks, and a week before the oral defense, and a week and two weeks after the oral defense. As a developing result, during the whole period of observation IgA, CgA, DHEA, and DHEA-S were significantly higher in the target group than the control (p<0.01), whilst TE and AMY were significantly lower in the target group (p<0.01), and there was no significant difference in cortisol. In conclusion, the difference in the impact of chronic stress on the immune-endocrine system was illustrated in this study. The variations observed in biomarkers might imply the difference in physiological reaction mechanism against chronic stress.

147) Abstract 1187

DON'T LOOK BACK IN ANGER: STRESS-RELATED THINKING PREDICTS THE CORTISOL A WAKENING RESPONSE AND SOMATIC SYMPTOMS

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Objective: Perseverative cognition (i.e., worry, stress-related thinking) may prolong stress-related physiological activation, however, its role within the context of the written emotional disclosure paradigm has not been examined. This study explored: 1) the efficacy of two expressive writing interventions and; 2) the effects of stress-related thinking on the cortisol awakening response and upper respiratory infection symptoms. Methods: Participants were randomly assigned to write about their most stressful life experience (n=39) or positive life experiences (n=42) or plans for the day (n=41) for 20 minutes on 3 consecutive days. Results: Results showed that the writing interventions had no beneficial effects on any of the outcome measures. However, a significant interaction was found between event-related thought and condition on the cortisol awakening response at 1 month follow-up and URI symptoms at 6 months. Among participants who wrote about stressful/trumatic events, higher stress-related thinking during the study predicted increased cortisol levels and URI symptoms compared to participants who reported low stress-related thinking. Discussion: These findings are consistent with Brosschot, Geria and Thayer’s (2006) perseverative cognition hypothesis and highlight the importance of ruminative thinking in understanding stress-health processes.

148) Abstract 815

UNDERSTANDING ALEXITHYMIA IN FEMALE ADOLESCENTS: ASSOCIATIONS WITH ATTACHMENT STYLE

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Alexithymia is a deficit in affect regulation, specifically manifesting as an inability to identify and express emotion. Alexithymic adults report emotional difficulties with caregivers during childhood, and research has addressed links between alexithymia and attachment style in adult relationships. However, attachment style may be associated with alexithymic traits at an earlier stage than adulthood, i.e. during
adulthood. Sixty healthy females aged 9-18y (mean 14.08, SD 2.71 years) participated in an Attachment Style Interview and completed the Toronto Alexithymia Scale (TAS-20). Additionally, the Hospital Anxiety and Depression Scale and the Spielberger State-Trait Anxiety Inventory were used to ascertain that the sample was psychopathology-free. In terms of attachment style groups, greater levels of alexithymia were exhibited by both anxious and avoidant insecurely attached groups compared to those who were securely attached (F1,7, 98.7 = 52.107, p < 0.05). Multiple regression analyses to identify which specific interpersonal attitudes were independent predictors of alexithymic traits revealed that fear of separation (a feature of anxious attachment style), predicted both overall alexithymia scores and the specific alexithymia trait of ‘difficulty identifying feelings.’ Constraints on closeness and mistrust (attitudes of both anxious and avoidant attachment styles) predicted the alexithymic scales of ‘difficulty describing feelings’ and ‘externally oriented thinking’, respectively. These findings indicate that features of anxious and avoidant insecure attachment styles are differentially related to the separate facets of alexithymia in adolescents. It could be that the anxiety of being separated from support figures may cause individuals inaccuracy in identifying what specific emotional reactions mean. It may also be possible that those features that create distance from others relate to a preference for focusing on behaviour rather than thoughts or feelings, which then results in a deactivation of emotional evaluations.

149) Abstract 830

**FATIGUE IN PATIENTS WITH QUIESCENT SYSTEMIC LUPUS ERYTHEMATOSUS: THE ROLE OF DEHYDROEPIANDROSTERONE SULPHATE**

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Background: Fatigue is a major problem in systemic lupus erythematosus (SLE). In some patient groups, associations between fatigue and low levels of the allegedly vitalizing hormone dehydroepiandrosterone (DHEA) and its sulphate (DHEAS) have been found. Low levels of DHEA(S) may also play a role in fatigue in systemic lupus erythematosus (SLE). To clarify this role, 1) serum DHEAS levels and fatigue in female patients with quiescent SLE were compared with those of healthy women and 2) in the SLE group, fatigue was compared between patients with low and normal DHEAS levels.

Methods: Included were 60 female patients with quiescent SLE (31 using prednisone and 29 not using prednisone) and 60 age-matched healthy women. Common threshold values of DHEAS differentiated between low and normal levels. The Multidimensional Fatigue Inventory (MFI) measured fatigue. Groups were compared on serum DHEAS and fatigue using Chi2 and Mann-Whitney tests.

Results: Compared to healthy women, there were more SLE patients, using and not using prednisone, with low DHEAS levels (p<.001) and SLE patients were also more fatigued (p<.001). In the SLE group, patients with low DHEAS levels were not more fatigued (p>.14) and in the subgroup not using prednisone, patients with low DHEAS levels were even less fatigued (p>.03) than patients with normal DHEAS levels. Figure 1 shows the general fatigue scores of patients with low and normal DHEAS levels in the SLE group not using prednisone.

Conclusion: Although patients with quiescent SLE more often have low serum DHEAS levels and are more fatigued than healthy controls, in SLE patients with low serum DHEAS levels, fatigue is indicated to be equal to or even less than in SLE patients with normal serum DHEAS levels. After our previous finding that DHEA administration does not result in a reduction of fatigue, these results give a further indication that low DHEA(S) levels do not play a role in fatigue of patients with SLE.

**Notes:** SLE = systemic lupus erythematosus; DHEAS = dehydroepiandrosterone sulphate; MFI = Multidimensional Fatigue Inventory (range 4-20); one dot for each participant; the box represents the 25th to 75th percentile, the bars represent the 10th to 90th percentile.
TELEPHONE-DELIVERED COGNITIVE BEHAVIORAL THERAPY FOR CHRONIC BACK PAIN
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The high prevalence of chronic low back pain (CLBP) in primary care requires alternatives to face-to-face specialty pain clinic-based care. In a proof-of-concept, Phase IIa randomized clinical trial we assessed efficacy of a telephone-delivered, "Minimal Therapist Contact", home-based behavioral intervention for chronic low back pain in primary care. Participants (N = 66) were randomized to either an 8-week, 8-hour, "Minimal Therapist Contact" Cognitive Behavioral Self Management Skills Training (CBSST) or a Supportive Psychotherapy control condition (SC) matched for contact time. Completers' analysis (CBSST N = 22; SC N = 28) indicated outcomes were significantly better for CBSST than SC at 8-weeks in terms of % Overall Improvement (p = .045), mean % "Improved" (p = .018) and proportion with >25% Improvement (p = .04). Gains were stable over 6-month follow-up. This suggests telephone-based CBSST may have a role in Stepped Care of chronic back pain in primary care.

152) Abstract 912
INDEPENDENT ASSOCIATION OF ANXIETY WITH EMERGENCY ROOM ADMISSION FOR NON-CARDIAC CHEST PAIN
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Background Non-cardiac chest pain (NCCP) accounts for more than half of the chest pain-related emergency department admissions in the US. NCCP is defined as chest pain similar to the pain observed in myocardial ischemia-induced angina pectoris, but in the absence of underlying heart disease as a causal factor. Anxiety and psychological distress play critical roles in the neurobehavioral processes involved in pain regulation, potentially contributing to NCCP. This study examines whether anxiety is associated with NCCP, independent of demographic, clinical and psychosocial risk factors.
Methods The study included 46 patients with NCCP (mean age 44.9±14.7; 67% women) and 1233 controls (mean age 55.2±14.3; 50% women). Anxiety was evaluated using the State-Trait Anxiety Inventory (STAI; continuous scores and cut-off for anxiety: ≥45=90th percentile). Distress-prone personality characteristics were assessed using the Type D scale (DS14) including negative affectivity and social inhibition. Information on clinical and demographic measures was obtained from medical records and self-report questionnaires. Associations between anxiety and NCCP were examined using logistic regression analysis and are presented as odds ratios (OR) with 95% confidence intervals (CI).
Results Elevated levels of anxiety were significantly associated with NCCP (OR=3.27, 95% CI 1.68-6.36; p<.001). We also found that the ‘distressed personality’ was more common in the NCCP group compared to healthy controls (OR=2.51, 95% CI 1.35-4.69; p<.004). Anxiety was more common in Type D than non Type D (35% vs. 6%; p<.001). In multivariable models, anxiety remained significantly associated with NCCP (OR=2.49, 95% CI 1.18-5.25; p=0.016), whereas Type D was not independently associated with NCCP (OR = 1.82, CI .90-3.66; p=0.09). Further adjustments for sex, age, marital status, smoking, and use of alcohol did not change the association between anxiety and NCCP.
Conclusions Anxiety is associated with non-cardiac chest pain. This association was independent of distress-related personality and other clinical and sociodemographic factors. Prospective studies are needed to demonstrate that screening and treatment of anxiety will decrease symptoms of non-cardiac chest pain.

153) Abstract 1007
DISCREPANCIES BETWEEN SELF-REPORTED AND OBJECTIVE SAMPLING DELAY FOR THE CORTISOL AWAKENING RESPONSE (CAR)
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The CAR is frequently studied in participants’ natural environment using self-collection of saliva samples. For measurement of the CAR accurate timing of saliva sampling is crucial; poor adherence to sampling protocol leads to misleading assessments of the CAR. Studies often rely on self-report and exclude samples rated as 10-15 minutes late. This study compared actimeter-determined awakening and electronic monitoring of sampling times with self-reported awakening and sampling times. It also explored demographic, situational or psychosocial correlates of delayed self-report of both awakening and sampling times. Fifty-one students (mean 21±4.4 y) collected saliva samples on 4 days at 0, 15, 30 and 45 minutes post awakening. Awakening times were determined by wrist-worn actimeters and sampling was monitored by electronic devices (Medication Event Monitoring; MEM). Participants were informed that these devices monitored their adherence to the protocol. Participants also reported their awakening and sample collection times using the usual diary report method. Actimeter-determined awakening was significantly earlier than self-reported awakening - average difference was 8.0±4.5 minutes. (F(1,25)=37.666,p<0.001,K² = 0.601). Sampling delay was calculated as the average delay for all 4 samples, objective sampling delay was derived from actimeter-determined awakening and MEM. Self-reported delay was derived from self-reported awakening and sampling. Figure 1 shows that objective sampling delay was significantly longer than self-reported delay, (F(1,25)=22.838,p<0.001,K² = 0.477). Across the 4 days the average objective delay was 10.0±3.6 minutes. Age, social-economic status, trait and state well-being and ill-being, busyness, sleep quality, waking time, and ease were not significantly correlated with either objective or self-reported delay for awakening and sampling. Results suggest that self-reported awakening and sampling delay differs to that determined by electronic monitoring, this was largely attributable to inaccuracy in determining awakening. Also, no measured variable was related to awakening and sampling delay, suggesting that it may be related to other factors such as sleep inertia following awakening.
PERSONALITY AND TEMPERAMENT ALTERATIONS IN YOUNG ADULTS WITH EARLY LIFE ADVERSITY
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Research has demonstrated that early life adversity impacts aspects of our physical and mental health, but less is known about the impact of early life adversity on personality, temperament, and behavioral dispositions. Here we examined the impact of early life adversity on personality and temperament in healthy young adults, 18-30 years of age. Participants (n = 594,354 women) were enrolled in the Oklahoma Family Health Patterns Project, a long-term study on risk for substance abuse. Lifetime adversity was extracted using items on the Diagnostic Interview Schedule chosen to be closely similar to the life adversity assessed retrospectively in the studies by Caspi. Physical or Sexual Adversity was documented by three items, while Emotional Adversity was documented by two items. This allowed each person to be assigned an adversity score ranging from 0 (no adverse events) to a maximum of 5. Chi-square analyses found that individuals with a family history of substance dependence (X^2 = 109.59, p < .0001) and women (X^2 = 62.66, p < .0001) experienced significantly more early life adversity.
Subjects were grouped into 0, 1, or >1 reported adverse events and compared using ANOVA. As the number of adverse life events increased, emotional stability became more labile and less positive. Persons high in early-life adversity had higher scores on the Beck Depression Inventory (F = 42.58, p < .0001), the Eysenck Personality Inventory Neuroticism subscale (F = 27.72, p < .0001), and less positive affect on the PANAS Positive Affect scale (F = 4.07, p < .05) and higher scores on the Negative Affect Scale (F = 4.1, p < .05). The California Personality Inventory Sociability subscale (CPI-S) and the Psychopathic Personality Inventory (PPI Factor I and II) were used to assess conformity to social norms. Subjects with more adverse events exhibited greater behavioral undercontrol (CPI F = 124.61, p < .0001, PPI Factor II F = 40.51, p < .001) and less empathy (PPI Factor I F = 7.50, p = .0062). These results suggest that early lifetime adversity may contribute to poorer mood regulation, greater impulsivity, and poorer social connectedness in adulthood.

THE EFFECT OF TYPE D PERSONALITY ON HEATH-RELATED QUALITY OF LIFE IS MEDIATED BY DEPRESSION, HEALTH CONCERNS AND SOCIAL SUPPORT
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Heart failure patients (n = 123) filled in the Hospital anxiety and depression scale, Type D Scale, Minnesota Living with Heart Failure, European self-care behavior scale, Multidimensional Scale of Social Support, and Health Complaints scale at baseline, 3 and 9 months. Medical information was obtained from the patient’s medical records. Mediated and direct effects were estimated using bootstrapped percentile based confidence intervals to test for significance of mediated effects. In a full mediational model, only social support (coefficient (c-f)=4.24; SE=1.95; z=2.17; p=0.03) and HRQL at 3 months (coefficient (pe)= 0.67; SE=0.13; z=5.32; p<0.01) had a direct effect on HRQL at 9 months. In a cross-sectional baseline mediational model the total effect of Type D personality (c-f=15.74; SE=5.22; z=3.02; p<0.01) on HRQL was mediated by depression (point estimate (pe) = 7.95; SE=4.20; 90% CI[2.60-13.35]) and health concerns (pe=8.14; SE=3.08; 90% CI[2.16-14.12]), while only disease severity had a direct effect on HRQL (c=9.58; SE=3.81; z=2.51; p<0.01). At 3 months, the total effect of Type D personality (c-f=24.26; SE=5.04; z=4.81; p<0.01) was mediated by depression (pe=10.80; SE=3.30; 90% CI[4.82-20.40]) and health concerns (pe=7.11; SE=3.27; 90% CI[1.04-15.19]), while disease severity no longer had a significant impact. At 9 months, the total effect of Type D personality (c-f=16.80; SE=5.68; z=2.96; p<0.01) was mediated by depression (pe=12.35; SE=4.33; 90% CI[5.66-23.46]) and social support (pe=2.76; SE=1.67; 90% CI[0.51-7.63]), while health concerns fell short of significance. These results indicate that prior levels of HRQL are the best predictor of subsequent HRQL, and that the effect of Type D personality on HRQL is not direct, but are mediated by depression, health concerns, and social support at different time points. Of note, disease severity only had a direct effect on HRQL at baseline. Taken together, these results indicate that predictors of HRQL are likely to change over time, and more research is needed to outline the complex pattern associating psychological factors with HRQL.

PLASTICITY GENES DO NOT MODIFY ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY AND DEPRESSIVE SYMPTOMS
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Objective: Physical activity is inversely associated with depression in adolescents but the overall associations are fairly weak, suggesting individual differences in the strength of the associations. The aim of this study was to investigate whether plasticity genes modify the reciprocal prospective associations between physical activity and depressive symptoms found previously.
Methods: In a prospective population-based study (N=1196) physical activity and depressive symptoms were assessed three times, around the ages of 11, 13.5 and 16. Structural Equation Modeling was used to examine reciprocal effects of physical activity and depressive symptoms over time. Three groups were examined: (1) F=4.07, p<.05) and higher scores on the Negative Affect Scale (F = 4.61, p < .05). A cumulative genetic liability index consisting of three groups (low, intermediate and high) according to the number of plasticity alleles carried by the adolescents was created. Using a multi-group approach we examined if the associations between physical activity and depressive symptoms differed between the three cumulative plasticity groups as well as between the individual polymorphisms.
Results: We found significant cross-sectional and cross-lagged paths from physical activity to depressive symptoms and vice versa. Neither the cumulative plasticity index nor the individual polymorphisms modified the strengths of these associations.
Conclusion: Associations between adolescents’ physical activity and depressive symptoms are not modified by plasticity genes.

RATES AND RISKS OF DIABETES SPECIFIC EMOTIONAL DISTRESS: COMPARING PRIMARY AND SECONDARY CARE PATIENTS WITH TYPE 2 DIABETES MELLITUS
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Background: Diabetes-distress (e.g. worries about complications, feelings of guilt related to diabetes) is common in type 2 diabetes (DM2). A widely used instrument to assess diabetes specific emotional distress is the PAID (Problem Areas In Diabetes) survey. This instrument has particularly proven its value in secondary care and is less often used in primary care. The main research question is: do rates and risks of diabetes specific distress differ between primary and secondary care patients?
Method: Patients with DM2 treated in secondary care (n=532) and primary care (n=501) completed the PAID questionnaire (range 0-100) and the PHQ-9 (PHQ-9 score ≥ 10 indicates depressive symptoms). Data on complications and HbA1c were collected in secondary care.
and are currently being collected in primary care. Mann-Winney test was used to compare means and logistic regression to identify factors associated with a high score on the PAID (20% highest score).

Results: The total diabetes distress score was considerably higher in secondary care patients (mean: 22 ± 20), relative to primary care patients (mean 8 ± 12, p < .001). Moreover, all 20 problem areas included in the PAID were seen as significantly more problematic by secondary care patients. Both in primary care and in secondary care, the item that patients most often endorsed was ‘worrying about future complications’. In primary care, higher levels of diabetes distress were more common in younger patients (OR= .946, p<.001), patients using insulin (OR=.236, p<.02), and those with depressive symptoms (OR=.56, p<.001). Sex, being single, being low educated and year of diagnoses were not predictive of a high score on the PAID.

In secondary care, factors associated with higher levels of diabetes distress were: ethnic minority (OR = 4.93, p=.024), higher HbA1c (OR = 1.93, p<.01), and depressive symptoms (OR = 4.61, p=.007). Variables that were not predictive of a high score on the PAID were sex, being single, using insulin, BMI and duration of diabetes. Interestingly, having complications according to the medical chart was not a predictor either.

Conclusion: Type 2 DM patients in primary care report substantially lower levels of diabetes distress than in secondary care. Worries about complications is one of the most prominent sources of distress for all patients, as found earlier. Both in primary and secondary care, symptoms of depression were strongly related to diabetes distress.

158) Abstract 806

POSTTRAUMATIC STRESS FOLLOWING CHILDBIRTH: DIAGNOSIS, TREATMENT AND PREVENTION

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Background: What to do with women who experienced childbirth as so traumatic that they keep having nightmares, flashbacks and problems concentrating, who do not want to become pregnant again or demand a cesarean section at the next delivery? One to two percent of women suffers from posttraumatic stress disorder (PTSD) following childbirth, which may affect mother-child bonding as well as future pregnancies.

Methods: Based on current knowledge from literature, including own research, an overview will be presented of the prevalence, risk factors, diagnosis and treatment of PTSD following childbirth. Results: PTSD is an anxiety disorder affecting 1-2 percent of women after childbirth. Risk factors include [a] obstetric complications and interventions (emergency cesarean section, preterm birth), [b] history of psychiatric problems or depression/anxiety during pregnancy, [c] psychosocial factors (low coping skills, low social support). Furthermore, 50 percent of women with PTSD following childbirth also suffers from postpartum depression. When PTSD is suspected, clinicians can use the self-report measure Traumatic Event Scale-B to quantify symptoms, and then move on to a more structured interview. Several studies indicate that spontaneous remission of PTSD following childbirth is uncommon. Possible negative consequences of the condition include insecure attachment of the infant, impaired partner relationship, avoiding future pregnancies and demanding a cesarean section in a subsequent pregnancy. Although these possible adverse outcomes justify treatment and prevention, effective interventions and prevention strategies have not been adequately researched in this patient group. International guidelines regarding PTSD in other (non-pregnant) populations point to eye-movement desensitization and reprocesening (EMDR) and cognitive behavioral therapy (CBT) as the most promising treatments. Identification of women at risk, both during pregnancy and postpartum, is key to early intervention and possible prevention.

Conclusions: Posttraumatic stress disorder following childbirth is a serious condition affecting 1-2 percent of postpartum women, with higher prevalence rates among women with complicated pregnancies/deliveries and those with a history of mental health issues. Adequate identification of women at risk and those with clinical symptoms is key to early intervention and eventually prevention.

159) Abstract 1178

SALT IN THE WOUND: WEIGHT STIGMA INDEPENDENT OF BMI PREDICTS CELLULAR AGING

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BACKGROUND: The proportion of overweight and obese Americans is expected to reach 75% by 2015. Regardless of obesity’s role effect on health, the framing of obesity as a health threat and a social burden creates fertile ground for stigma to develop; stigma that may in itself make a marked contribution to the pathophysiology of obesity. We hypothesize that experiencing weight stigma is stressful, and hypothesize that weight stigma will be positively associated with downstream biological markers of stress and health.

METHODS: From 448 women who had a fasting blood draw (to assay plasma F2-isoprostanes), completed self report measures and had height and weight measured. Weight stigma was measured using the Stigmatizing Situations scale augmented with 12 items assessing the extent to which individuals internalize weight stigma. They then provided 7 saliva samples per day for three consecutive days to measure free cortisol output, calculated as total secretion across the day (InCort). To isolate the effects of weight stigma independent of actual weight on the outcome variables, linear regression models were calculated testing the relation between weight stigma and each variable while controlling for BMI. As hypothesized, weight stigma was positively associated with chronic psychological stress, controlling for BMI (r = .35, p = .02). Similarly, weight stigma was positively associated with both cortisol (r = .31, p = .04) and isoprostanes (r = .44, p = .003), even when controlling for BMI.

CONCLUSION: This is the first study to document relationships between weight stigma and markers of HPA activation and oxidative stress. That these relationships existed even while controlling for BMI and visceral adiposity is significant, as it singly implicates psychological processes. In other words, despite what a person actually weighed, it appears to be the experience of stigma that had a relationship with these biomarkers of physiological stress. If future studies confirm these findings, the implications are troubling in our society that not only stigmatizes the overweight and obese, but also where the majority is in fact overweight or obese.

160) Abstract 1073

CULTURAL ACTIVITY AT WORK RELATED TO MENTAL HEALTH IN EMPLOYEES?

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Hypothesis: A positive relationship between frequent cultural activity at work and good employee health was expected.

Methods: A postal questionnaire with questions about cultural activities organised for employees and about emotional exhaustion (Maslach) and depressive symptoms (short form of SCL). Employee assessments of manager function and work environment (standardised dimensions/control questions) as well as socioeconomic variables were covariates. Random samples of men and women in the working
population in Sweden participated on three consecutive occasions in 2006 (n=5037), 2008 (n=9623, when participants were added) and 2010 (n=8912). The sample was almost doubled in 2008. The participants starting 2006 were followed until 2010 and so were those starting 2008.

Main outcome and results: Any cultural activity at work was reported by 46.4%, 52.7% and 44.8% during the three consecutive years. The most frequent response category was “some time per year” whereas more frequent activity was very uncommon. There was a lower frequency of cultural activities at work during the period of high unemployment during 2010. During the most culturally active year in the work sites in 2008, the linear multiple regression analysis showed that going from “never” to “some time a week or more often” on the “culture at work scale” statistically corresponded to a decrease of one third of the emotional exhaustion score standard deviation. After additional adjustment for “listening manager” and “psychological demands” and “decisions latitude” at work the statistical effect was reduced one seventh of the standard deviation. The effects of relationships with emotional exhaustion were more significant than those with depressive symptoms.

Conclusions: Cultural activities at work vary according to business cycle and have a statistical association with mental employee health, particularly with mental emotional exhaustion.

Implications for future research: There are particularly pronounced statistical protective effects of frequent cultural activity at work on likelihood of emotional exhaustion among employees.

Table  Cross-sectional multiple linear regression coefficients (B) for independent statistical “protective contribution” of cultural activities in relation to ill health in the different steps. Each year has been analysed separately.

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative a (adjusted for age, gender and income only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.61*** (n=4955)</td>
<td>0.68*** (n=9381)</td>
<td>0.58*** (n=8671)</td>
</tr>
<tr>
<td>(r=4.44)</td>
<td>t=7.26</td>
<td>t=8.09</td>
<td></td>
</tr>
<tr>
<td>Depr</td>
<td>0.27* (n=4946)</td>
<td>0.41*** (n=9414)</td>
<td>0.34*** (n=8729)</td>
</tr>
<tr>
<td>t=2.28</td>
<td>t=4.96</td>
<td>t=3.98</td>
<td></td>
</tr>
<tr>
<td>Alternative b (adjusted for same as a plus “Does your boss listen?”)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.30* (n=4826)</td>
<td>0.44*** (n=6564)</td>
<td>0.27*** (n=7964)</td>
</tr>
<tr>
<td>t=2.20</td>
<td>t=4.53</td>
<td>t=2.73</td>
<td></td>
</tr>
<tr>
<td>Depr</td>
<td>0.06 NS (n=4816)</td>
<td>0.17* (n=8586)</td>
<td>0.11 NS (n=8020)</td>
</tr>
<tr>
<td>t=0.47</td>
<td>t=1.96</td>
<td>t=1.27</td>
<td></td>
</tr>
<tr>
<td>Alternative c (adjusted for same as b plus demands and decision latitude at work)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.22 (n=4660)</td>
<td>0.27** (n=8297)</td>
<td>0.09 NS (n=7677)</td>
</tr>
<tr>
<td>t=1.70</td>
<td>t=3.07</td>
<td>t=0.97</td>
<td></td>
</tr>
<tr>
<td>Depr</td>
<td>0.05 NS (n=4655)</td>
<td>0.03 NS (n=6818)</td>
<td>0.00 NS (n=7721)</td>
</tr>
<tr>
<td>t=0.42</td>
<td>t=0.30</td>
<td>t=0.05</td>
<td></td>
</tr>
</tbody>
</table>

161) Abstract 918
WAYS OF COPING AND CARDIOVASCULAR BIOMARKERS IN ELDERLY INDIVIDUALS
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Purpose: Physical fitness and obesity have each been associated with cognitive function. Evidence also suggests that hemostatic balance may be involved in this relationship. The present study examined associations between physical fitness, obesity, coagulation and cognitive function in subjects with a broad range of blood pressure (BP), from normal to hypertensive.

Subjects and Methods: One hundred and fifty two unmedicated men and women (Mean±SD=40±7 years) underwent indirect calorimetry testing to determine peak metabolic equivalents achieved (METs) during a maximal treadmill exercise test. Dual energy x-ray absorptiometry (DEXA) was used to measure percent body fat. Blood levels of D-Dimer were assessed by ELISA as a marker of coagulation. The Paced Auditory Serial Addition Test (PASAT), which is a measure of cognitive function that specifically assesses auditory information processing speed, was used as a measure of auditory cognitive function. Multiple regression analyses with age, gender, education, systolic and diastolic BP entered as covariates were conducted. Two-second (faster processing speed), 3-second and total PASAT scores were entered as the dependent variables and percent fat, peak exercise METS and blood levels of D-Dimer as independent variables.

Results: Higher peak METS was associated with higher total PASAT score (indicative of faster cognitive processing) (beta=0.374, p=0.026). In contrast, higher D-Dimer levels were associated with lower PASAT scores (B=-0.268, p=0.042). Higher 3-second PASAT score was significantly predicted by lower D-Dimer (beta=-0.338, p=0.010) and 2-second PASAT score was significantly predicted by increasing peak METs (beta=0.401, p=0.019). BP and percent body fat were not associated with PASAT scores.

Conclusion: These results support previous studies findings that higher physical fitness is associated with cognitive function even in individuals with elevated BP. The findings also indicate that hypercoagulability may play a role in the pathophysiology of cognitive dysfunction.

162) Abstract 1023
PHYSICAL FITNESS AND COAGULATION ARE ASSOCIATED WITH AUDITORY COGNITIVE FUNCTION IN NORMOTENSIVE TO HYPERTENSIVE ADULTS
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The purpose of this study was to investigate whether levels of coagulation and physical fitness were associated with auditory cognitive function in normotensive to hypertensive adults.

Methods: One hundred and thirty dwelling elderly men and women (Mean±SD=72±27 years) underwent indirect calorimetry testing to determine peak metabolic equivalents achieved (METs) during a maximal treadmill exercise test. Dual energy x-ray absorptiometry (DEXA) was used to measure percent body fat. Blood levels of D-Dimer were assessed by ELISA as a marker of coagulation. The Paced Auditory Serial Addition Test (PASAT), which is a measure of cognitive function that specifically assesses auditory information processing speed, was used as a measure of auditory cognitive function. Multiple regression analyses with age, gender, education, systolic and diastolic BP entered as covariates were conducted. Two-second (faster processing speed), 3-second and total PASAT scores were entered as the dependent variables and percent fat, peak exercise METS and blood levels of D-Dimer as independent variables.

Results: Higher peak METS was associated with higher total PASAT score (indicative of faster cognitive processing) (beta=0.374, p=0.026). In contrast, higher D-Dimer levels were associated with lower PASAT scores (B=-0.268, p=0.042). Higher 3-second PASAT score was significantly predicted by lower D-Dimer (beta=-0.338, p=0.010) and 2-second PASAT score was significantly predicted by increasing peak METs (beta=0.401, p=0.019). BP and percent body fat were not associated with PASAT scores.

Conclusion: These results support previous studies findings that higher physical fitness is associated with cognitive function even in individuals with elevated BP. The findings also indicate that hypercoagulability may play a role in the pathophysiology of cognitive dysfunction.
FATIGUE IN PSYCHOSOCIAL SUBGROUPS OF PATIENTS WITH SJÖGREN’S SYNDROME

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Introduction. Fatigue is a prevalent and debilitating problem in the systemic autoimmune disorder Sjögren’s syndrome. Psychosocial factors are assumed to be partly responsible for persisting fatigue in this patient group. Aim of this study was to identify psychosocial subgroups of patients and to compare multiple dimensions of fatigue between these subgroups.

Methods. 300 patients with primary Sjögren’s syndrome (mean age 57 years, 93% female) completed questionnaires on cognitive emotion regulation (CERQ-short), physical activity cognitions (TAMPA-SK), illness cognitions (ICQ), coping strategies (Brief COPE), emotion processing and regulation (BEQ, TAS-20, ERQ), social support (ABO, SSL) and fatigue (MPI). These psychosocial variables were reduced with principal axis factor analysis. Psychosocial subgroups were identified using cluster analyses. Subgroup differences in fatigue were examined with univariate analysis of variance.

Results. Factor analysis yielded eight psychosocial factors: kinesiophobia (KP), negative thinking (NT), positive thinking (PT), positive disease outcome (PD), alexithymia (AT), emotional expressivity (EE), social support (SS), and spouse engagement (SE). Cluster analyses identified four psychosocial subgroups (see Figure) with 1) an adaptive profile (n=64), 2) a neutral profile (n=64), 3) a maladaptive profile (n=52), and 4) a mixed profile (i.e., adaptive on cognitive factors and maladaptive on emotional factors). Subgroup 3 reported more fatigue than the other subgroups on four of the five fatigue dimensions (p<.05), except physical fatigue compared to subgroup 2. The other subgroups did not differ from each other, with the exception of subgroup 2 reporting more mental fatigue, i.e., concentration and thought problems, than subgroup 4 (p<.05).

Conclusion. Patients with Sjögren’s syndrome with a generalized maladaptive psychosocial profile experience more fatigue than patients with an adaptive, neutral, or mixed profile. Thus, besides the identification of a single group with a generalized maladaptive profile, there is hardly support for tailoring fatigue interventions on the basis of psychosocial risk profiles.
A DIPHASIC VASOVAGAL RESPONSE TO BLOOD DONATION? MAYBE NOT &
Crystal D. Holly, PhD, Epidemiology, McGill University Health Centre, Montreal, Quebec, Canada, Saharaz Baleigh, B.Sc., Philippe Gilschist, MA, Blaine Ditto, PhD, Psychology, McGill University, Montreal, Quebec, Canada

The vasovagal reaction is commonly thought to be diphasic – with an excitatory phase that precedes and perhaps triggers the inhibitory phase associated with dizziness and syncope. However, Ritz et al. (2010) recently suggested that traditional models of vasovagal syncpe may have incorporated this view prematurely on slim evidence. To address this idea in the blood donation context, data from two trials of the effects of Applied Tension (AT) on vasovagal symptoms were examined. In both studies, blood pressure, heart rate, and state anxiety were measured approximately 30 min before withdrawal of 450mL of blood and 20 min afterward. Sample 1 were no treatment control participants (N=412, X=23.3±9.1 years) from Ditto et al. (2003, 2006). Sample 2 were people who were not asked to practice “full” AT (N=232, X=22.0±7.8 years) in Ditto et al. (2007, 2009). To simplify interpretation of results (though limiting the range of vasovagal reactions), analyses were limited to donors who provided a full unit of blood and were not treated for vasovagal symptoms by having their chair reclined. Participants were divided into two groups: those who did not report any symptoms on the short form of the Blood Donation Reactions Inventory and those who reported some. Analyses were 2 Vasovagal Symptoms (yes/no) x 2 Time (before/after donation) analyses of covariance controlling for age, sex, body mass index, and blood donation experience. In both samples, ratings of anxiety before donation were considerably higher than ratings after donation and blood pressure was lower after donation. As well, anxiety was significantly higher among those who subsequently experienced vasovagal symptoms. Despite this, no evidence of a diphasic response was observed. In Sample 1, even after adjusting for covariates, people who subsequently experienced vasovagal symptoms had lower systolic blood pressure (F(1,343)=4.47, p=0.035) and heart rate (F(1,342)=5.87, p=0.016) before donation. A similar finding for heart rate was observed in Sample 2 (F(1,823)=6.44, p=0.011). Though limited by the frequency of physiological measurement, vasovagal symptoms in this context seem associated with an anxiety-related inhibition of cardiovascular activity.

166) Abstract 763
RACIAL AND SEX DIFFERENCES IN THE RELATION OF DEPRESSION SUBSCALES TO CARDIOVASCULAR RISK FACTORS
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Depression is a well-known risk factor for cardiovascular disease (CVD). However, few studies have investigated the relations of subsets of depressive symptoms to CVD risk factors, and whether these associations vary as a function of race and sex. Here we used the Center for Epidemiological Studies – Depression (CES-D) subscales to examine relations of negative affect (NA), positive affect (PA), somatic complaints (SC), and interpersonal problems (IP) to CVD risk factors among 2,115 socioeconomically diverse African Americans and Whites enrolled in the Healthy Aging in Neighborhoods of Diversity across the Lifespan (HANDLS) study. Race-stratified multiple regression analyses were computed to investigate whether each of the four CES-D subscales (analyzed separately) was associated with C-reactive protein (CRP), total cholesterol (TC), systolic or diastolic blood pressure (SBP, DBP), glycosylated hemoglobin (HbA1c), body mass index (BMI), and waist circumference (WC). The models included a CES-D subscale by sex interaction term and were adjusted for age, poverty status, education status, smoking status, alcohol use, illicit drug use, diabetes/metabolic diseases, inflammatory diseases, antihypertensives, psychotropics, and anticholesterolics. Results indicated that, among Whites, greater NA was associated with higher HbA1c (p<0.05); lower PA was associated with greater BMI (p<0.01); greater IP was associated with higher C-reactive protein (p<0.01) and higher HbA1c (p=0.02); and greater SC was associated with a larger WC (p=0.02). In African Americans, greater NA was associated with higher SBP (p=0.02) and higher DBP (p=0.048); and greater SC was associated with higher SBP (p=0.05). Further, sex interactions revealed that, among African American women, greater IP was associated with higher C-reactive protein (p=0.04). Thus, African Americans and Whites differed on how clusters of depressive symptoms associated with CVD risk factors, with sex differences also noted in African Americans. It will be critical to examine whether these risk relations display common or disparate mechanistic pathways.

167) Abstract 1110
CROSS-SECTIONAL AND LONGITUDINAL ASSOCIATIONS BETWEEN INDIVIDUAL DEPRESSIVE SYMPTOMS AND GLYCATED HAEMOGLOBIN IN DIABETES PATIENTS IN THE NETHERLANDS
Mariska Bot, MSc, Frans Pouwer, PhD, Medical Psychology, Tilburg University, Tilburg, The Netherlands, Peter de Jonge, PhD, Psychiatry, University Medical Center Groningen, Groningen, The Netherlands, Frank J. Snoek, PhD, Medical Psychology, VU University Medical Centre, Amsterdam, The Netherlands

Background Both clinical and self-reported depression have been linked to higher levels of glycated haemoglobin (HbA1c), an important prognostic marker for diabetes complications. Depression involves a cluster of various symptoms, which may reflect different pathways and differentially affect prognosis. As little is known about the association of individual depressive symptoms with HbA1c, we explored this association in a cohort of diabetes outpatients. Methods Data were derived from a screening study in 3 diabetes outpatient clinics in the Netherlands. At baseline, the presence of the 9 depressive symptoms that are listed in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition was assessed with the Patient Health Questionnaire (PHQ-9). At baseline and after 1 year follow-up, HbA1c was derived from the medical charts. Linear regression models were constructed for each depression item to assess its relation with HbA1c. These were adjusted for age, sex, education level, ethnicity, smoking, body mass index, and insulin treatment. Results 646 patients had complete data on baseline depressive symptoms and HbA1c. Mean age was 53 years, 49% were female. Mean baseline HbA1c was 61 mmol/mol (7.7%). 288 patients (45%) had ≥1 depressive symptom(s), 139 patients (22%) had at least moderate depression (PHQ-score ≥10). The following items were significantly related to higher baseline HbA1c values: depressed mood (β=0.11, p=0.005), sleep difficulty (β=0.16, p<0.001), appetite problems (β=0.15, p<0.001), and suicidal ideation (β=0.14, p=0.001). Furthermore, depressed mood (β=0.09, p=0.03) sleep difficulty (β=0.12, p=0.004), appetite problem (β=0.11, p<0.01), and psychomotor changes (β=0.09, p=0.04) were significantly related to higher HbA1c values at 1 year follow-up. In patients with at least moderate depression, none of the individual items were related to baseline HbA1c levels. Conclusion In diabetes patients, several individual PHQ-9 items were related to higher HbA1c levels. These associations persisted over time. In patients with at least moderate depression, the individual items did not have additional value in predicting HbA1c levels, yet this analysis may be underpowered. Future research should explore potential pathways.
Background: The association between depressive symptoms and heart failure (HF) is well-established, but the underlying theoretical causes of depression in HF patients are largely unknown. Hence, the goal of this study is to examine the relative importance of inflammation, disease severity and psychological vulnerabilities as predictors of depression in HF patients. Methods: Depressive symptoms (Hospital Anxiety and Depression Scale) were assessed at baseline and 1 year follow-up in 177 HF outpatients (81.5% men; mean age = 66.49±8.82). Markers of inflammation (TNF-α, sTNF1, sTNF2, IL-6 and IL-10), disease severity (e.g. BNP, LVEF) and psychological vulnerability (Type D personality, UCLA Loneliness Scale) were assessed at baseline. Results: Markers of inflammation and disease severity did not explain the majority of variance in depression scores at baseline and 1 year follow-up, NYHA classification (β=0.142, p=0.033), co morbidity (β=1.148, p=0.024), Type D personality (β=0.293, p<0.0005), loneliness (β=0.382, p<0.0005), educational level (β=0.135, p=0.036) and BMI (β=0.149, p=0.016) are significant predictors of depression at baseline. Type D personality (β=0.356, p<0.0005), loneliness (β=0.228, p=0.003) and BMI (β=0.136, p=0.05) were significant predictors of depression at 12 months follow-up. Type D personality (OR=10.01, p<0.0005), loneliness (OR=1.11, p=0.029) and medical co morbidity (OR=2.92, p=0.04) were independent predictors of elevated depression levels at 12 months. Conclusions: Psychosocial vulnerabilities were independent contributors to the development of depressive symptoms. Future research into the biological and psychological pathways is necessary to identify potential targets for novel interventions for HF patients suffering from depression.

169) Abstract 1034
THE EFFECTS OF PSYCHOLOGICAL STATUS AFTER COGNITIVE-BEHAVIOR GROUP THERAPY FOR CORONARY ARTERY DISEASE PATIENTS
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Background & Purpose: Psychosocial characteristics such as hostility, depression, anxiety, type D personality were associated with the prognosis course of coronary artery disease (CAD). The purpose of the study was to examine the effects of cognitive-behavior group therapy (CBT) on psychosocial characteristics for CAD patients. Method: The participants consisted of 25 CAD patients (average age=58.2, male68% ). Who were assessed by Chinese Hostility Scale-Short form (CHSF), Beck Depression Inventory-IBDI-II State-Trait Anxiety Inventory STAI and Type D Scale-14DS14 before and after 8 weeks cognitive-behavior therapy programs. Results & Conclusion: This results of paired t-test showed the significant reductions in the scores of CHSF (β=5.516, p<0.000), Beck Depression Inventory (β=2.995, p<0.006), State-Trait Anxiety Inventory (β=3.721, p<0.001) and Type D Scale (β=3.275, p<0.003). The scores students (score>19) were 11 in boys (1.3%) and 43 in girls (5.5%) in boys in 2004 and 2010. A total of 1721 students (833 boys, 888 girls) in 2004 and 2011 participated. They completed the Eating Attitude Test (EAT-26), Generalized Self-Efficacy Scale (GSES), SF-36 and questionnaires for sleep, traumatic episodes and perceived stress. Result: The mean scores of EAT-26 were significantly higher in girls than in boys in both years (4.0 and 7.5 in 2004, 5.2 and 7.8 in 2010, in boys and girls respectively). The scores in boys were higher than 2010 in 2004 and in 2004 (p<0.05). Percentage of the students with high EAT-26 score over 19 increased from 3.1% to 5.5% (p<0.05). The numbers of high EAT-26 score girls (4.8%) in 2004, 19 in boys (3.6%) and 43 in girls (7.3%) in 2010. The

170) Abstract 1197
WAIT, WHO ARE WE MISSING? DEMOGRAPHIC PREDICTORS OF REFUSAL TO PARTICIPATE IN A RANDOMIZED CONTROLLED TRIAL OF DEPRESSION TREATMENT
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Objective. Randomized controlled trials (RCTs) of depression treatment in post-acute coronary (ACS) patients have proliferated, as we seek to understand if we can better treat depression and improve clinical prognoses in these patients. Enrollment into RCTs has altered drastically in the last 20 years, with potential changes in the composition of who will enroll (Lee et al., 2001). An important question then is who are we missing from our RCTs because they refuse to participate?

Methods. We used screening data from the Comparison of Depression Interventions after Acute Coronary Syndrome (CODIACS) trial (ClinicalTrials.gov Identifier:NCT01032018), a comparative effectiveness trial of two different depression treatments that enrolled post-ACS patients at 5 recruitment centers in the U.S from March 2010 – June 2011. All recruiting staff had centralized screening and recruiting training, and used identical informed consents and processes. We estimated the demographic characteristics of ACS patients who refused to participate using multiple logistic regression.

Results. Of 727 potential participants approached, 333 refused, a rate of enrollment similar to other U.S. cardiology trials. In the multivariable model predicting refusal to participate (Nagelkerke R2 = 0.08), older age (β=1.02 per year, 95% CI= 1.00-1.03) was associated with greater odds of refusal, while identification as Hispanic (OR= 0.3, 95% CI= 0.2-0.5) or black/African American (OR= 0.5, 95% CI= 0.3-0.8) was associated with lower odds of refusal. Gender was not associated with refusal to participate. Conclusions. An exceedingly important demographic group are those not represented as we form policy, health care reimbursement, and clinical care guidelines. Our results suggest that patients who are older, and don’t identify as either Hispanic or Black are more likely to refuse to participate in a recently enrolling trial. Thus, while many lament the relative absence of racial and ethnic minorities from past clinical trials, these data suggest that, when asked, individuals from those groups are more likely than majority groups to participate.

171) Abstract 867
EATING ATTITUDES IN JAPANESE ADOLESCENTS: COMPARISON WITH THE DATA IN FIVE YEARS AGO
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Background: The prevalence of eating disorder patients in the developed countries seems to be increasing including Japan. Usually, the onset of this disorder is in adolescence. Eating behavior might be linked to eating disorder. Aim: We hypothesized that the prevalence of adolescent behavior linking to eating disorder is increasing in Japan. Subjects and Method: We randomly sampled 15 year-old junior high school students in Miyagi prefecture, Japan, according to population of the residential area in 2004 and 2010. A total of 1721 students (833 boys, 888 girls) in 2004 and 2011 students (535 boys, 586 girls) in 2010 participated. They completed the Eating Attitude Test (EAT-26), Generalized Self-Efficacy Scale (GSES), SF-36 and questionnaires for sleep, traumatic episodes and perceived stress. Result: The mean scores of EAT-26 were significantly higher in girls than in boys in both years (4.0 and 7.5 in 2004, 5.2 and 7.8 in 2010, in boys and girls respectively). The scores in boys were higher than 2010 in 2004 and in 2004 (p<0.05). Percentage of the students with high EAT-26 score over 19 increased from 3.1% to 5.5% (p<0.05). The numbers of high EAT-26 score girls (4.8%) in 2004, 19 in boys (3.6%) and 43 in girls (7.3%) in 2010. The
numbers of students with low EAT-26 scores (score = 0) were 260 in boys (31.2%) and 133 in girls (15.0%) and 142 in boys (26.5%) and 76 in girls (13.0%) in 2010. The proportion of high EAT-26 students increased (p<0.05) and those with low EAT-26 scores decreased (p<0.0001) from 2004 to 2010. High EAT-26 students had more prevalence of traumatic episodes, higher perceived stress (p<0.01, respectively) and sleep disturbance (p<0.05) and lower scores in all SF-36 subscales (p<0.05) than low EAT-26 students in both year. GSES scores were not different. Sleep disturbance and fear of obesity are severer in high EAT-26 students in 2010 than in 2004. Conclusion: These results supported our hypothesis that the prevalence of adolescent behavior linking to eating disorder is increasing in these 5 years. Moreover, students free from eating attitudes problems have decreased. Early intervention with health education may be required to prevent development of clinically diagnostic eating disorders.

172) Abstract S60

EFFECTS OF SUBJECTIVE SOCIAL STATUS ON IN VIVO BETA-ADRENERGIC RECEPTOR RESPONSIVENESS
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In the last decade, a growing body of research has focused on the link between health and subjective social status (SSS), in addition to objective social status (as indicated by higher CD25 values) in participants with lower SSS (Hollingshead Two Factor Index). Our results suggest that beta-adrenergic receptor function may be an important component of the link between SSS and health.

173) Abstract 1238

CARDIAC CYCLE MODULATES ATTENTION TO POSITIVELY VALENCED WORDS

Visceral afferent information can impact emotion, and even short term fluctuations induced by the cardiac cycle can affect emotional processing, such as pain perception and the subjective intensity of emotional face stimuli. In addition, it is well established that emotional stimuli can modulate attention. Uniting these two strands of research, the propensity for cardiac cycle to affect the attentional “breakthrough” of emotional stimuli was investigated using an emotional attentional blink paradigm. An “attentional blink” refers to the propensity of an initial target (T1) to impair the identification of a second target (T2) presented 200–400 ms later in a stream of distractor stimuli. This effect can be partially reduced if T2 are high arousal items, with positively and negatively valenced targets better detected relative to low arousal neutral targets. To investigate cardiac effects on attention and potential implications for emotion, T2 stimuli were presented either synchronously with the R wave, or delayed by 300ms. Replicating the emotional blink effect, a main effect of emotion reflected an enhanced attentional breakthrough/detection of emotional items [F(2, 32) = 33.19, p < .001], with negative [t(16)=7.37, p<.001] and positive [t(16)=6.1, p<.001] T2 words better detected relative to neutral words. Moreover, detection of positive words was significantly modulated by cardiac cycle, with enhanced attentional “breakthrough” of positive T2 words if presented after the R wave compared to R-wave synchronous T2 stimuli [t(16)=2.27, p=.038]. These results demonstrate that short term visceral fluctuations induced by the cardiac cycle can modulate attention, and that this effect is particularly sensitive to positively valenced words.

174) Abstract 1079

ASSOCIATIONS BETWEEN SYSTEMIC INFLAMMATION AND COGNITIVE IMPAIRMENT IN A MULTIPLE SCLEROSIS SAMPLE
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Increasing evidence suggests an association between systemic inflammation and cognitive impairment (CI) in both clinical and non-clinical populations. While multiple sclerosis (MS) is a neurodegenerative disorder characterized by inflammation and demyelination there is a paucity of research investigating the role of systemic inflammation in the CI so fundamental to MS. This research therefore examined the potential relationships between cognitive function and a number of serum inflammatory markers in a sample of individuals with MS. Serum levels of Interleukin 6 (IL 6), tumor necrosis factor alpha (TNF-a), and high sensitivity C reactive protein (CRP) were measured in a sample of 20 individuals with MS (15 women, 5 men). Cognitive function was assessed using the Minimal Assessment of Cognitive Functioning in Multiple Sclerosis (MACFIMS). In multiple linear regression models, TNF-a significantly predicted lower total verbal recognition discriminability (B = - .56, p < 0.05), after controlling for depression, fatigue, age, and pre-morbid intelligence. Although IL 6 initially significantly predicted lower verbal memory scores, this association lost significance (B = - .44, p = 0.057) after controlling for age, depression, fatigue, and pre-morbid intelligence. There were no significant associations between CRP and any the cognitive measures. These results suggest the presence of an association between CI and systemic inflammation in MS that is only partially mediated by other factors commonly seen in MS, including depression and fatigue. More research, with larger samples and longitudinal designs, should be conducted investigating the relationship between systemic inflammation and CI in MS, given the potential relevance for (e.g., immunomodulatory) interventions.

175) Abstract 1116

REPRESSIVE COPING ASSISTS SHORT-TERM, BUT NOT LONGER-TERM, HEMODYNAMIC ADAPTATION TO RECURRENT LABORATORY STRESS
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Repressive coping style is an important psychosomatic typology, indicative of elevated risk of cardiovascular (CV) disease. Importantly, repressive coping results in subjective assessments of health risks that diverge from reality. By appraising challenges as less stressful, persons classified as repressors may derive short-term health benefits in terms of reduced physiological stress arousal. However, while reporting less emotional stress, repressors also exhibit higher rates of CV disease, typically seen as indicative of stress susceptibility. To elucidate the impact of repressive coping on primary disease mechanisms, we tested whether repressors differ from sensitizers in CV stress responding. 30 repressors and 32 sensitizers were drawn from a screening sample of 105 healthy college women, and exposed to standardized laboratory-
based CV reactivity assessment. In order to examine time effects, analyses were based on CV responses across two consecutive stress exposures. CV responses were examined in terms of reciprocal balancing of CO against TPR. MANOVA demonstrated significant group differences for CV responses to the first stress exposure, F(2,59) = 3.35, p = .042, with repressors showing greater CO increases, F(1,60) = 5.22, p = .026, and TPR decreases, F(1,60) = 4.15, p = .046, than sensitizers. This CO-TPR pattern implies a more accentuated healthful hemodynamic-level response among repressors. However, group effects disappeared during the second stress exposure, F(2,57) = 1.18, p = .316, suggesting that the difference was short-lasting. Instead, over time, repressors exhibited slightly higher overall CV arousal than sensitizers, when measured in terms of HR, F(1,60) = 5.69, p = .020. These findings provide empirical support for the assertion that repressors experience an advantage in terms of adaptive acute stress responses (where hemodynamic profile is optimized in the short-term) but maladaptive longer-term impacts on CV health (as indicated by elevated CV arousal).

176) Abstract 1077

WORRY PREDICTS DECREASED VAGAL TONE INDEPENDENTLY OF WORK STRESS IN A YOUNG HEALTHY SAMPLE OF FEMALE GERMAN WORKERS

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Background: Perseverative cognition, such as worry and rumination, is a common reaction to stressful events. Prolonged cardiovascular (CV) responses to stressors are recognized to be a potential pathogenic factor that may lead to cardiovascular disease (CVD). We aim to investigate the effects of worry on vagal function using heart rate variability (HRV) as an index of self-regulation.

Methods: Participants were 312 female employees from one of three sites of an airplane manufacturing plant in southern Germany. All subjects underwent medical examination, and 24-hour ambulatory heart rate recording while on their normal work routine. Night-time HRV indices (Time Domain: RMSSD, SDNN; Frequency Domain: HF, LF) were calculated. Effort Reward Imbalance (ERI) was assessed as a measure of psychosocial work characteristics. Worry was assessed using a brief worry scale. Pearson correlation and multivariate-adjusted partial correlation coefficients (PCCs) were calculated.

Results: HRV was negatively correlated with worry (e.g. RMSSD r = -0.21, p < 0.001). After multivariate adjustment for body mass index, history of CVD or hypertension or dyslipidemia, demographic variables, health behavior, work stress measurements and sleep quality, this association persisted (e.g. RMSSD r = -0.14, p < 0.05). The full models accounted for 9.11% of the variation in HRV.

Conclusion: Worry may play a substantial role in identification of females at risk for cardiovascular disease, beyond the influence of important confounders such as a stressful work environment. Therefore, reducing worry should be considered as an additional possibility in interventions to reduce cardiovascular risk.

177) Abstract 1043

HOSTILITY, INTERPERSONAL INTERACTIONS, AND CARDIAC AUTONOMIC CONTROL DURING EVERYDAY LIVING

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The contribution of personality characteristics such as hostility, depression, and anxiety to coronary artery disease is now well established, but our understanding of the intervening mechanisms is limited. We tested the hypothesis that hostility is associated with increased frequency and intensity of interpersonal conflicts (IC) throughout the course of daily activities, which are in turn associated with reduced vagal regulation of the heart and reduced high frequency (HF) heart rate variability. In 175 participants (88 men, 87 women) age 30 ± 7 years, we measured trait hostility (Cook Medley scale) and monitored continuous ECG data during 5 days (2 workdays, 2 non-workdays) while they completed ecological momentary assessments of mood, activity, and posture every 30 ± 5 min throughout the waking day. ICs were identified as any interaction in which participants endorsed any level of tension, impatience, or anger and intensity was computed as a composite of these items. Frequency was computed as the ratio of ICs/total number of interactions.

Total number of observations was 18,598 (M=107.1 ± 24/participant). Total number of interactions was 6552 (M=39.6 ± 22/participant). Data from EMA reports during interactions were analyzed using mixed effects regression models. HF power was log-transformed and the models were adjusted for age and posture. Mean CM was 17.9 ± 8.0. As predicted, hostility was associated with more intense (p=0.04) and somewhat with more frequent (p=0.07) IC episodes. As expected, upright posture was associated with significantly lower levels of HF power. Contrary to prediction, the intensity of ICs was not inversely related to HF power. However, we observed effect modification such that the well-recognized higher levels of HF power in the seated and reclining positions, compared to the upright posture, were more strongly attenuated in those persons who more frequently experience their interactions as conflictual. Together, these data provide partial support for hypotheses about the role that hostility plays in modulating cardiac vagal control through social interactions.

178) Abstract 1159

ELEVATED DEPRESSIVE SYMPTOMS PREDICT WORSENED HEALTH-RELATED QUALITY OF LIFE FOLLOWING AN ACUTE CORONARY SYNDROME

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Background: Health-related quality of life (HRQoL) is an important patient outcome. Although we know some of the predictors of HRQoL following acute coronary syndromes (ACS), we know very little about what predicts worsening of HRQoL immediately following an ACS. We thus sought to identify clinical-demographic characteristics that predict worsening of HRQoL in the month following an ACS.

Methods: Hospitalized patients with an ACS (n=358) were enrolled in a prospective cohort study. HRQoL was ascertained within 7 days of hospitalization and again 1 month post-discharge using the Short Form Health Survey (SF-12). Demographic (age, sex, ethnicity), psychosocial (Beck Depression Inventory [BDI], Hospital Anxiety and Depression Scale-Anxiety subscale), and clinical variables (ACS type, left ventricular ejection fraction, Charlson comorbidity index, Global Registry of Acute Coronary Events [GRACE] index, Pittsburgh Sleep Quality Index) were obtained. Clinically significant worsening of HRQoL was defined as a 0.5 standard deviation decrease in the SF-12 Physical Composite Score from baseline to 1-month follow-up. Multivariable logistic regression was used to examine predictors of clinically significant worsening, using “no clinically significant change” as the reference category.

Results: Approximately one-quarter of participants (25.1%) had worsening HRQoL, while over one-third (39.9%) had no clinically significant change in HRQoL, and 34.9% had an improvement in HRQoL. Elevated depressive symptoms (BDI ≥ 10) were the strongest predictor of increased risk for worsening of HRQoL (OR = 2.7, 95% CI = 1.2 - 5.8, P = 0.014), independent of baseline HRQoL and other clinical-demographic characteristics. Older patients were less likely to experience worsening. Higher scores on the GRACE index and baseline HRQoL likewise independently predicted worsening.

Conclusions: Clinically significant worsening of HRQoL after an ACS was most strongly predicted by elevated depressive symptoms. It remains to be tested if improving depression following ACS would slow or reverse the worsening of HRQoL exhibited by a quarter of our patients.
PERCEIVED HEALTH STATUS IS DETERMINED BY THE SYMPTOMATOLOGICAL PROFILE: THE CASE OF CONGENITAL HEART DISEASE

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BACKGROUND: Individuals with serious medical conditions, like patients with congenital heart disease (CHD) experience a paradoxically good health status, which might be explained by the symptomatology inherent to the condition. Our aim was to relate symptomatology to perceived health in CHD-patients.

METHODS: A secondary data analysis on two separate patient samples (i.e. 629 Belgian and 1109 Dutch patients) was conducted. Patients’ symptomatology was measured with the TAAQOL-CHD. Perceived health was measured by a Linear Analogue Scale in the Belgian patient sample and by the SF-36 in Dutch patients. First, age, sex, disease complexity, functional status, and symptom distress were related to perceived health by a linear regression analysis. Second, the relative importance of individual symptoms on perceived health was examined.

RESULTS: Older patients with a poor functional status and who experienced a high level of distress regarding their symptoms rated their perceived health as poor. In both patient samples distress about dizziness was related to perceived health. In Belgian patients distress about cyanosis, shortness of breath walking <100m, orthopnea, and oedema, and in Dutch patients distress regarding shortness of breath walking 1-5km, heart palpitations, and nycturia were related to perceived health.

CONCLUSIONS: Perceived health of CHD-patients is largely determined by patients’ symptomatology. In clinical practice, it is therefore important to discuss patients’ symptoms and the experienced distress during patient encounters. Counterintuitive results in studies examining perceived health and related concepts such as quality of life should be interpreted in light of our conclusions, as they can be explained by symptomatological profile.

ROLE OF SELF- Esteem AND CHILDHOOD EXPERIENCES IN COLLEGE STUDENTS RESPONSES TO ACUTE STRESS

Juliette Saltz, BA, Myriam V. Thoma, PhD, Aya Bashina, BA candidate, Nia Fogelman, BA candidate, Nicolas Rohleder, PhD, Psychology, Brandeis University, Waltham, MA

Rationale: Individual differences in how we interpret acute stress situations might result from interaction of genetic predisposition and lifelong experiences. Childhood maltreatment has been found to be related to increased stress responses in depressed and non-depressed individuals. Less is known about the role of non-traumatic childhood experiences in healthy young adults’ responses to acute stress, and potential mediators of this relationship.

Methods: Healthy undergraduate students (n=19; mean age: 22.4 yrs, SD=4.3 yrs; BMI=22.7 kg/m2, SD=3.3; 8 females) provided self-ratings of childhood experiences using the Childhood Trauma Questionnaire (CTQ), and of self-esteem using the Rosenberg Self-Esteem Scale (RSE). All participants were subsequently exposed to a standardized psychosocial stress paradigm (Trier Social Stress Test) twice on two separate days, to induce HPA axis activation. Saliva samples for assessment of salivary cortisol were taken repeatedly before and after each stressor.

RESULTS: Male and female students did not differ in self-esteem (RSE: F=0.3; p=0.58), but women had marginally higher scores on the CTQ (F=3.4; p=0.079). Stress-induced cortisol increased showed a significant inverse relationship with self-esteem on both days (r=-0.57; p=0.006; r=-0.75; p<0.001; resp.). Cortisol increases on day 2, but not day 1, were related with CTQ scores (r=-0.31; p=0.16). Controlling for RSE reduced this correlation to non-significance (r=-0.3; p=0.09)

THE EFFECT OF INFLAMMATION ON VASCULAR RESPONSES TO MENTAL STRESS

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Purpose: Mental stress can trigger myocardial infarction (MI) with inflammation and vascular responses to stress implicated as possible underlying mechanisms. Mental stress-induced ischaemia (MSI) has been associated with increased levels of inflammation and also reduced vasodilatory response to mental stress. Stress-induced vasodilation is evident in healthy participants, but is impaired in those at risk for cardiovascular disease. Inflammation is correlated with poorer vascular function at rest, but little is known about how inflammation affects vascular responses to mental stress. These effects were examined in the current study.

Method: 18 healthy male participants completed a ‘control’ and an ‘inflammation’ laboratory session. Inflammation was achieved by administering a Salmonella typhi Capsular Polysaccharide (typhoid) vaccination 6 hours prior to a mental arithmetic stress task. During both sessions heart rate (HR), cardiac output (CO), blood pressure (BP) and forearm blood flow (FBF) were assessed. Participants were subsequently exposed to arterial occlusion (RBC, DBP, and FBF) (all ps<0.001). Only FBF response to stress was attenuated during the inflammation session (interaction effect: p<0.05). There were no significant Condition effects.

Conclusions: The results showed that inflammation had an unfavorable effect on vascular responses to mental stress, but there was no effect on cardiac or blood pressure reactivity. This interaction between inflammation and the vascular responses during mental stress suggests that low level inflammation, a common feature of cardiovascular diseases, may contribute to MSII and possibly MI through influences on the vasculature.

ROLE OF SELF-ESTEEM AND CHILDHOOD EXPERIENCES IN COLLEGE STUDENTS RESPONSES TO ACUTE STRESS

Juliette Saltz, BA, Myriam V. Thoma, PhD, Aya Bashina, BA candidate, Nia Fogelman, BA candidate, Nicolas Rohleder, PhD, Psychology, Brandeis University, Waltham, MA

Rationale: Individual differences in how we interpret acute stress situations might result from interaction of genetic predisposition and lifelong experiences. Childhood maltreatment has been found to be related to increased stress responses in depressed and non-depressed individuals. Less is known about the role of non-traumatic childhood experiences in healthy young adults’ responses to acute stress, and potential mediators of this relationship.

Methods: Healthy undergraduate students (n=19; mean age: 22.4 yrs, SD=4.3 yrs; BMI=22.7 kg/m2, SD=3.3; 8 females) provided self-ratings of childhood experiences using the Childhood Trauma Questionnaire (CTQ), and of self-esteem using the Rosenberg Self-Esteem Scale (RSE). All participants were subsequently exposed to a standardized psychosocial stress paradigm (Trier Social Stress Test) twice on two separate days, to induce HPA axis activation. Saliva samples for assessment of salivary cortisol were taken repeatedly before and after each stressor.

RESULTS: Male and female students did not differ in self-esteem (RSE: F=0.3; p=0.58), but women had marginally higher scores on the CTQ (F=3.4; p=0.079). Stress-induced cortisol increased showed a significant inverse relationship with self-esteem on both days (r=-0.57; p=0.006; r=-0.75; p<0.001; resp.). Cortisol increases on day 2, but not day 1, were related with CTQ scores (r=-0.31; p=0.16). Controlling for RSE reduced this correlation to non-significance (r=-0.3; p=0.09) consistent with mediation of the childhood experience – cortisol response relationship by self-esteem.

Conclusions: Although preliminary, these findings show that childhood experiences as well as current self-ratings of self-esteem are predictors of the acute cortisol response to laboratory stress. Pending replication in a larger sample, these results might indicate that early life experience can affect later life stress responses even if non-traumatic. Furthermore, these effects might be mediated by personality factors such as self-esteem. Future studies will have to identify alternative mediators, and for example test whether experimental variation of self-esteem changes stress responsiveness.

ELECTRO-CORTICAL EVIDENCE FOR PREFERENTIAL PROCESSING OF DYNAMIC PAIN EXPRESSIONS

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Decoding pain in others is of high individual and social benefit in terms of harm avoidance and demands for accurate care and protection. The processing of facial expressions includes both specific neural activation and spontaneous congruent facial muscle reactions. Although there is a lot of research concerning basic emotions using static stimuli, there are only a few studies where dynamic facial expressions of pain were examined. Especially the facial expression of pain is determined by a distinct temporal evolution and plasticity recommending the use of
dynamic stimuli. In the present study, 22 participants viewed short video clips of faces depicting neutral and emotional (joy, fear, pain) expressions while electroencephalography (EEG) and facial electromyography (EMG) (M. Corrugator supercili., M. Orbicularis oculi, M. Zygomaticus major, M. Levator labii) were recorded. In addition, affective ratings were obtained and an emotion recognition task was administered. Analysis of emotion-modulated late positive potential (LPP) revealed a differentiation between pain expressions and all other facial expressions. The EMG analysis revealed a distinct pattern of facial response to happy faces, only. Emotion recognition was above chance level for all expressions with highest recognition rates for joy and neutral expressions. Moreover, pain faces were rated as most negative and highly arousing. Results demonstrate an enhanced neural processing of pain faces in comparison to other facial expressions in absence of specific facial muscle reactions. Findings are discussed in light of attentional demands of pain-related information and communicative aspects of pain expressions.

183) Abstract 1231

LEUKOCYTE ADRENERGIC AND SEROTONIN PATHWAY GENES ARE ASSOCIATED WITH DEPRESSIVE SYMPTOMS IN STABLE ANGINA PATIENTS

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Objective. Elevated depressive symptoms are associated with increased mortality and morbidity in heart failure (HF) patients. The mechanisms for this relationship are unclear. However, depressive symptoms are related to alterations in neuroimmune pathways, which are associated with worse outcomes in HF. Beta-adrenergic activity is known to regulate both cardiovascular and immune regulatory activities through beta-adrenergic receptors (ARs) on cardiac tissue and immune cells. Serotonin (5-HT) neurotransmission has been implicated in the pathobiology of depression. Concomitantly, 5-HT receptors are expressed on immune cells which also exhibit impairments in serotonergic transmission during depressive activation, which is associated with immune cell dysregulation. We sought to determine whether depressive symptoms are associated with leukocyte neuroimmune pathway-associated genes, β1 adrenoreceptor (ADRB1) and serotonin transporter (SLC6A4) in HF patients. Methods. Fifty-seven patients (age > 58 +/- 14) completed a Beck Depression Inventory (BDI) and blood was drawn for genotyping single nucleotide polymorphism (SNP) rs2020934 of SLC6A4 and rs6585258 of ADRB1. The heterozygotes were grouped with homozygotes of the variant allele under the assumption of a dominant model for each SNP. Association analysis was conducted using analysis of variance (ANOVA) and controlled for effects of age, sex, and race. Results. Both SNPs examined were in Hardy-Weinberg equilibrium (p > 0.05). The variant allele carrier for SLC6A4 rs2020934 was negatively related to BDI scores compared to homozygotes of the common allele (10.5 vs. 16.7; p=0.012). In addition, G allele carrier of ADRB1 promoter SNP rs6585258 was also negatively associated with BDI scores (10.9 vs. 18.2, p=0.01). Conclusions. We have identified statistically significant associations between genetic variants of neuroimmune pathway-associated genes, β1 adrenoreceptor (ADRB1, rs6585258) and serotonin transporter (SLC6A4, rs2020934) with depressive symptoms in HF patients. This suggests that genetic polymorphisms associated with increased susceptibility to depressive symptoms are likely to be involved in genetic control of specific biological pathways that may relate to neuroimmune activation in HF patients.

184) Abstract 1250

STRESS-ASSOCIATED INFLAMMATORY MODULATION IN STABLE ANGINA PECTORIS PATIENTS UNDERGOING STENT IMPLANTATION

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The goal was to investigate whether there could be differences in the neuroendocrine-inflammatory states of healthy controls (students, n=22) compared to patients with stable angina pectoris (SAP, n=23), and if the patients’ profiles were altered during/after percutaneous coronary intervention (PCI).

Included patients had min. 50% stenosis in two main coronary arteries shown by coronary angiography, and underwent implantation of metal stents in a single vessel. From students, blood samples were collected during first semester; in case of patients, blood was taken one day before PCI (resting state), immediately before PCI, immediately after PCI, and on the following day. Lactoferrin (specific activation marker of neutrophils) and IL-6 were assayed by ELISA in blood plasma. Plasma concentrations of ACTH and chromogranin A (marker of sympathetic activity) were determined by chemiluminescence and RIA, respectively. Routine hsCRP tests were also performed. Participants completed Rahe’s stress-coping inventory.

Compared to control values, the initial samples of patients were characterized by higher ACTH (mean±SE /pg/ml: 18.85±1.34 vs 27.33±2.11, p<0.005), chromogranin A (/ng/ml: 46.18±2.39 vs 178.81±22.00, p<0.001), lactoferrin (/ng/ml: 96.09±3.81 vs 161.98±12.90, p<0.001), IL-6 (/pg/ml: 0.20±0.04 vs 1.92±0.31, p<0.001), and CRP (/ng/ml: 0.24±0.01 vs 4.03±0.01, p<0.001). Immediately after PCI, plasma lactoferrin increased significantly in patients (/ng/ml: 260.53±16.84, p<0.001), that returned to the starting values next day. In the initial plasma samples, chromogranin A correlated positively with lactoferrin (r=0.49, p<0.001), with IL-6 (r=0.45, p=0.002), and with CRP (r=0.43, p<0.003). Interestingly, controls had considerably higher coping scores than patients (9.50±0.39 vs 6.57±0.47, p<0.001), while the slight difference between their stress levels was not significant.

Our results suggest that SAP patients could be in a stressed state that may modulate the inflammatory system positively via the sympathetic-adrenal system; stenting led to transitory neutrophil activation.

185) Abstract 864

POSITIVE AFFECT PREDICTS BETTER SELF-CARE AND ADHERENCE WITH LIFESTYLE ADVICE IN HEART FAILURE PATIENTS AT 1 YEAR FOLLOW-UP

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Purpose: Optimal self-care is crucial for the management of heart failure (HF) by actively managing symptoms, treatment, consequences, and lifestyle changes inherent to this chronic condition. Poor self-care may help explain differential risk in morbidity and mortality. While positive emotions have received little attention in this context, they may enhance a patient’s motivation and energy to successfully engage in adherence to treatment recommendations. Therefore, we aimed to examine the relative importance of baseline positive affect regarding self-management at 1 year follow-up in HF outpatients.

Methods: At inclusion, 221 HF outpatients (mean age 66.9±6.3 years, 78.7% men) from 3 depe teaching hospitals in the Netherlands completed a 4-item positive affect measure that was derived from the depression subscale of the Hospital Anxiety and Depression Scale (HADS). At 1-year follow-up, self-care, consultation behavior, and adherence with lifestyle advice were assessed with the short European Heart Failure Self-care Behavior scale.

Results: Reduced positive affect (1 SD below the mean score: ≤38) was present in 26% of patients with HF. Adjusting for clinical variables, demographics, and anxiety, positive affect was significantly associated with better self care (β=0.25, p<0.01), consultation behavior (β=0.22, p<0.05), and adherence to lifestyle advice (β=0.18, p<0.05) at 1 year follow-up. Also, age (β=0.25, p<0.01 for both) and having a partner (β=0.19, p<0.01; β=0.15, p<0.05) were both associated with better self care and consultation behavior. Age (β=0.14, p<0.05) and diabetes (β=0.22, p=0.01) were associated with better adherence to lifestyle advice.
Conclusions: Positive affect was associated with better self-care, consultation behavior, and adherence with lifestyle advice at 1-year, independent of clinical characteristics and anxiety. Assessment of reduced positive affect in clinical practice may be helpful to identify HF patients at risk of poor self-care.

186) Abstract 1230
TRAIT HOSTILITY PREDICTS THE FREQUENCY OF TOTAL SOCIAL INTERACTIONS AND NEGATIVE SOCIAL INTERACTIONS DIFFERENTLY BY SEX
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Trait hostility is an established predictor of coronary artery disease but the explanatory pathways are not well understood. The transactional model holds that hostile cognitions and affect lead to interpersonal stress, resulting in pathophysiological cardiovascular reactivity. Previous research has established gender differences in response to social interaction (SI) and interpersonal stress as a function of trait hostility. This study employed ecological momentary assessment (EMA) to explore gender differences in the interpersonal expression of hostility. We hypothesized that higher trait hostility would be associated with a higher rate of negative SIs. In 165 participants (80 men, 85 women) age 30 ± 7 years, we measured trait hostility as Cook Medley (CM) total score. Participants completed EMA ratings of SIs and reported interaction context every 30 ± 5 min throughout the waking day during 3 workdays and 2 non-workdays. We used linear regression models to test the interaction effect of sex and trait hostility on rate of SIs (defined as the number of SIs over all PDA entries), as well as on negative SI rate (i.e., the number of negative SIs over all SIs, where negative SIs were rated as tense, impatient, or angry). We also ran a stratified analysis to check whether the sex by trait hostility interaction effect differs by environmental context.
We found that the effect of trait hostility on rate of SIs depends on sex (p < 0.1). High hostile (HH) women tend to report more SIs than low hostile (LH) women. In contrast, this relation is reversed for men. Subsequent stratified analysis shows the same relationship. We also found, among those who had interactions, HH men tend to report a higher rate of negative SIs than LH women, and HH women reported lower rates of negative SI than LH women (p < .05). Subsequent stratified analysis did not show a consistent significant relationship across all strata. A significant trait hostility by sex interaction effect on negative SI rate was found only when the SI occurred in the home (p < 0.01).
Our findings suggest a more varied engagement pattern for HH women, contrasted with a more fixed pattern of social withdrawal for HH men, adding further evidence to the idea that men and women enact hostile cognitions differently in the interpersonal sphere.

187) Abstract 749
THE ASSOCIATION BETWEEN INTELLIGENCE AND LEUKOCYTE TELOMERE LENGTH: RESULTS FROM A LONGITUDINAL POPULATION BASED STUDY
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Introduction: Low intelligence has been associated with poor health and mortality, but the exact mechanisms remain obscure. We hypothesized that low intelligence accelerates the ageing process, indicated by an association with short telomere length. In addition, we hypothesized that part of the association between low intelligence and shorter telomere length is explained by enhanced exposure to adverse environmental events, as indicated by low socioeconomic position, and unhealthy behaviors.
Methods: This study was performed in a longitudinal general population cohort of 895 participants. At the time intelligence was measured, mean age of the participants was 52.8 years (SD = 11.3, minimum age = 33 years, maximum age = 79 years) and 46.8 % was male. The Generalized Aptitude-Test Battery was used to derive an index for intelligence. Leukocyte telomere length was measured with polymerase chain reaction. Lifestyle and socioeconomic factors were assessed with written self-report. Linear regression analyses, adjusted for age, sex, and baseline telomere length, were performed to test whether intelligence was associated with telomere length at approximately 2 years follow up, and to what extent this association was mediated by lifestyle and socioeconomic factors.
Results: Low intelligence predicts a decrease in leukocyte telomere length (β = .081, t = 2.160, p < .05). An important part of this association (39.5 %) was explained by unhealthy lifestyle, while low socioeconomic position was not an important mediator.
Discussion: Low intelligence seems to be a risk factor for accelerated biological ageing and this may explain why low intelligence is associated with poor health and mortality. A substantial part of the association between intelligence and telomere length over time was explained by unhealthy behaviors.

188) Abstract 1114
INTERCEPTIVE AWARENESS INFLUENCES DECISION MAKING PROCESS: A BIOFEEDBACK STUDY
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The ability to feel "bodily change" which produces an emotional bias similar to what is called interoceptive awareness (Damasio (1999)) stated the importance of this awareness in a brain area in decision making. We hypothesized that decision making could be influenced by interoceptive awareness using the technique of interoceptive focusing. 19 participants as a biofeedback group (BF Group) and 17 participants as a control group (Ctrl Group) took part in the present study. The biofeedback period (BF period) was implemented in the BF group after measuring device setting. During the BF period, the participants in BF group were shown their own skin conductance responses (SCR) in a graph, and they experienced stress state in a mental calculation task and rest state, while the participants in Ctrl group only read a newspaper without any biofeedback technique was applied. After BF period, a decision making task was carried out. In order to assess interoceptive awareness, we used the heartbeat perception task (Schantz et al., 1981). The participants counted how many heartbeats they felt over varying time intervals; responses were compared with how many heartbeats were measured by ECG and calculate the perception score. This task was delivered three times (before BF period, after BF period and after the decision making task). With regard to interoceptive awareness, the change value of the perception score was defined as what subtracted after BF period from before BF period. The BF group score was marginally significant higher than the Ctrl group’s (p < .10). With regard to anticipatory SCRs, the main effect of groups was not significant. With regard to the gamble choice ratio, there was a significant main effect of groups (p <.05). The BF group’s gamble choice ratio was significantly lower than the Ctrl group’s one. We suggested that the biofeedback technique has an efficacy on raising interoceptive awareness and this influences decision making.

189) Abstract 914
THE SOCIAL, PERSONALITY, AND EMOTIONAL PREDICTORS OF LONG-TERM DISTRESS IN PARTNERS OF PATIENTS WITH ACUTE CORONARY SYNDROME
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The partners of acute coronary syndrome (ACS) patients are at risk of experiencing symptoms of emotional and physical distress following the cardiac event, which are potentially detrimental to the patient’s recovery. Long-term adaptation of partners may be influenced by emotional, social, and personality factors as well as the severity of the patient’s illness. There is a lack of well-designed studies measuring these factors and outcomes longitudinally. The purpose of this study was to determine the nature and prevalence of long-term partner distress, and identify its predictors, using validated questionnaires and a prospective design. 117 spouses or cohabiting partners of patients with ACS (aged 57.55 ± 10.93 years) completed questionnaires at three time points. The predictor variables, marital satisfaction, anxiety and optimism were assessed 3 weeks after patient hospital admission (T1). Outcomes, assessed in terms of depression, sleep problems and physical quality of life (QoL) were measured at T1 and 6 and 12 months post-admission. Data from the latter two time-points were combined and designated ‘long-term follow-up’. At long-term follow-up, depression worsened, and was predicted by low marital satisfaction and optimism at T1. Long-term sleep problems were predicted by anxiety at T1. Physical QoL worsened, and was predicted by low optimism. For each multiple regression model, age, gender and social deprivation were taken into account, as well as clinical severity of the patient’s ACS and T1 levels of the outcome variable. These results suggest that psychosocial, emotional and personality factors are predictors of worsening emotional and physical distress for ACS partners in the year following the event. Individuals in an unhappy marriage, with high anxiety or optimism after ACS are at increased risk of depression, sleep problems and low physical QoL, and should be the target of additional support.

190) Abstract 1245
SICKNESS HURTS: HUMAN PAIN SENSITIVITY IN RESPONSE TO EXPERIMENTAL INFLAMMATORY STIMULATION
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The powerful pain facilitatory effects of a sickness response is well described in animals, but is little investigated in humans. In a randomized cross-over design, eight healthy participants (7 men, 1 woman, m=24 years) were injected once with 0.8 ng/kg endotoxin (E. coli) and once with placebo. Tests of pain sensitivity were performed before, 90 and 270 minutes after injection. Thresholds for heat pain, induced on the ventral left forearm, were similar after injection with endotoxin as compared to placebo. Pressure pain sensitivity was assessed with pressure algometry on four bilateral sites. After endotoxin, the thresholds for pressure pain on these sites turned lower, so that less pressure was needed for a stimulation to be perceived as painful compared to after placebo (p<.001). Lastly, endogenous pain modulation (diffuse noxious inhibitory controls; DNIC) was tested by measuring pressure pain thresholds before and after a secondary pain (cold pressor) was inflicted on the lower right arm. As expected, pressure pain thresholds were significantly higher after as compared to before application of cold pressor (p<.001), but were in general markedly lower in the endotoxin condition (p<.001). A pain inhibiting effect of cold pressor was present also after endotoxin, but appeared flattened. A follow-up study entailing 51 subjects in a between-subject design with a slightly lower dose of endotoxin (0.6 ng/kg), including DMR1 scans, replicated the above results. The present studies demonstrate for the first time that human pain thresholds are affected by an experimental and relatively mild transient stimulation of the inflammatory system.

191) Abstract 983
BETTER MARRIAGE IS ASSOCIATED WITH LOWER DEPRESSIVE MOOD AND DISEASE ACTIVITY IN FIRST YEAR INFLAMMATORY ARTHRITIS
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Objective: Adjustment to a chronic illness such as inflammatory arthritis is a ‘family event’. A supportive marital relationship has been associated with better patient outcomes. However, in some situations the changes associated with caregiving demands may lead to distress, conflict and poor adjustment for both the patient and the spouse. Given the implications for both members of the couple, a dyadic approach, which takes into account marital quality from the perspective of the patient and the spouse, is essential in order to understand the overall experience. In consideration of this issue, the present study used a family systems approach to examine the association between marital quality and depressive mood and disease outcomes in patients during the first year of their journey with inflammatory arthritis. We hypothesized that it is not simply the marital status (married or single) that is relevant but it is the quality of the spousal relationship that makes a difference.

Method: Patients with an average disease duration of 7.48 (4.03) months were recruited from a larger Early Inflammatory Arthritis registry, which recorded sociodemographic data and disease characteristics. The acute phase reagent C-reactive protein (CRP) levels were measured. Disease activity was estimated using the Disease Activity Score in 28 joints (DAS28). Current depressive symptoms were measured using the Center for Epidemiologic Studies Depression Mood Scale (CES-D). Patient- and spouse-perceived marital quality were assessed using the Dyadic Adjustment Scale (DAS).

Results: The study sample consisted of 73 patients living with spouse. The mean age of the study participants was 54.3 (12.1) years, 64.4% were female and 31.5% had children under the age of 18 years living at home. Patient-perceived marital quality (DAS-Patient) was negatively correlated to CRP (p = .007), DAS28 (p = .002) and CES-D (p = .001). This indicates that the better adjusted is the patient in his/her marriage the lower is his/her level of inflammation, disease activity and depressive mood. Spouses’ views about their marital adjustment significantly correlated to those of the patients’ (p<.001). This implies that patients and spouses are “in sync” with respect to their impressions of marital quality.

Conclusion: According to the current study, marital quality appears to play a role in the physical and psychological well being of the patients. Clinicians are encouraged to include both patients and their spouses in interventions.

192) Abstract 910
PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS OF MINDFULNESS INTERVENTIONS IN CARDIAC PATIENTS AFTER PCI: A RANDOMIZED CONTROLLED TRIAL
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Objectives. In this study effects of two mindfulness interventions, a group mindfulness intervention and a minimal self-help booklet intervention, were compared with each other, as well as to a no-treatment control group, in cardiac patients after percutaneous coronary intervention (PCI). It was hypothesized that patients receiving group mindfulness training would show stronger beneficial effects on mood as well as on blood pressure and reduced inflammatory status compared to patients receiving minimal mindfulness self-help. Methods. One-hundred-and-fourteen patients (mean age = 55 ± 7 years, 18% women) were randomly assigned to a group mindfulness intervention or a minimal self-help booklet intervention. Before and after the intervention, all patients received questionnaires, systolic and diastolic blood pressure (SBP and DBP) was measured and venipuncture was performed for determination of highsensitive C-reactive protein (hs-CRP). Results. Across mindfulness groups, significant pre-to-post intervention changes were
obtained for nearly all psychological variables. Compared to self-help, the group intervention was associated with larger increases in psychological and social facets of quality of life (p < .05, partial $\eta^2 = .06$) as well as self-reported mindfulness (p < .05, partial $\eta^2 = .09$). For perceived stress and symptoms of anxiety and depression, this effect was evident only in patients younger than 60 years of age. In the hypertensive ($\geq 140/90$ mmHg) subgroup, the group intervention ($N = 11$) showed significantly larger SBP and DBP decrease compared to self-help ($N = 14$; $p < .05$, partial $\eta^2 = .21$ and partial $\eta^2 = .19$, respectively). HS-CRP did not show any effects. Conclusions. Group mindfulness intervention seems beneficial for cardiac PCI patients regarding enhancement of psychosocial quality of life and blood pressure reduction (the latter in hypertensive patients only) and may be incorporated in standard care in this patient group.

193) Abstract 823

VARIATIONS IN THE SECRETION OF SALIVARY CORTISOL, IMMUNOGLOBULIN A, AND DHEA WHILE ASLEEP AND AFTER AWAKENING, AND ITS ASSOCIATION WITH PSYCHOLOGICAL SLEEP CONDITION

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The change in the secretion of stress-related substances, which are cortisol, immunoglobulin A (IgA), and dehydroepiandrosterone (DHEA) while asleep was regarded. As for the sample collection, we developed our own saliva collection technique while asleep as a non-invasive and non-disturbing manner of sample collection contrasting to conventional blood collection method that should impose greater psycho-physiological impacts on subjects. Subjects, 16 male university students, were instructed to take a 6-hour of sleep from 0:00 to 6:00 at the environmental controlled room, where saliva collection was made continuously in the time series. OSA sleep inventory and Chronic Fatigue Symptom (CFS) inventory were given to the subjects when they woke up to check their subjective sleep condition and chronic fatigue. In results, IgA concentration was found to gradually increase while subjects were asleep, and at after awakening it dropped to the initial level immediately. By contrast, cortisol and DHEA remained in the same level while asleep and got started to increase right after awakening. After that, cortisol reached at a peak at around 40 minutes after awakening, meanwhile DHEA reached at a peak immediately after awakening. Regarding to psychological scales, the variation in IgA after awakening has significant correlation with CFS (p < .05), and the variation in DHEA after awakening has significant correlation with the factor “frequent dreaming” and “refreshing” in OSA. In this study, the changing in salivary IgA, cortisol, and DHEA while asleep and after awakening were successfully illustrated by our own developed saliva collection apparatus. The profile of cortisol secretion after awakening has been partially understood by past studies, e.g. it has a peak at 30-40 minutes after awakening. However no study has ever illustrated precise changing of these substances in the time series, especially during the right. The contrasting profile of IgA and cortisol/DHEA might be derived from the difference in the stress reaction pathways in our body, which are sympatho-adrenal medulla axis for IgA and hypothalamus-pituitary-adrenal axis for cortisol and DHEA. Moreover the secretions of these substances were found to explain several psychological factors on sleep or chronic fatigue, while it is difficult to make a physiological significance on our results at this moment. At least our new methodology introduced in this study might open the possibility of the idea of biochemical assessment of sleep condition, i.e. in other words the objective evaluation of “Quality of Sleep” in our daily life.

194) Abstract 1091

NO PAIN NO GAIN: THE COMPLICATED COURSE OF MALIGNERING, FACTITIOUS DISORDER AND CONVERSION DISORDER

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Conversion Disorder is one or multiple motor or sensory symptoms that cannot be explained by a neurological or medical disorder. This disorder is associated with a psychological stressor and is not limited to pain or sexual dysfunction. Factitious disorder is the intentional production of physical or psychological symptoms for unconscious motivation to assume a sick role. Malingering is feigning of medical illness with conscious pursuit of external reward.

Method: Utilizing criteria from Diagnostic Statistical Manual- IV-TR this is a Single Case-Study of middle age Caucasian male following his first mental health intervention with symptoms transitioning from Conversion Disorder to Factitious Disorder. Case: Male patient presented with complete paralysis unilateral upper and lower extremities. Patient completed a full in-patient neurological and medical work-up that showed no organic causes for his medical presentation. Psychiatry consultation team was requested to examine the patient to rule out psychological stressors that could be presenting as neurological symptoms. Patient was not conscious of any stressors and denied any familial conflicts. Patient's paralysis improved at the time of discharge from in-patient medical facility. Outpatient commenced with collaboration of Department of Neurology and Psychiatry. Patient symptoms transitioned from paralysis to pain and impaired use of right upper extremity. Patient continued to deny any major stressors. However, close follow-up and intense psychiatric assessment revealed history of major psychiatric, personality disorder and personality disorder traits painting a complicated clinical picture of a patient who was unknowingly converting these stressors to physiological symptoms with a transition to feign of symptoms of unconscious gain of sick role. Physical impairment resulted in suicidal thoughts and psychiatric impatient admission. Detailed neuropsychological evaluation unmasked components of psychological illness and neurological deficits.

195) Abstract 1004

PROGNOSTIC ASSOCIATION OF SOMATIC AND COGNITIVE SYMPTOMS OF ANXIETY FOLLOWING MYOCARDIAL INFARCTION WITH RECURRENT MYOCARDIAL INFARCTION AND MORTALITY

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Background: Although anxiety has been found to be associated with mortality and cardiac events in patients with myocardial infarction (MI), no studies focused on dimensions of anxiety symptoms in relation to prognosis. This study explored the association between somatic and cognitive symptoms of anxiety following acute MI with different severity at baseline and recurrent MI and mortality at follow-up.

Methods: Patients (n=477) with an acute MI were recruited between May 2003 and May 2006. Assessment consisted of demographic and clinical data during hospitalization and the Hamilton Anxiety Rating Scale (HAM-A) at two months following MI. Endpoint was a composite of all-cause mortality and recurrent MI (mean follow-up= 3.8 years, sde 1.1 years). Results: Principal component analysis revealed two components, somatic and cognitive symptoms of anxiety. Somatic and cognitive anxiety symptoms were not associated with left ventricular ejection fraction (LVEF) (p= 0.38 and p= 0.33 respectively). Forty-nine patients had a recurrent MI or died during follow-up. The somatic anxiety component was a significant predictor of adverse outcomes (hazard ratio (HR): 1.33; 95% confidence interval (CI): 1.07-1.67; p=0.01). After adjustment for age, sex, cardiac history and LVEF, the association between somatic and adverse outcomes remained significant (HR: 1.35; 95% CI: 1.05-1.73);
p=0.02). Cognitive anxiety symptoms did not predict poor prognosis in unadjusted (HR: 0.87; 95% CI: 0.67-1.12; p=0.26) or adjusted analyses (HR: 0.76; 95% CI: 0.59-0.99; p=0.04).

Conclusions: Somatic anxiety symptoms independently predicted all-cause mortality and recurrent MI while cognitive anxiety symptoms did not have an adverse impact on prognosis. More research is needed to evaluate the differential associations of somatic and cognitive symptoms of anxiety with cardiac prognosis and the underlying mechanisms.

196) Abstract 816

STRESS, ADVERSITY, AND HEALTH OF YOUNG CHILDREN LIVING IN POVERTY
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Adverse childhood experiences (ACEs) such as abuse and family dysfunction have been related to chronic health problems in adulthood. Emerging evidence suggests that the cumulative effects of adversity and stress relate to worse health outcomes. Retrospective reports of ACEs also relate to asthma and allergies in adults. One prospective study has found that early trauma predicted asthma in children aged 6 to 13. Asthma is the third highest cause of hospitalization for children in the United States and its onset is usually before the age of 3. As yet, studies have not examined whether adversity in infancy and toddlerhood will increase the likelihood of early asthma onset. The present study examines rates of asthma and related disorders (allergies and eczema) in a sample (N = 247) of children mean age = 2.5 (SD=1.2) years old who were enrolled in a school readiness program for infants and toddlers living in poverty. Significantly more children with ACEs (p < .05), relationship stressors (p < .05) and stresses due to changes in the family (p < .05) had at least one of these major health issues (allergies, eczema, asthma). Children who experience ACEs and cumulative stress are more vulnerable to chronic health problems. Efforts to reduce major stressors and stabilize families may contribute to improvement in overall health trajectories of young children living in poverty.

197) Abstract 1237

PAIN: BASELINE VULNERABILITY TO INTERFERON INDUCED DEPRESSION
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Introduction: Major Depressive Disorder is a common consequence of interferon-a treatment. Understanding of etiological processes is evolving alongside authors re framing depression as an inflammatory disorder and increasing interest in the relationship between pain and depression.

Aim: We hypothesise higher baseline pain scores are associated with greater vulnerability to major depression during treatment for HCV.

Method: We assessed pain using self-reported Visual Analogue Scale in 110 patients, prior to interferon-a treatment. Hamilton Depression Scales and SCID DSM-IV (MDD) were administered monthly during treatment.

Results: MDD developed in 58% of subjects during treatment. Baseline pain scores were significantly greater in switch to depression group (p=0.006).

Although baseline HAMD scores were higher in switch to depression, the significance of this is abolished when controlling for pain score (p = 0.09). Controlling for baseline depression and age, the relationship between pain and switch to depression remains (p = 0.02)

Conclusion: Baseline self-reported pain scores are significantly greater in those switching to depressive disorder during interferon-a. Pain may impair emotional and neurocognitive functioning. Interest in the relationship between pain and depression is increasing; both serotonin and kynurenine pathways are implicated. Pain putatively joins other apparent vulnerability factors, such as SERT genotype, IL-6 genotype, baseline waking salivary cortisol and neuroticism/low agreeableness traits which have been demonstrated to influence depression emergence during interferon treatment.

198) Abstract 783

LIVING IN A HISPANIC ENCLAVE AFTER ACUTE CORONARY SYNDROME: THE MENTAL HEALTH IMPLICATIONS
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The U.S. census projects that Hispanics will be the majority population in 2042, and coronary heart disease is a major cause of morbidity and mortality in the Hispanic community. Both Hispanic ethnicity and depression appear to increase risk for adverse outcome after acute coronary syndrome (ACS) (Laurie, 2005) (Davidson, 2009), though living in a neighborhood with high Hispanic ethnic concentration may be protective against depression for Hispanics (Whitley et al., 2006). We sought to determine whether increased neighborhood ethnic concentration protects against post-ACS depression, independent of demographic, clinical, and ecological characteristics. Methods: ACS Patients (N = 472) completed the Beck Depression Inventory (BDI) and measures of demographics, disease severity, and perceived social support. Mean neighborhood household size, median income, number of single-parent households, and ethnic density were extracted from American Community Survey Census (2005 – 2009) data for each...
patient using their geocoded addresses. Results: In a regression analysis adjusted for the above demographic, clinical, and neighborhood factors ethnic density was associated with greater, and not lower depressive symptoms (Beta = 2.08, p = .04). Discussion: While previous research suggests that ethnic density may be protective against psychological disorders, these data suggest that living in a highly ethnically concentrated Hispanic community is associated with worse depression after ACS. These data add to a growing body of literature on the effects of racial or ethnic segregation and health.

PULSE N = 472 Post-ACS patients (each dot represents 1 patient)
Red = high Hispanic concentration; Yellow = moderate Hispanic concentration; Purple = low Hispanic concentration.

199) Abstract 1107

PSYCHOLOGICAL STRESS LEVELS AND AUTONOMIC ACTIVITY IN EVERYDAY LIFE PREDICT STRESS RESPONSES IN THE COLD PRESSOR TEST

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Background: Associations between stress levels in everyday life and controlled laboratory conditions remain a controversial topic. The aim of the present study was to compare psychological and physiological stress levels assessed in a real-life setting with laboratory stress levels.

Methods: Thirty-five healthy male students (age M=24.4, SD=2.6 yrs) took part in the study. The first part of the study consisted of a two-day period within which subjects collected saliva and rated their stress levels on a visual analogue scale immediately after awakening, 30min later, at 9am, and then every two hours for a total of nine times a day while maintaining their regular daily activities. Salivary alpha-amyrase (sAA) was assessed as a marker for autonomic nervous system activity at each time point. In the second part, subjects were invited to two laboratory sessions on two separate days, with randomized exposure to either a standardized stress test (cold pressor test, CPT, stress condition) or a rest condition. Again, sAA and subjective stress were assessed repeatedly during both conditions.

Results: During both days, sAA levels showed a distinct diurnal rhythm, with a trough in the morning and a steady increase over the course of the day (time effect p<.001). Self-reported stress levels significantly fluctuated over the course of the two days (time effect p=.022). In the laboratory part, the CPT resulted in significant increases in sAA and in self-reported stress levels (time effect: p=.001, interaction effect, p=.001). Regression analyses revealed that overall sAA levels in everyday life predicted sAA levels in both laboratory conditions (p<.001). The same held true for subjective stress levels (p<.001). It was also found that overall subjective stress levels in everyday life predicted the psychological laboratory stress response (p=.026). Furthermore, a trend was found for the sAA awakening response predicting overall sAA in the stress condition (p=.067).

Discussion: Stress levels in everyday life were shown to predict psychological as well as physiological stress levels in the laboratory. Further, subjects with high stress levels in everyday life experienced a more pronounced psychological stress response to a laboratory stressor.

200) Abstract 1166

EFFECT OF WEIGHT LOSS ON CARDIOVASCULAR STRESS RESPONSIVITY

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Obesity and excess body weight is an important risk factor for several chronic conditions. Heightened and sustained psychophysiological responses to psychosocial stress are prospectively associated with the development of cardiovascular (CV) risk factors. At present, it is unclear whether adiposity is associated with heightened or blunted autonomic reactivity to mental stress. Since previous work has mainly been cross-sectional, we report preliminary findings of an intervention study designed to examine the effect of weight loss on stress-induced CV and immune responses.

Participants underwent a psychophysiology stress protocol at baseline and after completing a 9 week supervised weight loss programme (M 9.50±1.20 weeks) using meal replacements and nutritional advice. Systolic (SBP) and diastolic (DBP) blood pressure, heart rate (HR) and total peripheral resistance (TPR) responses to a speech scenario and a mirror drawing task were evaluated using within-subjects ANOVAs. Twenty-four overweight women (M age 31.39±8.02 yrs; BMI 33.26±6.05 kg/m2) were recruited although eight participants (33.3%) did not complete the intervention. There were no differences in age or BMI between study completers and non-completers (all p≥0.69).

On average, participants lost 2.51±3.13 kg (range = 3.80 to -6.60) in weight and 3.40±2.27 kg (range = 7.20 to -8.50) in fat mass. There was a main effect of the stressor (F1,15=9.40, p<.008) and an interaction effect across conditions for SBP (F3,45=3.64, p=.02) and DBP (stressor effect F1,15=6.64, p=.02; interaction F3,45=2.92, p=.04) indicating smaller blood pressure responses (M difference SBP= -8.40±7.97 mmHg; DBP= -5.37±4.83 mmHg) after weight loss. No differences were observed in stress-induced HR and TPR responses. Weight-loss induced changes in weight and fat mass correlated with changes in DBP reactivity (rho=.56, p=.02 and -.48, p=.10 respectively) within the 2 stress sessions.

This preliminary finding has shown that weight loss achieved through supervised caloric restriction is associated with reduced blood pressure responses to mental stress. Since the effect of adiposity and excess body weight on psychophysiological responses to psychosocial stress is currently debated, we have offered some evidence that obesity is likely to be associated with heightened rather than reduced responses.
201) Abstract 1174

TYPE D MALES SHOW MALADAPTIVE CARDIOVASCULAR RESPONSE PROFILES TO NOVEL AND RECURRENT STRESS

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Epidemiological research examining the Type D personality has established its role as an important predictor of outcome following coronary events. In non-clinical samples, laboratory-based studies have shown that Type D personality is associated with a number of stress-related psychosomatic pathways. However, in both strands of research, male gender emerges as a common, but unexplored, factor, with much of the epidemiological research using predominantly male samples, and laboratory-based research findings confined to male participants. Consequently, the aim of the present study was to explore potential gender differences in Type D associations with health-related outcomes. 76 healthy individuals were recruited to participate in a laboratory-based study. Participants (40 male, 36 female) were classified as Type D or non-Type D using the DS16 and underwent cardiovascular monitoring during a 10-minute resting baseline period, a 5-minute cognitive stressor, a 10-minute recovery period, showing a exposure to the 5-minute cognitive stressor. Patterns of cardiovascular reactivity to the novel stress and adaptation to recurrent stress were examined using ANOVA. Results showed that Type D males showed an exaggerated systolic blood pressure (SBP) response on initial exposure to stress, F(1,76) = 4.28, p = .042, when compared to females or non-Type D males. On second exposure to the stressor, Type D males maintained this maladaptive response profile, showing a sensitized SBP, F(2,148,154.662) = 5.172, p = .006, and diastolic blood pressure, F(2,198,158.236) = 2.961, p = .049. In contrast, Type D females demonstrated equivalent increases to non-Type D males and females in response to novel stress as well as successfully adapting to recurrent stress. These findings confirm that important gender differences exist in the association between Type D personality and maladaptive physiological responding to both novel and recurrent stress.

202) Abstract 801

IS THERE ANY RELATIONSHIP BETWEEN DEPRESSION AND SLEEP APNEA?

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It is well known that psychological factors such as depression and anxiety affect the onset and course of various physical diseases. Although a few reports show some patients with obstructive sleep apnea syndrome (OSAS) have atypical depression, there is still some discussion about the relationship between OSAS and depression, which are both well known to relate to cardiovascular disease. To clarify whether there is any relationship between severities of depression and OSAS. We conducted semi structured interviews with 1826 male and 325 female patients, aged 16 years and above, who were considered as suffering from OSAS, by using Hamilton Depression Rating Scale (HAM-D) before polysomnography at Aichi Medical University. Among the subjects, 1376 men (52 ± 14 yr) and 243 women (58 ± 14 yr), who had 5 or more on the apnea hypopnea index (AHI), were diagnosed with OSAS. In the male OSAS patients, HAM-D score relates to Epworth sleepiness score (r=0.069, p=0.01), lowest SpO2 (r=-0.055, p=0.04), arousal index (r=-0.063, p=0.02), proportions of Stage (N1+N2) (r=0.075, p=0.006) and REM stage (r=-0.076, p=0.005). In the female OSAS patients, HAM-D score relates to age (r=0.127, p=0.05) and body mass index (BMI, r=0.151, p=0.02). There is no correlation between HAM-D score and AHI in either sex. Stepwise multiple regression analysis was performed to estimate the magnitude of the association between the indices regarding sleeping condition as independent variables and HAM-D score as a dependent variable. The indices regarding sleeping condition as independent variables, and that BMI (F value=5.25, p=0.02) was independent variable related to HAM-D score of female OSAS patients. This study may support that there is no significant relationship between the severities of depression and OSAS.

203) Abstract 1064

TYPE D PERSONALITY AND REGULATION OF THE HYPOTHALAMUS-PITUITARY-ADRENAL (HPA) RESPONSE DURING INTERPERSONAL STRESS

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Objective: To examined whether type D personality is associated with a cortisol response to interpersonal stress.

Methods: Sixty four healthy adults (age=50.7±7.91; female 51.56%) participated in the study. All participants were exposed to a 5-minute interpersonal conflict task, and blood cortisol was measured prior to, during and after task. Two-way ANCOVA repeated measurement was adapted to investigate the impacts of type D personality and experiment stage on cortisol response by controlling the covariates age and sex.

Results: The main effect of experiment stage was significant (F = 3.225, p < .05) and showed that the plasma cortisol response was increased after stress (7.79±3.64) comparing to baseline (6.69±2.91) and recovery (6.62±2.98) stages. Furthermore, the main effect of type D personality was also significant (F = 4.634, p < .05) and showed that the plasma cortisol response was lower for Type D personality (6.33±2.49) than that of non-Type D personality group (8.46±3.91). The interaction effect was not significant.

Conclusions: Type-D personality may be associated with blunted cortisol response to interpersonal stress.

204) Abstract 1133

METABOLIC RISK FOR POLYMORPHISMS WITHIN THE MTHFR GENE

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Background: Studies of metabolic risk for functional variants within the methylenetetrahydrofolate reductase (MTHFR) gene have provided inconsistent results. Though polymorphisms at two codons, 677(C/T) and 1298 (A/C) have been known to influence MTHFR enzymatic activity, association studies of cardiovascular risk have largely focused on 677(C/T). A recent study, however, suggests that 1298(A/C), but not 677(C/T), is associated with metabolic syndrome in those taking antipsychotic medication. We investigated if the phenomenon is more generalized, and not limited to those taking antipsychotic agents.

Method: Subjects included 728 European-American men and women (38% male; age range 45-74 years) who participated in the University of Pittsburgh HeartSCORE study. A composite index of metabolic risk was calculated as an aggregate of five risk factors: waist circumference, resting blood pressure, fasting serum triglycerides, HDL-cholesterol and glucose. Subjects were genotyped for 677 C/T (rs1801133) and 1298 A/C (rs1801131) single nucleotide polymorphisms.

Results: The distribution for 677 C/T did not conform to Hardy Weinberg equilibrium and was not used in further analyses. Distribution of 1298 A/C genotypes conformed to Hardy Weinberg equilibrium. On linear regression, after adjusting for age, gender, SES, physical activity, smoking, insulin use and use of lipid lowering and antihypertensive medications, 1298 A/C genotype was associated with greater metabolic risk score (B = 0.024, t = 2.239, P = 0.025). Those
homozygous for CC alleles (N =69) had greater metabolic risk scores than those with a allele carriers (B = 0.028, t = 2.34, P = 0.02); mean metabolic scores for the two groups were 0.147 and -0.019 respectively (t = -2.001, P = 0.046). In secondary analyses, CC genotype was associated with increased waist circumference (B = 0.025, t = 2.351, P = 0.019 and lower levels of serum HDL B = -0.021, t = -1.973, P<0.05).

Conclusion: The association between MTHFR 1298A/C polymorphism with metabolic risk score in a cohort of individuals not taking antipsychotic agents generalizes the finding to a broader population. Since results for 677CT polymorphism could not be interpreted, further studies are needed to confirm if 1298CA polymorphism exhibits stronger association with metabolic risk than 677CT polymorphism, especially in light of the evidence that polymorphism at 677(CT) exerts greater influence on the enzymatic activity than 1298A/C.

205) Abstract 1002

NEURAL CORRELATES OF DIFFERENCES OF AFFECTIVE EXPERIENCE BETWEEN MEN AND WOMEN

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People believe that women are more emotionally intense than men, but the scientific evidence is equivocal. In this study we tested the novel hypothesis that men and women differ in neural correlates of affective experience, rather than in its intensity, with women being more internally (intocceptive) focused but men being more externally (visually) focused. Adult men (n=17) and women (n=17) completed a functional magnetic resonance imaging (fMRI) study while viewing affectively potent images and rating their moment-to-moment feelings of subjective arousal. We found that men and women do not differ overall in their intensity of moment-to-moment affective experiences when viewing evocative images, Men; M(SD) = 1.70 (.27), Women; M(SD) = 1.81 (.27), F(1,32)=1.56, p=.20 but instead, as predicted, parametric modulation analysis revealed that women showed a relatively greater association between the momentary arousal ratings and neural responses in the anterior insula cortex (AI): the right ventral AI (x, y, z) = (34, 18, -14), T(32)=3.63, p=.0002, mid AI (42, 12, 0), T(32)=4.08, p=.0004, and left mid AI (-40, 14, -2), T(32)=3.73, p=.0001, which represents bodily sensations, whereas men showed relatively stronger correlations between their momentary arousal ratings and neural responses in visual cortex left V1 (-10, -86, 0), p=.001. Furthermore, men did show stronger functional connectivity than women between AI and dorsal ACC (dACC) when viewing evocative images. Activations in the AI were positively correlated with activation in the dACC in both men and women during the task but these correlations were stronger for men than for women; left dAI (-35, 18, 7) - dACC (3, 31 23), T(32)=3.82, p=.001; right mAI (-33, 18, -5) - dACC (1, 25, 27), T(32)=3.68, p=.001; left mAI (42, 15, -3) - dACC (-3, 29, 21), T(32)=4.10, p=.001, suggesting enhanced functional connectivity in men in the circuitry involved with regulating shifts of attention to the world. These results demonstrate that the same affective experience is realized differently in different people, such that women's feelings are relatively more self-focused while men's feelings are relatively more world-focused.

206) Abstract 1247

COMBAT EXPOSED WAR VETERANS AT INCREASED RISK FOR SUICIDE SHOW HYPERACTIVATION OF PREFRONTAL CORTEX AND ANTERIOR CINGULATE DURING ERROR PROCESSING

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Objective: Suicide is a significant public health problem. Suicidal ideation (SI) increases risk of completed suicide; however, the brain basis of SI is unknown. The prevalence of suicide is significantly higher among individuals exposed to combat relative to the general population. Combat exposed individuals are also at increased risk of concussion and major psychiatric illnesses such as major depressive disorder (MDD) and posttraumatic stress disorder (PTSD) - all of which increase risk of suicide. The objective of this study was to characterize neural correlates of SI among individuals exposed to combat in Iraq or Afghanistan. We hypothesized that combat veterans with a history of SI relative to combat veterans with a history of SI would show inefficient utilization of neural circuitry involved in self-monitoring.

Methods: Two groups of “highly distressed” individuals (i.e., two or three of the following: 1. current MDD, 2. current PTSD, 3. history of concussion) performed a validated stop task of fMRI. Task-related activation was compared between SI subjects (i.e., highly distressed OEF-OIF veterans with a history of SI) and non-SI subjects (i.e., highly distressed OEF-OIF veterans with no history of SI).

Results: Although the SI and non-SI subjects showed similar behavioral task performance, the SI group required more activation of prefrontal cortex and anterior cingulate to maintain their performance. Conclusions: These findings suggest a brain basis of SI and may further suggest that fMRI could be used to identify individuals at risk for suicide before they engage in suicidal behavior. This research was funded by grants from the Veterans Administration and the Congressionally Directed Medical Research Program, and supported by the VA Mental Illness Research, Education and Clinical Center and the VA Center of Excellence for Stress and Mental Health. Dr. Matthews’ VA salary is supported by a CDA-2 from VA CSR&D.

207) Abstract 807

EFFECT OF AN INTERACTION OF SELF-REPORTED DISTRESS AND CORTISOL DIURNAL RHYTHM ON EMOTIONAL MEMORY CONSOLIDATION

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Objectives: A flatter diurnal cortisol rhythm may be indicative of a long-term response to chronic stress. Previous studies have demonstrated that circadian-mediated cortisol levels have an important role in cognition, however, little is known the relationship between cortisol diurnal rhythm and cognitive function in healthy subjects. This study investigated the relationship between self-reported distress and daily salivary cortisol patterns in relation to emotional memory consolidation. Methods: Healthy volunteers (30 male and 12 female; mean age 20.67yrs) participated in the study. On the first experimental day (Day1), the participants were asked to fill out the General Health Questionnaire (GHQ-12) to assess subjective distress over the past several weeks. Salivary cortisol levels were measured at four time points (8:00, 11:00, 15:00, 20:00) at Day 1. The participants viewed emotionally arousing story and one week later they were asked to return to the laboratory and were given a surprise memory test. The story consisted of three phases and emotionally arousing narration occurred during phase 2. Heart rate was assessed during the experiment. The participants were then classified into two groups according to their GHQ-12 scores (GHQ-group: not-distressed (ND), 0-2; distressed (D), 3+). They were also classified into two groups by the median split of cortisol decline rate from 8:00 to 11:00 (Cortisol-group; low level decrease, high level decrease). Results: The repeated ANOVA revealed a significant main effect of phase (F(2,76)=4.31, p<.05) and a significant GHQ-group x Cortisol-group x phase interaction for memory scores (MS) (F(2,76)=3.20, p<.05). As shown in Figure 1, for the ND group, phase 2 was associated with an increase in low level cortisol decrease group. On the other hand,
for the D groups, MS were higher in phase 2 compared to phase 1 only in high level cortisol decrease group. For Heart rate, only a main effect of phase was found (F(2,56)=4.08, p<.05; Phase1, 3 > Phase2). Conclusions: There is a difference between self-reported distress and cortisol diurnal rhythm, which is probably caused by response time lag. For example, participants who report distressed and have flatter cortisol diurnal rhythm are consistent responders. These findings may suggest that the interaction of self-reported distress and cortisol diurnal rhythm should take into account for understanding the effect of chronic stress on memory consolidation in healthy subjects.

208) Abstract 1228

EFFECTS OF FLUID LOADING ON PAIN PERCEPTION AND CARDIOVASCULAR REACTIVITY
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Previous research indicates an association between the changes in baroreceptor activity and changes in pain threshold. The purpose of this study was to explore whether increases in blood volume via fluid loading (12ml/kg) influences pain perception. Sixty healthy participants (30 male; 30 female) were randomly divided into experimental (fluid loading) and control (no fluid loading) groups. Hematocrit (Hct) levels were assessed before the fluid loading manipulation and at the end of the study. A series of 6 pairs of thermal stimulations (thermal threshold; thermal tolerance) were delivered via thermode (start temperature: 30°C, rise: 5°C/sec) to the underside of the arm. Participants were asked to rate their perceived pain after each stimulation. Systolic (SBP), diastolic (DBP), mean arterial (MAP) blood pressure and heart rate (HR) were taken during a 5-minute baseline period and immediately following thermal tolerance stimulations. Fluid loading occurred after the first 3 pairs of thermal stimulations, followed by a 25-minute fluid absorption period. The final 3 pairs of thermal stimulations followed the fluid absorption period. A series of within-between repeated measures ANOVAs revealed that Hct significantly decreased following fluid loading for both males and females (p<.001). Results also revealed that pain perception significantly increased for males following fluid loading in comparison to the control group (p=.022). Results in cardiovascular reactivity for males revealed significantly greater changes in SBP (p=.007), MAP (p=.044), and cardiac output (p=.031), in the fluid loading group compared to the control group. No significant group differences were found for females. No significant differences in pain tolerance were found between conditions, possibly due to limitations in maximum allowable thermal stimulation. Results of this study appear to indicate that plasma volume expansion can alter pain, possibly through alteration in baroreceptor activity.

209) Abstract 1022

POSITIVE EATING ATTITUDES PROTECT FEMALES WHILE A HIGHER COMMITMENT TO EXERCISE PROTECT MALES FROM PERCEIVED STRESS
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Background: Excessive exercise has been found to have both negative physical and psychological health effects, with stress being one of the major pathways linking exercise to health. However, so far it is unclear whether these effects are direct effects of exercise behavior or rather mediated by exercise attitudes. Further, findings in the eating disorder literature suggest a gender-dependent link between exercise behavior and eating attitudes. Based on these findings, the current study set out to characterize the effects of exercise and eating attitudes – in contrast to exercise and eating behaviors – on stress measures in both males and females.

Methods: 54 healthy students (33 female) were asked to complete questionnaires assessing eating and exercise attitudes, eating and exercise behaviors, as well as perceived chronic stress levels. Two days of at home saliva sampling were used to assess basal cortisol profiles. Results: No significant associations were found between self-report data and cortisol. However, gender-dependent effects of both eating attitudes (beta=-4.17, p=.045) and exercise attitudes (beta=-0.42, p=.025) on perceived stress were found, such that lower stress was associated with positive eating attitudes in females and with higher commitment to exercise in males. Both effects were thereby independent of the respective behavior.

Conclusion: Although there were no significant findings in relation to cortisol, our preliminary results do suggest that positive eating attitudes may act as a protective factor against perceived stress for females, while for males, a higher commitment to exercise can be stress protective. Importantly, both effects were independent of the respective behavior, (i.e., eating and exercise behavior), emphasizing the health relevance of perceptions and attitudes – even over actual health behaviors. Lastly, the fact that healthy males were affected by exercise attitudes but not eating attitudes may help to explain gender difference in prevalence rates of eating disorders.

DURATION OF THERAPY AND DOSE OF PSYCHOTHERAPY ARE CRUCIAL FOR THE EFFECTIVENESS OF PSYCHOSOMATIC REHABILITATION IN GERMANY BUT OF MINOR IMPORTANCE FOR LONG-TERM FOLLOW UP RESULTS
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Several studies have revealed that psychosomatic rehabilitation is effective and cost efficient. All these studies included patients with at least 6 weeks of therapy. Efficacy is not well examined if duration of therapy (and dose of psychotherapy) is reduced. We therefore retrospectively compared the outcome if rehabilitation was less than 6 weeks with the results of “regular” therapy. All the patients who were treated 2010 in the psychosomatic rehabilitation center St. Franziska Stift with a therapy of at least 3 weeks were included into this retrospective analysis. Parameters were assessed at onset, the end of therapy and after one year follow up. 646 patients had rehabilitation of regular duration (44+/– 3 days) and 169 were treated for 33 (+/– 4) days. Effectiveness was significantly better if patients had a regular rehabilitation (Cohen’s d 1.12 vs 0.83, p<.01 for depressive symptoms). Age, diagnoses, social status, unemployment, duration of sick leave were relevant confounders. At one year follow up the effects were still large in both groups, however, duration of inpatient therapy was of minor importance. Outpatient therapy programs after discharge become more important. We conclude that retrospective analyses are not really appropriate to assess the optimal duration of psychosomatic rehabilitation with the German rehabilitation setting when long term outcome is considered.
MARITAL STATUS INFLUENCES THE EFFICACY OF A BRIEF GRATITUDE INTERVENTION
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Positive Psychology focuses on the role of human flourishing; this is an important component in conceptual models relating to psychological health and wellbeing. Aiming from this is the development of interventions designed to enhance flourishing and well-being. Gratitude interventions have been shown to enhance well-being immediately and over a sustained time period. Such interventions often involve writing gratitude letters and delivering and or reading it to the recipient, this is quite intense and time-consuming. This study aimed to design a brief gratitude intervention for use by healthy women. Healthy women (N=30, 26.0±3.8 years) completed a gratitude intervention on 5 evenings whereby they listed their gratitude and persons they felt gratitude towards. They received reminders to complete the activity via SMS text-messages. Measures of gratitude (the gratitude questionnaire), and trait wellbeing and ill-being (the Subjective Happiness Scale, the Positive and Negative Schedule, and the CEDS) were obtained prior to, immediately after and one week after the intervention. Using the ecological momentary assessment method, participants rated their mood over 2 days before and one week after the intervention to measure state well-being and ill-being. Before the intervention married women had lower levels of gratitude than single women. Intervention effects are only evident in married women; feelings of gratitude significantly improved immediately after and one week after the intervention in married women (F(1,44)=16.3,p<.001), but not single women (F(2,44)= 15.23,p<.001). There was no change in trait and average state well-being and ill-being for either married or single women. Results suggest that a brief gratitude intervention is effective in enhancing married women’s gratitude feelings but not single women. This finding is explained with reference to research showing that gratitude is related to relationship quality and strength. The differences in effects between married and single women may also be related to models of social support, and the potential iterative associations of social support and gratitude. The finding highlights the importance of matching the intervention to the population.

SELF-REGULATORY FATIGUE IN CHRONIC MULTI-SYMPTOM ILLNESSES: SCALE DEVELOPMENT AND VALIDATION
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Context: Self-regulatory capacity involves ability to regulate thoughts, emotions, and behavior. Chronic multi-symptom illnesses (CMI) such as Fibromyalgia (FM) and Chronic Fatigue Syndrome (CFS) are often accompanied by cognitive, emotional, and physical challenges, and have recently been associated with self-regulatory fatigue (SRF).

Objectives: SRF has to date been measured through experimental tasks, and the current study aimed to develop and validate a new scale index of self-regulatory capacity for use in CMI.

Method: Two self-regulation researchers developed 30 items related to self-regulatory capacity. These items were distributed to patients (N=296) diagnosed with FM and/or CFS. A principle factor analysis was employed to examine factor structures, identify inter-item relationships, and aid in development of a scale measuring SRF.

Results: The final scale consists of 18 items measuring self-regulatory capacity, with components of cognitive, emotional, and behavioral SRF. Internal consistency and reliability was acceptable (Cronbach α = .81), and the final scale was moderately correlated with self-control (r = -.48) and highly correlated with physical fatigue (r = .75). The scale correlated negatively (r = -.51) with dispositional optimism, supporting recent research suggesting individual differences in personality may impact the manifestation of SRF.

Conclusion: The current study provides a new scale, with evidence of reliability and validity, for measurement of self regulatory capacity in patients with CMI. Though cross-validation studies are necessary, use of such a validated scale will allow researchers and clinicians to better understand the concept of self-regulation and how SRF impacts symptoms and responses to treatment among CMI populations.

BRIEF PSYCHOLOGICAL STRESS INDUCES AN INCREASE IN CONVENTIONAL CD3+CD56+ NKT CELLS BUT NOT IN INVARIANT CHAIN NKT CELLS
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Brief psychological stress has primarily been investigated with regard to its effects on conventional lymphocytes like natural killer (NK) cells, CD4+ and CD8+ T cells. The present study, however, focused on more “specialized” lymphocyte subsets to identify potential links between stress, the immune system, and somatic diseases. Using flow cytometry we determined peripheral frequencies of Th1- (CD226+) and Th2-type (CRTH2+) T cells, γδ T cells, as well as conventional CD56+ natural killer T (NKT) cells and invariant NKT cells (iNKT) in healthy young males (N=31) undergoing brief laboratory stress. We found acute psychological stress to induce a prolonged increase in CD4+ and CD8+ T cells expressing a Th2 phenotype. We further detected an acute increase in CD4+ and CD8-double negative γδ T cells, and, in accordance with the literature, an increase in NK cells under stressful conditions paralleled by a significant rise in the numbers of conventional CD56+ NKT cells. In contrast, numbers of iNKT remained unchanged throughout the experimental procedure. The present data add further evidence to a psychoneuroimmunological model proposing that under stressful conditions certain lymphocyte subsets, like iNKT and less mature T cells, are retained in lymphoid...
tissues while antigen-experienced effector-type T cells with a Th2 phenotype, γδ T cells, and conventional CD56+ NKT cells are mobilized into the peripheral blood. One may speculate that in case of frequent stress exposure this might result in the promotion i.e. of allergic conditions.

214) Abstract 714

TEMPERAMENT AND CHARACTER PERSONALITY PROFILE AND ILLNESS-RELATED DISTRESS IN CENTRAL SEROUS CHORIORETINOPATHY

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Psychosocial stress is a risk factor as well as a consequence of central serous choriotinopathy (CSC). With regard to personality a type A-like behaviour associated with impulsiveness, overachievement and hard-driving competitiveness has been discussed. We investigated 57 consecutive CSC patients and 57 age and gender matched controls by means of the Symptom Checklist 90-R and the Temperament and Character Inventory. In CSC patients we assessed somatic risk factors, illness characteristics, subjective assessment of severity of illness and illness-related stress in different areas of life (work, private life). CSC patients showed a significantly higher emotional distress as measured by the Global Severity Index and a lower cooperativeness, no differences with regard to other personality dimensions were found. Cooperativeness as well as subjective assessment of severity of CSC were significant predictors of illness-related work stress accounting for 30% of variance. Not all facets of type A behaviour could be confirmed in CSC patients, mainly a lower cooperativeness was found implicating competitiveness and hostility. Low perceived social support and loss of control may explain the significant contribution of this personality dimension to illness-related work stress. Treatment of CSC should embrace psycho-education about factors contributing to illness-related stress.

215) Abstract 1046

EXPLORING THE RELATIONSHIP BETWEEN BLUNTED NOCTURNAL DECLINE AND DAYTIME AMBULATORY BLOOD PRESSURE RESPONSES IN YOUTH

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Blunted nocturnal decline of < 10% in blood pressure (BP) has been established as predictive of cardiovascular risk. Recent adult studies have suggested a relationship exists between blunted BP nocturnal decline and generalized blunted BP responses during the day. With childhood risk factors tracking into adulthood and levels of cardiovascular risk factors increasing in youth, understanding cardiovascular health in adolescence is necessary. This study aimed to examine whether blunted nocturnal BP decline is related to blunted daytime BP responses in youth. 138 youth (69 % boys; 46% Hispanic, 25% Black; mean age = 16.1 yrs; 42% were systolic and 36% diastolic blunted BP decliners) completed a 24-hour ambulatory BP assessment including diary entries detailing location, activity, stress, and posture. Separately for systolic and diastolic BP, hierarchical linear modeling was used to determine if those who exhibited blunted nocturnal decline also exhibited smaller BP responses during the day to particular locations, postures, stress and activity. For those with or without blunted nocturnal decline, no significant differences in average systolic (b=1.07, t(2401)=0.40, p=.69) or diastolic (b=1.63, t(2401)=1.02, p=.31) daytime ambulatory BP levels were observed. For both systolic and diastolic daytime ambulatory BP, those youth who exhibited blunted nocturnal decline had a smaller BP increase in locations other than home, school, work, or clinic as compared to youth who did not exhibit a blunted nocturnal decline (Systolic: b=5.00, t(2401)=2.31, p=.02; Diastolic: b=5.08, t(2401)=3.03, p=.003). While some differences in how cardiovascular at risk youth respond to daytime activities appeared, differences were not observed in daytime BP readings taken during work, home, school, activity or times of reported stress. Unlike findings from this study, evidence of a generalized blunted response pattern in youth was not observed. Additional research could establish the appropriateness of using situational ambulatory BP responses to identify cardiovascular at risk youth. Supported by NIH grant P01HL36588.

216) Abstract 970

WHEN SOCIAL EXCHANGES BECOME TOO MUCH - BLUNTED CORTISOL AWAKENING RESPONSES IN COLLEGE STUDENTS EXPERIENCING HIGH NUMBERS OF SOCIAL EXCHANGES

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Social isolation has repeatedly been associated with negative health outcomes, an association that has been particularly well studied in older adults. Social isolation thereby captures not only lack of social exchanges, but also lack of (perceived) social support. Although some have shown perceived social support to be the stronger predictor of the two, social support is usually assumed to be positively correlated with number of social exchanges. However, it is unclear whether this is also true in a population in which social exchanges are defined by circumstances, such as in college students. In the current study we aimed at investigating the association between perceived social support and number of social exchanges in college students as well as at exploring the health-relevance of each of the two. Thirty-six students from Brandeis University (mean age=20.7, SD=2.46, male=14) completed the Interpersonal Support Evaluation List and the Positive and Negative Social Exchanges scale. Participants collected 12 saliva samples over two consecutive days to assess their daily cortisol profiles. Cortisol profiles were then averaged across the two days and cortisol awakening responses (CAR) were defined as difference between wake-up value and peak value in the subsequent hour. As expected, social support was positively correlated with CAR independent of gender and controlling for saliva sampling compliance (r=−.33, p=.059). Interestingly, more social exchanges both, positive and negative, were associated with less perceived social support (r=−.39, p=.024) and furthermore, blunted CAR (r=.41, p=.016). As in every population studied, students as well show health benefits from perceiving high social support. However, our findings also suggest that not only having no social exchanges, but also having too many social exchanges can be a health detriment, as indicated by blunted cortisol awakening responses. Hence, while in older populations the remedy for social isolation-related health deficits may be to increase the amount of social exchanges, this may not hold true for a college student population. For students, decreasing the number while increasing the quality of social exchanges may be more beneficial.

217) Abstract 725

DISORDERED EATING BEHAVIOUR IS ASSOCIATED WITH BLUNTED CORTISOL AND CARDIOVASCULAR REACTIONS TO ACUTE PSYCHOLOGICAL STRESS

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Research suggests a potential dysregulation of the stress response in individuals with bulimia nervosa. This study measured both cardiovascular and cortisol reactions to a standardised laboratory stress task in individuals identified as showing disordered eating behaviour to determine whether dysregulation of the stress response is characteristic of the two branches of the stress response system. Female students (N = 455) were screened using two validated eating disorder questionnaires. Twelve women with disordered eating, including self-induced vomiting, and 12 healthy controls were selected for laboratory stress testing. Salivary cortisol and cardiovascular activity, via Doppler imaging and semi-automatic blood pressure monitoring, were measured at resting baseline and during and after exposure to a 10-minute mental arithmetic stress task. Compared to controls the disordered eating group showed blunted cortisol, cardiac output, heart rate, and stroke...
DISTRESS AND SLEEP QUALITY MODERATE THE EFFECT OF EXERCISE ON COGNITIVE FATIGUE AND PAIN IN WOMEN WITH FIBROMYALGIA

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Fibromyalgia is a multi-symptom disorder characterized by widespread pain, fatigue and cognitive difficulties. Cognitive fatigue in particular appears related to increased distress and reduced daily functioning. Psychological assets, such as pain self efficacy, appear to be instrumental to improved functioning in those with fibromyalgia, whereas psychological vulnerabilities, such as negative affect, appear to be related to increased pain. The purpose of this research was to determine if sleep quality and exercise differentially affect cognitive fatigue and pain in those with fibromyalgia. Women with fibromyalgia (n = 27) completed a five-day daily diary study, reporting morning and evening levels of cognitive fatigue, pain, emotional distress, as well as sleep quality and exercise. Multilevel modeling indicated that regular exercise decreased cognitive fatigue and pain in those with fibromyalgia (gamma = -1.57, (95% CI -3.01, -1.13), p < .005 and gamma = -.95 (95% CI -.171, -.19), p < .05, respectively). However, on days with poorer sleep quality, the protective effects of exercise on pain were reduced, controlling for morning pain (gamma = -.25 (95% CI -.49, -.01), p < .05). Conversely, in those who also have morning emotional distress, the protective effects of exercise on cognitive fatigue at the end of the day were stronger, controlling for morning cognitive fatigue and pain (gamma = 1.20 (95% CI .22, 2.18), p < .05). Whereas exercise does reduce pain in these women, improving sleep quality may have greater impact on pain management than exercise alone. Additionally, exercise may be especially important in counteracting cognitive fatigue in those who are emotionally distressed. Highlighting the impact of exercise on cognitive fatigue may increase adherence to exercise recommendations in women with fibromyalgia.

THREAT-RELATED ATTENTIONAL BIAS AND INDIVIDUAL DIFFERENCES IN HEALTH-RELATED PHYSIOLOGICAL FUNCTIONING

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In evolutionary terms, detection of environmental threat serves an adaptive function, safeguarding individuals from harm by alerting them to possible danger. To such, vigilance towards threat may underlie physiological processes of subjective stress responding with implications for health. Experimental studies where participants’ attention has been experimentally manipulated towards or away from threatening stimuli have confirmed that directing attention towards threat exacerbates later anxiety responses to stress. However, such research has relied on the presentation of verbal threat stimuli, which are likely to lack ecological validity when considered in terms of relevant evolutionary constructs, and has failed to account for the role of individual differences in subjective appraisals of stressors and their subsequent physiological effects. In a sample of 59 undergraduate women (aged 17 to 34 years), psychometrically pre-screened for psychoticism, we employed a visual search paradigm that utilized photorealistic facial stimuli to bias participants’ attention either towards or away from them. The subsequent cardiovascular stress arousal using photoplethysmography. Participants underwent a computer-based attention biasing intervention before exposure to a standard laboratory stressor. ANCOVAs revealed significant time x condition x psychoticism interactions for cardiac output (F(1,54) = 6.081, p = .017), stroke volume, (F(1,54) = 6.667, p = .013) and total peripheral resistance (F(1,54) = 6.996, p = .011). For participants with high psychoticism, directing attention towards emotionally positive (i.e., non-threatening) faces increased cardiac responding to stress, and towards emotionally angry (i.e., threatening) faces increased vascular responding. For participants low in psychoticism, the exact opposite pattern emerged: threat stimuli elicited cardiac responses while non-threat stimuli elicited vascular responses. These findings indicate passive coping to threat amongst those with high psychoticism and active coping amongst those with low psychoticism. The findings imply that subjective perceptions can be associated with health-related cardiovascular function in ways that are moderated by individual temperaments.

SOCIOECONOMIC DEPRIVATION, NEIGHBORHOOD PERCEPTIONS, AND CORTISOL NON-RESPONSE TO MENTAL STRESS

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Background: There is a growing literature relating neighborhood factors with health. One hypothesized mechanism involves the individual’s response to chronic stress stemming from exposure to the social environment, but few studies have tested how objective or perceived aspects of neighborhood impact psychobiologic processes. Methods: Participants (N=526, age=72.8±5.7 yrs) were drawn from the Heart Scan study, an ancillary study of the Whitehall II
epidemiological cohort. Generalized estimating equations (GEE) were used to generate differences in scores of social control, neighborhood threat, and fear of crime per percent increase in area income and employment deprivation adjusting for age, sex, duration of neighborhood residence, and individual-level measures of income and employment. A logit link function was used to evaluate the estimated risk of cortisol non-response (i.e., “blunted” cortisol response profile associated with chronic stress) due to area measures of deprivation as well as social control, neighborhood threat, and fear of crime. Cortisol non-response was defined as a <5% increase in cortisol to two mental stressors, the Stroop task and mirror tracing. These analyses were adjusted for age, sex, average task stress rating, baseline cortisol level, duration of neighborhood residence, and individual-level income.

Results: Each percent increase in income deprivation was associated with: 1) lower social control (score: 5.6; 95% CI: 0.2, 11.0; p=0.042); 2) higher neighborhood threat (score: 2.3; 95% CI: 1.4, 3.2; p<0.0001); and greater fear of crime (score: 2.2; 95% CI: 0.2, 4.3; p=0.035) whereas employment deprivation was only associated with neighborhood threat (score: 3.8; 95% CI: 1.9, 5.7; p<0.0001). The highest levels of income and employment deprivation were also associated with risk of cortisol non-response (OR=1.94; 95% CI: 1.19, 3.17; p=0.008) and (OR=1.90; 95% CI: 1.17, 3.09; p=0.009), respectively. Social control (OR=0.94; 95% CI: 0.90, 0.97; p=0.001) and neighborhood threat (OR=1.43; 95% CI: 1.13, 1.81; p=0.003) were significantly associated with cortisol non-response. Fear of crime did not influence cortisol in these data.

Conclusion: These findings support the hypothesis that social environment influences neighborhood perceptions which, in turn, are associated with physiologic differences associated with disease processes. Given that few studies have explored how cortisol is affected by neighborhood perceptions, more research is needed before firm conclusions can be drawn.

223) Abstract 1068

THE PSYCHOLOGICAL TOLL OF TRAIT HOSTILITY IN EVERYDAY LIFE: ECOLOGICAL MOMENTARY ASSESSMENT OF NEGATIVE MOOD AND INTERPERSONAL INTERACTIONS ACROSS CONTEXTS OF EVERYDAY LIVING

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The transactional model of coronary artery disease (CAD) has resulted in inconclusive explanations of the mechanisms by which trait hostility contributes to pathogenic cardiovascular reactivity. Using ecological momentary assessment (EMA), we examined in vivo relationships between interpersonal conflicts (ICs) and negative mood across different life contexts for individuals with high versus low Cook Medley trait hostility (CM). We predicted that elevated hostility would be associated with higher rates of IC and concomitant reports of negative mood across home, work, and other contexts which could contribute to the psychological distress that drives pathophysiology directly or through other behaviors that promote CAD.

CM was assessed for 175 participants (88 men, 87 women; age 30 ± 7 years) who then underwent 3 workdays and 2 non-workdays of EMA in which mood and the presence/absence of social interaction as well as context (home, work, other) were recorded every 30 ± 5 min throughout the waking day. A social interaction rated with any level of tension, impatience or anger was an IC. Negative mood intensity was a weighted factor score of 4 items (angry, nervous, stressed, sad) rated on a 5-point scale. From a total of 17,673 EMA responses, 6,473 reports of social interaction distributed across home, work, and other contexts were analyzed. Using a mixed-models design we tested the main effects of CM, social interaction quality (conflictual or not) and context; and interaction effects between CM and context. Sex, age, and proportion of social interactions that were conflictual were covariates. As expected ICs vs. non-conflict interactions were associated with higher negative mood (p < .0001); home was associated with lower negative mood than work (p < .05) and other contexts (p < .05). Trait hostility marginally predicted negative mood (p = .08). There was a significant interaction effect between CM and context (p < .0001).

Higher-hostile individuals had increased negative mood intensity during both conflictual and non-conflictual social interactions at work or home versus other contexts. These findings suggest that one psychological toll of trait hostility is increased negative mood during social engagement in the work and home contexts; however, establishing any causal relationship between social conflict and mood requires a lagged study of social conflicts and subsequent mood.
224) Abstract 1134

INTRA-INDIVIDUAL PSYCHOLOGICAL AND PHYSIOLOGICAL RESPONSES TO ACUTE LABORATORY STRESSORS OF DIFFERENT INTENSITY

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Background: Both physical and psychological stressors elicit significant changes in stress-responsive systems. So far, only few studies directly compared different stressors in their ability to evoke psychological and physiological responses.

Methods: 20 healthy young men (20-30 years) were exposed to four well-established stress paradigms in a randomized order: Stroop Test [Stroop], Trier Social Stress Test [TSTST], Cold Pressor Test [CPT], Ergometer stress test [Ergo]). Salivary cortisol (marker of the hypothalamic-pituitary-adrenal axis), cardiovascular activity and alpha-amylase (markers of the autonomic nervous system [ANS]), subjective stress and state anxiety were measured at various times pre and post stressor.

Results: Repeated ANOVA revealed significant increases in psychological as well as biological stress markers in response to all four tasks. The extent of responses differed between the stressors, with highest cortisol responses in response to the TSTST followed by Ergo, CPT, and Stroop, i.e. indicating a dose-response relationship. In contrast, the most pronounced alpha-amylase and cardiovascular changes were caused by Ergo, followed by TSTST, Stroop, and CPT. With regard to subjective stress and anxiety the same results were observed, with highest increases during the TSTST and Ergo.

Conclusions: These results show that intensity of stressors influences subjective and psychological stress responses in a dose-response manner. In future studies, the selection of an adequate stressor should therefore be based on research question and study aim, i.e. whose stress response (e.g. patients or athletes) or which stress-responsive systems (e.g. HPA axis or specific sub-components of the ANS) should be examined.

225) Abstract 1149

NEURAL BASIS FOR THE MINDFUL COPING FOR AFFECTIVE PICTURES

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There are adaptive and maladaptive ways of emotion regulation strategies. The representative example of maladaptive ways of emotion regulation is emotion suppression, which leads sympathetic excitation, and gets the individuals to diminish well-being. On the other hand, meta-cognitive strategy of emotion regulation such as mindfulness and metacognitive therapy are effective to treat psychological disorders. To date, the two types of emotion regulation strategies have not been well examined in simultaneously. The purpose of this study is to investigate the neural mechanisms by using fMRI during the different types of emotion regulation. Twenty-one healthy right-handed volunteers were participated. Before entering MRI scanner, the participants were well instructed and trained how to cope with the presented affective pictures by the two strategies and the strategy of just “look” without any coping strategies. In the fMRI scanner, the participants conducted the three types of coping strategies for affective pictures. As a result, both strategies of emotion regulation could decrease negative emotion for affective pictures and reduced neural activity of emotional circuit. In the meta-cognitive strategy of emotion regulation, left VLPFC and dorsal anterior insula are negatively correlated with the activity in the left amygdala. These areas are related with verbal function and representing motivational states associated with specific action plans (Wager & Barrett, 2004). Describing their own emotional states objectively could develop emotional process. Further research is required to investigate peripheral stress responses.

226) Abstract 1072

TARGETED REJECTION PREDICTS INCREASED PRO- AND ANTI-INFLAMMATORY GENE EXPRESSION IN HIGH STATUS YOUTH

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Objective: Adolescence is a sensitive period for shaping a person’s vulnerability to health problems across the lifespan. As teenagers assign increasingly more value to their social environment, difficulties that arise from that environment have the potential for being more deleterious. One difficulty that is particularly noxious for adolescents is targeted rejection, which is the active, intentional rejection of one person by another person or group. However, the mechanisms linking targeted rejection and health remain largely unknown. The current study examines how targeted rejection links to inflammatory processes known to contribute to a variety of diseases of aging.

Methods: 147 adolescent women at risk for developing depression were followed prospectively every 6 months for 2.5 years. At each visit, participants underwent a semi-structured interview that assessed for the presence of recent severe targeted rejection life events. Participants also reported their subjective social status using the MacArthur Youth Ladders and had blood drawn for assessment of leukocyte mRNA for the pro- and anti-inflammatory signaling proteins NF-kB and I-kB.

Results: Individual differences in subjective social status significantly moderated the association between targeted rejection and NF-kB (p = .004), I-kB (p = .001), and the ratio of NF-kB to I-kB (p = .046). At visits when participants had recently experienced targeted rejection, they produced more mRNA for both NF-kB and I-kB, and had a smaller ratio of NF-kB to I-kB. These effects, however, were only present for youth high in perceived social status. The findings were not due to differences in age, ethnicity, oral contraceptive use, alcohol use, or waist-to-hip ratio, nor were they accounted for by depressive symptoms or the balance of circulating leukocytes. Conclusions: Adolescent women who perceive themselves higher in social status exhibit an inflammatory residue following targeted rejection, suggesting that rejection is particularly challenging for them. This response may increase subsequent risk for inflammation related diseases.

227) Abstract 829

ARE HYPOCHONDRIACAL BELIEFS ASSOCIATED WITH INDICATORS OF HEALTH IN CARDIAC PATIENTS?

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Objective: In a previous study looking at associations between endothelial function (EF) and depression, we observed that patients with higher levels of anxiety, who did not have comorbid depressive symptoms, had surprisingly greater endothelial reactivity. In fact, the literature on associations between anxiety and health is mixed. This study examined associations of one possible mediator, hypochondriacal beliefs, with various health behaviors and prognostic indicators of cardiovascular health.

Methods: A sample of outpatients referred for myocardial perfusion single photon emission computed tomography stress testing at the Montreal Heart Institute was recruited (n=328). Patients were administered the Whiteley Index (WI), measuring hypochondriacal beliefs, as well as health behavior, socioeconomic, and medical history questionnaires on the day of their stress test. EF was assessed the following day using a nuclear medicine variation of the well-established flow-mediated dilatation technique. A blood sample was drawn to quantify c-reactive protein (CRP) levels.

Results: No association was observed between WI scores and smoking status (r²=.00, p=.12), depression (r²=1.11, p=.29), or pack years (F=1.08, p=.30). No relationship was seen between WI scores and...
average weekly physical activity over the last year (F=0.03, p=.86), or average weekly alcohol consumption (F=11, p=.74). Analyses of the relation between WI scores and CRP levels produced a trend approaching significance (F=3.60, p=.059). No association was seen with EF (F=47, p=.49). All analyses were performed after adjusting for apriori defined covariates.

Conclusions: As there was no relationship between WI and EF, hypochondriacal beliefs are unlikely to mediate the relation between anxiety and EF observed in previous research. These results do not suggest an association between WI and health behaviors. However, a positive relationship trending towards significance was observed between WI and CRP, a prognostic indicator of cardiac health, suggesting increasing hypochondriacal beliefs may be associated with greater inflammation. If this relationship does exist, it would seem driven by a mechanism not involving health behaviors.

228) Abstract 1202
CHARACTERIZATION OF EMOTIONAL DISTRESS AND STRESS VULNERABILITY IN CANCER PATIENTS
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BACKGROUND: Distress, considered an almost universal emotional experience in cancer patients, may arise from disease adaptation processes and treatment difficulties and expectations. Although determined by the real threat that cancer presents, individual vulnerability has a major impact on the global response and outcomes. The present study aimed to explore the presence of social processes for emotional distress and patient’s vulnerability, facing diagnostic procedures and therapeutic approaches, in a day care oncology unit in a general hospital. These are preliminary features of a 2 years follow-up project evaluating the relationship between psychosocial aspects and disease outcomes.

METHOD: Patients were approached during admission, at the beginning of a new treatment (chemotherapy) in a first episode or cancer relapse. After their informed consent, they were assessed by day unit nurses. Participants completed basic demographic information including age, gender, education level and marital status, medical data, National Comprehensive Cancer Network Distress Thermometer (Roth et al, 1998), Stress Vulnerability Questionnaire (V. Serra, 2000) and Brief Symptom Inventory – BSI (Derogatis, 1993, Portuguese Version Canavarro, 1995).

RESULTS: Sample included 82 subjects, 61.5% females, 75 % married and 70% with college or superior education. Mean age was 57.8 years. The majority of the subjects were in the first episode of the disease and breast (25%), colorectal (25%) and lung (13%) cancer were the most frequent diagnosis. Mean value of Distress Thermometer, ranging from 0 to 10 according to severity, was 4.7(s=2). Stress Vulnerability Total score (mean 35.4, sd 11) was below cut off point (43) but different factor results point to the relevance of perfectionism and intolerance to frustration in individual’s vulnerability. In BSI, higher mean values were obtained in Anxiety and Depression Scales.

CONCLUSIONS: These results seem to reflect more than a personal vulnerability, the impact of the disease itself. Nevertheless, the characterization of emotional and behavioural aspects should be considered as an important component of patient’s diagnoses and management.

229) Abstract 1036
HIGH PREVALENCE OF TYPE D PERSONALITY IN FIBROMYALGIA
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Purpose: Type D personality, combining negative affectivity and social inhibition, originated in the cardiovascular literature and has been linked to disease course and outcome. It is hypothesized that the prevalence of type D is high in fibromyalgia, because patients experience negative affect associated with symptoms and they may have become socially inhibited as a way to deal with disbelief and lack of understanding for their medically unexplained symptoms. The aim of this study was to examine the prevalence and correlates of Type D personality in fibromyalgia.

Methods: In an internet study, 556 English-speaking patients with fibromyalgia (94% women), 21 to 77 years old (M=47; SD=11), filled out questionnaires of Type D personality (DS14), physical and mental health (SF-36), and pain, loneliness, and quality of life (visual analogue scales).

Results: The internal consistency of the Type D questionnaire was high (α=.90). Using the standard cut-score, Type D personality was present in 56% of patients, which exceeds the prevalence estimates in cardiovascular populations (25-35%). Compared to norms, negative affectivity was high (M=35.1, SD=6.6), and social inhibition was moderate (M=22.5, SD=6.8). Compared to norms, mean pain (M=4.3, SD=1.9) was above average (M=12.28, SD=9.8). Having Type D personality was associated with worse scores on the mental health scales social functioning (d=.27, p=.002), role limitations due to emotional functioning (d=.54, p=.001), mental health (d=1.02, p=.001), and vitality (d=.36, p=.001) and the physical health scale general health perception (d=.48, p=.001), but not with any of the other physical scales. No association was found with YAS pain (p=.12), but Type D patients reported more loneliness (7.10 vs 4.92; t(553)=8.44, p=.001) and a lower quality of life (4.81 vs 5.98, t(555)=6.04, p=.001).

Conclusions: Type D personality is highly prevalent in fibromyalgia and it is associated with worse mental health and more loneliness, suggesting that Type D is maladaptive for emotional and social adjustment in this population. These results might arise from disease adaptation processes and treatment difficulties and expectations. Although determined by the real threat that cancer represents, individual vulnerability has a major impact on the global response and outcomes. The present study aimed to explore the presence of social processes for emotional distress and patient’s vulnerability, facing diagnostic procedures and therapeutic approaches, in a day care oncology unit in a general hospital. These are preliminary features of a 2 years follow-up project evaluating the relationship between psychosocial aspects and disease outcomes.

230) Abstract 1235
MALADAPTIVE STRESS RESPONSE PATTERNS IN POSTMENOPAUSAL WOMEN
Diana Wang, Danielle Gianferant., Nicolas Rohleder, PhD, Brian Dahlben, Michelle Lerman, Myriam Thoma, PhD, Psychology, Brandeis University, Waltham, MA
Objective: Ageing is associated with physiological alterations, and related with increased morbidity. The aging process is becoming better understood at the molecular and cellular level, but less is known about the causes of interindividual differences. Differences in how individuals respond physiologically to stressful events in their lives might explain some of the variation. Maladaptive acute stress response patterns might predispose to physiological damage and contribute to disease, but evidence on stress response patterns in older adults is still scarce.

Methods: A sample of n=26 young (mean age 22.0 yrs.; SD=4.5), and n=10 older adults (57.4 yrs.; SD=5.8) of both genders (n=20 men, n=16 women; premenopausal women in luteal phase) were exposed to repeated acute stress (Trier Social Stress Test). HPA axis activation and habituation was assessed by measuring cortisol in repeated saliva samples taken both days.

Results: As expected, female participants of both age groups showed significantly lower HPA axis responses to acute stress than males (F=3.23; p=0.042). While the overall group showed only a trend towards lower cortisol responses to the second TSST (F=2.26; p=0.095), habituation was strong in the younger group (F=3.70; p=0.02), but absent in the older group (F=0.99; p=0.39). Furthermore, in the older group, a marginally significant interaction of gender with repeated stress exposure (F=3.49; p=0.066) was found; Older men showed habituation, while in postmenopausal women, HPA axis
responses, although smaller than those of older men, showed signs of sensitization.

Conclusions: Although preliminary, the current data allow the cautious conclusion that older age is associated with changes in acute stress response patterns. Particularly in older, postmenopausal women, sensitization of HPA axis responses to repeated stress might be a sign of development of a maladaptive pattern. Data on peripheral inflammation will be presented at the conference and will allow conclusions about the potential health effect of the observed HPA axis response pattern.

231) Abstract 890

ATRIAL MYXOMA MASQUERADE: CASE REPORT AND LITERATURE REVIEW
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In a general hospital, the consulting psychiatrist may be called when no "organic pathology" can be found. A panoply of symptoms which are evanescent in nature may be presumed "hypochondriacal." After extensive medical assessment by a variety of specialists, a patient may be advised to see a psychiatrist. A true hypochondriac may be encountered frequently, but so are many patients with a variety of aches and pains due to illnesses which may not be clarified for months.

A case will be described of a 50 year old woman whose presentation with symptoms ultimately demonstrated to be due to an atrial myxoma were initially attributed to a range of other illnesses, including hyperthyroidism, stroke, and ultimately depression and somatoform disorder, before arriving at the correct diagnosis and appropriate treatment.

Atrial myxoma is the most common intracavitary cardiac tumor. There is now a vast international literature. The first angiographic diagnosis of myxoma was in 1951. In the first two decades there were over 1000 cases, and many more are now recorded presenting from infancy to the elderly. Clinical pictures vary—but most common are cardiac with mechanical obstruction resulting in dyspnea, palpitations, insomnia, and weight loss. Syncope when the patient is upright is common with intracavitary cardiac tumors. Atypical cardiac pain may be present. In some surgical units, there may be 3-5 cases per 1000 cardiac procedures. Occasionally there are bi-atrial tumors. There is some literature on familial incidence. There are tumors that recur.

232) Abstract 948

IMPROVEMENT OF NAUSEA SYMPTOMS BY EXPECTATIONS AND CONDITIONING
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Background: Expectancy and Pavlovian conditioning are two underlying mechanisms of placebo and nocebo responses. In previous studies we could induce nocebo but so far no placebo responses. This was attempted here with manipulation of expectancies (Exp. 1) and with conditioning (Exp. 2). Methods: Exp 1: Forty-eight healthy volunteers (50% females, 26.8 ± 5.4 years) were tested twice and were exposed to a rotation procedure on Day 1 (baseline) and on Day 2 (assigned to one of 3 groups: 100% expectancy or 50% expectancy or control). They received a placebo, but group 1 was told to receive an effective antiemetic gastrointestinal preparation (Zintona®), group 2 to be in a double-blind placebo-controlled Zintona trial, while group 3 was told to be control group. The rotation consisted of 5 x 2 min with 1 min breaks at constant speed (15 rpm). Exp. 2: Thirty-two healthy volunteers (50% females, 26.0 ± 4.6 years) were exposed to standard rotation on Day 1. On Day 2 prior to rotation they received either a drink with the information it contained Zintona (but in fact was a placebo) or were told to be control group. Rotation was deliberately reduced (from 15 rpm to 10 rpm) without informing the subject. On Day 3 they were tested with the initial rotation speed (15 rpm). Outcome variables in both experiments were symptoms rating (SRmax) pre and post rotation, tolerated rotation time (RT), and number of head movements (HM).

Psychometrically, HRC and EGG were used as covariates. Results: Exp. 1: Repeated measure ANOVAs showed a significant Day x Group interaction for SRmax (p = 0.007). This effect was seen in women only (p = 0.017). HM and RT significantly increased from day 1 to day 2 irrespective of group. Exp. 2: In comparison to controls, conditioning induced lower SRmax and higher RT and HM (p = 0.016) with no effect of gender. Psychometrics did not affect the responses in both experiments, and EGG were unaffected by expectancy manipulation and by conditioning. Conclusion: A positive placebo effect on subjective symptoms by verbal suggestions or by a Pavlovian conditioning procedure is shown here for rotation-induced nausea for the first time. (Supported by a grant from VW Foundation, #83 805).

233) Abstract 1100

THE DEVELOPMENT OF A COGNITIVE-BEHAVIOR GROUP INTERVENTION PROGRAM TO REDUCE THE HOSTILITY LEVELS OF CORONARY HEART DISEASE PATIENTS AND ITS EFFECT ON BLOOD COAGULATION FUNCTION: A CONTROLLED STUDY
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The purpose of study: To develop a cognitive-behavior group intervention program to reduce the hostility levels of coronary heart disease (CHD) patients and examine its effect on blood coagulation function.

Method: A case control study with matched age, sex and education, based on a two group pre- and post-test design was adopted. Experimental group included 22 CHD patients (mean age = 58.05±8.38, male 68.2%) who attended a two-week and-a-half hour session of cognitive-behavior group intervention program with psycho-educational and biofeedback relaxation training. Control group included 16 CHD patients (mean age = 59.25±6.44, male 68.8%) who did not receive any psychological treatment until they finished the three-month waiting status.

Results: After intervention, there were significant reductions in hostility level (t = 5.20, p < .001) and respiration rate (t = 2.95, p < .001), and a significantly higher reduction of prothrombin time (t = 3.54, p < .01) for participants of experimental group. The repeated measure of ANCOVA showed significant interaction effects and indicated that there was a significantly higher reduction of prothrombin time (F = 4.94, p < .01) and a marginally higher increase of prothrombin time (F = 3.66, p = .06) in experimental group than those of waiting-controlled group by controlling the covariate variables as age and sex.

Conclusion: The eight-session cognitive-behavior group intervention program not only has an effect to reduce psychological distress, but also has an effect to involve the pathophysiological mechanism of CHD, decreasing the blood coagulation rate, which may reduce the recurrent risk of CHD.

243) Abstract 978

MODULATING DNA-BINDING KINETICS IN STAT1 BINDING KINETICS IN STAT1 TO THE NEUROBIOLOGY OF DEPRESSION
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BINDING KINETICS IN STAT1

The STAT1 (signal transducer and activator of transcription 1) executes their anti-proliferative and pro-apoptotic effects. In this study we have asked whether the DNA-binding domain of STAT1 can be a useful target for the prevention of interferon-induced depression. For this purpose, we created STAT1 point mutants with substitutions of conserved single amino acid residues in the DNA-binding domain and subsequently characterized their phenotypes. We were particularly interested in
identifying DNA-binding mutants, which displayed normal interferon-induced tyrosine phosphorylation and nuclear accumulation, but had impaired DNA-binding kinetics leading to reduced expression of interferon-driven genes. While cells expressing the point mutant T385A showed a prolonged phase of tyrosine phosphorylation and nuclear accumulation upon stimulation with interferon, the F364A mutant exhibited the designed phenotype. With respect to the kinetics of interferon-inducible tyrosine phosphorylation and nuclear build-up, cells expressing the F364A mutant were indistinguishable from cells expressing the wild-type molecule, and, moreover, showed similar sensitivity to the inhibitory action of the tyrosine kinase blocker staurosporine. However, when we tested for transcriptional activity, we found that the F364A mutation significantly reduced the induction of an artificial luciferase reporter gene and several endogenous interferon-driven target genes. Expression of the gbp1 and mig1 genes was decreased, while there was no change in the activation of the irf1 gene. The molecular mechanism behind this phenotype was revealed as resulting from an abnormally high dissociation rate from high-affinity DNA-binding sites as compared to the wild-type protein. Taken together, we have identified a promising target within the STAT1 molecule, which should be further tested in the context of interferon-induced signal transduction pathways in depression.

235) Abstract 1011
ASSOCIATIONS AMONG STRESSFUL LIFE EVENTS, HEALTH AND WELL-BEING AMONG OLDER ADULTS: FINDINGS FROM THE HEALTH AND RETIREMENT STUDY (HRS)
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PURPOSE: Considerable research has documented the influence of stressful life events on health and well-being. While the effects of stressful life events on health and well-being are robust, and contribute to health disparities, less is known about the impact of stressful life events on health and well-being in older adults. Furthermore, it is unclear whether early life events, recent life events, and lifetime traumatic experiences are each uniquely predictive of health and well-being among older adults, or whether their effects on health and well-being are of comparable magnitude.

METHOD: A nationally representative sample (N=4,516) of adults aged 50 and over (Mean = 70, Range = 50-100; 64% Female) from the 2008 wave of the Health and Retirement Study (HRS) completed measures of early life events, lifetime traumatic experiences, and recent life events, as well as measures of well-being (negative affect, positive affect, life satisfaction), and health (self-rated health, functional limitations).

RESULTS: Preliminary analyses revealed three main findings. First, the distribution of early life events, lifetime traumatic experiences, and recent life events differed across age, sex, and education (all p<.01). Second, early life events, lifetime traumatic experiences, and recent life events were all significant and independent predictors of health and well-being (p<.01). Finally, whereas early and recent life events and lifetime traumas had effects of similar magnitude on health, the influence of early and recent life events was significantly larger than the effect of lifetime traumatic experiences.

CONCLUSION: Early life events, lifetime traumatic experiences, and recent life events are important predictors of health and well-being among older adults, but do not influence health and well-being to the same extent.

236) Abstract 1112
CATECHOLAMINERGIC RESPONSES TO THE INSULIN TOLERANCE TEST IN CHRONIC FATIGUE SYNDROME
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Objectives: In chronic fatigue syndrome (CFS), only little is known about the role of the autonomic nervous system (ANS) and its contribution to potential cardiovascular or inflammatory abnormalities. CFS has previously been associated with a state of heightened ANS (re)activity, which might be explained by an increased sensitivity to stressful stimuli, including metabolic challenges, at the sympatho-adrenal level.

Methods: We tested ANS sensitivity by using the Insulin Tolerance Test (ITT) as a metabolic stressor in 18 CFS patients (10 women, mean age: 35.8±6.9, BMI: 22.3±2.6) and 16 controls (matched by sex, age, and BMI; 9 women, mean age: 35.06±6.3, BMI: 24.36±5.0). Selection criteria for patients were: fulfillment of CFS research diagnostic criteria (US and UK definitions), no current intake of any medication causing fatigue, and exclusion of any medical factor that might be associated with chronic fatigue. Plasma epinephrine (E) and norepinephrine (NE) were collected immediately before, as well as 10 and 30 minutes after injection of 1.5U/kg soluble insulin.

Results: An 18-fold increase in E was observed 30 min after insulin injection (p<.001). Plasma NE levels showed a qualitatively similar response with a 1.5-fold increase 30 min after the administration of insulin (p<.001). Groups neither differed in baseline parameters of E and NE (all p>.25), nor in their catecholaminergic response over time (E: p=.235; NE: p=.842). Descriptively, CFS patients showed a reduced mean E response in the ITT (E: p=.166; NE: p=.994).

Conclusions: Our results did not indicate an altered ANS sensitivity in response to a metabolic stressor in CFS. Since the ITT might evoke a sympatho-adrenal counterregulatory response, our findings indicate that this particular part of the ANS might be intact in CFS. However, no final conclusion may be drawn regarding the role of other aspects of the ANS in the precipitation and perpetuation of this debilitating disorder. Future studies should address the variability of the effect of different stimuli on the ANS by using different stressors to assess ANS sensitivity in CFS.

237) Abstract 1219
DOES PRAYER IMPROVE SLEEP? ASSOCIATIONS BETWEEN SPIRITUALITY AND ACTIGRAPHIC SLEEP IN WOMEN
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Research suggests that spirituality has beneficial effects on psychological well-being. However, few studies have examined its effect on sleep. Given that recent findings indicate that poor sleep is associated with worst physical health and quality of life, identifying psychological factors that influence sleep may shed light on ways to improve sleep in interventions. This study examined whether higher levels of spirituality were associated with better sleep outcomes in women between the ages of 25-75 who participated in a larger study of psychological distress and biological functioning in cancer caregivers and controls. Wrist actigraphy was used to monitor sleep in participants’ home environment over a 3-day period. Sleep variables included total sleep time, sleep efficiency, number of awakenings, and time awake after sleep onset. Women also provided saliva samples (4 times per day over 3 days) in their natural environment. The Daily Spiritual Experiences Scale (DSES) total score was used to measure participants’ general sense of spirituality. Hierarchical regression analyses examined relationships between spirituality and sleep controlling for age. Analyses of actigraphic sleep data showed that on each of the three nights, higher spirituality was associated with more total sleep time (b=.04=.07, R2change’s > .14, p’s < .05), more sleep efficiency (b=.05, R2change’s > .15, p’s < .05), and less time awake after sleep onset (b=-.37, R2change’s > .12, p’s < .05). There was also evidence that higher evening cortisol might be a physiological pathway linking spirituality and sleep. Women who reported lower levels of spirituality had higher evening cortisol output than those who reported more spirituality on Night 2 (b=.24, p =.11) and Night 3 (b=.34, p=.05). Further, there was a negative relationship between evening cortisol and total sleep time on both nights (Night 2: b=.34, p < .05; Night 3: b=.32, p=.12), such that higher evening cortisol was associated with less total sleep time. These findings suggest that spirituality has beneficial effects on sleep. This supports previous research demonstrating that spirituality is associated with better mental health outcomes.
238) Abstract 1054

BREAST CANCER PATIENTS WHO REPORT GREATER SECURITY AND SUPPORT IN CLOSE RELATIONSHIPS HAVE HIGHER EMOTIONAL AWARENESS
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Background: The mechanisms through which improved breast cancer survival is predicted by supportive close relationships are unknown. We hypothesized that close relationship quality is related to patients’ level of emotional awareness, assessed by a performance measure (Level of Emotional Awareness Scale – LEAS). Several models of couples’ therapy support this hypothesis (Greenberg & Johnson, 1986).

Methods: Eighty-five English-speaking women were assessed at 9 +/- 3 weeks after diagnosis (86%) or recurrence (14%) of breast cancer. Subjects completed the LEAS by writing how they and another person would feel in response to emotion evoking scenarios. Higher LEAS scores result from a greater number of emotion words, more differentiated emotion words and identification of the emotion words self and other. The Social Relationships Inventory (SRI) measures intimate partner support for the married subjects (n=59). Security of close relationships was assessed with the attachment subscale of the Social Provisions Scale(SPS). Suppression and avoidance of emotions were assessed as potential mediators with the Gross-John Suppression Scale and COPE-Avoidance subscale.

Results: Mean age was 56 +/- 12 years; 75% were White European Americans, 22% Latinas and 3% Blacks. Disease stages were I = 35%; II = 32%; III = 15% and IV = 9% with 55% having surgery and 45% chemotherapy at the time of assessment. Mean LEAS scores were comparable to population norms [32 +/- 5, (18-45)], as were those of partner support [SRI 24 +/- 5, (8 – 30)] and security [SPS 14.6 +/- 1.9(7 – 16)].

Higher emotional awareness (LEAS) was correlated with both support (r=0.35***) and security (r=0.47***). Avoidance was negatively correlated with support (r = - .23*), suppression was negatively correlated with security (r=.23**) and both correlated negatively with LEAS(r = -.27*, r = -.21*, respectively). The LEAS – support correlation remained after controlling for avoidance [r = -.04**]. The LEAS – security correlation was reduced, but still significant, after controlling for suppression (r = -.34***) indicating partial mediation of the LEAS – security association by suppression.

Conclusions: Greater emotional awareness is associated with prognostically significant characteristics of close relationships (self-reported security and support). These results provide a new avenue for studying how relationship quality may affect emotion processing mechanisms relevant to disease outcome in breast cancer patients.

*p<.05, **p<.01, ***p<.001

239) Abstract 1167

DISASSOCIABLE LARGE-SCALE NETWORKS ANCHORED IN THE ANTERIOR INSULA SUBSERVE AFFECTIVE EXPERIENCE AND ATTENTION/EXECUTIVE FUNCTION
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BACKGROUND. The anterior insula has anatomically distinct dorsal and ventral aspects (Augustine, 1996) and meta-analyses of the neuroimaging literature suggest that these two aspects are relatively modality-specific or important for different task domains (Craig, 2009). The dorsal anterior insula (dAI) region appears to be relatively more engaged during tasks that require executive attention, whereas the ventral anterior insula (vAI) region appears to be relatively more engaged during tasks that are related to affective experience (Wager & Barrett, 2004).

METHODS. In two independent samples of cognitively normal adults, we used seed-based resting-state functional connectivity magnetic resonance imaging to test the hypothesis that the dAI and vAI are nodes in separable large-scale functional networks with different behavioral correlates.

RESULTS. The dAI region was functionally connected to frontal and parietal regions preferentially implicated in cognitive control such as dorsal anterior cingulate (dACC), supplementary motor area, and supramarginal gyrus. The vAI was functionally connected to regions preferentially implicated in affect including ventral ACC (vACC) and orbitofrontal cortex (OFCC). As hypothesized, individual differences in the strength of connectivity within the dAI network predicted individual differences in executive attention as measured by Trails B time, whereas individual differences in the strength of connectivity within the vAI network predicted inter-individual variation in the intensity of subjective arousal ratings to negative images.

CONCLUSIONS. The dAI network encompasses frontal and parietal regions implicated in attentional-executive processes whereas the vAI network includes regions such as vACC and OFCC known to be involved in affective experience. The stronger connectivity within the dAI network is associated with individual differences in the capacity to control attention whereas stronger connectivity within the vAI network is associated with individual differences in the intensity of affective experience. These results provide support for the hypothesis that the identification and manipulation of salient information is subserved by at least two brain networks that have distinct large-scale topography and behavioral correlates.

240) Abstract 991

HPA AXIS HABITUATION TO REPEATED ACUTE PSYCHOSOCIAL STRESS IS RELATED TO LESS PRONOUNCED SENSITIZATION OF PLASMA INTERLEUKIN-6
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Background: Adaptation to repeated acute psychosocial stress is understood to be beneficial for health. However, not much is known about the interplay between stress-related (e.g. cortisol) and health relevant biomarkers (e.g. interleukin-6, IL-6) with regard to repeated stress. While HPA axis habituation is regarded as an adaptive response pattern, lower HPA axis responses to repeated stress might theoretically allow disinhibition of inflammatory stress responses, which would be maladaptive instead of adaptive.

Methods: We exposed n=22 healthy individuals (9 women, 13 men; mean age=22.9 yrs.; mean BMI=23.6 kg/m2) to the Trier Social Stress Test (TSST) on two consecutive days. Salivary cortisol and interleukin-6 (IL-6) were measured repeatedly before and until 2 hours after stress on both days.

Results: Cortisol and IL-6 significantly increased in response to stress exposure (cortisol p<0.001; IL-6 p<0.001). On day 2, average cortisol responses were lower than on day 1, consistent with habituation (p=0.011). Greater cortisol habituation was a significant predictor of less pronounced IL-6 sensitization (r=0.61; p=0.002).

Conclusions: Our findings corroborate the assumption that HPA axis habituation to repeated stress is an adaptive, and not a maladaptive response pattern, because it was related with lower IL-6 responses to repeated stress. Our findings are incompatible with the assumption that high cortisol responses are required for inflammatory control. Intermediate regulatory steps, for example changes in glucocorticoid sensitivity, might explain this finding. Future studies will be needed to understand this intermediate mechanism.
EARLY-LIFE STRESS AND CHRONIC PSYCHOLOGICAL DISTRESS OVER THE LIFECOURSE PREDICT DIVERGENT CORTISOL REACTIVITY PATTERNS IN ADULTHOOD

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Background. Experiencing early-life stress (ELS) is associated with substantially increased lifetime risk for chronic psychological problems, with evidence indicating that dysregulation of the physiological stress reaction system may be partly responsible. However, some ELS-exposed people remain psychologically resilient. Although two opposing patterns of hypothalamic-pituitary-adrenal axis (HPA) stress reactivity have been observed in ELS-exposed samples, the hypothesis that these divergent patterns are associated with different longitudinal trajectories of psychological risk over the lifecourse has not been explored. Methods. For the current study, we used healthy Whitehall II study subjects (n=543) who participated in the 2008 Heart Scan Study (HSS) to assess salivary cortisol responses to a cognitive stressor, ELS exposure, and other psychosocial factors. HSS data were then linked to 20 years of participants’ Whitehall data, including repeated measures of psychological distress (GHQ-28). Mean age of the sample was 63 years. Results. Piecewise growth curve analyses revealed that ELS-exposed persons with a history of chronic psychological distress had significantly blunted cortisol reactivity and lower baseline cortisol compared to non-ELS-exposed participants, while ELS-exposed persons with no history of distress had significantly elevated baseline cortisol and greater total cortisol production. Total cortisol production also differed between the groups. Conclusions. Our findings indicate that for ELS-exposed individuals, different trajectories in mental health over the lifecourse are associated with opposing cortisol reactivity patterns. While the temporality of the effect remains unclear, the findings have important implications for our understanding of ELS-related mental health risk and treatment of these disorders.

Abstract 721

CORTISOL ACTIVITY IN THE LABORATORY AND DAILY LIFE COURSE SOCIOECONOMIC ADVERSITY AND CHRONIC PSYCHOLOGICAL DISTRESS OVER THE LIFECOURSE

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Stress-responsive physiological pathways, such as the hypothalamic-pituitary-adrenal (HPA) axis, have been suggested as potential routes through which socioeconomic status (SES) adversity may be associated with greater risk for adverse health outcomes. Poorer HPA functioning, as indexed by overall greater cortisol output, or patterns of hypo- or hyper-reactivity to challenge, is hypothesized to result from a number of psychosocial and behavioral correlates of SES adversity. The current study explores whether indicators of HPA functioning vary as a function of life course SES adversity. Methods: Data come from the Biomarker Substudy (n = 1,255), the National Study of Daily Experiences Substudy n = 2,022), and the first and second surveys of the national Study of Midlife in the U.S (MIDUS, n = 4,163; 53% female, mean age = 55 years). Life course SES adversity was assessed as a summary composite (range 0-16, M = 6.75, SD = 3.5) using multiple ordinal indicators of SES during childhood (parental education, welfare status, family’s financial situation) and adulthood (education, household income, difficulty paying for basics and bills, current financial situation). Results: Overnight urinary cortisol levels did not significantly vary as a function of level of life course SES adversity. However, those with greater life course SES adversity had higher AUC output during the cognitive challenge in the laboratory (B = 2.5, p < .001), and greater cortisol levels during the daily sampling protocol. Results: Overnight urinary cortisol levels did not significantly vary as a function of level of life course SES adversity. However, those with greater life course SES adversity had higher AUC output during the cognitive challenge in the laboratory (B = 2.5, p < .001), and greater cortisol levels during the daily sampling protocol. Conclusions: The link between childhood trauma and later adverse health outcomes in adulthood has been well established. Though distally occurring, traumatic events in childhood are thought to exert sustained significant effects, influencing health outcomes several years later in adulthood. Research efforts have attempted to ascertain mediators of this relationship, in order to identify targets for intervention. The current study tested whether a specified behavioral pathway mediated the relationship between early trauma experiences, and adverse self-reported health in adulthood. Structural equation modeling was employed to test the mediation of a latent health risk behavior variable on the relationship between a latent maltreatment variable and adverse adult health variable, in a sample of 258 adult women. Indicators of the child maltreatment latent variable included psychological maltreatment, physical abuse, and witnessing parental violence. Indicators of the health-risk behavior latent variable included risky sexual behavior, drug use and smoking. Indicators of adverse self-reported adult health latent variable included menstrual symptoms, general physical health symptoms, and functional impairment. Results indicated that health-risk behaviors partially mediated the relationship between CM and adverse adult health (r2 (24, N = 258) = 58.05, p= .000, r2/df = 2.42, 8)

Abstract 899

LIFE COURSE SOCIOECONOMIC ADVERSITY AND CORTISOL ACTIVITY IN THE LABORATORY AND DAILY LIFE

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The link between childhood trauma and later adverse health outcomes in adulthood has been well established. Though distally occurring, traumatic events in childhood are thought to exert sustained significant effects, influencing health outcomes several years later in adulthood. Research efforts have attempted to ascertain mediators of this relationship, in order to identify targets for intervention. The current study tested whether a specified behavioral pathway mediated the relationship between early trauma experiences, and adverse self-reported health in adulthood. Structural equation modeling was employed to test the mediation of a latent health risk behavior variable on the relationship between a latent maltreatment variable and adverse adult health variable, in a sample of 258 adult women. Indicators of the child maltreatment latent variable included psychological maltreatment, physical abuse, and witnessing parental violence. Indicators of the health-risk behavior latent variable included risky sexual behavior, drug use and smoking. Indicators of adverse self-reported adult health latent variable included menstrual symptoms, general physical health symptoms, and functional impairment. Results indicated that health-risk behaviors partially mediated the relationship between CM and adverse adult health (r2 (24, N = 258) = 58.05, p= .000, r2/df = 2.42, 8).
CFI = .94, RMSEA = .074; CI = .050-.099). This suggests that adult health is negatively affected by increased health risk behaviors that may develop subsequent to early maltreatment. This finding builds upon previous theoretical and empirical work exploring health behavior correlates of maltreatment. Further, these behaviors may be important targets for intervention given the demonstrated relationship between trauma, behaviors and health outcomes.

Abstract 1229
TARGETED REJECTION DURING ADOLESCENCE PREDICTS INCREASED RISK FOR DEPRESSION
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Risk for experiencing depression is approximately equal for boys and girls until early adolescence, at which point women become twice as likely as men to experience a major depressive episode. Theoretical models attempting to explain this dramatic and sustained increase in risk for depression among women often include a role for social stress and partisanship, social rejection, which are known to upregulate inflammatory activity and precipitate onset of the disorder. Whether different types of social rejection are differentially associated with risk for depression, however, remains unknown. To address this issue, we followed 147 adolescent women at elevated risk for depression for a period of 2.5 years. Every six months, participants were administered a semi-structured interview (i.e., the UCLA Life Stress Interview) to test for the presence of a recent severe life event, and the Structured Clinical Interview for DSM-IV to test for the presence of a recent major depressive episode. Hierarchical linear modeling analyses designed to test relations between different types of social rejection and risk for depression revealed that, when controlling for age, ethnicity, and alcohol consumption, adolescent girls who experienced a recent severe social rejection life event that involved a loss of social status and severing of a relational tie (i.e., “targeted rejection”) exhibited a 12.9-fold increase in risk for depression relative to their non-targeted rejection counterparts (95% CI: 2.2-75.8; p = .006). In contrast, social rejection life events that did not involve a loss in status or the severing of a relational tie (i.e., “non-targeted rejection”) led to a 6.7-fold increase in risk for depression (95% CI: 1.6-28.4; p = .011). To our knowledge, this study is the first to refine types of severe social rejection life events and to use this information to predict differential risk for depression in adolescence. We discuss these findings by considering how social rejection-related increases in inflammation may precipitate depression and elevate risk for physical conditions that are often comorbid with depression, including asthma, arthritis, and cardiovascular disease.

Paper Session:
The Serotonin System: Neural and Emotional Effects

Abstract 885
CITALOPRAM REDUCES MOOD REACTIVITY TO SOCIAL CONFLICTS DURING DAILY LIFE: RESULTS OF A PLACEBO-CONTROLLED INTERVENTION
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Using a placebo-controlled experimental trial, we have previously shown that citalopram reduces self-reported trait anger and metabolic risk among high hostile individuals. In this report, we examine intervention effects on momentary social interactions and mood in the same trial. 159 healthy adults with elevated hostility but no current Axis I disorders were randomized to citalopram or placebo for a 2-month period. Using Ecological Momentary Assessment (EMA) methods, we assessed momentary affect (anger, sadness and anxiety) and recent social interaction characteristics every 45 minutes during three waking days on two occasions, before and after treatment. There were no treatment effects on mean momentary measures of social conflict or negative mood. Reactivity to negative social interactions however was beneficially affected by treatment: The relationship between social conflict and anger (slope) during daily life was reduced over the course of treatment, to a much greater extent in the drug group than among controls (Condition x Time x Conflict on momentary anger F (1, 9645) = 7.87, p = .005). In the Drug group F for Time x Conflict (1, 9645) = 34.45, p < .0001 and the slope of association between Conflict and anger was reduced 36% pre- to post-treatment. In the Placebo group F (1, 9645) = 3.93, p < .05 and b was reduced only 12%. There was a marginally significant effect of treatment on mean momentary positive affect (e.g., joyful, excited) (Condition by Time F (1, 136) = 3.61, p = .06) as well. The association between increases in positive mood and declines in conflict-anger slopes was significant in the drug group (r = -.35, n = 71, p = .003) but not among controls (r = .02, n = 67, n.s.), suggesting that these two changes occurred in parallel over the course of treatment. These findings augment the generalizability of our previously reported treatment results in this sample, they are consistent with previous findings showing a potential role of central serotonin in modulating aggression and response to threat, and they support the utility of EMA methods for evaluating the effectiveness of behavioral medicine treatments.

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Abstract 1088
REDUCTION OF COLORECTAL DISTENTION-INDUCED BRAIN ACTIVATION BY CLOMIPRAMINE IN MEN
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Aim: Antidepressants are widely used for irritable bowel syndrome (IBS). Clomipramine is an injectable tricyclic antidepressant which mainly inhibits serotonin reuptake. Acute administration of antidepressants may modify visceral perception-related brain activation which plays an important role in pathophysiology of IBS. However, physiological changes in brain-gut axis in humans by acute administration of antidepressants are quite obscure. The aim of this study is to test the hypothesis that acute administration of clomipramine reduces the specific regions of the brain activation during colorectal distention in healthy males. Methods: Eighteen normal healthy males aged 22 ± 1 participated in this study. Either clomipramine (250 μg/kg) (n = 9) or placebo (saline) (n = 9) was intravenously infused to the subjects. Using a colonoscope, a barostat bag was inserted into the descending colorectum of each subject. Colorectum was distended with a computer-controlled barostat device with 0 mmHg, 20 mmHg, or 40 mmHg of the bag pressure at random order. During colorectal distention, regional cerebral blood flow with injection of H2[15-O] was measured by positron emission tomography scanning. After each scan, blood was sampled from the venous line for the analysis of plasma catecholamines, adrenocorticotropic hormone (ACTH) and cortisol. Visceral perception and emotion were assessed with ordinal scale. Results: Intravenous infusion of clomipramine significantly deactivated amygdala and posterior cingulate cortex in response to colorectal distention, compared with placebo (p < 0.005). Clomipramine significantly activated hippocampus and parahippocampal gyrus in response to colorectal distention, compared with placebo (p < 0.005). By contrast, plasma adrenaline, ACTH, and cortisol significantly increased after the administration of clomipramine (p < 0.01). Conclusion: These results suggest that administration of clomipramine can suppress visceral nociception via inhibition of activities of amygdala and posterior cingulate cortex even during acute single infusion.
Abstract 996

INFLUENCE OF SEROTONIN TRANSPORTER GENE VARIATION AND ANXIETY-RELATED PERSONALITY ON BRAIN ACTIVITY DURING FEAR CONDITIONING IN JAPANESE SUBJECTS

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Background: The short (S) variant of the human serotonin transporter gene (5-HTTLPR) has been demonstrated to induce amygdala hyperactivity to negative emotional cues and which may reflect an association between individuals possessing S allele and anxiety-related trait in Caucasian, long (L) allele dominant population (1). However, this association has not been confirmed as there have been several inconsistent reports. We investigated the effect of the 5-HTTLPR variant and personality on brain activity during fear conditioning in Japanese, S allele dominant population.

Methods: Forty-seven subjects (23 males, mean age 23±2 years) participated in this study. Functional magnetic resonance imaging was used to acquire blood oxygen level dependent contrast images during fear conditioning, in which auditory tones were paired with an aversive electric stimulus. Skin conductance response was measured to confirm the conditioning response. State-trait Anxiety Inventory (STAI) and 20-item Toronto alexithymia scale (TAS-20) were used to assess personality trait in each subject.

Results: Conditioned stimulus (CS+), compared to non-conditioned stimulus (CS−), induced higher brain activity in the right parahippocampal gyrus, right anterior insula, brain stem, bilateral precentral gyrus, supplementary motor areas, caudate, superior temporal gyrus and cerebellum (p≤0.05). CS+ induced brain activity in the right parahippocampal gyrus was higher during first quarter of the experiment and increased over time. In this right parahippocampal gyrus, sixteen subjects carrying SS allele of 5-HTTLPR showed higher brain activity when compared to 26 subjects carrying SL or LL allele (p=0.03) and 16 subjects with higher STAI score showed tendency of lower brain activity than 21 subjects with lower STAI score (p=0.06), in addition, 14 subjects with higher TAS-20 score showed lower brain activity than 17 subjects with lower TAS-20 score (p=0.03).

Conclusions: Consistent with previous studies, subjects with SS phenotype of 5-HTTLPR showed hyper brain response in the area related with fear conditioning when compared to L allele carriers, however, these SS allele driven hyper activity was not parallel with the effect of anxiety-related personality on the brain response. As indicated in recent interesting papers (2, 3), neurobiological effect of S allele may not be simply associated with anxiety-related trait in Japanese population.

1. Hippi et al., Bio Psychiatry, 2006

Abstract 1108

THE EFFECT OF EXPERIMENTAL REDUCTION IN DAILY PHYSICAL ACTIVITY ON STRESS-INDUCED CARDIOVASCULAR, NEUROENDOCRINE AND SUBJECTIVE RESPONSES

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The study tests whether reduced daily physical activity (PA) is associated with changes in cardiovascular (CV), neuroendocrine and subjective responses to stress. The health protective effect of regular PA is thought to be in part mediated by hemodynamic regulation of autonomic activity and other physiological mechanisms. However, exercise trials have produced inconsistent results. A novel method to investigate the effect of PA on biological responses is the exercise withdrawal design (EWD) which entails withdrawing active, healthy individuals from regular PA. The EWD has been shown to induce negative mood symptoms and greater IL-6 responses to stress and is therefore a useful method to investigate the effect of PA on autonomic reactivity.

Forty-seven healthy, active participants (VO2 peak 49.23±10.50, age 24.78±4.75 yrs, 44.7% female) were assigned to either a PA maintenance or PA withdrawal condition in a cross-over, randomized order. Daily physical activity was measured by an accelerometer device positioned at the hip in order to monitor protocol adherence. Psychophysiological stress testing was implemented after each condition. Saliva samples, CV and subjective measures were taken regularly during the 2 stress sessions.

Within-subjects analyses indicated no changes in BMI or resting blood pressure following 2 weeks of PA withdrawal. However, resting heart rate was slightly elevated compared to PA maintenance (M diff. 2.43 bpm, p=0.05). Heart rate recovery from mental stress was impaired at 20 (p=0.04) and 45 minute post-stress (p=0.004) in the PA withdrawal phase while the HRV response was reduced in the speech task, the 20 and 45 minute recovery in the PA withdrawal phase. There was no significant effect of PA withdrawal on systolic or diastolic blood pressure reactivity and total peripheral resistance. The cortisol response at 20 minute post-
stress was higher in the PA withdrawal than in the maintenance phase (p<.05). Subjective stress appraisal and perceived task control did not differ within the two PA phases. The associations described above became stronger when we excluded participants with poor compliance to PA withdrawal (PA reduction of 5% per cent).

Reducing daily PA for 2 weeks is associated with some cardiac autonomic impairments in stress recovery and greater stress-induced cortisol. However, no effects were observed in blood pressure responses or subjective measures. Short-term reduction in physical activity may not immediately translate into CV impairment in healthy participants.

Abstract 1224
ASSOCIATION BETWEEN N-3 FATTY ACIDS AND METABOLIC RISK IS MODERATED BY PHYSICAL ACTIVITY
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Consumption of long-chain, n-3 fatty acids (eicosapentaenoic and docosahexaenoic acids; EPA, DHA) from fish or fish oil supplements reduces risk for cardiovascular events, yet the effects of these nutrients on metabolic risk factors and diabetes has been reported variously as favorable, neutral or deleterious. These conflicting findings could indicate effect moderation by another determinant of metabolic risk and insulin resistance, such as physical activity. Subjects were 546 healthy, community volunteers, 30-54 years of age, not taking fish oil supplements or medications affecting blood pressure (BP) or insulin. Standardized measures of BP and waist circumference were obtained, along with fasting serum for lipids, glucose, insulin and phospholipid fatty acid analysis. The sum of EPA and DHA (mg %) was employed as biomarker of n-3 fatty acid exposure. Habitual physical activity (kcal/week) was estimated using the Paffenbarger Survey. A metabolic risk score was calculated as the sum of standardized distributions of BP, waist circumference, HDL cholesterol (HDL-c), triglycerides (TG), insulin, and glucose values. Insulin resistance was estimated from the homeostatic model assessment. In linear regression models with covariate adjustment for age, gender and race, physical activity was found to predict metabolic risk score (t = -3.6, P <.001) whereas the sum of EPA+DHA did not (P >1). However, physical activity moderated the effect of EPA+DHA on metabolic risk (exercise-x(EPA+DHA) t = -3.9, P<.001). Similarly, physical activity was found to moderate the effect of EPA+DHA on insulin resistance (exercise-x(EPA+DHA) t = -2.9, P<.004). Regression analyses using n-6:n-3 ratios, and EPA and DHA individually, as predictors of metabolic risk score and insulin resistance yielded similarly strong interactions with physical activity. Partial correlations in subjects reporting physical activity less than 2,000 kcal/week versus those expending 2,000 kcal/week or more while covarying age, gender and race revealed the following: among low exercisers greater EPA+DHA tended to convey greater metabolic risk (r=+.15 P=.06), and insulin resistance (r=+.14; P=.07), whereas greater EPA+DHA among high exercisers was associated with lower metabolic risk (r=-.23 P=.002) and insulin resistance (r=-.15; P=.04). Habitual physical activity may unmask the salutary effects of n-3 fatty acids on cardiometabolic risk and insulin resistance.

Abstract 901
POOR AEROBIC FITNESS IS ASSOCIATED WITH ACCELERATED COGNITIVE DECLINE WITH AGING
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Growing evidence suggests that physical activity level may account for variability in cognitive function among older adults, and aerobic intervention may actually improve cognitive functioning in this population. However, much less is known about the longitudinal association between direct measures of aerobic fitness and cognitive function across the lifespan. Here, we examined the prospective association between baseline maximal oxygen consumption (VO2max), a measure of aerobic fitness, and longitudinal performance on an extensive neuropsychological battery. Up to 1,400 participants from the Baltimore Longitudinal Study of Aging (aged 19 to 94, 51% male, 74% white), free of heart failure and neurologic/cerebrovascular disease, underwent VO2max assessment using a standard treadmill test protocol and completed tests of memory, attention, perceptuomotor speed, language, executive function, and cognitive screening measures on up to 6 occasions (M=2, SD=1) over up to 18 years (M=7, SD=4) of follow-up. Mixed-effects regression models were adjusted for age, sex, race, education, body mass index, hypertension, antihypertensive medication use, cardiovascular and inflammatory disease, and depression. Analyses revealed significant longitudinal associations between baseline VO2max and trajectory of performance on multiple measures of verbal and visual memory, as well as a cognitive screening test (all p’s<.05). Individuals with lower baseline VO2max demonstrated accelerated trajectories of cognitive decline over time. This pattern of association was observed for nearly all neuropsychological outcome measures, regardless of significance. Cardiorespiratory fitness is therefore related to neuropsychological performance across the lifespan, and memory appears to be a particularly vulnerable domain. Evidence that aerobic fitness correlates with accelerated cognitive decline only emphasizes the importance of behavioral interventions to optimize cognitive aging over time. This research was supported in part by the Intramural Research Program of the NIH, National Institute on Aging.

Abstract 976
COGNITIVE BEHAVIORAL THERAPY AND GRADED EXERCISE FOR CHRONIC FATIGUE SYNDROME: A COMPARATIVE META-ANALYSIS INCLUDING MODERATORS OF EFFECTS
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Several reviews have concluded that graded exercise therapy (GET) and cognitive behavioral therapy (CBT) may be efficacious treatments for chronic fatigue syndrome (CFS). The aim of the current meta-analyses was to extend these reviews by directly comparing the two treatment approaches and addressing methodological limitations of previous reviews. An additional aim was to explore possible moderators of treatment effects including treatment setting (secondary versus primary care), individual versus group therapy, quality of study, and number of therapy. Published and unpublished trials were identified through a systematic search of Medline, Biological Abstracts, Science Citation Index, Social Science Citation Index, PsycINFO, PsycBOOKS, Cochrane Reviews, Cochrane Database of Clinical Trials, ProQuest Dissertations & Theses, Dissertation Abstracts International and Google Scholar in April 2011. A total of 21 randomized-controlled trials met inclusion criteria; GET (n = 5) and CBT (n = 16). The standardized mean difference coefficient (d) was used as the effect size (ES) statistic, adjusted using Hedge's correction, g. Overall effect sizes suggested that GET (g = 0.28) and CBT (g = 0.40) were equally efficacious, Levels of fatigue were significantly reduced compared with controls (g = 0.35, CI = 0.24, 0.46, p <.001), as were levels of functional impairment (g = 0.38, CI = 0.27, 0.49, p <.001), depression (g = 0.28, CI = 0.08, 0.49, p <.01), and anxiety (g = 0.16, CI = 0.02, 0.31, p <.05). CBT effect sizes were lower in primary care settings and for treatments offering fewer hours of contact. CBT tended to result in a greater reduction in depression and anxiety than GET, possibly reflecting the greater emphasis on the role of emotional factors in the perpetuation of fatigue. The results suggested that both CBT and GET are promising treatments for CFS, although CBT may be a more effective treatment when patients have co-morbid anxiety and depressive symptoms. The results will be discussed in relation to recent meta-analysis of similar trials in chronic pain.
TRAIT ANXIETY AND PATTERNS OF NORMATIVE BLOOD PRESSURE FUNCTIONING USING A SELF-MONITORING PROTOCOL
Eimear M. Lee, MSc., Brian M. Hughes, PhD, Psychology, National University of Ireland, Galway, Galway, Ireland
Anxiety has been established as a long-term predictor for poor health outcomes, notably in relation to coronary heart disease and mortality. It has also been associated with poor health-related quality of life, and increased reporting of concurrent physical symptoms. High trait anxiety is related to an increased tendency to appraise daily situations as threatening, which may lead to an increased state of alert or activation for those who are higher in anxiety. Much research has examined the relationship between blood pressure and anxiety in laboratory and ambulatory contexts, however fewer studies have examined cardiovascular (CV) processes over an extended period of monitoring. Forty four undergraduate women were given mobile blood pressure monitors to use over a period of four consecutive days, at pre-determined daytime and evening periods. Participants self-monitored blood pressure (BP), heart rate (HR), and HF symptoms (KCCQ Functional Status (FS) subscale) at baseline. Optimism was associated with fewer hospitalizations (χ2=12.1, β = 0.91, P = .035). When the HF was broken into Optimism and Pessimism subscales, only Optimism (β = 0.91, p = .035) mediated the relationship of perceived racism to nocturnal BP, accounting for about 10% of the variance. These data underscore the difficulties of recovery from the affective consequences of exposure to race-related maltreatment and provide initial evidence that sustained negative emotion has implications for health outcomes.

Abstract 1160

PAPER SESSION: PERSONALITY, EMOTION, AND CARDDIOVASCULAR OUTCOMES

TRAIT ANXIETY AND PATTERNS OF NORMATIVE BLOOD PRESSURE FUNCTIONING USING A SELF-MONITORING PROTOCOL
Eimear M. Lee, MSc., Brian M. Hughes, PhD, Psychology, National University of Ireland, Galway, Galway, Ireland
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Abstract 980

DISPOSITIONAL OPTIMISM PREDICTS FEWER SELF-REPORTED SYMPTOMS AND 18 MONTH HOSPITALIZATIONS IN HEART FAILURE PATIENTS
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Background: Psychosocial factors can adversely affect the clinical course of heart failure (HF), but the role of protective factors has received less attention. Dispositional optimism may have a beneficial effect on health outcomes in HF patients. We investigated the relationship between optimism, HF symptoms, and subsequent hospitalizations over an 18 month period. Methods: In the ongoing BETRHEART study, 105 patients (79 males; mean age = 56.8 ± 11.7 years) with HF (ejection fraction (EF) ≤ 40%) completed psychosocial and clinical health questionnaires at baseline and at 3 month follow-up. Dispositional Optimism was measured using The Life Orientation Test (LOT) (Scheier & Carver, 1985); its relationship to self-reported health status and HF symptoms (Kansas City Cardiomyopathy Questionnaire (KCCQ)) and hospitalizations during an 18-month follow-up period was assessed. Results: Controlling for age, gender, BMI, smoking, NYHA classification, and EF, Optimism (higher LOT total scores) was associated with fewer reported physical limitations and symptoms (KCCQ Functional Status (FS) subscale; model R2=.32, β = 0.31, p = .001), improved quality of life (KCCQ Quality of Life (QoL) subscale; R2=.36, β = 0.53, p< .0001) and fewer overall symptoms (KCCQ Clinical Summary (CS) Score; R2=.33, β = 0.45, p< .0001) at baseline. Optimism was predictive of better quality of life at 3 months (QoL; R2=.17, β = 0.33, p<.002) and fewer overall symptoms (CS; R2=.12, β = 0.25, p = .02), and marginally predictive of functional status (FS; R2=.12, β = 0.20, p= .06). Total LOT scores were also associated with fewer hospitalizations during the 18 month follow-up (χ2=12.3, β = 0.91, P = .035). When the LOT was broken into Optimism and Pessimism subscales, only Optimism was associated with fewer hospitalizations (χ2=12.1, β = 0.85, p = .04). Conclusions: Independent of standard medical risk factors, dispositional optimism is a protective factor in HF patients, and is associated with fewer reported HF symptoms, better reported quality of life, and fewer HF hospitalizations during 18-month follow-up. Further, optimism and pessimism operate differentially in predicting HF health outcomes.

Abstract 1161

EVENING ANGER MEDIATES THE RELATIONSHIP OF PERCEIVED RACISM TO NOCTURNAL BLOOD PRESSURE
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Elevedated nocturnal blood pressure is associated with increased risk for cardiovascular disease. Perceived racism/ethnic discrimination has been positively associated with nocturnal blood pressure in 5 of 6 studies of adult samples. However, the mechanisms explaining this relationship are not well understood. The aim of this study is to test the hypothesis that evening levels of negative mood mediate the relationship of perceived racism to nocturnal BP. Participants included 395 American born Black (n = 215) or Latino (n = 180) adults (mean age = 39.55 years, range = 24-65); half of whom were women (n = 200). Perceived racism was assessed with the Perceived Ethnic Discrimination Questionnaire (PEDQ) which obtained once per hour after the participant reported going to sleep. Dispositional Optimism was measured using The Life Orientation Test (LOT) (Scheier & Carver, 1985); its correlation with PEDQ which was followed up with further 4 × 1 ANCOVAs to investigate the effects of daytime and evening periods. Significant quadratic interactions were observed both for daytime SBP (F[1,41] = 5.45, p = .03, partial eta square = .18), and evening time DBP (F[1,41] = 4.73, p = .04, partial eta square =.10). For those higher and lower in trait anxiety, patterns of blood pressure over daytimes and evenings differed for SBP and DBP respectively. Those highest in levels of trait anxiety consistently displayed less health-full patterns of BP over daytime and evenings periods. Lower levels of anger anxiety were associated with impaired ability rest after periods of activation. This may reflect the innate tendency of those higher in trait anxiety to evaluate ambiguous daily situations as harmful to well-being, thus potentially impeding restful CV activity.

Abstract 1142

PROGNOSTIC IMPORTANCE OF TYPE D (DISTRESSED) PERSONALITY IN PATIENTS WITH CORONARY ARTERY DISEASE
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Objective. Type D (distressed) personality - the combination of high negative affectivity (NA) and social inhibition (SI) - is related to adverse cardiovascular outcomes. Methodological considerations in view of selected null studies indicate the need for a reexamination of this construct. Therefore, we examined whether associations with clinical outcomes involve the specific combination of high NA and SI or instead involve the main effect of either NA or SI alone.
Methods. At baseline, 1503 patients with coronary artery disease (CAD) were assessed for Type D personality. At 5-year follow-up, the endpoints were a composite of major adverse cardiac events (MACE; i.e., cardiac death, myocardial infarction (MI), coronary bypass surgery or angioplasty), and cardiac death/MI. The Type D personality model was tested by i) examining the interaction of continuous NA and SI z scores; and ii) construing a 4-group classification of low NA/low SI, low NA/high SI, high NA/low SI and high NA/NA patients.

Results. At follow-up, 295 patients had a MACE, including 116 patients with cardiac death/MI. Adjusting for clinical variables, the interaction of continuous NA and SI z scores predicted MACE (OR=1.24, 95%CI 1.09-1.39, p=0.001) and death/MI (OR=1.25, 95%CI 1.05-1.49, p=0.01). The main effects of continuous NA and SI z scores were not significant in these models. Using the standard cutoff of 10 on both the NA and SI scales in multivariable regression models, Type D personality was also associated with MACE (OR=1.82, 95%CI 1.33-2.50, p<0.001) and death/MI (OR=2.49, 95%CI 1.55-3.99, p=0.01<0.001). In contrast, low NA/high SI patients or high NA/low SI patients were not at an increased odds of MACE or death/MI.

Conclusion. Consistent with the Type D model, it is the combination of high NA and SI (and not only one of these traits) that places CAD patients at risk in the present study.

Abstract 1157

EXPRESSIVE WRITING REDUCES INTRUSIVE THOUGHTS AND IMPROVES QUALITY OF LIFE IN PATIENTS WITH RENAL CELL CARCINOMA

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Most previous research examining the efficacy of brief expressive writing interventions have used small sample sizes and followed people for no more than 3 months. We conducted a large randomized trial to examine an emotion-based writing intervention for patients with renal cell carcinoma and followed them for 10 months after the end of the writing sessions. Two hundred patients with renal cell carcinoma were randomly assigned to either write their deepest thoughts and feelings about their cancer (EWT) or to write about neutral topics (NWT) four separate occasions over 10 days for a maximum of 20 minutes at each writing session. Patients completed the MD Anderson Symptom Inventory (MDASI), Brief Fatigue Inventory, SF-36, 36 Role Physical, and the two largest health insurers in our region. We applied 2007 Medicare rates to inpatient and outpatient claims and approximated intervention costs (e.g., care manager time, pharmacotherapy) to estimate incremental costs between UC and CC from the payor’s perspective, and used generalized linear models with gamma distribution to correct for skewness in cost data. Then we converted SF-36 MCS scores collected at baseline, 2, 4, 6, and 12-months follow-up to preference-based utilities, and calculated the incremental cost per quality-adjusted life year (QALY) gained for CC relative to UC.

Results: At baseline, the 189 patients with continuous 12-month claims data were similar by sociodemographic and clinical characteristics. Examination of group differences 1 month after the writing sessions, controlling for the respective baseline measure, revealed decreased IES scores for the EWT group (intrusive thoughts: EW, 5.0 v NW, 7.2; p<.02; avoidance behaviors: EW, 6.3 v NW, 8.7; p<.07). By 4 months after the intervention, the EW group reported higher levels of SF-36 Social Functioning scores (EW: 52.6 v NW: 49.7; p<.04). At the 10 month time point, the EW group reported fewer cancer-related symptoms (EW: 20.8 v NW: 30.8; p<.01) and quality of life (EW: 69.6 v NW: 54.0; p<.02), and fewer sleep disturbances (scale of the PSQI: EW: 1.4 v NW: 1.6; p<.05). Means for the other SF-36 subscales at 10 months were in the expected, but did not reach statistical significance. There were no group differences for CES-D or fatigue scores at any time point. These findings indicate expressive writing leads to short-term reduction in intrusive thoughts about the cancer experience and results in long-term improvement in aspects of quality of life.

Abstract 1177

12-MONTH COST-EFFECTIVENESS OF TELEPHONE-DELIVERED COLLABORATIVE CARE FOR TREATING POST-CABG DEPRESSION

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Purpose: Depressive symptoms commonly follow coronary artery bypass graft (CABG) surgery and are associated with poorer clinical outcomes. We demonstrated that telephone-delivered collaborative care (CC) for post-CABG depression reduces mood symptoms, and improves health-related quality of life (HRQoL) and physical functioning more than doctors’ usual care (UC) at 8-months follow-up (Rollman BL et al. JAMA 2009). We now report the cost-effectiveness of our intervention so as to guide employers, insurers, and health systems on whether to adopt similar treatment strategies for treating depression following an acute cardiac event.

Methods: From 3/04-9/07 we enrolled 302 post-CABG patients who screened positive for depression prior to hospital discharge; had at least a moderate level of mood symptoms two weeks later (PHQ-9 ≥ 10); met all eligibility criteria; and were randomized to either our 8-month intervention or to UC. Later, we obtained insurance claims data for 189 (63%) patients with ≥ 12 months continuous enrollment from Medicare and the two largest health insurers in our region. We applied 2007 Medicare charges to inpatient and outpatient claims and approximated intervention costs (e.g., care manager time, pharmacotherapy) to estimate incremental costs between UC and CC from the payor’s perspective, and used generalized linear models with gamma distribution to correct for skewness in cost data. Then we converted SF-36 MCS scores collected at baseline, 2, 4, 6, and 12-months follow-up to preference-based utilities, and calculated the incremental cost per quality-adjusted life year (QALY) gained for CC relative to UC.

Results: At baseline, the 189 patients with continuous 12-month claims data were similar by sociodemographic and clinical characteristics to the 113 excluded from our analyses due to incomplete claims data; and by randomization status (90 CC and 99 UC; mean age: 67 years, 61% male). At 12-months, CC patients had $449 lower mean total costs than UC ($18,172 vs. $18,621) at an incremental cost-effectiveness ratio of $9,889 per QALY (95% CI: $11,940 - $7,838) vs. UC.

Conclusions: Collaborative care for post-CABG depression is more effective and less costly than UC, and compares highly favorably to other interventions at improving HRQoL.

Abstract 799

AN EXAMINATION OF AUTOMATED TELEPHONE INTERVENTIONS IN MINDFULNESS AND MASTERY FOR DEPRESSED COMMUNITY RESIDENTS

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Method. A randomized controlled trial was designed to examine the effects of a brief, daily intervention targeting either personal control/mastery (MC) or mindfulness awareness/acceptance (MA) compared with a placebo treatment that consisted of tips to a healthy lifestyle (HT). Using an automated interactive voice response (IVR) system, eighty-four individuals with mild to moderate symptoms of depression received MC, MA, or HT interventions delivered in prerecorded messages via phone each morning. Each evening, participants completed an on-line daily diary that included the outcome measures.
Results. Multi-level analyses of diary data revealed significantly greater improvements in emotional health and self-reported physical health, for the treatment conditions across the 31-day trial, in comparison to placebo controls. For measures of emotional health the effects of MC and MA were equivalent. Only the MA condition led to better self-reported physical health than the HT placebo control condition.

Conclusions. The everyday lives of depressed community members were improved by automated daily messages designed to enhance personal mastery, mindfulness and acceptance. Across the 31 days of the study, the MA group demonstrated the most robust effects. The personal mastery condition also yielded benefits compared with placebo, though less pronounced. The findings support these new designs for public health intervention.

Table 1: Intervention Effects on Outcomes of Emotional Health, Physical Health, and Cognitive Adjustment/Daily Stress

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Fixed Effects by Group</th>
<th>Group Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MC</td>
<td>MA</td>
</tr>
<tr>
<td>Emotional health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>-.065 (.015)**</td>
<td>-.052 (.014)***</td>
</tr>
<tr>
<td>Negative affect</td>
<td>-.037 (.010)***</td>
<td>-.024 (.010)**</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.017 (.009)</td>
<td>.058 (.015)***</td>
</tr>
<tr>
<td>Role-emotional</td>
<td>1.397 (1.676)**</td>
<td>1.586 (6.05)**</td>
</tr>
<tr>
<td>Physical health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average pain</td>
<td>.376 (.272)</td>
<td>-.519 (.381)</td>
</tr>
<tr>
<td>Role-physical</td>
<td>.357 (.407)</td>
<td>1.488 (.476)**</td>
</tr>
<tr>
<td>Health complaints</td>
<td>.011 (.019)</td>
<td>-.072 (.015)***</td>
</tr>
<tr>
<td>Cognitive adjustment/daily stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catastrophizing</td>
<td>-.072 (.028)**</td>
<td>-.053 (.015)***</td>
</tr>
<tr>
<td>Hope</td>
<td>.008 (.015)</td>
<td>.046 (.015)***</td>
</tr>
</tbody>
</table>

Abstract 1184

COST-EFFECTIVENESS OF ENHANCED DEPRESSION TREATMENT IN ACUTE CORONARY SYNDROME PATIENTS

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Objective. As many as 40% of the 1.4 million Americans who will be discharged with a diagnosis of acute coronary syndrome (ACS) this year will experience elevated depression symptoms (Carney & Freedland, 2009), which are associated with poor quality of life (QOL; Rumsfeld et al., 2001) and a doubling of risk for ACS recurrence and mortality (Glassman et al., 2009). A number of clinical trials have attempted to treat depression in ACS patients, with varying degrees of success, but whether those treatments are cost-effective (and thus likely to be broadly adopted) is not known.

Methods. Using published data (Choudhry et al., 2011; Katon et al., 2006), we modeled the cost-effectiveness of enhanced depression treatment as conducted in the ongoing Comparison of Depression Interventions after Acute Coronary Syndrome (CODEACS) trial. We used TreeAge Pro 2011 to calculate the incremental-cost effective ratio (ICER) for enhanced depression treatment, taking into consideration the range of possible costs and effects on QOL and cardiac events.

Results. Our results suggest that the ICER of depression treatment compared to usual care is $10,851/quality adjusted life year (QALY) gained, assuming that the benefit of enhanced depression treatment is limited to QOL improvement only. The cost-effectiveness of the intervention remains robust in one-way sensitivity analysis; if treatment is half as effective as expected for change in QOL, the ICER for treatment becomes $21,702/QALY gained; conversely, if the treatment is twice as effective as expected, the ICER for treatment becomes $5,425 / QALY gained. In addition, the potential for reducing adverse clinical outcomes in ACS patients increases the cost-effectiveness of enhanced depression treatment. Although such large effect sizes are rare in contemporary settings, if enhanced depression treatment were to reduce the risk of fatal and non-fatal CHD events by 12.4% or more, the intervention would be cost-saving (Figure).

Conclusions. These results are the first to model the cost-effectiveness of enhanced depression treatment in ACS patients, and suggest that enhanced depression treatment is likely associated with meaningful clinical benefit at a reasonable cost.
MATERNAL SMOKING DURING PREGNANCY PROGRAMS THE INFANT HPA AXIS: EPIGENETIC REGULATION OF PLACENTAL GLUCOCORTICOID RECEPTOR GENE AS A POTENTIAL MECHANISM

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Maternal smoking during pregnancy (MSDP) is linked to numerous adverse medical and neurobehavioral outcomes in offspring (e.g., growth, attention, externalizing deficits), but mechanisms remain unknown. We propose that, like maternal stress, MSDP programs the offspring hypothalamic pituitary adrenocortical (HPA) axis leading to adverse outcomes. We further propose that this alteration is mediated by epigenetic regulation of the placental glucocorticoid receptor (GR) gene. We investigated associations between MSDP and neonatal cortisol reactivity and explored whether alterations in cortisol reactivity were mediated by altered epigenetic regulation of placental GR. 95 mother-infant pairs (50% MSDP-exposed) were recruited from a racially/ethnically diverse (58% minorities), low-income sample. MSDP was assessed by 3rd trimester timeline followback interview and verified by saliva and meconium cotinine. Infant cortisol response to a neurobehavioral exam was assessed over the first month (days 2, 5, 30). Placental tissue was collected at delivery (n=59); methylation of placental GR promoter exon 1F was assessed using quantitative pyrosequencing. Preliminary analyses revealed that MSDP-exposed infants showed attenuated basal cortisol and cortisol reactivity over the first month vs. unexposed infants (days 2, 5, 30 F’s=3.0, p’s<.05; Figure 1A). Further, increasing MSDP exposure was associated with a decreasing basal and reactive cortisol (F’s=4.1, p’s<.05). MSDP-exposed infants also showed alterations in epigenetic regulation of the placental GR promoter, with exposed infants showing altered methylation at three CpG sites (CpG 2, 3, 4, 12; t’s=1.7, p’s=.01-.09; Figure 1B). Further, increasing MSDP exposure associated with decreasing GR promoter methylation at CpG sites 3,4, and 12, but increased methylation at site 2 (p’s<.05). Variations in GR methylation were directly related to infant basal and reactive cortisol levels (CpG 3 and day 2 basal and reactive cortisol, r=.29, F=3.59, p’s<.05). Results provide initial support for the hypothesis that MSDP programs offspring HPA (dys)regulation and that epigenetic regulation of placental GR function may serve as a novel and potentially underlying mechanism. Results have implications for identifying early biobehavioral markers of risk from MSDP, and for delineating potentially modifiable pathways to adverse outcomes from MSDP.

Abstract 1009

PROBLEM BEHAVIOR, COGNITION, AND MOTOR FUNCTION 14-17 YEARS AFTER TREATMENT OF PREMATURELY BORN BABIES WITH GLUCOCORTICOIDS FOR CHRONIC LUNG DISEASE

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Neonatal glucocorticoid (GC) treatment, in particular dexamethasone (DEX), is used worldwide to prevent prematurity born babies from developing chronic lung disease (CLD). Some neonatal intensive care units use the equally effective GC hydrocortisone (HC). Research showed adverse effects of DEX treatment in ex-premature at school-age while these effects remained absent after HC treatment. This is the first follow-up study on the consequences of early DEX and HC treatment later in life. In a retrospectively matched cohort study we compared 14-17 year old adolescents who received DEX (n=63) or HC (n=67) after premature birth (gestational age < 32 weeks) to examine potential differences in long-term treatment effects on problem behavior, cognition, and motor function. Groups were matched for neonatal characteristics. Caregivers and teachers of DEX-treated participants reported significantly more social and attention problems and internalizing problem behavior. DEX-treated participants themselves only reported more somatic complaints than participants in the HC-treated group. Significantly more DEX-treated girls need special education or additional support during school than HC-treated girls (resp. 28% and 5%, p<.05). Estimated full scale IQ as analyzed using the WISC-III-NL was lower in DEX-treated adolescents (p<.05). In addition, the DEX group performed poorer on neuropsychological tasks measuring sustained attention, executive functioning, and information processing speed. Gross motor skills were also impaired. Especially on balance tasks the DEX group had lower scores than their HC-treated counterparts. We conclude that neonatal treatment with DEX can not HC has long-lasting adverse effects on behavior and on cognitive and motor functions. Collectively, our findings indicate that HC is a safe alternative for DEX to treat neonatal CLD.

Abstract 1074

NEGATIVE FEELINGS INCREASE NEXT DAY CORTISOL LEVELS

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Background: Neuroendocrine system functioning is widely considered to play a key role in translating negative emotions into adverse health states. Yet, little naturalistic research has attempted to implement a causally-sensitive design to gauge the direction of the affect-cortisol link. Using data from over 1,400 people drawn from a national sample
of American adults, this study sought to test if negative affective states precede changes in cortisol concentrations or if a reverse causality interpretation (i.e. cortisol promoting negative feelings) is more likely.

Method: Participants provided salivary cortisol samples upon waking, 30 minutes after waking, prior to lunch and at bedtime on four consecutive days. The total cortisol output over the course of the day was calculated using a standard equation for the estimation of the area under the curve based on the logged values of the four cortisol samples provided (Pruessner, Kirschbaum, Meinischmidt, & Hellhammer, 2003). Negative affect was via nightly telephone interviews during which participants rated the degree to which they experience 14 negative feelings during the day (rated on a scale from 0 = None of the time to 4 = All of the time). Multilevel analysis was used and each model was adjusted for time of waking, day of the week, age, gender, education, BMI, medication, and the presence of chronic illness.

Results: Negative feelings were positively related to same day cortisol output (t = 3.81, p < .005) and next day cortisol levels (t = 2.85, p < .005). Negative affect was also predictive of cortisol output the following day in analyses that adjusted for next day negative affect (t = 2.79, p < .01). Salivary cortisol concentrations failed to predict next day negative feelings in any analysis.

Conclusions: Using data drawn from a national sample of American adults this study found evidence to suggest that negative feelings may profoundly influence cortisol levels. Furthermore, by statistically ruling out reverse causality effects this study provides strong evidence to suggest that negative affective states can dysregulate the hypothalamic-pituitary-adrenal axis in everyday life, leading to unfavorable endocrine states with potential health consequences.

Abstract 1215
A PERSON-CENTERED APPROACH TO MODELING DIURNAL CORTISOL: THE IMPORTANCE OF DIFFERENCES IN AGE AND STRESSOR EXPOSURE
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Cortisol is a marker of HPA-axis activation that has been hypothesized to be one of the biological mechanisms linking chronic stressors and heterogeneity in age-related health declines (e.g., Epel, 2009). The aims of the current paper were 1) to identify person-centered profiles of diurnal cortisol among a national sample of U.S. adults, and 2) to examine whether chronic stress moderates the relation between diurnal cortisol and age. Growth Mixture Models with latent time basis were used to estimate daily profiles of diurnal cortisol among participants taking part in four consecutive days of saliva collection (N=1,622; 34-87 years old); The 3-class solutions provided the best-fit across all four days of saliva collection, further indicating a striking stability within parameters of each profile across the entire study period. As illustrated in the Figure, the majority of respondents exhibited a “typical” profile, characterized by relatively low awakening and bedtime levels, coupled with robust cortisol awakening response and diurnal slope. Approximately one-quarter of participants experienced an “elevated” profile, distinguished by high morning values coupled with blunted cortisol awakening response and diurnal slope. One-tenth of respondents exhibited a waking level similar to that of the “typical” class, but remained remarkably “flat” throughout the rest of the day, showing weak cortisol awakening response and diurnal slope. In contrast to “elevated” and “flat” profiles, “typical” profile was positively associated with being younger, being employed, and higher self-rated health, and negatively associated with minority status, cigarette smoking, and being male (p’s<.05). After accounting for relevant control variables, multinomial logistic regression demonstrated that greater chronic stress in early midlife is associated with a lower probability of exhibiting a “typical” profile, and an increased risk of exhibiting a “flat” profile (p<.001). The current study demonstrates the utility of the Growth Mixture Modeling approach to diurnal cortisol, and supports previous work showing that older age, minority status, and poorer health and health behaviors are associated with a deviation from the robust waveform of diurnal cortisol. Furthermore, results support previous work showing that chronic stress in early midlife may increase the likelihood of a flatter rhythm of diurnal cortisol—a profile that is typically associated with older adulthood.

Paper Session: Inflammation
Abstract 1179
SELF-RA TED HEALTH IN RESPONSE TO EXPERIMENTAL MANIPULATIONS OF INFLAMMATION
Mats Lekander, PhD. Stress Research Institute, Stockholm University, Stockholm, Sweden, Lisa Lidberg, M Sc, Stress Research Institute, Stockholm, Sweden, Sweden, Bianka Karshikoff, M Sc, John Axelsson, PhD, Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden, Caroline Olgyart Higland, PhD, Physiology and Pharmacology, Karolinska Institutet, Stockholm, Sweden.

Self-rated health is often viewed as a relatively stable construct and few studies have investigated short-term variations or used experimental approaches to manipulate subjective health perception. We have previously showed that higher levels of inflammatory cytokines are generally connected to less favorable self-rated health. Therefore, we explored the subjective health experience in response to a canonical activation of an inflammatory response with endotoxin in healthy subjects. In a first study, eight healthy participants were injected at two occasions: once with 0.8 ng/kg lipopolysaccharide (LPS) and once with placebo. In a second study, a between-subject design was used where 51 healthy subjects were injected with either LPS (now reduced to 0.6 ng/kg) or placebo. Stimulation resulted in a peak response in pro-inflammatory cytokines after 90-120 minutes. Ninety minutes after injection, perceived health framed to represent the present day (“How is your health right now?”), was significantly lowered in the endotoxin condition in both studies (p’s <.01). Interestingly, also global health (“How would you rate your general state of health?”) was significantly lower in the endotoxin condition in both studies (p’s<.01). In conclusion, it is demonstrated that a transient inflammatory activation not only affects subjectively perceived health for the moment, but also how health status on the more general level is appraised.

Abstract 1138
BASAL AND INDUCED SYSTEMIC INFLAMMATORY ACTIVITY ARE ASSOCIATED WITH IMPAIRED COGNITIVE PERFORMANCE IN HEALTHY YOUNG ADULTS
Jet Veldhuijzen van Zanten, PhD, Nicola J. Paine, BSc, Sarah Aldred, PhD, Christopher Ring, PhD, Sport and Exercise Sciences, Mark T. Drayson, PhD, Division of Immunology and Infection, Jos A. Bosch, PhD, Sport and Exercise Sciences, University of Birmingham, Birmingham, West Midlands, UK

Introduction: Elevated inflammatory activity has been associated with poorer cognitive performance in older adults and in those with medical diseases. The current study examined the association between cognitive performance and both basal and vaccination-induced inflammatory activity in young and healthy individuals. Methods: Eighteen young males (mean (SD) age = 20 (0.8) years) completed a Paced Auditory
Serial Addition Task (PASAT). This task is a broad spectrum test of cognitive function including working memory and attention. Participants first completed the cognitive performance test during a control session and a week later during elevated inflammation. Elevated systemic inflammatory activity was induced by administering a Salmonella typhi (typhoid) vaccination 6 hours prior to administering the cognitive performance test. Results: PASAT performance was negatively associated with C-Reactive Protein (CRP) in both the control condition ($r = -0.51, p=0.04$) and, albeit marginally, the inflammation condition ($r = -0.47, p=0.07$). All participants improved their performance during the second (inflammation) session. Interestingly, this improvement was negatively associated with the change in CRP levels ($r= -0.75, p=0.001$); i.e., a greater increase in CRP in the inflammation session was associated with a smaller improvement in cognitive performance. Conclusions: These data provide the first evidence that inflammation can also negatively affect cognitive performance in young adults with no underlying medical condition. The implications of the present observations are far reaching, and further research is warranted to elucidate the underlying mechanisms.

Abstract 938

LOWER SUBJECTIVE SOCIAL STATUS PREDICTS INCREASED ACUTE STRESS-INDUCED INFLAMMATORY DISINHIBITION

June A. He, BA, Psychology, Syracuse University, Syracuse, NY, Myriam V. Thoma, PhD, Alex Fiksdal, BA, Ashley Geiger, BA, Michelle Lerman, BA candidate, Nicolas Rohleder, PhD, Psychology, Brandeis, Waltham, MA

Objective: Previous research has shown that within a restricted sample of relatively high achieving socioecconomic status (SES) college students, striking gender differences emerge with regard to subjective social status (SSS) and inflammatory processes. Female students rate themselves lower than males on community SSS, and show higher circulating interleukin-6 (IL-6). A direct relationship between SSS and baseline IL-6, however, has not been found; this phenomenon may be explained by the fact that unstimulated IL-6 shows low variability in young adults. The present study investigated whether persons with lower SSS would experience a higher IL-6 response to acute psychosocial stress. Methods: Nineteen healthy young adults (58% female, mean age 22 ± 4.25 years; mean body mass index 23.8 ± 3.5 kg/m²) were exposed to a standard psychosocial stress test (Trier Social Stress Test; TSST) on two consecutive afternoons. Blood samples were taken 1 minute prior to the TSST (baseline), and 30 and 120 minutes after stress on both study days. Plasma IL-6 was analyzed via high sensitivity ELISA, and the acute stress-induced IL-6 response was defined as the difference between baseline IL-6 and peak IL-6 at 2 hours post-stress. Subjective social status was measured via MacArthur social status ladders. Results: Plasma IL-6 increased significantly in response to acute stress (time effect; $F=35.1, p<0.001$); this did not vary by study day ($F=2.3, p=0.11$). Lower SSS in the community significantly predicted an increased IL-6 response to stress on the second day of the study ($r = -0.57, p = 0.035$, but not the first ($p>0.05$). Analysis of covariance revealed that the magnitude of the IL-6 response did not differ by gender on either day of the study, and that there was no interaction of gender and SSS on IL-6 responses (all $p>0.05$). Conclusions: Exposure to acute psychosocial stress reveals a significant relationship between low SSS and a health-relevant physiological mechanism—the inflammatory response to stress. However, no gender differences emerged in this analysis, despite the tendency of female students to rate themselves lower on the SSS scale. Further studies are warranted to determine if the fact that SSS predicted a significant increase on the second, but not the first day of the study lends support to the hypothesis that responses to repeated stress may differentiate better than responses to an initial exposure. These results provide further evidence that SSS may be a better predictor of health than SES, especially within populations where minute differences in objective SES may be less important than subjective perceptions of differences in community social status.

Abstract 1041

GENE X ENVIRONMENT: BEREAVEMENT INFLUENCES ON CELLULAR INFLAMMATION

Christian Schultz-Florey, BS, Medicine, Hannover Medical School, Hannover, Niedersachsen, Germany, Michael R. Irwin, MD, Cousins Center for PNI, Otto Martinez, PhD, Microbiology, Immunology & Molecular Genetics, UCLA, Los Angeles, CA, Mary-Frances O’Connor, PhD, Psychology, University of Arizona, Tucson, AZ

Background: The death of a spouse is one of the most distressing life events, which is associated with an increase in morbidity and mortality risk, independent of a host of covariates. However, some widow(er)s remain healthy and thus appear to be protected from this “widowhood effect”. The present study hypothesized that bereavement may be a social stress that interacts with a pro-inflammatory genetic variation (Gene x Environment interaction) to produce modulated levels of inflammation. Methods: All participants were older adults; 36 widowed participants had experienced the death of a spouse an average of 2 years prior, and were compared to 28 married controls. Circulating levels of pro-inflammatory cytokines, including interleukin (IL)-6, IL-1 receptor antagonist (IL-1RA), and soluble tumor necrosis factor receptor II (sTNFRII), were assayed. Additionally, pro-inflammatory single nucleotide polymorphisms (SNP) of the IL-1β -511, IL-6 -174, IL-6 -572, IL-1β -180, TNF-α -308 were genotyped. Results: Controlling for BMI, bereaved subjects had significantly higher levels of IL-1RA and IL-6 than married controls. Supporting the GxE hypothesis, bereaved IL-6 -174G homozygotes had over two-fold higher levels of IL-6 compared to non-bereaved -174G homozygotes ($F = 5.09, p = 0.03$), while bereaved IL-6 -174C allele carriers had the same level of IL-6 as non-bereaved -174C carriers ($F = 0.6, p=0.83$). Conclusions: Consistent with a recent report in other patient populations, sympathetic activation caused by bereavement-related distress may lead to up-regulation of IL-6 production in carriers of two IL-6 -174G alleles, whereas the -174C allele appears to be protective. The present data may help to explain the relationship between the “widowhood effect” and inflammatory disease.

Paper Session:
Cellular and Cognitive Aging

Abstract 900

CAROTID ATHEROSCLEROSIS PREDICTS INCIDENCE OF DEMINIA IN THE BALTIMORE LONGITUDINAL STUDY OF AGING

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A rapidly emerging literature suggests that cardiovascular health may be as important to the pathogenesis of Alzheimer’s disease and all-cause dementia as it is to the development of vascular dementia. Though several studies have identified higher prevalence of carotid atherosclerosis among dementia patients vs. controls, very few have focused on carotid atherosclerosis as a predictor of dementia in a cognitively normal baseline sample. Here we examined prospective relations of common carotid artery plaque and intimal medial thickness (IMT) to incident dementia among 293 participants aged 60 and older (mean baseline age=73 years, 60% male, 81% white) from the Baltimore Longitudinal Study of Aging. Carotid studies were performed with high resolution B-mode ultrasonography, and cognitive status was determined by annual neuropsychological assessment and consensus conference. Cox proportional hazards models were adjusted for baseline age, sex, race, education, blood pressure, cholesterol, cardiovascular disease, and smoking. The dependent measure was age at onset of dementia or the last observed (censored) age of cognitively normal participants. After up to 14 years of follow-up (median=7), 52 participants developed dementia. Presence of carotid plaque predicted dementia significantly (hazard ratio [HR] = 1.42; 95% confidence interval [CI], 1.02-1.98). Thirty-three percent of participants with bilateral carotid plaque developed dementia during the study period, versus 17% and 15% with unilateral and no plaque, respectively. Maximal carotid IMT also predicted dementia significantly, but in men only (HR=1.42; 95% CI, 1.02-1.97). Unadjusted descriptive analyses showed escalating dementia incidence with increasing baseline carotid IMT quintile (i.e., 17%, 19%, 26%, 21%, 31%, respectively). Results suggest possible dose-response relations between atherosclerosis severity and prospective dementia risk. Our findings provide indirect evidence that early intervention to reduce atherosclerosis may limit or delay the onset of dementia with aging. This research was supported in part by the Intramural Research Program of the NIH, National Institute on Aging.
Abstract 827
WHEN THE GLASS IS HALF EMPTY: DO INFLAMMATORY REACTIVITY AND OXIDATIVE STRESS PROMOTE CELLULAR AGING IN PESSIMISTS?
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Pessimistic individuals generally expect negative outcomes in the future and are at increased risk for diseases of aging and early mortality. We previously reported that higher levels of pessimism are associated with "older" cellular age as indexed by shorter leukocyte telomere length (LTL). Inflammatory activity and oxidative stress are potential contributors to the relationship between pessimism and LTL, but little is known about their associations with pessimism. In the present work, we examine the relationship between pessimism and LTL in an extended sample and additionally explore if pessimism is associated with higher baseline levels of inflammatory activity and oxidative stress and elevated inflammatory reactivity to acute stress. Our sample included 59 postmenopausal women (M age = 60.6 ± 6.6; M BMI = 26.0 ± 5.0; 51% chronically stressed caregivers) who were exposed to a standardized acute psychological stressor in the form of the Trier Social Stress Task (TSST). Blood was collected at rest for assessment of LTL, basal inflammatory activity and oxidative stress and at 0, 30, 50 and 90 minutes after TSST onset for assessment of inflammatory reactivity. Levels of the pro-inflammatory cytokine interleukin-6 (IL-6) and the oxidative damage marker 8-oxo-7,8-dihydroguanine (8-oxo-G) were used to index inflammatory activity and oxidative stress respectively. Covariates were age, BMI, caregiver status and perceived stress. Higher pessimism was associated with shorter LTL (β = -0.46, p = .01) and higher basal levels of both IL-6 (β = .41, p = .03) and 8-oxo-G (β = .43, p = .02). Mixed model analyses using a restricted maximum likelihood model and an unstructured covariance structure indicated that the TSST elicited increases in IL-6 and 8-oxo-G (β = .07, p = .001 and β = .31, p = .048, respectively). Pessimistic high IL-6 increase did not vary with pessimism levels (β = .01, SE = .01, p = .48), pessimists had higher levels of IL-6 at baseline and throughout the 90 minutes of TSST blood sampling (β = .06, SE = .02, p = .01). Elevated inflammatory activity and oxidative stress in pessimists may drive cell turnover and damage DNA, leading to an accelerated rate of leukocyte telomere shortening and increased risk for diseases of aging.

Abstract 844
PROSPECTIVE ASSOCIATION BETWEEN ANXIETY BUT NOT DEPRESSIVE DISORDERS AND LEUKOCYTE TELOMERE SHORTENING IN A POPULATION BASED SAMPLE
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Background Telomere length is considered an emerging marker of biological ageing. Depression and anxiety are associated with excess mortality risk, but the mechanisms remain obscure. Telomere length might be involved, since it is associated with psychological distress as well as with mortality. The aim of this study was to test whether anxiety and depressive disorders predict telomere shortening in a large population based sample. Methods All analyses were performed in a longitudinal study with three measurement waves in a general population cohort of 911 participants. The Composite International Diagnostic Interview was used to measure the presence of anxiety and depressive disorders. Telomere length was measured using monochrome multiplex polymerase chain reaction. We used linear multivariable regression models to evaluate the association between anxiety and depressive disorders and telomere length at approximately 2 years follow-up adjusting for baseline telomere length and lifestyle factors. Results The presence of anxiety disorders predicted shorter telomeres at follow-up (β = -0.073, t = -2.302, p = 0.023). This association was only marginally reduced after adjusting for baseline telomere length and lifestyle factors (β = -0.061, t = -1.882, p = 0.063). No association was found between depressive disorders and telomere shortening at follow-up (β = 0.010, t = -0.315, p = 0.753).

Conclusion This study found that anxiety disorders predicted accelerated telomere shortening in a general population cohort. The association was only marginally explained by baseline telomere length and lifestyle factors. How anxiety disorders might lead to accelerated telomere shortening and whether this might be a mediator explaining the excess mortality risk associated with anxiety deserves further investigation.

Abstract 1140
EMOTIONAL SOCIAL SUPPORT IS POSITIVELY ASSOCIATED WITH LATE LIFE TELOMERE LENGTH: THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS (MESA)
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Lacking social connection increases risk for age related disease morbidity and mortality, particularly in late life when vulnerability to social disconnection and disease are greater. Given current evidence linking chronic stress with accelerated rates of telomere loss, we hypothesized that social support may also be related to telomere length, a marker of cellular aging and a predictor of morbidity and mortality. We hypothesized that limited emotional social support (ESS) would be related to shorter telomere length, particularly in an older adult population. We conducted cross-sectional analyses on 948 subjects (18.4% White, 53.1% Hispanics, and 28.5% African American) at Exam 1 of the Multi-Ethnic Study of Atherosclerosis (MESA), ages 45-84 years. Emotional social support was measured using the ENRICHD social support inventory (5-item) and telomere length was determined using real time quantitative PCR. Across the entire sample, social support was not significantly associated with telomere length (p = .87) after adjusting for demographic (age, gender, race/ethnicity, SES), age X gender, age X race, health (BMI, diabetes status, pulse pressure), and lifestyle factors (smoking, history, physical activity, and diet), however the interaction term Age X ESS was significant, B(SE) = .008(.002), p = .001. Stratification by age groups revealed a significant positive association between ESS (score range: 5-25) and telomere length in the older (65-84 years old) B(SE) = .005(.002), p = .007 per unit increase in ESSL but not younger participants (45-64 years old), B = .12, after adjusting for covariates (See Figure 1). These results from a racially/ethnically diverse community sample of men and women provide initial evidence that low ESS is associated with shorter telomere length in older adults, and suggest that the social environment may contribute to rates of cellular aging, particularly in late life. Socio-emotional adversities may be particularly important in later life because of increased vulnerability to factors that impact cellular senescence at a time of rapid cellular aging. Several mechanisms may explain the association of social support with shorter telomeres, including declines in telomerase activity, upregulation of inflammation, and increased reactive oxygen species generation. Future research should focus on characterizing the differential vulnerability of cells relevant to specific diseases to these processes.
PROGNOSTIC IMPORTANCE OF COGNITIVE DEPRESSIVE SYMPTOMS IN YOUNGER VERSUS OLDER POST-MI PATIENTS

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Background. In recent studies, cognitive symptoms of depression were not related to cardiac prognosis following a myocardial infarction (MI), but this association might be affected by the age at which patients are diagnosed with MI. Therefore, we examined whether the prognostic importance of these symptoms is age-dependent, in data from the Enhancing Recovery in Coronary Heart Disease (ENRICHD) study.

Method. Patients with depression following MI (n=1823) in the ENRICHD study were stratified into younger (<70; m=55±0.0 years) and older (≥70; m=76±4.9 years) age groups. Measurements included demographic and clinical data and the Beck Depression Inventory. The endpoint was a composite of recurrent MI and mortality over 2.1 years. Results. At baseline, older patients had more severe manifestations of cardiac disease and more somatic comorbidities than younger patients (p<0.0001). During the follow-up period, 456 patients died or had a recurrent MI. In older patients, depressive symptoms did not predict prognosis. In contrast, cognitive symptoms of depression independently predicted adverse outcome in younger patients (hazard ratio [HR]: 1.03; 95% confidence interval [CI]: 1.01-1.04; p=0.01). Feelings of hopelessness largely explained this association. After adjustment for somatic depressive symptoms and clinical covariates, increased hopelessness remained a significant predictor of adverse events in younger patients (HR: 1.47; 95% CI 1.11-1.95; p=0.01).

Conclusion. This study supports the prognostic importance of cognitive symptoms of depression following an MI in younger patients, and of hopelessness in particular. More research is needed on potential age-related differences in the effects of depression and other psychological risk factors on cardiac prognosis.

Abstract 712

PERSISTENT DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH CORONARY ARTERY CALCIFICATION IN MIDLIFE WOMEN

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BACKGROUND: Depressive disorders have been associated with cardiovascular disease (CVD) and mortality, but the impact of depressive symptoms on early atherothrombosis in midlife women has not been well described. Past studies have failed to find an association between single episodes of depression and CAC scores, and evidence linking recurrent episodes to CAC is limited. DESIGN: The Study of Women’s Health Across the Nation (SWAN), started in 1996, is a longitudinal, multi-ethnic, multi-site study designed to assess health and psychological factors in middle-aged women. An ancillary study (SWAN Heart), conducted in Chicago and Pittsburgh between 2001 and 2003, linked CVD risk factors to subclinical atherosclerosis in women with no history of CVD. Depressive symptoms were measured with the CES-D scale over 5 years prior to CAC assessment and classified as high (CES-D≥16) or not. CAC, measured by computed tomography, was categorized as 0, 0 to <10, and ≥10 Agatston units and analyzed using partial proportional odds models. RESULTS: In this large biracial cohort of middle-aged women (1970-1980 birth year), 44% were American, 333 Caucasian, mean age 51 years, 27% post-menopausal, high depressive symptoms at least once over five years were common; 19% had one; 9% had two, and 11% experienced three or more episodes. Women were generally healthy but heavy (mean BMI = 29). Coronary calcium was low; 54% had no CAC, 25% had scores between 0 and 10, and 21% had CAC≥10 Agatston units. In a multivariable model adjusted for age, race, education, menopausal status, BMI, blood pressure, low density lipoprotein cholesterol, and statin use, women with 3 or more episodes were twice as likely to have CAC ≥10 Agatston units than women with no depressive episodes [RR (95% CI)=2.23 (1.20-4.12), p=0.01]. The effect of depressive symptoms did not differ by race. Women with 1 or 2 episodes did not differ from women with no episodes. CONCLUSION: In this healthy diverse cohort of midlife women free of clinical CVD, persistent episodes of depressive symptoms were significantly associated with elevated CAC scores. The results suggest that persistent depressive symptoms are more likely to have pathophysiological and behavioral effects on the development of subclinical cardiovascular disease than does a single episode of elevated depressive symptoms.

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Abstract 997

GENERALIZED ANXIETY DISORDER AFTER ACUTE MYOCARDIAL INFARCTION AS A PREDICTOR OF CARDIOVASCULAR EVENTS AND ALL-CAUSE MORTALITY OVER 10 YEARS

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Objective: To assess the association between generalized anxiety disorder (GAD) and cardiovascular events and all-cause mortality in myocardial infarction (MI) patients, independent from depression.

Background: Most studies that addressed the relationship between anxiety and cardiac disease have used questionnaires to measure anxiety. No study assessed the prognostic impact of GAD, diagnosed with a formal psychiatric interview, after acute MI on adverse outcomes. Methods: Patients with acute MI (n=438) were recruited between September 1997 and September 2000 and were followed up until December 2007. Measurements included demographic and clinical data. Current GAD and post-MI depression were assessed by means of the Composite International Diagnostic Interview at 3 months post-MI. The endpoint consisted of all-cause mortality and cardiovascular related readmissions over a period of 10 years. Results: During the follow-up period, 198 patients died or had an adverse event. GAD was associated with the rate of adverse events after adjustment for age and gender (hazard ratio: 1.94; 95% confidence interval: 1.14-3.30; p=0.01). Additional adjustment for measures of cardiac disease severity and depression did not change the results. Conclusions: MI patients with GAD were at an almost 2-fold increased risk of cardiovascular events and all-cause mortality compared to patients without GAD. This association was independent from demographic and clinical variables and depression. More research is needed to identify the mechanisms through which GAD is associated with an adverse prognosis.

Abstract 1016

THE RELATIVE CONTRIBUTIONS OF POSTTRAUMATIC STRESS DISORDER AND MAJOR DEPRESSION TO CORONARY HEART DISEASE RISK: A PROSPECTIVE TWIN STUDY

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Background. Growing evidence suggest that posttraumatic stress disorder (PTSD) increases the risk of coronary heart disease (CHD). PTSD, however, is highly comorbid with major depressive disorder (MDD), an
established risk factor for CHD. We sought to determine the relative contributions of PTSD and MDD on CHD risk. Methods. We conducted a prospective study of monzygotic and dizygotic middle-aged male twins part of the Vietnam Era Twin Registry. Lifetime diagnoses of PTSD and MDD were assessed at baseline in 1990-1991 with the Diagnostic Interview Schedule. Among twin pairs free of CHD at baseline, we selected three groups: 1) pairs discordant for PTSD, 2) pairs discordant for major depression, 3) pairs without a history of depression or PTSD. These pairs underwent a follow-up clinic visit for outcome assessment at Emory University between 2002-2010 (median follow-up 15 years). Outcomes included a CHD history (previous myocardial infarction, unstable angina, and coronary revascularization) and myocardial perfusion abnormalities by means of [N13] positron emission tomography; a stress total severity score (STSS) quantified perfusion abnormalities. GEE and mixed models were used to account for pair cluster and to separate between- and within-pair effects. Results. A total of 540 twins (270 pairs) were included, with mean age at baseline of 41 yr (range 34-48). Of these, 110 were discordant for a lifetime diagnosis of PTSD and 109 for MDD. The incidence of CHD was higher in twins with PTSD only (23%) or PTSD+MDD (21%), intermediate for those with MDD only (13%) and lowest for those with neither (8%). When PTSD and MDD were included in the same model, after adjusting for demographic and behavioral factors, the RR for PTSD was 1.89 (p=0.01), and for MDD it was 1.33 (p=0.22). Within discordant twin pairs results were similar: PTSD, but not MDD, was also associated with higher STSS, denoting more perfusion defects. Within pairs, the geometric mean STSS was 63.3 in twins with PTSD and 36.2 in their brothers without PTSD (p=0.03). Corresponding results for MDD were 23.7 and 22.2 (p=0.80). Conclusions. Among Vietnam era veterans, PTSD is a more robust risk factor for CHD than MDD. Comorbidity of PTSD and MDD does not increase the risk associated with PTSD alone.

Paper Session: Central and Molecular Mechanisms of Pain

Abstract 865

GENDER DIFFERENCES IN BRAIN ACTIVITY EVOKED BY VISCERAL PAIN IN HEALTHY SUBJECTS

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Background: Gender greatly influences pain processing. However due to the limited number of studies, information available about gender-differences in normal human central processing of visceral pain is still preliminary. We investigated whether gender differences exist in brain response to visceral pain in a large cohort of healthy volunteers. Methods: Sixteen males and sixteen females (mean age = 31 and 28 respectively) participated in an MRI study. Data was collected whilst subjects received painful balloon distensions to the distal esophagus as well as during anticipation of pain. The Eysenck Personality Questionnaire-Revised (EPQ-R) was used to assess personality trait in each subject. During fMRI scanning, subjective perception of the pain stimulus was measured by visual analogue scale, as well as skin conductance response (SCR). Results: There was no significant difference in subjective ratings of pain and personality scale (neuroticism, extraversion, and psychoticism) between males and females. Males showed higher SCR in anticipation and esophageal pain compared to rest (p=0.02, p=0.0002, respectively). Female showed higher SCR in only pain compared to rest (p=0.0005). During anticipation, males demonstrated greater activation in the right amygdala and anterior cerebellum, whilst produced greater brain activity than males in the right supplementary motor area (SMA) and posterior cerebellum. During esophageal pain males showed greater activation in the SMA and left caudate, whilst females showed greater activation in the mid cingulate cortex, premotor cortex and cerebellum. All brain data was significant at least level p ≤ 0.05. Conclusions: Brain activity during anticipation suggests men may experience less fear whilst women may withdraw a fear response and planning motor response. During pain, men show an increased motor response whilst women preferentially activate brain areas associated with the negative affective component of pain suggesting they may attribute more negative emotions during pain processing. These differences may be underlying the gender biases that exist in functional pain disorders that are more prevalent in females and where affective co-morbidity is present.

Abstract 791

ALTERED BRAIN CONNECTIVITY IS ASSOCIATED WITH VISCERAL HYPERSENSITIVITY IN ABUSED FUNCTIONAL DYSPEPSIA PATIENTS

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Background Functional dyspepsia (FD) patients with a history of abuse show enhanced perception of and brain responses to gastric distension. Aim To test whether group differences in effective connectivity of a priori brain circuits underlie the difference in gastric perception between abused and non-abused FD patients. Methods H215O-PET data from 21 FD patients, scanned during 3 conditions (baseline, gastric distension & sham distension), each repeated 4 times, were used. 8 patients had a history of physical/sexual abuse. Behavioural partial least squares (bPLS) was used to compare brain activity patterns functionally related to perceived gastric sensation. Structural equation modeling was used to test between-group differences in effective connectivity within a priori brain circuits. Results Mixed models analysis showed a significant main effect of scan (repetition of each condition), condition, abuse and a significant abuse-by-condition interaction effect. bPLS Two gastric perception-related networks were observed, correlating strongly and significantly with perceptual ratings during all 3 conditions. Significant group differences were found in ‘ABUSE’ networks. Effective Connectivity In the ‘ABUSE’ network, between-group differences in connectivity were found in a selective attention to threat circuit. In the ‘NON-ABUSE’ network, between-group differences were found in emotional arousal and cortical-modulatory circuits (Figure). Conclusion Distinct perception-related networks are engaged in FD patients with and without abuse history. Differences in connectivity within selective attention to threat, emotional-arousal and cortical-modulatory circuits underlie the perceptual hypersensitivity in FD patients with a history of abuse. Figure Legend Solid arrows represent significant between-group differences; thickness of arrows represents significance level. ACC, MCC, PCC: anterior, mid, posterior cingulate cortex; PPC: prefrontal cortex; INS: insula
Abstract 959
OFFSET ANALGESIA ACTIVATES THE PERIAQUEDUCTAL GRAY AND ROSTRAL VENTROMEDIAL MEDULLA IN FIBROMYALGIA PATIENTS BUT DOES NOT RESULT IN PAIN RELIEF
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Interrupting a continuous noxious heat by a greater noxious heat causes rapid and disproportionate pain reduction when the original noxious heat returns. This reduction in pain experience, known as offset analgesia, is believed to be the consequence of active descending inhibitory control of pain originating in the periaqueductal grey (PAG) and rostral ventromedial medulla (RVM). Several studies of patients suffering fibromyalgia have suggested that fibromyalgia pain may be a consequence of failing descending inhibitory control. To test this possibility, brain activation was measured using fMRI in twelve fibromyalgia patients during an offset procedure. Each subject experienced six second periods of noxious heat followed by an equal period of more intense heat before returning to the original temperature for a further six seconds. Subjects were also scanned during control trials involving continuous, unchanging, noxious heat for 18 seconds or involving six seconds of noxious heat followed by an equal period of more intense heat before returning to the non-noxious baseline for a further six seconds. Brain activation during the final six seconds of each trial was compared with activation during the first six seconds and this difference was contrasted across trials. PAG/RVM activation was observed during the final six seconds of offset trials but not during either of the control trials and this difference across trials was significant. Previous studies have reported reduced pain experience during the offset period that correlates with the activation of the PAG/RVM. Patients with fibromyalgia, however, did not report any pain relief during the offset period despite activation of the PAG/RVM. Two very different interpretations flow from this finding. One interpretation is that although offset analgesia activates the PAG/RVM in patients with fibromyalgia, the activation does not result in pain relief because the typical descending inhibition that is caused by PAG/RVM activation is dysfunctional in patients with fibromyalgia. A second interpretation is that patients with fibromyalgia do have an intact descending inhibitory system but they continue to report pain because of expectancy and other cognitive biases.

Paper Session:
Stress

Abstract 964
STRESS, OBESITY, AND INFLUENZA VIRUS VACCINE IMMUNOGENICITY IN PREGNANT WOMEN
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Objective: Trivalent influenza virus vaccine (TIV) is recommended for all pregnant women because they are susceptible to severe disease, but there are virtually no data on predictors of adequate antibody responses among pregnant women, with the greatest decrements among those with both risk factors. If these findings are replicated in a larger cohort assessed over multiple flu seasons, re-evaluation of flu vaccine recommendations for pregnant women with specific risk factors would be warranted.

Abstract 1017
STRESS AT WORK AND AT HOME AND ENDOTHELIAL DYSFUNCTION AMONG MEN IN THE HEALTH PROFESSIONALS FOLLOW-UP STUDY
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A growing literature suggests that psychosocial stress may lead to poor cardiovascular health outcomes, and effects cannot be fully explained by altered health behaviors, such as smoking, alcohol consumption, poor diet, or exercise. In both animal models and studies of humans working night shifts, stress has been linked to endothelial dysfunction, an important step in the pathway towards atherosclerosis and cardiovascular disease. However, the effects of different types of stressors, and the exact biological mechanisms through which they affect health are yet unclear. We investigated the cross-sectional associations between stress at home (n=480) and stress at work (n=415) with two biomarkers of endothelial function, soluble intercellular adhesion molecule (sICAM) and soluble vascular cell adhesion molecule (sVCAM), in a cohort of US male health professionals. Self-reported stress was assessed with a two-part question about stress at work and at home, as part of a larger questionnaire, which also elicited information about medical history (e.g. history of high blood pressure, high cholesterol, use of antihypertensive medications), and health behaviors (e.g. diet, exercise, smoking). We hypothesized that men who reported higher levels of stress either at work or at home would have higher concentrations of circulating sICAM and sVCAM than men with lower reported stress. We found that men with high or moderate levels of stress at work had significantly higher levels of BMI ≥ 30). For influenza A, logistic regression showed that for each standard deviation (SD) increase in the CES-D, the odds of a 4-fold response was 2.1 times lower (odds ratio (OR)=0.49, p=.04). Among obese women, 40% (6/15) showed a 4-fold increase in influenza A antibody titers compared to 64% (14/22) of non-obese (excluding underweight) (OR=0.38, p=.16). Demonstrating interactive effects of obesity and stress, a 4-fold response against influenza A was observed in 22% (29/139) of women with both risk factors versus (7/9) with neither risk factor (OR=0.08, p=.03). Similar effects of both stress and obesity were evidenced for influenza B. Discussion: These preliminary data suggest that obesity and stress are associated with poorer antibody responses to flu vaccine among pregnant women, with the greatest decrements among those with both risk factors. If these findings are replicated in a larger cohort assessed over multiple flu seasons, re-evaluation of flu vaccine recommendations for pregnant women with specific risk factors would be warranted.
sVCAM (B=92.02 ng/ml [17% increase], p=0.022) relative to those who reported low stress at work, independent of medical history and/or health behaviors. No differences in sICAM or sVCAM levels were found according to stress at home, until those with a history of high blood pressure or high cholesterol were excluded from analyses, revealing a marginally significant positive association of high stress at home with higher sVCAM (p=0.054) and sICAM (p=0.053). The strong association between stress at work and sVCAM, even after adjusting for carefully measured health history and health behavior variables, may suggest a direct biological mechanism through which work stress affects cardiovascular outcomes.

Abstract 713
PERCEIVED STRESS AND INCIDENCE OF STROKE SYMPTOMS: REASONS FOR GEOGRAPHIC AND RACIAL DIFFERENCES IN STROKE (REGARDS)
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Chronic stress is related to excess risk of stroke morbidity and mortality, and subclinical cerebrovascular disease. Stroke symptoms, prior to any occurrence of stroke, are associated with modifiable stroke risk factors and future stroke; no studies have examined incidence of stroke symptoms in relation to stress. This study examined the association of perceived stress levels with incident stroke symptoms over a median 5.4 years of follow-up in the REasons for Geographic And Racial Differences in Stroke (REGARDS) study, a U.S. population-based cohort of 30,239 black and white adults, age 45 and older, enrolled in 2003-2007. This analysis included 21,909 participants (mean age, 64.5 ± 9.3 years; 54.8% female; 38.4% black) without history of stroke, transient ischemic attack, or stroke symptoms at baseline. Stress was measured by Cohen’s 4-item Perceived Stress Scale at baseline and modeled categorically in quartiles. Stroke symptoms were ascertained via biannual telephone interviews using the Questionnaire for Verifying Stroke-Free Status, which asked about sudden onset of 6 symptoms (unilateral numbness, unilateral weakness, bilateral vision loss, difficulty communicating, unilateral vision loss, loss of ability to understand) since the last follow-up interview. Incident stroke symptoms, defined as first occurrence of any stroke symptom during follow-up, occurred in 15.4% of participants. Hazard ratios (HR) for developing incident stroke symptoms for those in the three highest quartiles (Q2, Q3, Q4), compared to their low stress (Q1) peers, were 1.22 (95% CI=1.10-1.35), 1.27 (95% CI=1.15-1.40), and 2.01 (95% CI=1.83-2.20), respectively (p-trend <0.001), adjusted for age, sex, and race. Associations remained with further adjustment for income, education, diabetes, heart disease, hypertension, dyslipidemia, C-reactive protein, body mass index, smoking, physical activity, and alcohol use (Q2: HR=1.24 [95% CI=1.11-1.38]; Q3: HR=1.24 [95% CI=1.11-1.39]; Q4: HR=1.81 [95% CI=1.64-2.00]; p-trend <0.001). Evaluating each stroke symptom separately showed similar results. The HR comparing highest to lowest stress quartiles ranged from 1.45 (95% CI=1.20-1.77) for bilateral vision loss to 2.60 (95% CI=2.08-3.24) for difficulty communicating. Results show that higher levels of stress are consistently and independently related to development of stroke symptoms in an initially stroke-free cohort.

Abstract 1181
REACTIVITY TO DAILY STRESSORS AND LONG-TERM RISK OF REPORTING A CHRONIC PHYSICAL HEALTH CONDITION
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Daily stressors, such as an argument with a spouse, an impending deadline, or a missed meeting, are associated with short-term changes in self-reported physical health. Whether these minor hassles have long-term physical health ramifications, however, is unknown. The current study examined whether exposure and reactivity to minor daily stressors are associated with risk of reporting a chronic physical health condition ten years after initial assessment. Participants (N = 793) from the National Study of Daily Experiences (NSDE), the nightly interview portion of the Midlife Development in the United States Survey (MIDUS), completed a series of daily diary interviews between 1995 and 1996 and again 10 years later. Greater affective (i.e., emotional) reactivity to daily stressors at Time 1 was associated with an increased risk of reporting a chronic physical health condition at Time 2 (aRR = 0.9, 95% CI = 0.03-18), but no significant associations emerged for stressor exposure. Of all the conditions examined, those most associated with a history of heightened stressor reactivity were digestive disorders (aRR = 0.4, 95% CI = 0.10-.70) and chronic pain conditions (aRR = .25, 95% CI = 0.1 - .48). Results of this study indicate that it is not exposure to daily stressors that has long-term physical health consequences, but rather how one reacts to these stressors.

Paper Session: Sleep and Fatigue
Abstract 1000
INFLUENCE OF WEATHER CONDITIONS ON DAILY SYMPTOMS OF PAIN, STIFFNESS AND FATIGUE IN FIBROMYALGIA
Ercodie R. Bossema, PhD, Department of Clinical and Health Psychology, Utrecht University, Utrecht, The Netherlands, Henriët van Middendorp, PhD, Department of Medical Psychology, University Medical Center St Radboud Nijmegen, Nijmegen, The Netherlands, Johannes W. Bijlsma, PhD, MD, Department of Rheumatology and Clinical Immunology, University Medical Center Utrecht, Utrecht, The Netherlands, Johannes W. Jacobs, PhD, MD, Department of Rheumatology and Clinical Immunology, University Medical Center Utrecht, Utrecht, Rinie Greven, PhD, Department of Clinical and Health Psychology & Department of Rheumatology and Clinical Immunology, University Utrecht & University Medical Center Utrecht, Utrecht, The Netherlands

Background: Although patients with fibromyalgia sometimes attribute symptoms of their disease to weather conditions, research so far did not conclusively demonstrate such a relation in prospective studies. Our aim was to examine concurrent and prospective associations between weather conditions and daily fibromyalgia symptoms.

Methods: Female patients with fibromyalgia (n=533, mean age 47.0 years, mean time since diagnosis 3.5 years) completed diaries, including questions on pain, stiffness and fatigue, during 28 consecutive days. Weather conditions were obtained from the Royal Netherlands Meteorological Institute (KNMI) in 'De Bilt', The Netherlands, and included temperature, sunshine duration, rainfall, air pressure, atmospheric humidity, and wind speed. Data were analysed with multilevel regression analysis. Considering that 6 aspects of weather were included, the p-value was set to .008.

Findings: Few significant correlations were found of weather variables with pain and fatigue, but not stiffness. Concurrently, rainfall was associated with more same day pain (p=.007). Prospectively, temperature was associated with more next day fatigue (p=.003). In addition, more humidity from one day to the other was associated with more pain (p=.008).

Discussion: This study provides some evidence for an influence of weather conditions on symptoms of pain and fatigue, but not stiffness, in patients with fibromyalgia. Subsequent analyses will examine the number of patients sensitive to specific weather types and whether this is due to psychological or physiological mechanisms.
Abstract 1013

SELF-REPORT AND BEHAVIORALLY ASSESSED SLEEP IN EARLY GESTATION: ASSOCIATIONS WITH PATIENT REPORTED OUTCOMES

Michele L. Okan, PhD, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA

Regular sleep is an important behavior for health maintenance during pregnancy, yet it is frequently disturbed. Emerging data indicate an association between disturbed sleep in pregnancy and adverse health outcomes, such as depression, gestational diabetes and preterm birth. An unresolved question persists regarding the significance of self-reported versus objectively collected sleep data, and the degree to which one may be more important than the other as they relate to health outcomes among pregnant women. Given the importance of efficient sleep during pregnancy, we sought to examine whether there are differential relationships between self-reported (SR) or actigraphy-assessed (AC) sleep and patient reported outcomes. Sleep data were collected with sleep diaries and actigraphy in 71 women for three 2-week periods between 10-20 weeks gestation. Women also completed the Inventory for Depressive Symptoms (IDS) and Pregnancy Distress Questionnaire (NuPDQ) at 20 weeks gestation which were used as patient reported outcome measures. Pearson correlations evaluated whether sleep was correlated with outcomes. Sleep duration and continuity differed between collection methods. Sleep duration: SR = 488.3 ± 67.6 min vs. AC = 375.8±77.7 min; wake after sleep onset (WASO): SR = 25.7 ± 19.3 min vs. AC = 104.6 ± 65.0 min; and sleep efficiency (SE): SR = 91.3 ± 6.05% vs. AC = 72.9 ± 13.6%. There were also differential associations between collection method and outcome. Greater depressive symptomatology at 20 weeks was only associated with WASO and SE at 18-20 weeks from self-report only (r = .26, p = .04; r = -.26, p = .007). Whereas, greater sleep duration at 20 weeks was associated with shorter sleep duration from both SR and AC at 14-16 weeks, and AC at 18-20 weeks was associated (r = -.27, p = .009; r = -.28, p = .01; r = -.35, p =.01). These findings indicate that there is utility in using both self-report and actigraphy to collect sleep information from pregnant women, as they appear to provide unique, yet complementary views of sleep. Using a multi-modal approach will likely provide a more comprehensive understanding of how sleep impact health outcomes.

Abstract 813

SLEEP AND BIOMARKERS IN THE ENGLISH LONGITUDINAL STUDY OF AGEING: ASSOCIATIONS WITH C-REACTIVE PROTEIN, FIBRINOGEN, DEHYDROEPIANDROSTERONE SULFATE AND HEMOGLOBIN

Marta Jackowska, MSc, Meena Kumari, PhD, Andrew Steptoe, DPhil, Epidemiology & Public Health, University College London, London, Greater London, United Kingdom

Sleep duration and quality are associated with adverse physical health outcomes. The mechanisms are not well understood, and little is known about associations with biomarkers in older population cohorts. This cross-sectional community-based study assessed associations between self-reported sleep measures and biomarkers in a representative sample of British people aged 50 years and older. Participants were 6465 men and women aged 50-99 years from the English Longitudinal Study of Ageing. Associations of sleep duration, sleep disturbance and sleep quality with C-reactive protein (CRP), fibrinogen, dehydroyepiandrosterone sulfate (DHEAS) and hemoglobin were analyzed, adjusting for age, sex, wealth, BMI, smoking, limiting long-standing illness and depressive symptoms. Greater sleep disturbance (P=0.050) and long sleep duration (>8 hours, P=0.038) were associated with raised CRP levels, and long sleep was also related to raised plasma fibrinogen (P=0.010). DHEAS levels were lower among respondents reporting sleep disturbances (P=0.002) and poor sleep quality (P=0.019), but were unrelated to sleep duration. Short sleep duration (≤6 hours, P=0.001), sleep disturbance (P=0.002) and poor sleep quality (P=0.003) were associated with lower hemoglobin levels. Anemia was more prevalent among long sleepers (P=0.020) and those with more disturbed sleep (P=0.003). This study sheds lights on the relationships between sleep parameters and biological markers in community-dwelling older people. In line with past studies, long sleep duration and disturbed sleep were related to elevated levels of inflammatory markers. Importantly, disturbed sleep was associated with lower levels of DHEAS, hemoglobin and greater likelihood of anemia as well. These findings are cross-sectional so need to be interpreted with caution, but nonetheless they support the hypothesis that sleep is an important marker of physical health risk in the elderly. A fuller investigation of these relationships, using longitudinal cohort studies, will broaden our understanding of the mechanisms relating sleep indices with ill health in advancing age.

Abstract 889

FATIGUE, SLEEP RESTRICTION, TYPE D PERSONALITY AND HEMODYNAMIC RESPONSE TO SOCIAL STRESS IN YOUNG ADULTS

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Research suggests that fatigue is not just a physiological phenomenon, but rather results from combined influences of both physiological and psychological factors and thus has become an important symptom in research. This symptom is related to circadian and sleep related homeostatic influences, while studies have indicated that the effects of sleep restriction on the psychophysiological functioning of an individual may depend on factors such as individual differences in personality characteristics. The Type D (distressed) personality is defined as a combination of negative affectivity and social inhibition with proposed pathogenetic mechanisms including blood pressure (BP) hyper-reactivity. To examine the effects of sleep restriction and Type D on fatigue and BP reactivity to social stress, 96 normotensive young adults completed a laboratory based social stressor, following acute sleep restriction, receiving just 40% of their usual sleep, and again following a full night’s rest. Analysis using the Multidimensional Fatigue Inventory (MFI) indicated that those classified as Type D demonstrated significantly higher baseline levels of general fatigue, (t = 2.30, p = .024) compared to non-Type D. Mixed ANOVA analysis of BP during social stress also revealed a stress*sleep*Type D interaction for both systolic BP (F(1, 92) = 6.37, p = .013) and diastolic BP (F(1, 92) = 4.52, p = .036), suggesting differential effects of hemodynamic reactivity to social stress, while rested and sleep restricted, as a function on Type D personality status. Such findings suggest that effects of acute sleep restriction may be moderated by individual trait differences in negative affectivity and social inhibition, resulting in attenuated social stress related BP reactivity for individuals classified as Type D, in addition to distinct fatigue experience.

Paper Session: Cancer

Abstract 950

CHRONIC STRESS ENHANCES PROGRESSION OF ACUTE LYMPHOBLASTIC LEUKEMIA VIA BETA-ADRENERGIC SIGNALING

Donald M. Lamkin, Ph.D., Erica K. Sloan, Ph.D., Steve W. Cole, Ph.D., Cousins Center for Psychoneuroimmunology, Semel Institute for Neuroscience and Human Behavior, University of California, Los Angeles, CA

Clinical studies suggest that stress-related psychosocial factors are associated with accelerated progression of hematopoietic (blood) cancers such as acute lymphoblastic leukemia (ALL), but it is unclear whether such effects are causal or what biological pathways mediate such effects. Given the rich network of sympathetic nerve fibers that innervates the bone marrow to regulate normal (non-leukemic) hematopoietic progenitor cells, we tested the possibility that stress-induced SNS signaling might also affect ALL growth and dissemination. Nalm-6 human pre-B-cell ALL cells were transduced with firefly luciferase gene to allow for in vivo optical tracking and
were then injected i.v. into male SCID mice for bone marrow engraftment. Mice that were randomized to 2 hours of restraint stress per day for 2 weeks showed significantly enhanced ALL growth and dissemination in comparison to controls (p < .001). Those effects were blocked by the β-adrenergic antagonist, propranolol (p < .05), which reduced tumor burden in stressed mice to levels equivalent with controls. Quantitative RT-PCR indicated expression of β1- and β3-adrenergic receptors (but not β2) in ALL cells, but cAMP signaling assays showed no evidence that such receptors were functionally activated in response to the SNS neurotransmitter, noradrenaline. Stimulation of ALL cells in vitro with noradrenaline also failed to enhance Nalm-6 growth, suggesting that stress effects on ALL progression in vivo were likely mediated by SNS effects through the bone marrow microenvironment surrounding leukemia, rather than through direct effects on leukemia cell proliferation. These findings identify β-adrenergic signaling as a key mediator of stress effects on ALL progression, and suggest new approaches to tackling this disease.

**Abstract 1155**

**BLUNTED CORTISOL PRODUCTION IN PARTNERS OF MEN WITH PROSTATE CANCER IS ASSOCIATED WITH INCREASED IL-6 AND SUBTHRESHOLD PTSD**

KoMala S. Thomas, PhD, Psychology, Pitzer College, Claremont University Consortium, Claremont, CA; Julianne Bower, PhD, Psychology, UCLA, Los Angeles, CA; Timothy Williamson, BA in progress, Psychology, Pitzer College, Claremont University Consortium, Claremont, CA; Michael Hoyt, PhD, Psychology, UC Merced, Merced, CA; Michael Irwin, MD, Psychiatry and Biobehavioral Sciences, Annette Santon, PhD, Psychology, David Wellich, PhD, Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA

Prostate cancer (PC) is the most common cancer diagnosed in men, and it is associated with significant distress in patients as well as their partners. This study examined the relationship of caregiving for a partner with PC to diurnal cortisol output and interleukin-6 (IL-6) in women between the ages of 42 and 75 years old. Participants were women whose spouses/partners had PC (n = 19) and women who were in relationships with men with no diagnosed medical illness (n = 26). Women provided saliva samples (4 times per day over 3 days) in their natural environment. They also provided a blood sample to measure circulating levels of the inflammatory marker, IL-6. To assess for the presence of psychiatric symptoms, the Structured Clinical Interview for DSM-IV Axis-I Disorders was conducted. Prior to conducting analyses, cortisol and IL-6 levels were log transformed to control for significant skewness. Analyses revealed that partners of men with PC had lower daily cortisol output than demographically matched controls across the three days (F=20.72, p<.001). PC Partners also had higher IL-6 levels (F=4.51, p<.05) and were more likely to report sub-threshold PTSD than controls (68.4% versus 23.1%, c2= 11.30, p<.01), which was defined as experiencing intense fear in response to a traumatic event and meeting all criteria for at least one PTSD symptom cluster. Follow-up analyses revealed that lower cortisol production was associated with higher IL-6 levels (r= -.435, p<.05). Further, post-traumatic stress symptoms explained differences in cortisol production between partners and controls. Women who reported at least sub-threshold PTSD symptoms had lower cortisol production than those with no PTSD symptoms F=5.10, p < .01. Given this is the first study examining relationships between cancer caregiving, cortisol production, and inflammation in spouses/partners of men with PC, these findings need to be replicated in future research. Nonetheless, these data suggest that partners of men with PC may be at heightened risk for altered hypothalamic-pituitary-adrenal axis activity and increased inflammation, possibly associated with the presence of post-traumatic stress symptoms. This highlights the importance of developing interventions aimed at reducing risk of psychopathology in partners of men with PC, with potential impacts on biomarkers of disease risk.

**Abstract 1151**

**SOCIAL SUPPORT AFTER DIAGNOSIS AND DISEASE-SPECIFIC AND ALL-CAUSE MORTALITY IN PATIENTS WITH PROSTATE CANCER**

Andrea Vodermaier, Ph.D., Wolfgang Linden, Ph.D., Psychology, University of British Columbia, Vancouver, British Columbia, Canada

Purpose: The present study examined the role of psychological factors at the time of cancer diagnosis on disease-specific and all-cause mortality in a large population-based cohort of patients with prostate cancer. The main hypotheses were (1) anxiety, depression, and support needs are linked with higher disease-specific and all-cause mortality and (2) perceived social support is linked with lower disease-specific and all-cause mortality. Sample and Methods: Newly diagnosed cancer patients were routinely screened for emotional distress. Survival analysis with a median follow-up of 49 months was conducted to predict disease-specific and all-cause mortality as a function of clinical anxiety, depression, perceived social support and support needs. Analyses were adjusted for age, disease stage, and performance status. Results: N=686 patients with prostate cancer were included in controlled analyses, of which 6.3% had deceased. Mean age at diagnosis was 68.0 years. After diagnosis, 8.0% reported a level of anxiety and 5.5% reported a level of depression that was suggestive of a clinical disorder, anxiety significantly predicted disease-specific mortality (HR=2.38 (1.08-5.26), p=0.02) as did support needs (HR=2.52 (1.32-4.81), p<.005, for DFS; HR=2.42 (1.41-4.16), p<.001, for OAS). Depression and perceived social support were not directly associated with mortality. However, age moderated effects of perceived social support on disease-specific mortality (HR=1.08 (1.01-1.15), p<.022) and all-cause mortality such that younger patients with prostate cancer who perceived low social support after diagnosis had the highest mortality risk. In a multivariate model support needs remained the only significant psychological predictor variable for disease-specific and all-cause mortality. Conclusions: Prostate cancer patients with unmet support needs may be at higher risk of mortality as are younger patients who report low social support.

Table 1. Three-Year Survival Estimates by Patient and Clinical Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Median Survival (months)</th>
<th>No of Events</th>
<th>3-Year Estimate</th>
<th>95% CI</th>
<th>p</th>
<th>Overall Survival</th>
<th>No of Events</th>
<th>3-Year Estimate</th>
<th>95% CI</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td></td>
<td>85</td>
<td>44</td>
<td>25</td>
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<td>36</td>
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<td>Disease Stage</td>
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<td>57</td>
<td>0.85</td>
<td>0.01</td>
<td>0.005</td>
<td>96</td>
<td>0.86</td>
<td>0.01</td>
<td>&lt;0.001</td>
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<td>50</td>
<td>26</td>
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<td>0.007</td>
<td>46</td>
<td>0.86</td>
<td>0.01</td>
<td>0.007</td>
</tr>
<tr>
<td>MI</td>
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<td>645</td>
<td>50</td>
<td>26</td>
<td>0.89</td>
<td>0.01</td>
<td>0.007</td>
<td>46</td>
<td>0.86</td>
<td>0.01</td>
<td>0.007</td>
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<td>18</td>
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<td>0.65</td>
<td>0.03</td>
<td>0.005</td>
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<td>Anxiety</td>
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<td>0.07</td>
<td>18</td>
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<td>0.96</td>
<td>0.07</td>
<td>0.07</td>
<td>112</td>
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<td>0.09</td>
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<td>0.93</td>
<td>0.05</td>
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<td>≥3</td>
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<td>47</td>
<td>0.97</td>
<td>0.08</td>
<td>0.03</td>
<td>91</td>
<td>0.95</td>
<td>0.08</td>
<td>0.001</td>
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<td>0.08</td>
<td>0.03</td>
<td>73</td>
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<td>0.08</td>
<td>0.005</td>
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<td>≥2</td>
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<td>50</td>
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<td>0.08</td>
<td>0.05</td>
<td>73</td>
<td>0.94</td>
<td>0.05</td>
<td>0.005</td>
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ECOG=Eastern Cooperative Oncology Group
Table 2. Cox’s proportional hazards regression model for prostate cancer-specific and overall survival

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<tr>
<th>Unadjusted Model 1 (n=1,598)</th>
<th>Prostate Cancer-Specific Survival</th>
<th>Overall Survival</th>
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<td>HR  95% CI  p</td>
<td>HR  95% CI  p</td>
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<tr>
<td>Age</td>
<td>1.00 (0.92-1.09) 0.18</td>
<td>1.04 0.99-1.08 0.126</td>
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<tr>
<td>Disease Stage</td>
<td>18.70 (35.87-8.77) 0.01 15.5 4 8.77-27.55 0.001</td>
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<tr>
<td>Anxiety</td>
<td>1.5 0.772.93 0.23 1.13 0.631-2.03 0.677</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
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<tr>
<td>Perceived Support</td>
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<tr>
<td>Support Needs</td>
<td>2.6 6 1.29-5.47 0.00 2.42 1.34-4.37 0.003</td>
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<table>
<thead>
<tr>
<th>Adjusted Model 2 (n=364)</th>
<th>Prostate Cancer-Specific Survival</th>
<th>Overall Survival</th>
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<tbody>
<tr>
<td></td>
<td>HR  95% CI  p</td>
<td>HR  95% CI  p</td>
</tr>
<tr>
<td>Age</td>
<td>1.0 0.98-1.09 0.18 1.04 0.99-1.08 0.126</td>
<td></td>
</tr>
<tr>
<td>Disease Stage</td>
<td>20.92 8.76-50.00 0.01 14.1 5 6.64-30.61 0.001</td>
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<td>Performance Status</td>
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<tr>
<td>Anxiety</td>
<td>1.0 0.43-2.55 0.91 0.73 0.32-1.65 0.450</td>
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<tr>
<td>Depression</td>
<td>1.6 0.40-6.94 0.48 1.29 0.33-5.04 0.710</td>
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<tr>
<td>Perceived Support</td>
<td>0.92 0.35-2.42 0.86 0.79 0.36-1.76 0.571</td>
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<tr>
<td>Support Needs</td>
<td>3.4 5 1.20-9.91 0.02 3.59 1.48-8.74 0.005</td>
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</tbody>
</table>

Abstract 1085

COMPUTERIZED SCORING OF EMOTIONAL AWARENESS CONTENT IN WRITING SAMPLES BY PATIENTS WITH BREAST CANCER

Richard D. Lane, M.D., Ph.D., Psychiatry, Psychology and Neuroscience, Karen L. Weih, MD, Psychiatry and Family & Community Medicine, University of Arizona, Tucson, AZ; Amnette L. Stanton, Ph.D., Psychology and Psychiatry/Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, California, Vernon L. Hartz, M.S., Cancer Center, Carolynn L. Fort, B.S., Psychiatry, University of Arizona, Tucson, AZ

Background: Self-report inventories assume that subjects are accurate self-observers. However, there are substantial health-related individual differences in emotional awareness that are not captured by self-report. The 10-item Levels of Emotional Awareness Scale (LEAS-10) is a reliable and valid performance measure of emotional awareness, but it is time-consuming to administer and score. We evaluated whether computerized scoring of emotional awareness content in independent writing samples (essays) about the experience of having breast cancer covaried with hand- and computer-scoring of the LEAS-10.

Methods: Eighty-five English-speaking women were assessed at 9 +/- 3 weeks after diagnosis (86%) or recurrence (14%) of breast cancer. Their mean age was 56 +/- 12 years; 75% were White European Americans, 22% White Latinas and 3% Blacks. Subjects completed the LEAS-10, describing how they and another person would feel in response to emotion-evoking scenarios. Higher LEAS scores result from a greater number of emotion words, more differentiated emotion words (scored 0-3) and identification of the feelings of self and other.

Results: The sum of all unique valuables (cumulative score of emotion words) correlated more highly with LEAS-10 variables (traditional hand scoring r = 0.33; computer scoring r = 0.39; both p<.001) than did the other essay variables (word count, number of scorable emotion words, number of unique emotion words or sum of all emotion word scores).

Conclusions: Writing samples addressing women’s deepest thoughts and feelings about breast cancer can be computer scored for emotional awareness content. The number of unique emotion words in the essay correlates significantly with standard LEAS-10 scores. This method for computer scoring of writing samples may broaden research on emotional awareness.
How to Cite your Abstract

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