The abstracts are grouped by symposia, followed by all of the oral presentations, and conclude with all of the poster presentations.

**Wednesday, March 2**

9:00 – 5:00  Preconference Workshops (Inflammation & Immunity; Funding and Publishing; the MacArthur Model)
5:30 - 6:15  Welcome, Announcements, Awards, Data Blitz
6:15 – 7:15  Cocktail Reception and Citation Poster Session (p. A35 - A38)
7:15 – 8:15  Just Desserts Fundraising Event (By invitation)

**Thursday, March 3**

8:00 – 8:35  President’s Award Lecture: Karen Matthews, PhD
8:35 - 9:10  Herbert Weiner Early Career Award: Gregory E. Miller, PhD
9:10 - 9:30  Break
9:30 – 10:30  Patricia R. Barchas Award Lecture: Janice Kiecolt-Glaser, PhD
10:30 - 11:30  Invited Presentation: Margaret Chesney, PhD
11:30 - 12:45  Lunch on your own / Roundtable Lunches
12:45 - 2:15  Symposium: Cardiac Vagal Reactivity and Risk for Cardiovascular Disease (p. A2 - A3)
              Symposium: The Ins and Outs of Cortisol Research in Psychosomatic Medicine (p. A3 - A4)
              Paper: Stress, Distress, and the Immune System (p. A21 - A22)
2:15 – 2:30  Break
2:30 – 4:00  Symposium: The Clinical Importance of Levels of Emotional Awareness (p. A4 - A5)
              Symposium: Sleep, Health and Disease (p. A5 - A6)
              Invited Symposium: Progress in Respiratory Disease…(p. A6 - A7)
4:00 - 4:15  Break
              Symposium: Stress and Coronary Heart Disease: The Neurocardiac Interaction (p. A8 - A9)
5:15 – 6:30  Poster Session I (p. A38 - A68)
6:30-7:30  Mentor / Mentee Reception (followed by an organized dinner for students at local restaurant)
7:30  Past Leaders Dinner Meeting

**Friday, March 4**

8:00 – 10:00  Symposium: The Metabolic Syndrome: Clinical Definitions, Epidemiology, and Future Directions (p. A10 - A11)
              Symposium: Stress and Biology During Childhood (p. A11 - A12)
              Symposium: Is there Life After ENRICHD? (p. A12 - A13)
11:15 - 11:30  Break
11:30 - 12:30  Symposium: Psychosocial and Behavioral Influences on Antibody Response to Vaccination (p. A13 - A14)
              Paper: Biobehavioral Concomitants of Emotion (Dys)regulation in Musculoskeletal Pain Patients (p. A26 - A27)
12:30 – 1:45  Lunch on your own / Roundtable Lunches
1:45-3:45  Cutting Edge Symposium
3:45 – 4:15  Break
              Paper: Cardiovascular Mechanisms in Stress and Disease (p. A28 - A29)
5:45 – 7:00  Poster Session II (p. A68 - A94)
6:00 - 9:00  Council Dinner Meeting

**Saturday, March 5**

9:00 - 9:50  President’s Address: Nancy Frasure-Smith, PhD, President, APS
10:00 – 10:50  Alvin P. Shapiro Award Lecture: William Busse, MD
11:00 - 12:00  Invited Presentation: Linda Watkins, PhD & Steve Maier, PhD
12:00 - 1:15  Lunch on your own / APS Business Meeting with lunch
1:15 - 3:15  Symposium: Stress and the Immune Response… From Lab Bench to Real Life (p. A16 - A17)
              Paper: Cancer: Biological and Psychological Processes (p. A31 - A33)
3:15 - 3:30  Break
3:30 - 5:00  Symposium: Trauma, Depression, Coping and Behavioral Treatment Affect HIV Disease Course (p. A17 - A18)
              Symposium: Alternative Treatments for Targeting Depression, Stress and Cardiovascular Risk Factors (p. A19 - A20)
              Paper: Stress, Cortisol and Biobehavioral Processes (p. A33 - A34)
5:00 - 6:15  Poster Session III (p. A95 - A122)
7:00 – 12  Dinner and Entertainment
SYMPOSIA

Symposium 1317
CARDIAC VAGAL REACTIVITY AND RISK FOR CARDIOVASCULAR DISEASE
Kristen Salomon, Psychology, University of South Florida, Tampa, FL, Peter J. Gianaros, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA, Julian F. Thayer, Gerontology Research Center/LPC, National Institute on Aging, Baltimore, MD, Marcellus M. Merritt, Laboratory of Personality and Cognition, National Institute on Aging, Baltimore, MD, Jos F. Brosschot, Psychology, Leiden University, Leiden, The Netherlands

Recently, researchers have begun to examine parasympathetic responses to stress as a marker of risk for cardiovascular disease (CVD). The objective of this symposium is to present research examining cardiac parasympathetic reactivity as a stable reactivity measure, as indexed by vagally-mediated heart rate variability, and elucidate its relationship to risk for CVD. The first speaker will present evidence that cardiac parasympathetic responses to standard reactivity tasks can be considered a stable individual difference that is related to ethnicity, as well as aortic and coronary calcification. Additional findings demonstrate that increased cardiac parasympathetic responses predict later levels of resting cardiac parasympathetic tone and diastolic blood pressure (DBP). The second speaker will discuss evidence demonstrating that hyperreactivity status in African Americans is related to greater reductions in parasympathetic reactivity and greater increases in DBP reactivity during an emotional challenge. The fourth speaker will discuss a number of functional neuroimaging studies that illustrate the role of the central autonomic network in stressor-induced heart rate, blood pressure and cardiac parasympathetic reactivity as well as present findings that relate stressor-induced activation in the insular cortex to individual differences in reactivity. Finally, the third speaker will review evidence linking heart rate decreases immediately following the termination of exercise to mortality and will discuss findings demonstrating that this effect may be vagally-mediated. Further, vagal influences on this heart rate decrease are greater in the context of higher sympathetic activity; an effect illustrating the accentuated antagonism between sympathetic and parasympathetic influences on heart rate. Taken together, these findings suggest that cardiac parasympathetic reactivity may function as an independent and novel marker of risk for CVD.

Individual Abstract Number: 1318
CARDIAC VAGAL CONTROL DURING STRESS AND RISK FOR CARDIOVASCULAR DISEASE
Kristen Salomon, Psychology, University of South Florida, Peter J. Gianaros, Psychiatry, Karen A. Matthews, Psychiatry, Psychology, and Epidemiology, University of Pittsburgh School of Medicine, Pittsburgh, PA

The relationship of cardiac vagal control (CVT) to cardiovascular disease (CVD) is supported by evidence demonstrating that low CVT predicts increased risk of coronary insufficiency, myocardial infarction, and CVD mortality, both before and after adjustment for other cardiovascular risk factors. Thus, low levels of the vagal component of heart period variability, respiratory sinus arrhythmia (RSA; an indirect measure of CVT) may be a prognostic risk factor for the development of CVD. Here, we review a number of findings suggesting that exaggerated reductions in RSA to stress may function as a stable reactivity measure and as an independent marker of risk for CVD. First, in a longitudinal study of 149 children and adolescents, RSA reactivity during three different tasks was consistent within subjects across tasks, suggesting stable individual differences in RSA reactivity. Aggregated RSA responses to stress predicted RSA (b = -018, p < .01) and DBP (b = -005) approximately three years later. Specifically, larger decreases in RSA during stress predicted lower resting RSA and higher resting DBP after controlling for demographic and anthropomorphic variables and session 1 resting levels. Second, in a sample of 87 post-menopausal women, greater decreases in RSA during a speech preparation period were significantly related to increased calcification in the coronary arteries (b = -012, p < .01) and in the aorta (b = -012, p < .05) after adjustment for CVD risk factors. Third, in a sample of 202 adolescents, ethnicity was related to RSA reactivity such that African-Americans exhibited larger decreases during stress than European-Americans, F(1,198) = 9.201, p = .003. Together, these findings suggest that greater RSA reactivity - suggesting a greater reduction in RSA during stress - may be related to an elevated risk of CVD.

Individual Abstract Number: 1424
FUNCTIONAL NEURAL CORRELATES OF CARDIOVASCULAR AND CARDIAC AUTONOMIC REACTIVITY TO PSYCHOLOGICAL STRESSORS IN HEALTH AND DISEASE
Peter J. Gianaros, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA, Stuart W. Derbyshire, Anesthesiology, J. R. Jennings, Psychiatry & Psychology, University of Pittsburgh, Pittsburgh, PA

A growing number of functional neuroimaging studies in humans indicate that the brain systems that regulate cardiovascular and cardiac autonomic reactions to psychological stressors are also involved in a range of cognitive, emotional, and behavioral processes. These brain systems, collectively called the central autonomic network, include the anterior and posterior regions of the cingulate cortex, the orbitofrontal and insular cortex, the medial thalamus, the amygdala, and mid- and hindbrain regions, such as the periaqueductal gray. We will review a set of PET and fMRI studies on the functional neural correlates of cardiovascular and cardiac parasympathetic reactivity to psychological stressors in both healthy and hypertensive individuals. Overall, our studies show that stressor-induced changes in heart rate, blood pressure, and high-frequency heart rate variability (a putative marker of cardiac parasympathetic control) are strongly correlated with the concomitant activation of the central autonomic network. Results further indicate that individuals with a stable disposition to show exaggerated cardiovascular reactivity also show greater insular cortex activation to psychological stressors. These findings will be discussed in terms of their implications for the study of the functional neural contributions to stressor-induced cardiovascular and cardiac parasympathetic reactivity and to cardiovascular disease risk.

Individual Abstract Number: 1582
HEART RATE RECOVERY AFTER EXERCISE AND MORTALITY: AN INDEX OF VAGAL REACTIVITY
Julian F. Thayer, Gerontology Research Center/LPC, National Institute on Aging, Baltimore, MD

The decrease in heart rate (HR) in the first minutes following the termination of exercise has been shown to predict mortality. In this context faster recovery is associated with better health and decreased risk of mortality. Here we review the evidence for this relationship and discuss results from our lab on the mechanism for this effect. In one of the first studies 2428 patients referred for exercise reperfusion testing were followed for six years (Cole et al 1999). Compared to those with a drop of greater than 12 bpm, those with an abnormal response had a 4-fold greater risk of all-cause mortality. These researchers confirmed these findings in a study of 5234 asymptomatic men and women enrolled in the Lipids Research Clinics Prevalence study (Cole et al, 2000). The drop in HR 2 minutes after exercise cessation and using a cutoff for an abnormal response at 42 bpm was associated with a 2.58 greater risk of all-cause mortality during the 12 year follow-up period. Yet another study from this group investigated HR recovery in 9454 individuals referred for exercise testing, 42 percent of which had a previous myocardial infarction (MI). Using a drop in heart rate 2 minutes after cessation of exercise and a cutoff of 22 bpm for an abnormal response these researchers found a 2.6 greater relative risk of all-cause mortality in the seven year follow-up period. We have investigated the vagal dominance of HR control using a within-subject design. The effect of a given level of vagal activity on HR decrease was greater in the context of higher level levels of sympathetic activity compared to low levels of sympathetic activity (B = 0.05, p <0.001). This accentuated antagonism may be the mechanism responsible for the relationship between HR recovery after exercise and mortality.

Individual Abstract Number: 1587
HYPERTENSION AND REDUCED AUTONOMIC RESPONSE TO AFFECTIVE STIMULI AMONG AFRICAN-AMERICAN ADULTS
Marcellus M. Merritt, Gerontology Research Center/LPC, National Institute on Aging, Baltimore, MD, John J. Sollers III, Gerontology Research Center/LPC, National Institute on Aging, Michele K. Evans, Alan B. Zonderman, Gerontology Research Center, Julian F. Thayer, Gerontology Research Center/LPC, National Institute on Aging, Baltimore, MD

Past research suggests that diagnosed hypertension status (HTN) and age predict reduced resting heart rate variability (HRV). However, do these two factors predict the change in HRV during emotional challenge? Recent studies...
find that HTN is partly a product of cardiovascular reactivity to mental and emotional stress. The present study assessed the role of HTN and age in HRV response to facial reactivity. Participants were 106 African-Americans (51 males, 55 females; aged 21-92) who are part of the Healthy Aging In Nationally Diverse Longitudinal Studies (HANDLS). Participants evaluated emotional expressions in faces (PAT). The PAT task was preceded by a five-minute baseline and followed by a five-minute recovery period. Heart rate, diastolic blood pressure (DBP), total peripheral resistance (TPR) were obtained continuously using a Portapres beat-to-beat BP monitor. Measures of log-transformed high frequency HRV (HF-HRV) were computed to assess vagal response. Correlations and univariate ANOVAs were run with HTN, age, and other demographic factors with change scores for DBP, TPR, and HF-HRV (i.e., faces minus baseline). HTN was associated with reduced HF-HRV [r(105) = -0.25; p = .01] and increased DBP [r(106) = 0.25; p = .01] responses to PAT faces. When controlling for demographic factors, those with HTN (37%) had larger decreases in HF-HRV [F(1, 100) = 3.55; p = .06] (-6.7 vs. -1.5 ms) and increases in DBP [F(1, 101) = 10.50; p = .002] (11.1 vs. 4.7 mmHg) compared to normotensives. These results suggest that in African-Americans HTN is associated with reduced autonomic control in the context of emotion recognition.

Symposium 1719
THE INS AND OUTS OF CORTISOL RESEARCH IN PSYCHOSOMATIC MEDICINE
Clemens Kirschbaum, Psychology, Technical University of Dresden, Dresden, Germany, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland, Joe E. Schwartz, Psychiatry, SUNY Stony Brook, Stony Brook, NY, Brigitte M. Kudielka, Clinical and Theoretical Psychobiology, University of Trier, Trier, Germany, Clemens Kirschbaum, Psychology, Technical University of Dresden, Dresden, Germany, Arthur Stone, Psychiatry, SUNY Stony Brook, Stony Brook, NY

The past decade has witnessed a steadily increasing interest in and use of noninvasive hormone measurements as tools in laboratory and field studies with a special emphasis on salivary cortisol. From small case studies over typical lab stress experiments to large-scale epidemiological research projects, salivary cortisol measures are now employed with several 100,000 samples obtained annually worldwide. The ease of sampling, storage, and shipping of saliva samples has prompted many research groups to include those wet measures despite only limited prior experience in endocrine research. This symposium will provide state-of-the-art presentations on the methodological and technical aspects of cortisol research in psychosomatic medicine that are indispensable for both the advanced and the novice researchers in this field. A first presentation will provide a theoretical and historical background of salivary cortisol measurement. It will comment on technical issues including assay technology and compliance assessment. Next, data from large-scale field studies with over 19,000 samples will be shared with the audience. From these and other data sources, normal values and technical aspects of saliva sample generation and storage conditions will be discussed. Among the most frequently studied aspects of the circadian rhythm in ambulatory studies, the cortisol morning rise would receive special attention by a third presentation. It will cover methodological aspects of the morning rise, discussing moderating factors such as gender, age and compliance. Finally, a forth talk will provide the audience with an in-depth analysis of within and between subject variability with regard to salivary cortisol measures. How reliable or stable are cortisol levels obtained under ambulatory conditions? How many samples at what intervals are required to capture the individual cortisol status? Those and a number of related questions with high practical relevance to the researcher will be answered.

Individual Abstract Number: 1720
ERRATIC VALUES OR ENDOCRINE FINGERPRINT? SALIVARY CORTISOL MEASUREMENTS IN LARGE FIELD STUDIES
Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

While the individual's endocrine response to laboratory stressors has received considerable attention, several questions regarding the regulation of the HPA axis under field conditions await elucidation. It remains to be demonstrated whether circadian cortisol secretion or field condition stress responses are related to adverse health outcomes. In the present paper issues of sampling and pre-analytical methodology in large scale field studies will be discussed, along with definitions, interpretations and the appropriate statistical modelling. The presentation bases on three field studies conducted in the past years: 1) a study involving 150 students who were confined to a secluded boarding school for three days during which 3 diurnal profiles including awakening were collected. Participation stress study, in which nurses and physicians of a highly stressful pediatric intensive care unit sampled saliva every two hours for 24 working days (123 participants, 3785 samples). 3) The EADS-ETH cohort study in which 749 middle aged industrial employees sampled cortisol profiles for 20 working days plus 1 leisure day and 664 of the participants went on to a global health check involving assessment of allostatic load, 22-hour heart rate variability and a fourth day of diurnal profiles (n = 19123 samples). From the nurses stress study and the latter study the incidence rate of true endocrine stress responses will be derived. For about 450 individuals of the EADS-ETH cohort study, sleep, the exact moment and pattern of awakening and subsequent sampling reliability could be ascertained from ECG and activity recordings. On the basis of the nurses stress study the statistical implications of the nested nature of the data will be discussed (samples nested within days nested within individuals) as well as the methodology to deal with differing number of observations within individuals and the pitfalls of inadequate statistical modelling.

Individual Abstract Number: 1721
DIURNAL PATTERNS OF CORTISOL: INDIVIDUAL VARIABILITY AND RELIABILITY
Joe E. Schwartz, Joan E. Broderick, Arthur A. Stone, Psychiatry, SUNY Stony Brook, Stony Brook, NY, Clemens Kirschbaum, Psychology, Technical University of Dresden, Dresden, Germany

Cortisol is an important stress hormone, secreted by the hypothalamic-pituitary-adrenal (HPA) axis. Circulating levels of free cortisol are reliably assessed from saliva samples, enabling researchers to assess cortisol levels in the natural environment multiple times per day, sometimes over multiple days. Such data have given us a good understanding of the typical diurnal pattern of cortisol during waking hours: a relatively high level at wake up, a further rise of about 50% during the first 30-60 minutes after awakening, and a fairly steady decline during the rest of the day (with a modest bump at lunchtime). However, there is evidence of substantial individual differences in the diurnal pattern (e.g., differences in average level, the magnitude of the morning rise, and the steepness of the diurnal slope) that are somewhat to moderately repeatable across days. This study presents the findings of 450 individuals of the EADS-ETH cohort study, sleep, the exact moment and pattern of awakening and the statistical implications of the nested nature of the data will be discussed, (samples nested within days nested within individuals) as well as the methodology to deal with differing number of observations within individuals and the pitfalls of inadequate statistical modelling.

Individual Abstract Number: 1722
DETERMINANTS OF THE CORTISOL AWAKENING RESPONSE (CAR)
Brigitte M. Kudielka, Clinical and Theoretical Psychobiology, University of Trier, Trier, Germany

Within the first hour of awakening in the morning, cortisol levels quickly rise 50-150% over wake-up levels. Magnitude and course of this cortisol awakening response (CAR) change under acute or chronic stress and different disease conditions. In order to unravel the determinants of CAR and to discuss methodological issues associated with this response, two independent studies are presented. In a first study 169 volunteers obtained saliva samples directly after awakening on 13 days within 1 month. The diurnal morning cortisol levels was strongly influenced by health status and time of awakening. Cortisol profiles in a healthy subsample of subjects differed between two wake-up groups with more pronounced responses in early compared to late wakeners. No differences were found in respect to gender, menstrual cycle phase or smoking. In a second study it was investigated how accurately subjects adhered to saliva sampling instructions throughout a day. Objective compliance was measured using an electronic monitoring device given to the subject either with or without their knowledge of the device’s nature. A significant number of subjects did not obtain the samples reliably in the ambulatory setting. Interesting, the circadian cortisol profile differed between compliant and noncompliant subjects with the most important effect in the rise of cortisol at awakening. Compliant subjects showed a robust increase, whereas noncompliant individuals had only minimal changes from baseline at 30 minutes after awakening. We conclude, that non-compliance can partially...
validates cortisol results and mask potential differences between subject groups of interest.

**Individual Abstract Number: 1723**

**SALIVARY CORTISOL: HISTORY, TECHNIQUES, PARAMETERS, PROBLEMS**

Clemens Kirschbaum, Psychology, Technical University of Dresden, Dresden, Germany

Some 25 years ago, researchers suggested measuring steroid hormones in saliva as non-invasive substitutes of serum levels. Following a decade of only sporadic use, the measurement of steroids in saliva, especially cortisol, has recently become a common method in behavioral and psychosomatic medicine research. Technical advances in the biochemical detection of cortisol now allow for rapid and large-scale hormone assessment. This presentation will present an overview of research projects employing salivary cortisol measures spanning from clinical cases to epidemiological studies. Technical questions and problems associated with the parameters derived from repeated cortisol assessments will be discussed. In addition, the choice of biochemical assays used for analysis, methods of quality control, and technology to measure adherence to study protocols will be highlighted.

### Symposium 1083

**THE CLINICAL IMPORTANCE OF LEVELS OF EMOTIONAL AWARENESS**

Richard D. Lane, Psychiatry, University of Arizona, Tucson, AZ, Jeffrey M. Lackner, Medicine, UB, SUNY, Buffalo, NY, Silla M. Consoli, C-L Psychiatry, University of Arizona, Tucson, AZ, Claudia Subic-Wrana, Department of Psychosomatics and Psychotherapy, University of Cologne, Wolfgang Linden, Psychology, The University of British Columbia, Vancouver, BC, Canada

The way emotion is experienced and regulated lies at the core of the mind-body connection. During the first half of the 20th century there was a major focus on the pathogenic consequences of emotional responses that were not experienced or reported. In recent years there has been a trend toward greater acceptance of self-reported emotions as accurate information for research purposes. The levels of emotional awareness model attempts to integrate these perspectives by proposing that emotional experience emerges from a sensorimotor foundation just as Piaget proposed for conscious thought. According to this model, lower levels of emotional awareness (e.g. less complex and differentiated feelings) will be associated with dysregulated emotional states and adverse health outcomes. The first speaker will provide an overview of the theory, the properties of the Levels of Emotional Awareness Scale (LEAS), and the findings with the LEAS in healthy individuals, which suggest that emotional awareness is a fundamental ingredient of emotional intelligence. The second speaker will discuss the inverse relationship between LEAS scores and both emotional distress and pain in patients with irritable bowel syndrome. The third speaker will present evidence that obese women score lower on the LEAS than controls but that among obese women higher LEAS scores are associated with greater social anxiety. The fourth speaker will present evidence that patients with somatiform disorders 1) score lower on the LEAS than patients with other psychiatric disorders and 2) show significant increases in LEAS scores after 3 months of treatment. The discussant will focus on the broader clinical implications of the levels of emotional awareness model.

**Individual Abstract Number: 1088**

**IS IBS A PROBLEM OF EMOTION DYSREGULATION?: A TEST OF THE LEVELS OF EMOTIONAL AWARENESS MODEL**

Jeffrey M. Lackner, Medicine, UB, SUNY, Buffalo, NY

Research linking psychological processes to IBS is largely grounded in data showing differences in levels of emotionality between IBS patients and multiple reference groups. Although IBS patients describe themselves as significantly more distressed than normals and non-treatment seeking IBS persons, the magnitude of distress neither necessarily rises to clinical levels nor is consistently related to clinical symptoms. These data suggest that IBS could be better understood as a problem of emotion dysregulation than heightened emotionality. An important feature of emotion regulation is the ability to process emotional information in a complex and differentiated manner (levels of emotional awareness, LEA). If the ability to experience and express emotion promotes adaptation, IBS patients with lower LEA should experience more adverse health outcomes than individuals with higher LEA. 65 normals (M age = 38 yrs, 51 females) and 50 Rome II diagnosed IBS patients (M age = 44, 39 females) completed measures of emotional awareness (LEAS), pain severity (SF-36 Pain scale), distress (Brief Symptom Inventory Global Severity Index), fear of arousal symptoms (Anxiety Sensitivity Index), worry (Penn State Worry Questionnaire), and interpersonal problems (Inventory of Interpersonal Problems). Partial correlations (controlling for age, gender) indicate that Total LEAS scores were inversely associated with somatic complaints (e.g., pain r = -.35, p < .01) in IBS patients and positively associated with emotional complaints (e.g., overall distress r = .26, p < .05) in controls. Secondary analyses indicate that the ability to recognize and describe emotion in others (LEAS-Other) correlated inversely with overall distress (r=.34), somatization (r=.31), interpersontal problems (r=.38, p < .01), fear of arousal symptoms (r=.36), and worry (r=.33) in IBS but not in healthy subjects, with all p values < .05 except as noted. Data dovetail with the notion that IBS is a problem of emotion dysregulation marked by a deficit in the conscious awareness of emotional experiences.

**Individual Abstract Number: 1156**

**SOCIAL ANXIETY IS ASSOCIATED WITH HIGHER LEVELS OF EMOTIONAL AWARENESS IN OBESE PATIENTS WAITING FOR GASTRIC BANDING SURGERY**

Silla M. Consoli, C-L Psychiatry, European Georges Pompidou Hospital, Paris, France, Paris, France, Richard D. Lane, Psychiatry, University of Arizona, Tucson, AZ

Emotional disorders in obese people have already widely been described. Our aim was to study the emotional impact and the factors modulating the social consequences of morbid obesity in a population of candidates for gastric banding surgery. Data collected included self-reports of quality of life (MOS-SF36), alexithymia (TAS), levels of emotional awareness (LEAS), depressive mood (BDI) and social anxiety (SIB). Population consisted of 16 men and 83 women (mean age 36.6 ± 11.1). Mean body mass index (BMI) was 46.1 ± 6.3. SF36 scores were significantly impaired in comparison with data available in the general population. Only 25% of the subjects could be considered as alexithymic on the TAS. LEAS scores were lower than those observed in the general population (52.5 ± 10.4 vs 65.3 ± 6.2; p < 0.001). None of the emotional awareness scores was correlated with the social anxiety score (SIB). Nonetheless, LEAS scores were positively correlated with LEAS-Other (r = 0.28; p < 0.01). In conclusion, morbidly obese patients seeking gastric banding surgery present with poorer quality of life, lower levels of emotional awareness and higher levels of social anxiety, compared with data derived from general populations, without any significant alteration of assertiveness, stressing the burden of social stigmatisation of obesity. The positive correlation between LEAS and social anxiety scores suggests a protective role of an altered emotional awareness against social anxiety, allowing the less emotionally aware obese individuals to preserve more satisfactory social interactions.

**Individual Abstract Number: 1360**

**THEORY AND MEASUREMENT OF LEVELS OF EMOTIONAL AWARENESS**

Richard D. Lane, Psychiatry, University of Arizona, Tucson, AZ

Emotional awareness is a cognitive skill that goes through a developmental process similar to that which Piaget described for the development of intelligence. Individual differences in emotional awareness reflect variations in the degree of differentiation and integration of the schemata (elementary knowledge structures) used to process emotional information, whether that information comes from the external world or the internal world through introspection. The five levels of emotional awareness in ascending order are awareness of physical sensations, action tendencies, single emotions, blends of emotions, and blends of blends of emotional experience (the capacity to appreciate complexity in the experiences of self and other). Impairments or inhibitions in the processing of emotions that are well known in psychosomatic medicine, such as alexithymia, can be understood as an arrest along this developmental continuum. The Levels of Emotional Awareness Scale (LEAS) is a written performance measure that asks a person to describe how they anticipate to feel in response to a series of emotionally-arousing prompt words and 20 scenes described in 2-4 sentences. Scoring is based on specific structural criteria.
aimed at determining the degree of differentiation in the use of emotion words and the differentiation of self from other. The LEAS has high internal consistency, inter-rater reliability and test-retest reliability. A variety of findings support the LEAS as a trait or individual difference measure. The LEAS correlates moderately and significantly with two other cognitive developmental measures, verbal intelligence, openness to experience, self-reported empathy, impulse control, seeking help for emotional problems, actual amount of social support, and emotion recognition ability for both verbal and non-verbal stimuli. Women consistently score higher on the LEAS than men. The correlation with the 20-item Toronto Alexithymia Scale is r = -0.19 (n = 380, p < .001). The LEAS is a performance measure that has the potential to capture deficits in emotional awareness that cannot be captured by self-report measures.

**Individual Abstract Number: 1361**

**MULTIMODAL PSYCHOTHERAPEUTIC INPATIENT TREATMENT IMPROVES EMOTIONAL AWARENESS IN PATIENTS WITH PSYCHOSOMATIC CONDITIONS**

**Claudia Subic-Wrana, Department of Psychosomatics and Psychotherapy, University of Cologne**

Patients who need psychotherapeutic inpatient treatment are impaired by various symptoms that may be caused by different underlying mechanisms. In psychosomatic disorders, emotional deficits and the quality of emotions may be a specific, illness-related mechanism that differentiates these disorders from other mental conditions. We tested this assumption by comparing the level of emotional awareness in patients with psychosomatic conditions to those of patients suffering from other mental disorders. All patients underwent the same multimodal psychotherapeutic treatment program. We asked if patients with different diagnoses improved in their level of emotional awareness to different degrees. Data from inpatients of a psychosomatic ward were collected at onset (N = 394) and at the end of multimodal psychodynamic treatment (N = 249). The sample consisted of six diagnostic groups: DP = depression; AX = anxiety and obsessive-compulsive; AJ = adjustment, ED = eating and SO = somatiform disorders; PF = psychological factors related to somatic disorders. Changes at the two time points were measured with the LEAS, which in previous studies demonstrated its ability to detect deficits in emotional awareness in a valid and reliable manner; effects of gender, age, educational level and associations between the LEAS and self-reported negative affect were controlled for. With one exception (DP to PF), the LEAS mean scores at onset of treatment were significantly lower in the psychosomatic conditions than in the mental disorders (SO and 1. AX: p = .054; 2. AF: p = .012; 3. ED: p = .000; 4. DP: p = .05; 5. PF: p = .01; 1. AX: p = .069; 2. AF: p = .032; 3. ED: p = .000). These findings are consistent with a priori predictions. By the end of treatment, only the patients with psychosomatic conditions significantly improved in their level of emotional awareness (p = 0.05). These findings demonstrate that emotional awareness can improve with treatment.

**Symposium 1132**

**SLEEP, HEALTH AND DISEASE**

**Martica Hall, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Michael R. Irwin, Cousins Center for Psychoneuroimmunology, Psychiatry, UCLA Neuropsychiatric Institute, Los Angeles, CA, Joel E. Dimsdale, Department of Psychiatry, University of California San Diego, La Jolla, CA, Julian F. Thayer, Gerontology Research Center, LTP, National Institute on Aging, Baltimore, MD, Thomas G. Pickering, Medicine, Columbia University Medical Center, New York, NY, Martica Hall, Psychiatry, University of Pittsburgh, Pittsburgh, PA**

A growing body of evidence suggests that sleep is essential to health and functioning. This research has traditionally been conducted by sleep researchers and epidemiologists; the more recent entry of behavioral medicine researchers into this field has fueled interest in lifestyle and psychosocial factors that may impact sleep and its health consequences. The studies described in this symposium represent innovative research on the complex relationship between stress, sleep, and health. Dr. Dimsdale and his colleagues present evidence that the stress of caregiving is associated with subjective sleep complaints, functional impairment and shorter sleep times. These data suggest that sleep is most disturbed in older caregivers and in those caring for patients with the highest degree of impairment. Two presentations will focus on the clinical impact of sleep in caregivers. A third presentation focuses on the role of sleep and significant pre-clinical and clinical health outcomes. Drs. Thayer and Fisher show that heart rate variability during sleep is significantly associated with glycemic control, as measured by glycosylated hemoglobin and fasting glucose levels. Dr. Pickering presents evidence from two studies that sleep is an important mediator of the relationship between lifestyle and psychosocial factors and their health outcomes including nocturnal blood pressure dipping and hypertension. Finally, Dr. Irwin uses partial sleep deprivation as an experimental probe to evaluate the link between sleep and physiological activation in alcohol dependence. As compared to healthy controls, abstinent, alcohol-dependent men exhibited increases in heart rate and circulating catecholamines following a night of partial sleep deprivation. These responses were still evident 24 hours later, after a full night of recovery sleep. Taken as a whole, these studies suggest that sleep is an important variable to consider in our search to understand how lifestyle and psychosocial factors impact health, functioning and disease.

**Individual Abstract Number: 1162**

**SLEEP DEPRIVATION POTENTIATES ACTIVATION OF CARDIOVASCULAR AND CATECHOLAMINE RESPONSES IN ABSTINENT ALCOHOL DEPENDENT MEN**

**Michael R. Irwin, Cousins Center for Psychoneuroimmunology, Psychiatry, UCLA Neuropsychiatric Institute, Los Angeles, CA, Michael Ziegler, Department of Medicine, University of California, San Diego, La Jolla, CA**

Background: Alcohol dependence is associated with an increased incidence of hypertension and cardiac disorders. A deficit in the conscious awareness of these cardiac disorders has been noted in patients with alcoholism. Methods: To determine whether sleep deprivation induces differential cardiovascular and sympathetic responses in alcohol dependence, we measured heart rate, blood pressure, and circulating sympathetic catecholamines in 36 abstinent alcohol dependent men and 36 age-, gender- and ethnicity matched controls after a baseline night of sleep. In the morning following a night partial sleep deprivation, and again following a full night of recovery sleep. Results: Baseline heart rate, blood pressure and sympathetic catecholamines were similar in the two groups. Administration of partial night sleep deprivation induced greater increases of heart rate (P < 0.01) and circulating levels of norepinephrine (P < 0.05) and epinephrine (P < 0.05) in the alcohol dependent men as compared to responses in controls. Even after a full night of recovery sleep, elevations in heart rate (P < 0.05 Quality of Sleep (PSQI) and the Functional Outcome of Sleep (FOSQ). A home-based polysomnogram (PSG) was also conducted. A 2x2 ANOVA (age x caregiver status: CG vs NCG) was conducted as well as a 2x3 ANOVA (age by CG status: CG of moderate-to-severe dementia patients (CG-Md) vs NCG). A total of 73 spousal CGs of patients with Alzheimer's disease (AD) and 40 NCG controls were studied. CGs were older (M = 72.2 years, SD = 8.9 years, M = 67.6 years, SD = 8.1 years) and had fewer years of education (M = 14.7 years, SD = 2.3 vs. M = 15.7 years, SD = 2.6; t = 2.2, p < 0.05) than NCG. Each subject completed the Pittsburgh Sleep Quality Index (PSQI) and the Functional Outcome of Sleep (FOSQ). A home-based polysomnogram (PSG) was also conducted. A 2x2 ANOVA (age x caregiver status: CG vs NCG) was conducted as well as a 2x3 ANOVA (age by CG status: CG of moderate-to-severe dementia patients (CG-Md) vs NCG). Older CG had shorter total sleep time (TST) on PSG (M = 5.9 hours) than both younger CG (M = 6.7 hours, SD = 0.1) and older NCG (M = 6.6 hours, p < 0.01). Older CG-Md had a shorter TST than younger CG-Md (p < 0.05). Older CG-Md also had a shorter TST than younger CG-Md (p < 0.05). CG also reported poorer sleep quality on PSQI (p < 0.05) and greater functional impairment on FOSQ than NCG (p < 0.05). Results showed that CG slept fewer hours than NCG. Effects of caregiving on sleep appear to be particularly salient for older CG and those caring for spouses with moderate to severe levels of dementia. It is possible that older caregivers spend more time in bed, thus requiring more time for care at wake and bedtime. Future work to examine differences in care practices by age may
provide understanding regarding sleep differences. Studies to examine health consequences of sleep disturbance for older caregivers are also needed. Supported by AG15301; AG08415.

Individual Abstract Number: 1462
HEART RATE VARIABILITY DURING SLEEP IS INVERSELY ASSOCIATED WITH GLYCOSYLATED HEMOGLOBIN AND FASTING GLUCOSE IN APPARENTLY HEALTHY ADULTS
Julian F. Thayer, Gerontology Research Center, LPC, National Institute on Aging, Baltimore, MD, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

Decreased vagally mediated cardiac autonomic control is associated with increased risk of morbidity and mortality from a number of causes. Glycosylated hemoglobin (HbA1c) and abnormal glucose levels are also associated with morbidity and mortality. Furthermore, poor sleep is associated with mortality and we have previously shown that measures of heart rate variability (HRV) during sleep are associated with sleep quality. We examined the relationship between HRV indices during sleep and measures of glycemic control in apparently healthy adults. 24 hour heart rate, HbA1c, and fasting glucose (FG) data were available for 563 male and female employees of an airplane factory. We chose the root mean squared successive differences (RMSSD) during sleep as our measure of HRV. RMSSD was inversely associated with HbA1c (r = -.25) and FG (r = -.20) in univariate analyses. In multivariate models controlling for cardiovascular disease, diabetes, smoking, resting blood pressure, body mass index, HDL and LDL cholesterol, hematocrit, triglycerides, age, and gender the relationship between RMSSD and HbA1c (partial r = -.14) and FG (partial r = -.09) remained significant. HRV is reduced in diabetics and such reductions have been shown to precede other clinical signs of diabetes. The inhibitory influence of night-time HRV with respect to glycemic control may be another aspect of the salubrious effect of a good nights sleep on health.

Individual Abstract Number: 1646
SLEEP AND CARDIOVASCULAR DISEASE
Thomas G. Pickering, Medicine, Columbia University Medical College, New York, NY

Sleep is an under-appreciated interface between stress and cardiovascular disease. Data from 6120 subjects in the Sleep Heart Health Study (SHHS) will be presented to show that although sleep-disordered breathing SDB is related to hypertension, it appears that this is confined to systolic and diastolic hypertension, and not to systolic hypertension of the elderly. A sub-study of the SHHS related sleep patterns to 24 hour ambulatory blood pressure in 281 normotensive and hypertensive subjects, and found that SDB was commoner in hypertensive than in normotensive subjects, even after controlling for factors such as BMI. SDB was related to both clinic and ambulatory blood pressure in untreated but not treated hypertensives. The sleep parameters that appeared to be most closely related to hypertension were apnea-hypoxia and hypoxemia rather than arousal. SDB was also related to less dipping of the nocturnal blood pressure. In another study of 150 black and white subjects, medical school, Piscataway, NJ, Rosalind Wright. Medicine, Harvard Health, Boston, MA, Mary D. Klinnert, PhD, National Jewish Medical and Research Center, Denver, CO, Paul Lehrer, UMDNJ -- Robert Wood Johnson Medical School, Piscataway, NJ, Rosalind Wright. Medicine, Harvard Medical School, Boston, MA

Asthma prevalence has increased considerably in the last 20 years in many countries, especially for children. Already every fourth death worldwide is due to chronic obstructive pulmonary disease (COPD). By the year 2020, COPD is predicted to rank in the fifth place among the major contributors to the worldwide burden of disease. A solid clinical and experimental literature has already highlighted the important role of psychosocial factors in exacerbation of chronic respiratory disease and its management. Systematic research into the various mechanisms of influence has only just begun. Studies so far have detailed autonomic, immunologic, and interpersonal behavior as important pathways. New techniques of noninvasive airway inflammation assessment, ambulatory monitoring of respiration, and imaging of central nervous system activation are bound to advance the field significantly in coming years. While earlier psychosocial models of respiratory disease etiology involving psychodynamic mechanisms have not gained empirical support, more recent progress in genetics and immunology of the airways can help to reformulate the role of psychosocial factors in etiological models. The first prospective studies are now available that demonstrate the importance of behavioral variables among predictors of asthma onset. This symposium will highlight attempts to clarify the role of psychosocial influences on asthma development through psychosocial and psychoneuroimmunologic pathways. Central nervous system pathways of dyspnea and their potential association with pain perception will be explored. Finally, the current status of behavioral interventions as adjunct treatments of asthma will be reviewed, and an example of a recent randomized controlled trial targeting the autonomic regulation will be presented.

This symposium is sponsored by a grant from Vivometrics.

Individual Abstract Number: 2001
IMPACT OF PSYCHOLOGICAL STRESS ON ASTHMA: FROM BENCH TO BEDSIDE
Galen D. Marshall, Division of Clinical Immunology and Allergy, Department of Medicine, The University of Mississippi Medical Center, Jackson, MS

Psychological stress, allergy and asthma morbidity as well as incidence are all steadily increasing in our society. Integral physiological relationships between the central nervous, neuroendocrine and immune systems have been established. The impact of psychological stress, both acute and chronic, on neuroendocrine and immune network function has also been demonstrated. The converse is also true, increased risk of morbidity and we have previously shown that measures of heart rate variability during sleep are associated with sleep quality. We examined the relationship between HRV indices during sleep and measures of glycemic control in apparently healthy adults. 24 hour heart rate, HbA1c, and fasting glucose (FG) data were available for 563 male and female employees of an airplane factory. We chose the root mean squared successive differences (RMSSD) during sleep as our measure of HRV. RMSSD was inversely associated with HbA1c (r = -.25) and FG (r = -.20) in univariate analyses. In multivariate models controlling for cardiovascular disease, diabetes, smoking, resting blood pressure, body mass index, HDL and LDL cholesterol, hematocrit, triglycerides, age, and gender the relationship between RMSSD and HbA1c (partial r = -.14) and FG (partial r = -.09) remained significant. HRV is reduced in diabetics and such reductions have been shown to precede other clinical signs of diabetes. The inhibitory influence of night-time HRV with respect to glycemic control may be another aspect of the salubrious effect of a good nights sleep on health.

Individual Abstract Number: 2002
NEUROPHYSIOLOGY AND PSYCHOPHYSICS OF SHORTNESS OF BREATH
Robert B. Banzett, Harvard School of Public Health, Boston, MA

'Dyspnea' (shortness of breath) is a cardinal symptom of many serious diseases. Half the patients admitted to tertiary care hospitals report dyspnea, equal to the number reporting pain. Dyspnea is reported by about 25% of outpatients. Despite the strong association of dyspnea with distress and mortality, knowledge of the neural mechanisms of dyspnea has lagged far behind the study of pain. Although pain and dyspnea are distinctly different sensations, it is perhaps natural that analogies have been made between these sensations. Only recently, however, have we discovered that there is a neurobiological link between pain and dyspnea - many of the brain structures activated by dyspnea are also activated by pain. The author will discuss the similarities and differences of pain and dyspnea at both the psychophysical measurement and functional brain imaging levels, and will review the affrent mechanisms underlying several distinct classes of dyspnea (e.g., air hunger, tightness, and work).

Symposium 2000
PROGRESS IN RESPIRATORY DISEASE: LONGITUDINAL RESEARCH, PSYCHONEUROIMMUNOLOGY, BRAIN IMAGING, AND BEHAVIORAL INTERVENTION
Chairs: Thomas Ritz, Psychology, University of Hamburg, Hamburg, Germany, Edith Chen, Psychology, University of British Columbia, Vancouver, BC, Canada

Galen D. Marshall, Department of Medicine, The University of Mississippi Medical Center, Jackson, MS, Robert B. Banzett, Harvard School of Public Health, Boston, MA, Mary D. Klinnert, PhD, National Jewish Medical and Research Center, Denver, CO, Paul Lehrer, UMDNJ -- Robert Wood Johnson Medical School, Piscataway, NJ, Rosalind Wright. Medicine, Harvard Medical School, Boston, MA

Respiratory diseases pose a major health problem with rising prevalence. Asthma prevalence has increased considerably in the last 20 years in many
The development of asthma in children results from a combination of genetic predisposition and environmental exposures. Genetic predisposition is typically marked by presence of asthma among first degree relatives of the child, especially the mother. Investigations of environmental exposures have focused on a multiple factors, ranging from food and airborne allergens to endotoxin, and investigations are ongoing regarding the role and mechanisms of such factors. Relatively little attention has been focused on psychosocial aspects of the environment that may affect childhood asthma. There is, however, increasing evidence indicating a role for psychosocial factors of various types contributing to pediatric asthma onset and persistence. We have investigated the role of ‘parenting risk’ on asthma onset. ‘Parenting risk’ encompasses parent psychological characteristics and aspects of parent-child interaction believed to put children at risk for behavioral and emotional difficulties as well as for manifestations of atopic illness. We demonstrated that parenting risk assessed in the newborn period had an independent and significant influence on asthma onset by age 3 among genetically at-risk children. This association persisted to school-age, when at ages 6 to 8 the children with asthma were more likely to be those with increased parenting risk at birth. Others have found that toddlers with atopic dermatitis are more likely to develop asthma by 4 1/2 years when behavior problems were present compared to those without behavior problems. Similarly, recovery from atopic illness between 18 months and 3 years of age was far more probable among families with functional interactions and good social support networks than among those without. There likely are multiple avenues through which psychological factors may influence atopic illness. We are only beginning to understand physiological mechanisms that may account for associations between interpersonal interactions, psychological stress and asthma onset and persistence.

Individual Abstract Number: 2003

PSYCHOSOCIAL INFLUENCES ON THE DEVELOPMENT AND PERSISTENCE OF PEDIATRIC ASTHMA

Mary D. Klinnert, National Jewish Medical and Research Center, Denver, CO

The development of asthma in children results from a combination of genetic predisposition and environmental exposures. Genetic predisposition is typically marked by presence of asthma among first degree relatives of the child, especially the mother. Investigations of environmental exposures have focused on a multiple factors, ranging from food and airborne allergens to endotoxin, and investigations are ongoing regarding the role and mechanisms of such factors. Relatively little attention has been focused on psychosocial aspects of the environment that may affect childhood asthma. There is, however, increasing evidence indicating a role for psychosocial factors of various types contributing to pediatric asthma onset and persistence. We have investigated the role of ‘parenting risk’ on asthma onset. ‘Parenting risk’ encompasses parent psychological characteristics and aspects of parent-child interaction believed to put children at risk for behavioral and emotional difficulties as well as for manifestations of atopic illness. We demonstrated that parenting risk assessed in the newborn period had an independent and significant influence on asthma onset by age 3 among genetically at-risk children. This association persisted to school-age, when at ages 6 to 8 the children with asthma were more likely to be those with increased parenting risk at birth. Others have found that toddlers with atopic dermatitis are more likely to develop asthma by 4 1/2 years when behavior problems were present compared to those without behavior problems. Similarly, recovery from atopic illness between 18 months and 3 years of age was far more probable among families with functional interactions and good social support networks than among those without. There likely are multiple avenues through which psychological factors may influence atopic illness. We are only beginning to understand physiological mechanisms that may account for associations between interpersonal interactions, psychological stress and asthma onset and persistence.

Individual Abstract Number: 2004

HEART RATE VARIABILITY BIOFEEDBACK TRAINING AS A TREATMENT FOR ASTHMA

Paul Lehrer, UMDNJ – Robert Wood Johnson Medical School, Piscataway, NJ

Study objectives: We evaluated the effectiveness of heart rate variability (HRV) biofeedback as a treatment for asthma. Ninety-four adult outpatient paid volunteers with asthma were randomly divided into four treatment conditions: (1) a full protocol (ie, HRV biofeedback and abdominal breathing through pursed lips and prolonged exhalation); (2) HRV biofeedback alone; (3) placebo EEG biofeedback; and (4) a waiting list control. Subjects were first prestabilized using controller medication and then were randomly assigned to experimental groups. Medication was titrated biweekly by blinded asthma specialists according to a protocol based on National Heart, Lung, and Blood Institute guidelines, according to symptoms, spirometry, and home peak flows. Subjects recorded daily asthma symptoms and twice-daily peak expiratory flows. Spirometry was performed before and after each weekly treatment session under the HRV and placebo biofeedback conditions, and at triweekly assessment sessions under the waiting list condition. Oscillation resistance was measured approximately triweekly. Compared with the two control groups, subjects in both of the two HRV biofeedback groups were prescribed less medication, with minimal differences between the two active treatments. Improvements averaged one full level of asthma severity. Measures from forced oscillation pneumography similarly showed improvement in pulmonary function. A placebo effect influenced an improvement in asthma symptoms, but not in pulmonary function. Subjects receiving the full protocol had significantly fewer asthma exacerbations requiring medication increases above baseline. The results suggest that HRV biofeedback may prove to be a useful adjunct to asthma treatment and may help to reduce dependence on steroid medications. Further evaluation of this method is warranted.
should include high-level courses in statistical methods. Post-graduate training can be accomplished during summer courses, professional conferences, and regular consultation of the statistical literature.

**Individual Abstract Number: 1046**

**THE IMPORTANCE OF CLEAR LANGUAGE: CORRELATES, RISK FACTORS, CASUAL FACTORS, MODERATORS, AND MEDIATORS**

Helen C. Kraemer, Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA

In one way or another, it has often been noted that sloppy language leads to sloppy science. If well-trained, careful researchers can examine exactly the same data and reach contradictory conclusions, the consequences include inconsistent results in the research literature, results that are often misleading and can misdirect subsequent research efforts, thus slowing research progress. A major case in point has been the usage of terms like “risk”, “risk factor”, “casual”, and “moderators” and “mediators” in both observational risk research and clinical trials. The "MacArthur Model" will be presented, an effort to encourage precise use of such terms in such a way as to guide research design, measurement, and analysis decisions.

**Individual Abstract Number: 1047**

**COPING WITH THE REALITIES OF LONGITUDINAL DATA: ANALYZING CHANGE OVER TIME IN THE PRESENCE OF MISSING DATA**

Maria M. Llabre, Psychology, University of Miami, Coral Gables, FL

Two areas of statistical development that are particularly relevant to psychosomatic medicine are techniques for handling missing data and methods for analyzing change over time. Longitudinal studies in psychosomatic medicine likely experience attrition and/or other sources of missing data, and frequently anticipate nonlinear change in outcomes. Newer methods for the analysis of data sets with missing observations can be shown to surpass more conventional approaches in terms of bias and power. Growth models for quantifying change over time are better suited that traditional analysis of variance approaches for capturing the complexity of data from longitudinal designs, including nonlinear trajectories. While the use of these approaches can improve the quality of our research, it will take training of new researchers and retraining seasoned investigators for our field to benefit from these powerful tools. This presentation will illustrate models of change that use all available data, and the advantages of these models over more traditional approaches. The presentation will consider the quantitative training required to properly use these methods in psychosomatic research.

**Symposium 1197**

**STRESS AND CORONARY HEART DISEASE: THE NEUROCARDIAC INTERACTION.**

Robert Soufer, Section of Cardiovascular Medicine, Matthew M. Burg, Robert Soufer, Aseem Vashist, Cardiovascular Medicine, Yale University School of Medicine, New Haven, CT; Richard Lane, Psychiatry, Psychology, Neuroscience, University of Arizona, Tucson, AZ

The contribution of stress and emotional factors to the development of CHD has been well described, with more recent efforts directed toward an elucidation of pathways by which these factors are transduced into CHD outcomes. The current symposium utilizes recent advances in neuro-imaging technologies to contribute important insights into the role of the central nervous system as a key element of the pathophysiological pathway, relying on the administration of laboratory based stressful tasks to provide the context for investigation. The first of three papers describes gender-based similarities and differences in CNS activation among normal and CAD patients during testing. The second paper elaborates the CNS activation observed during mental stress as a function of standard psychological measures of anger and hostility. The third paper describes differences in CNS activation observed during mental vs. pharmacological demand related stress. These papers are discussed in the context of their contribution to a greater understanding of central nervous system influences on CHD.

**Individual Abstract Number: 1534**

**CENTRAL NERVOUS SYSTEM (CNS) ACTIVITY DURING MENTAL STRESS AS A FUNCTION OF TRAIT BASED MEASURES OF ANGER: A POSITRON EMISSION TOMOGRAPHY (PET) STUDY**

Matthew M. Burg, Aseem Vashist, Farid Jadabaia, Cardiovascular Medicine, Hal Blumenfeld, Neurology, Soufer Robert, Cardiovascular Medicine, Yale University School of Medicine, New Haven, CT

Background: CAD patients with high vs. low trait anger are more prone to myocardial ischemia and potentially fatal arrhythmia during mentally and emotionally stressful events. The CNS correlates of this risk have not previously been examined. Objective: To observe differences in cerebral activation between hi and lo trait anger CAD patients during mental stress (MS) vs benign counting condition (CC), with particular focus on regions associated with cognitive and emotional processing and autonomic balance. Methods / Results: 75 CAD patients completed Spielberger measures of trait anger and, and Cook-Medley measures of hostile affect and aggressive responding immediately prior to MS testing during brain PET. The CC task served as a control condition for brain activity associated with mental manipulation of numbers and speech related neuromuscular activity. Comparison groups were based on lower and upper quartiles for each anger measure; lo and hi composite anger groups were based on consistent hi/lo scores on all measures. These groups were compared on CNS activity during MS, controlling for activity during CC. Cerebral hyperactivation was observed among hi vs. lo anger groups in Brodmann's areas (BA) 9-11 (prefrontal association cortex), BA 24 & 32 (limbic association cortex), and BA 45-47 (prefrontal association cortex/dorsolateral prefrontal cortex), regions associated with thought/cognition, emotion processing, and behavior planning. Conclusion: These data suggest that hi vs. lo trait anger CAD patients experience MS as cognitively more challenging, with concomitant arousal of emotion associated with fronto-limbic activation in the CNS. This brain map indicates a high level of perceived challenge and noxiousness associated with the task, and has been implicated in emotional arousal and autonomic influences on cardiovascular control.

**Individual Abstract Number: 1536**

**GENDER DIFFERENCES AMONG NORMAL AND CORONARY ARTERY DISEASE (CAD) SUBJECTS DURING MENTAL STRESS (MS): A POSITRON EMISSION TOMOGRAPHY (PET) STUDY.**

Robert Soufer, Cardiovascular Medicine, Yale University School of Medicine, New Haven, CT, James D. Brenner, Psychiatry, Emory University, Atlanta, GA, Matthew M. Burg, Cardiovascular Medicine, Hal Rosenfeld, Neurology, Yale University School of Medicine, New Haven, CT

Background: Gender differences in cognitive and emotional processing have been described. These experiments have not previously been extended to patients with CAD. Objective: To compare central nervous system (CNS) activation during mental stress (MS) in both normal and CAD males and females. Methods and Results: Female subjects with (n = 9) and without (n = 8) CAD, and male subjects with (n=10) and without (n=6) CAD were compared on CNS activity by PET during MS, controlling for brain activity during a benign counting task (CC) that served as a control condition for brain activity associated with mental manipulation of numbers and speech related neuromuscular activity. During MS, normal females demonstrated increased activity in the visual association cortex, while CAD females demonstrated more pronounced increase in the limbic association cortex (Brodmann areas 25, 28, 36). CAD females vs. CAD males demonstrated bilateral activity increases in medial temporal regions, the rostral anterior cingulate and orbitofrontal gyrus, and decreases bilaterally in the parietal and middle temporal regions. Generally, among CAD patients, males demonstrated a relative decrease in the anterior cingulate, orbital frontal, and medial temporal regions, while females demonstrated a relative increase in activation in these regions. Conclusion: Females demonstrate significant differences in brain activity compared to males, during mental stress. These differences are most pronounced among CAD patients, and are remarkable for differences in laterality, magnitude, and vector of activation and deactivation patterns.

**Individual Abstract Number: 1539**

**CENTRAL NERVOUS SYSTEM CORRELATES OF MYOCARDIAL ISCHEMIA: NEUROCARDIAC DISTINCTIONS BETWEEN MENTAL STRESS AND DOBUTAMINE PROVOCATION**

Aseem Vashist, Matthew M. Burg, Cardiovascular medicine, Yale University School of Medicine, New Haven, CT; James A. Arrighi, Brown University, Providence, RI; Farid Jadabaia, Cardiovascular Medicine, Hal Blumenfeld,
Background: Distinctions of the neuro-cardiac interaction among mental stress (MS) and demand related myocardial ischemia has not been studied. Objective: We hypothesized that the cerebral activation during MS is greater in regions associated with emotion/memory and sympathetic activation compared to demand related, dobutamine Stress (DS). Methods and results: 58 coronary artery disease patients underwent simultaneous measurement of cerebral blood flow with O15 PET and cardiac wall motion analysis with echocardiography during arithmetic MS and DS conditions. Ischemia was defined as a regional wall motion abnormality by echocardiography during each stressor condition. Of the 58 subjects, four were non-ischemic during MS and DS, 13 were ischemic during MS but not with DS; 1 was ischemic during DS but not with MS, 8 were ischemic to both MS and DS. PET brain images were analyzed by SPM 99 software and the co-ordinates were determined. Dobutamine was infused intravenously up to a maximal rate of 40 μg/kg/min to achieve the target heart rate and echocardiographic images were acquired at baseline, during mental stress, dobutamine baseline and at peak dobutamine infusion. When MS ischemic conditions were compared to DS ischemic conditions, cerebral hyperactivation during MS, compared to DS, were observed in the subcortical limbic (amygdala and hippocampus) and neocortical (cingulate, frontal cortex) regions of the brain (MS vs. DS ischemia p<0.01). Conclusion: These data suggest that ischemia to mental stress has a distinct cerebral activation when compared to ischemia which results from demand stimulus. These areas are referable to the cognitive nature of MS and occur in regions associated with memory/emotion and sympathetic activation.

Symposium 1592

BIOPSYCHOSOCIAL IMPACT OF TERRORISM, OUTBREAKS AND DISASTERS: ARE WE REALLY READY?
Steven E. Locke, Psychiatry, Harvard Medical School, Wayland, MA, Gail Ironson, Dean Cruess, Psychology, University of Miami, Coral Gables, FL, Mahendra Kumar, Psychiatry, University of Miami, Coral Gables, FL, Mahendra Kumar, Psychiatry, University of Miami, Coral Gables, FL, Neil Schneiderman, Psychology, University of Miami, Coral Gables, FL

The impact of terrorism, outbreaks, and disasters is being felt world-wide. Natural disasters such as the hurricanes that hit Florida and the earthquake that hit Japan this past fall underscore our vulnerability to nature and the need for preparedness. Although last year's SARS outbreak was a near miss for the US, others suffered, including not only deaths but devastating economic losses. Despite this reminder of our vulnerability, the US. now finds itself ill-prepared for an event as simple and predictable as the annual influenza outbreak. Hopefully, funds designated for homeland security will also support the development of a public health infrastructure that will also prepare us better for the more likely disasters (e.g., a flu pandemic), even if the primary justification is predicated on a need to protect us from anthrax or smallpox.

This symposium will address the intersection of psychosomatic medicine and public health preparedness. Dr. Ironson will describe the longitudinal follow-up of a cohort of survivors of the catastrophic Hurricane Andrew, including the psychobiological impact of that naturally-occurring stressor measured over time. Dr. Koopman will discuss coping behaviors such as altruism and generativity that characterized a large fraction of survey respondents following the 9/11 attacks. Dr. Engel will address the threat to our systems of medical response presented by the likely occurrence of posttraumatic stress symptoms following a terrorist attack. He will describe the challenge of that potentially confounding problem and propose solutions for more effective triage based upon a biopsychosocial model of acute stress. Finally, these three papers will be discussed by Dr. Kiecolt-Glaser, whose expertise in the area of human stress, behavioral measurement, and psychoneuroimmunology will provide a valuable perspective from which to design more effective systems of biodefense and public health preparedness.

Individual Abstract Number: 1593

POSTTRAUMATIC STRESS SYMPTOMS, INTRUSIVE THOUGHTS AND DISRUPTION ARE LONGITUDINALLY RELATED TO ELEVATED CORTISOL AND CATECHOLAMINES FOLLOWING HURRICANE ANDREW
Gail Ironson, Dean Cruess, Psychology, University of Miami, Coral Gables, FL, Mahendra Kumar, Psychiatry, University of Miami, Miami, FL, Charles Benight, Kent Burnett, Psychology, University of Miami, Coral Gables, FL, Tom Mellman, Psychiatry, Christina Wynings, Psychology, University of Miami, Miami, FL, Rod Wells, Psychology, University of Miami, Coral Gables, FL, Debra Greenwood, Psychology, University of Miami, Coral Gables, FL, J.B. Fernandez, Andrew Baum, Psychology, University of Miami, Coral Gables, FL, Neil Schneiderman, Psychology, University of Miami, Coral Gables, FL

This is the first longitudinal study of a collective trauma (Hurricane Andrew) in which subjects were assessed within a few months after the event (1 to 4 months) and both psychological and neuroendocrine data were collected at a second time point within a year. Major findings include elevated posttraumatic stress symptoms (including intrusive and avoidant thoughts) and stress hormones initially (approximately twice normal control values) which decreased significantly over time and returned to levels of non-hurricane controls at the end of the year. Thus, in contrast to previous reports, suggesting low cortisol in posttraumatic stress disorder (PTSD), our sample had elevated cortisol, perhaps due to the nature of the trauma (i.e. disaster versus crime, rape or war) or our timing getting samples, a few months after the event. In addition, the decrease in stress hormones over the year (cortisol in particular and epinephrine less strongly) was related to a decrease in psychological symptoms of trauma(experiencing, intrusive thoughts and avoidant thoughts). Cortisol and norepinephrine were both related to the hurricane experience variables as well (damage and rebuilding; damage and disruption). Gender differences showed females reported more distress but males had higher norepinephrine and cortisol. Finally, cortisol correlated most consistently both cross sectionally and longitudinally with reported days ill.

Individual Abstract Number: 1615

WHAT'S LOVE GOT TO DO WITH IT: ALTRUISM, GENERATIVITY, AND SPIRITUALITY IN THE AFTERMATH OF 9/11
Cheryl Koopman, Lisa Butler, Jay Azarow, Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA

This study examines expressions of altruism and generativity in the aftermath of the September 11, 2001 terrorist attacks. This study examined data from a large Internet-based study on the psychosocial effects of the terrorist attacks. Participants completed questionnaires assessing altruistic behavior, religion/spirituality, well-being, distress, and other psychosocial factors in the fall of 2001 and again six months later. Participants also wrote narrative descriptions of their reactions to 9/11, 150 of which were content-analyzed for altruistic and generative themes by trained coders. At baseline, 86% of respondents reported that they had engaged in one or more altruistic behaviors (e.g. giving blood, making donations to relief organizations, reaching out to individuals affected by the attacks, and engaging in community service), and nearly all (97%) reported that such altruistic responses made them feel better. In addition, 43% of respondents mentioned altruistic concerns and/or behavior in their narrative passages; this dropped to 28% at follow-up, a statistically significant decline (p < .05). The type of generativity most frequently mentioned at baseline and follow-up was intergenerational involvement with younger persons. Generative concerns and/or behavior were mentioned in their narratives by 44% of respondents at baseline, dropping to 34% at follow-up. Multiple regression analyses of the baseline data (N = 1890) reveal that those who engaged in altruistic behaviors and who expressed generative concerns in their narratives tend to be better educated, somewhat more religious and spiritual, and report both higher levels of existential aspects of psychological well-being and (interestingly) higher levels of psychological distress. This area of research has potentially important implications for public policy in an age of terrorism, and deserves further study in well-evaluated preventive and therapeutic interventions and social programs as well as in descriptive and naturalistic research.
The Global War on Terrorism has led to increased concern about the capability of the US health care system to respond to casualties from a chemical, biological, or radiological (CBR) agent attack. Relatively little attention, however, has focused on the potential, in the immediate aftermath, for large numbers of casualties presenting to triage points with acute health anxiety and idiopathic physical symptoms. This sort of mass idiopathic illness is not a certain outcome of CBR attack. However, in the event that this phenomenon occurs, resulting surges in demand for medical evaluations may disrupt triage systems and endanger lives. Conversely, if continuous primary care is not available for such patients after initial triage, many may suffer with unrecognized physical and emotional injuries and illness. We report the results of an expert planning initiative seeking to facilitate triage protocols that will address the possibility of mass idiopathic illness and bolster health care system surge capacity. Our report reviews knowledge regarding key triage assumptions, gaps in knowledge, and offers a three-stage heuristic triage model for further discussion and research. Optimal triage approaches must offer flexibility and rely on a mix of empirical evidence, critical incident modeling, lessons from simulation exercises, and case studies. Our triage model emphasizes early identification of idiopathic physical symptoms, avoidance of psychologizing labels and longitudinal follow-up for all patients and active clinical collaboration between primary care and psychiatry for the significant minority of patients that develop persistent symptoms and disability.

Symposium 1359
THE METABOLIC SYNDROME: CLINICAL DEFINITIONS, EPIDEMIOLOGY, AND FUTURE DIRECTIONS
John F. Todaro, Centers for Behavioral and Preventive Medicine, Brown Medical School and The Miriam Hospital, Providence, RI, Jeanne M. McCaffery, Centers for Behavioral and Preventive Medicine, Brown Medical School and The Miriam Hospital, Providence, RI, Edward C. Suarez, Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, Wolfgang Linden, Psychology, UBC, Vancouver, BC, Canada, John F. Todaro, Centers for Behavioral and Preventive Medicine, Brown University and The Miriam Hospital, Providence, RI, Raymond Niaura, Providence, RI

The metabolic syndrome is characterized as a cluster of metabolic risk factors, including insulin resistance, abdominal obesity, dyslipidemia, and hypertension. Twenty-four percent of the U.S. population meets the clinical definition for the metabolic syndrome, with prevalence rates nearing 44% among individuals over 50 years of age. Clearly, the prevalence of the metabolic syndrome has reached epidemic proportions and requires immediate attention from the broader healthcare community. Behavioral medicine is well-positioned to conduct much needed research aimed at refining clinical definitions, identifying at-risk populations, and testing novel interventions to prevent and reduce metabolic syndrome risk factors. This symposium will explore current clinical definitions and apply advanced statistical approaches toward identifying primary components of the metabolic syndrome. Associations between negative emotions, such as hostility and depression, will be examined in an effort to identify psychosocial risk factors that may influence the development of the metabolic syndrome. Moreover, the role of systemic inflammation in the pathogenesis of the metabolic syndrome will be presented. Finally, this symposium will conclude with a discussion of these findings and implications for future research.

Individual Abstract Number: 1623
ASSSESSMENT AND TRIAGE OF MASS IDIOPATHIC ILLNESS ASSOCIATED WITH CHEMICAL, BIOLOGICAL, OR RADIOLOGICAL TERRORIST ATTACK
Charles Engel, Psychiatry, Uniformed Services University, Arthur J. Barsky, Psychiatry, Harvard Medical School, Cambridge, MA, Dori B. Reissman, National Center for Injury Prevention and Control, CDC, Robert DeMartino, Center for Mental Health Services, U.S. Public Health Service, Ian Katz, Psychiatry, Sukker School of Medicine, Michael D. McDonald, Global Health Initiatives, Inc., Steven E. Locke, Psychiatry, Harvard Medical School, Wayland, MA

Individual Abstract Number: 1743
CONFIRMATORY FACTOR ANALYSIS OF THE METABOLIC SYNDROME AMONG MEN WITH NORMAL BLOOD PRESSURE OR UNTREATED HYPERTENSION
Jeanne M. McCaffery, Raymond S. Niaura, Brown Medical School, Providence, RI, Bing-Jiu Shen, University of Miami, Coral Gables, FL, Matthew F. Muldoon, Stephen B. Manuck, University of Pittsburgh, Pittsburgh, PA

The metabolic syndrome has been conceptualized as a clustering of several cardiovascular risk factors reflecting one unitary disease process. However, strong statistical support for the existence of a syndrome is lacking. Here, we illustrate the use of confirmatory factor analysis to evaluate the extent to which a single common factor underlies variability in insulin resistance, obesity, lipids and blood pressure in a community sample of 358 men (248 with hypertension), ages 40-70, not receiving antihypertensive medications. Our model fit the data reasonably well (CFI = .94, average absolute standardized residual = .03 and RMSEA = .09). The obesity, insulin resistance and dyslipidemia factors each loaded highly on the underlying metabolic syndrome factor (loadings > .65, p < .01). The blood pressure factor also loaded significantly on the underlying metabolic syndrome but the strength of association was not as great (loading = .34, p < .01). These results provide strong evidence that a common construct, labeled the metabolic syndrome, underlies variability in insulin resistance, obesity, dyslipidemia and blood pressure. Nonetheless, the loading of blood pressure on the underlying construct was small relative to the other core components, even in this sample free of biases due to antihypertensive medication or restriction in range of blood pressure due to the exclusion of persons with hypertension. Overall, these analyses demonstrate that confirmatory factor analysis is well suited to explore the nature of interrelationship in the metabolic syndrome. These models may also be adapted to incorporate additional components of the syndrome as well as predictor variables. Supported by HL-40962.

Individual Abstract Number: 1559
THE RELATIONSHIP BETWEEN PSYCHOLOGICAL RISK FACTORS AND INSULIN RESISTANCE: IS INFLAMMATION THE LINK?
Edward C. Suarez, Stephen H. Boyle, Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC

Hostility/anger and depressive symptoms are associated with the metabolic syndrome (MetSyn) and its constituents such as insulin resistance (IR) with some studies reporting stronger associations in women. What is not known is what mechanisms underlie these associations. One possibility is that inflammation mediates the relation of psychological attributes to IR and the MetSyn. To test this general hypothesis, the current study examined whether the relationship between IR, estimated by the homeostasis model assessment (HOMA), and psychological attributes is mediated by C-reactive protein (CRP). Fasting insulin, glucose and high sensitivity CRP were assessed in a multiethnic sample of 135 non-diabetic adult men and women, aged 18-50. Participants were nonsmokers with no current or past history of any chronic medical conditions. High sensitivity CRP, fasting insulin and glucose were determined from fasting blood samples, and IR was estimated by HOMA. Hostility/anger were assessed via the Buss-Perry Aggression Questionnaire (BPAQ) and the Beck Depression Inventory (BDI) was used to assess severity of depressive symptoms. A principal component analysis of the BPAQ and BDI yielded a single factor, referred to as the psychological risk factor (PRF), that accounted for 65.5% of the variance. In a regression analysis, the PRF X Gender interaction (P = .001) predicted HOMA-IR. Univariate correlations indicated that log(HOMA-IR) was associated with PRF in women (r = .28, P = .02) but not men (r = -.01, ns). Similarly, log(CRP) was associated with log(HOMA-IR) (r = .28, P = .02) and PRF (r = .27, P = .03) in women, but not in men. Using regression results, we performed a Sobel test of mediation for men and women. In women, but not men, the Sobel test of mediation yielded a z = 1.68, P = .09 suggesting a trend toward an indirect effect of PRF on HOMA-IR via CRP. Together, these results indicate that in women, but not men, the effect of PRF on HOMA-IR may be partially mediated by inflammation.
Individual Abstract Number: 1596

DOES HOSTILITY MEDIATE THE PROSPECTIVE ASSOCIATION OF OBESITY AND 10-YEAR BLOOD PRESSURE CHANGE?

Wolfgang Linden, Psychology, UBC, Vancouver, BC, Canada; Jocelyne Leclerc, Yvonne Erskine, Psychology, UBC

Long-term blood pressure changes are generally held to be the result of a complex interaction of genetics, behavioral changes and personality mediation (Schwartz et al., 2003, Psychosom Med). Obesity (defined here as [a] skinfold thickness or [b] body mass index (BMI)) usually correlates with blood pressure levels. In a 10-year prospective study of hypertension development in 110 initially normotensive men and women, we found that skinfold thickness at time 1 significantly predicted absolute levels of SBP, DBP, and heart rate 10 years later (r = .30*, .28*, and .23; N=110); it also predicted SBP and DBP change over time (r = .17* and .31*). Note that BP and heart rate indices reported here reflect 24-hr ambulatory means. Gender differences were minimal. Skinfold thickness outperformed BMI in every analysis. Given that obesity is likely implicated in a complex pathway of personality and biological factors predicting heart disease, we also tested whether the obesity blood pressure linkage was mediated by personality factors and found that hostility on its own correlated with diastolic BP change (r=.19*) but not with absolute SBP at year 10, nor with SBP change. Initial hostility also predicted change in obesity (r=.10*), however, regressing 10-yr DBP change on hostility and obesity did not change the strength or direction of the obesity and DBP change relationship (r=-.31 vs r=-.28) thus ruling out hostility as a mediating variable.

Individual Abstract Number: 1619

NEGATIVE EMOTIONS AND THE METABOLIC SYNDROME IN OLDER MALES: FINDINGS FROM THE NORMATIVE AGING STUDY

John F. Todaro, Raymond Niaura, Brown Medical School, Providence, RI; Avron Spiro III, Boston VA Healthcare System, Kenneth D. Ward, University of Memphis Center for Community Health, Memphis, TN

The National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III has issued clinical definitions for the metabolic syndrome. To date, however, there has been relatively little research examining the associations between this definition of the metabolic syndrome and negative emotions, such as hostility and depression. We conducted a cross-sectional examination of the relationship between negative emotions (hostility and depression) and the metabolic syndrome in older men (mean age = 60.4, SD = 7.6) participating in the Normative Aging Study (NAS). Seven hundred and ninety-five men who completed the Cook-Medley Hostility scale and D scale from the MMPI and who participated in a comprehensive physiologic and laboratory assessment were included in the study. All men were free of diagnosed CHD and diabetes. Logistic regression was used to examine the relationship between negative emotions and the presence of the metabolic syndrome. In multivariate models, age, education, cigarette smoking, alcohol use, and total caloric intake were used as covariates. Two hundred and twenty individuals met the NCEP-III criteria for the metabolic syndrome (27.7%). In an unadjusted logistic regression analyses, hostility was significantly associated with the presence of the metabolic syndrome, OR = 1.02 (95% CI, 1.00 - 1.04, p < .05). Depression, however, was not significantly related with the metabolic syndrome, OR = 1.06 (95% CI, 0.79 - 1.42, p > .05) After adjusting for potential covariates and depression, hostility continued to be associated with the presence of the metabolic syndrome, OR = 1.02 (95% CI, 1.00 - 1.04, p < .05), with a one SD increase in hostility scores resulting in a 16% increased risk of having the metabolic syndrome. Moreover, this association appears to be independent of depression, which suggests that hostility may be uniquely related to the development of the metabolic syndrome in healthy individuals.

Symposium 1466

STRESS AND BIOLOGY DURING CHILDHOOD

Edith Chen, Psychology, University of British Columbia, Vancouver, BC, Canada; Craig K. Ewart, Psychology, Syracuse University, Syracuse, NY; Edith Chen, Psychology, University of British Columbia, Vancouver, BC, Canada; Rosalind J. Wright, Medicine, Harvard Medical School, Cambridge, MA; Joanne Weinberg, Cellular & Physiological Sciences, University of British Columbia, Vancouver, BC, Canada

Relationships between stress and biology have been extensively studied in adulthood, but far less is known about this topic during childhood. The goal of this symposium is to discuss (1) the role of different types of stressors during childhood; and (2) the effects of these stressors on different biological systems in childhood. The first speaker will present data on an individual-level stress factor - the role of youth's social and self-regulatory skills- in managing stressors. This speaker will discuss the effects of poor self regulatory competence on cardiovascular measures taken in the laboratory as well as in the field. This presentation highlights the importance of understanding how youth psychologically respond to stressors when studying the physiological effects of stress earlier in life. The second speaker will present data on a societal-level stress factor - the role of socioeconomic status (SES). This speaker will discuss the relative influence of SES during different periods of childhood, and discuss relationships of SES and stress with immune markers in healthy adolescents. This presentation highlights the importance of understanding the larger social environment and its changing role across development when studying the psychobiology of stress in childhood. The third speaker will present data on both individual- and societal-level stress factors and discuss their effects on chronic childhood conditions such as asthma. This speaker will discuss the effects of different types of stressors on both morbidity measures and immune measures relevant to childhood asthma. This presentation highlights the importance of understanding how different types of stressors affect disease processes that occur early in life. The discussant will synthesize these findings and discuss important next steps in childhood psychobiology of health research.

Individual Abstract Number: 1468

MEASURING SELF-REGULATORY COMPETENCE IN ADOLESCENTS: NEW INSIGHTS INTO BEHAVIORAL MECHANISMS OF CARDIOVASCULAR HEALTH

Craig K. Ewart, Psychology, Syracuse University, Syracuse, NY

In adolescence, exposure to stressors that threaten cardiovascular (CV) health is influenced increasingly by a youth's social and self-regulatory skills. These include an ability to select appropriate self-goals, to devise effective action strategies, and to focus attention on positive outcomes that can guide one's actions and foster optimistic trains of thought. Assessment protocols designed to measure CV reactivity typically confront subjects with stimuli that are unavoidable and difficult, or even impossible, for them to control, thus reducing their opportunity to modulate stress exposure--and CV responses--through skillful self-regulation. Measuring self-regulation skills calls for methods that allow wider latitude for exercising self-control in the face of challenges, and that can test a youth's ability to generate goals, to formulate plans, and to regulate emotions through mechanisms of attention control and cognitive appraisal. New methods to assess adolescent self-regulatory competence have been developed in Project Heart, a program of research investigating CV risk factors in urban youth. Data from this research, and from studies conducted in collaboration with investigators at other centers, will be used to illustrate two promising techniques: (1) a semi-structured social competence interview; and (2) social simulation tasks mediated by structured role play and video. Poor self-regulatory competence assessed via these methods in 2 large urban samples (N's = 180; 212) predicted increased vascular reactivity and diminished heart rate variability under social challenge (studies 1 and 2), and elevated ambulatory diastolic blood pressure during normal activities (study 2). The sizes of these effects (d's = .41 to .79) suggest that interpersonal and behavioral self-regulatory competence may offer possible causal mechanisms linking personality and the social environment to CV health and illness.
Low socioeconomic status (SES) has a profound effect on physical health, elevating risk for a variety of poorer health outcomes. Although these relationships are robust in adulthood, their strength throughout childhood remains unclear. Second, the psychological and biological pathways through which SES exerts effects on childhood health are not well-established. Our program of research aims to address these two questions. In one set of epidemiological studies, we tested whether SES and health relationships were stronger during certain periods of childhood using the National Health Interview Survey, a nationally representative sample of U.S. children. We tested SES gradients with respect to two prevalent childhood conditions, injuries and acute respiratory conditions. For both conditions, we found significant interaction effects of SES with age (b’s ranging from -1.5 to -23, p’s < .05). These interactions revealed that SES gradients were stronger during adolescence compared to earlier in childhood. Based on these epidemiological findings, we then targeted the period of adolescence in studies of biological pathways. In one study, we recruited a sample of healthy adolescents for a laboratory study on the effects of SES and stress on immune markers. Parents were interviewed about SES, and adolescents were interviewed about life stress. Blood was drawn from adolescents, and peripheral blood mononuclear cells were stimulated in vitro with a fixed dose of mitogen (PMA/INO). Higher levels of family SES were associated with heightened production of stimulated cytokines (r = .56, p < .01). Similarly, lower levels of chronic stress were associated with greater cytokine production (r = -.34, p < .05). These findings indicate that more positive environments (higher SES, lower stress) are associated with a more robust immune response upon exposure to a pathogen. Overall, these research approaches allow us to identify critical periods when SES effects emerge during childhood, and to begin to explain the psychobiological pathways by which SES exerts effects on childhood health.

Individual Abstract Number: 1470
DIFFERENTIAL STRESS EXPERIENCE AND ITS RELATIONSHIP TO CHILDHOOD ASTHMA AND ASTHMA IMMUNE MARKERS
Rosalind J. Wright, Channing Laboratory, Harvard Medical School, Cambridge, MA

The overall goal of our ongoing research program is to examine the role of psychosocial stressors in a systems framework considering multiple biologic pathways by which stress can contribute to asthma causation. We have tested the notion that stressors can cumulatively influence immune system development and airway inflammation in early life, thus making certain populations more susceptible to other environmental factors (e.g., allergens, air pollutants). This research program takes a multi-level approach, measuring both individual-level stress (perceived stress, pregnancy anxiety) and community-level stress (e.g., neighborhood disadvantage, high crime/violence rates). In ongoing epidemiological studies, we have examined associations of the above types of stress with asthma onset and morbidity. We have also assessed the influence of stress on the hormonal stress response and on T-helper cell differentiation relevant to the expression of an atopic or proinflammatory phenotype. In one recent study of a prospective birth-cohort predisposed to atopy/asthma, caregiver stress was measured at 2-month intervals for the first 2 years of life and biomarkers were ascertained from children's blood (age range 18-32 months). Markers of early childhood immune responses included: 1) immunoglobulin E (IgE) expression; 2) mitogen-induced and allergen-specific [Dermatophagoides farinae (Der f 1) and cockroach (Bl a 2)] proliferative response; and 3) subsequent cytokine expression (INFg, TNF-a, IL-10, and IL-13). The relationship between stress and the proliferative response and total IgE was examined using logistic regression. In adjusted analyses, higher caregiver stress in the first 6 months after birth was associated with high Der f 1 [OR=1.5, 95% CI (1.0, 2.3)]. Higher stress between ages 6 and 18 months was associated with a high total IgE [OR>2.03, 95% CI (1.1, 3.6)], increased production of TNF-a, and reduced INFg. Thus increased stress in early childhood was associated with an atopic immune profile in children predisposed to atopy/asthma.
(CAD); CAD with low left ventricular ejection fraction (LVEF); > two risk factors (e.g., hypertension, diabetes, dyslipidemia), participated in the intervention, with follow-ups ranging from 3 months to 5 years. Outcomes included medical risk factors (lipid profiles, blood pressure, exercise capacity, weight, cardiac events) and psychosocial variables (depression, hostility, quality of life). The main findings were: (1) at baseline, women's prognostic characteristics (sociodemographic: living alone, being unemployed; medical: lipid profile, diabetes; psychosocial: spousal support; quality of life) were significantly more adverse when compared to men. Analyses by diabetic status revealed the same pattern, indicating worse health status among diabetic patients; (2) by the end of three months, both sexes, regardless of diabetic status and LVEF, evidenced significant improvements in lifestyle behaviors, medical, and psychosocial risk factors, which were maintained through the follow-up periods; (3) the magnitude of risk factor change observed in the multisite studies was similar to that observed in the earlier randomized controlled trial; (4) fewer cardiac events were evident, even among high-risk (low LVEF) patients, and almost 80% of MLDP patients who were eligible for bypass surgery or angioplasty at baseline were able to safely avoid it. These findings demonstrate that a multi-component cardiac intervention program can be successfully implemented in diverse regions of the USA, with demonstrated benefits for both sexes and different levels of disease severity.

Individual Abstract Number: 1427
THE ENRICHED TRIAL: FACT OR FICTION?
James A. Blumenthal, Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC

The ENRICHED Trial was a multi-center, randomized clinical trial in over 2400 cardiac patients at increased risk for adverse events by virtue of their being depressed or socially isolated. Results of the trial have been reported previously in JAMA, 2003. The trial has been criticized about its findings. In this presentation, key aspects of the study will be identified, including study design, identification of patients, selection of instruments, delivery of treatment, and analysis and interpretation of results. The presentation will provide general commentary about the merits and shortcomings of the trial, and end with recommendations for future research in the area.

Individual Abstract Number: 1522
FOCUS OF BEHAVIORAL INTERVENTION IN CORONARY HEART DISEASE: WHAT LIES BEYOND DEPRESSION?
Johan Denollet, Medical Psychology, Tilburg University, Tilburg, The Netherlands

Psychological distress affects the clinical course of patients with coronary heart disease (CHD), but duration/timing of intervention, demographic characteristics of participants and mode of treatment may modulate the effect of behavioral intervention in CHD. In this presentation, it will be argued that the focus of intervention is another key aspect. Evidence suggests that, in addition to depression, other psychological constructs also need to be considered for future trials. This will be illustrated by presenting post-hoc analyses of findings from a non-randomized controlled trial that have been reported previously (Circulation, 2001): 150 men with CHD either participated in comprehensive cardiac rehabilitation (n=78) or received standard medical care only (n=72); after 9 years of follow-up, 15 patients had died. In post-hoc analyses, patients were considered to have a high-risk personality if they had a Type D personality (high negative affectivity and neuroticism are related to antibody status following influenza vaccination in healthy students at baseline. Antibody status was also assessed at baseline and at five weeks and five months following vaccination with the trivalent influenza vaccine and the meningococcal A+C polysaccharide vaccine. Results: Taking into account baseline antibody titre, high life events scores prior to vaccination were associated with lower responses to the B/Shangdong influenza strain at both five weeks and five months and meningococcal C at five weeks. Life events scores were not associated with response to the other two influenza viral strains nor response to meningococcal A. Participants with high social support scores and those with low neuroticism had stronger 5-week and 5-month antibody responses to the A/Panama influenza strain, but not to any of the other strains. These associations could not be accounted for by demographic or health behaviour factors, and also emerged from analyses comparing those who exhibited a four-fold increase in antibody titre from baseline with those who did not. Conclusions: Life events, social support and neuroticism are related to antibody status following influenza vaccination in distinctive ways that may be partly determined by vaccine novelty and prior neuroticism and exposure. Life events also produced poor antibody response to meningococcal C polysaccharide vaccination after previous meningococcal C conjugate vaccination. None of the psychosocial factors were associated with the purely thymus-independent vaccination.

Individual Abstract Number: 1395
THE ASSOCIATION BETWEEN LIFE EVENTS, SOCIAL SUPPORT, NEUROTICISM AND ANTIBODY STATUS FOLLOWING THYMUS-DEPENDENT AND THYMUS-INDEPENDENT VACCINATIONS
Anna C. Phillips, Victoria E. Burns, Douglas Carroll, Christopher Ring, School of Sport and Exercise Sciences, University of Birmingham, Birmingham, UK

Objective: This study determined whether stressful life events, social support, and neuroticism were related to antibody status following both thymus-dependent and thymus-independent vaccinations. Method: Life events in previous year, customary social support and neuroticism were measured in 57 healthy students at baseline. Antibody status was also assessed at baseline and at five weeks and five months following vaccination with the trivalent influenza vaccine and the meningococcal A+C polysaccharide vaccine. Results: Taking into account baseline antibody titre, high life events scores prior to vaccination were associated with lower responses to the B/Shangdong influenza strain at both five weeks and five months and meningococcal C at five weeks. Life events scores were not associated with response to the other two influenza viral strains nor response to meningococcal A. Participants with high social support scores and those with low neuroticism had stronger 5-week and 5-month antibody responses to the A/Panama influenza strain, but not to any of the other strains. These associations could not be accounted for by demographic or health behaviour factors, and also emerged from analyses comparing those who exhibited a four-fold increase in antibody titre from baseline with those who did not. Conclusions: Life events, social support and neuroticism are related to antibody status following influenza vaccination in distinctive ways that may be partly determined by vaccine novelty and prior neuroticism and exposure. Life events also produced poor antibody response to meningococcal C polysaccharide vaccination after previous meningococcal C conjugate vaccination. None of the psychosocial factors were associated with the purely thymus-independent vaccination.
the diary period was associated with both response points in A/NC (ps<.01). Caledonia (A/NC)) at 1 and 4-months post-immunization (ps<.05), however, predicted higher response to one component of the vaccine (A/New sleep reported on the day prior to immunization. Although average diary sleep fell asleep/woke-up, lost sleep, and sleep quality. High baseline sleep quality response in a young, healthy sample, and that sufficient sleep on the two additional factors, including ethnicity may moderate the association of SES to health. Studies of the effects of SES on health are complicated in part by the final paper examines an important potential moderator of the relationship of SES to health in an immigrant sample. Specifically, the authors examine the degree to which achievement motivation increases the negative effects of low SES on health. Together, these papers yield insights into the complex relationship of both objective and subjective SES to health.

Individual Abstract Number: 1557
THE IMPACT OF SLEEP ON INFLUENZA IMMUNIZATION RESPONSE Sarah D. Pressman, Department of Psychology, Carnegie Mellon University, Sheldon Cohen, Department of Psychology, Carnegie Mellon University, Pittsburgh, PA, Gregory E. Miller, Department of Psychology, University of British Columbia, Vancouver, BC, Canada

Popular belief suggests that not getting enough sleep is damaging to one's health. There is growing evidence that sleep deprivation impacts the immune system, however, there is minimal work showing that natural variation in sleep plays a role in immune function. The current study examined whether sleep behavior plays a role in influenza immunization response amongst a young, healthy population. Subjects were 83 undergraduates who had not previously been immunized against influenza. Prior to vaccination, participants completed an assessment of typical sleep habits over the last month using the Pittsburgh Sleep Quality Index. Participants also recorded their daily sleep habits over 2 weeks (starting 2 days pre-vaccine) on electronic hand-held diaries. Each morning, participants recorded when they fell asleep/woke-up, lost sleep, and sleep quality. High quality sleep predicted higher response to one component of the vaccine (A/New Caledonia (A/NC)) at 1 and 4-months post-immunization (ps<.05), however, no other baseline sleep parameter was diagnostic. Average sleep duration over the diary period was associated with both response points in A/NC (p<.01). A closer examination of daily variation revealed that this effect was driven by sleep reported on the day prior to immunization. Although average diary sleep quality and loss were not related to response, sleep quality recorded the day prior to vaccine was marginally associated with 1-month response while sleep loss the night prior to vaccine predicted 1-month response and 4-months marginally. In summary, we found that poor sleep is harmful for vaccination response in a young, healthy sample, and that sufficient sleep on the two nights prior to vaccination is essential for an effective response. This is the first evidence that natural variation in sleep habits is associated with response to immunization and suggests that adequate amounts of sleep are needed for optimal response to immunological challenge.

Symposium 1654
SES, MOOD, AND HEALTH: NEW FINDINGS ON COMPLEX RELATIONSHIPS
Elizabeth Bronodlo, Psychology, Elizabeth Bronodlo, Department of Psychology, St. John's University, Jamaica, NY, Marcus Green, Patrick Steffen, Department of Psychology, Brigham Young University, Provo, UT, Thomas Pickering, General Medicine, Columbia Presbyterian Medical Center, New York, NY

The relationship of socioeconomic status (SES) to morbidity and mortality has been well documented. However, the mechanisms linking SES to health are still not well understood. Recently investigators have suggested that psychosocial factors, including mood, may mediate this relationship. Other factors, including ethnicity may moderate the association of SES to health. Studies of the effects of SES on health are complicated in part by the multidimensional nature of socio-economic status. Income, occupational status, and education may confer different benefits and may influence health through different pathways. Further, the effects of SES may vary depending on whether the measure is individual or neighborhood SES or whether perceived versus actual SES is examined. This symposium presents three papers examining the influence of SES on mood and health. Measures of several dimensions of SES are included and both perceived and objective SES ratings are employed in all papers. The first paper examines the association of different components of SES (i.e., income, education, and occupational status) assessed at several different levels (individual, family, and neighborhood) to negative mood and hostility. The findings indicate that the relationship of SES to negative mood varies depending on the component and level of SES assessed. The second paper examines the effects of both objective and subjective assessments of SES on self-reported health in Hispanic immigrants. The authors report that subjective assessments yield closer relationships with perceived health than do objective assessments. The final paper examines an important potential moderator of the relationship of SES to health in an immigrant sample. Specifically, the authors examine the degree to which achievement motivation increases the negative effects of low SES on health. Together, these papers yield insights into the complex relationship of both objective and subjective SES to health.

Individual Abstract Number: 1703
DIMENSIONS OF SOCIO-ECONOMIC STATUS ARE RELATED TO NEGATIVE MOOD AND HOSTILITY IN A COMMUNITY SAMPLE
Elizabth Bronodlo, Department of Psychology, St. John's University, Jamaica, NY, Karina Bienfait, Department of Psychology, St. John's University, Jenni Atencio, Department of Psychology, St. John's University, Jamaica, NY, Andrea Cassells, Carmen Rodriguez, Catherine Cubbin, Jonathan N. Tobin, Clinical Directors Network

Socioeconomic status (SES) has been related to increased health risk, and specifically increased cardiovascular risk. The mechanisms linking SES to impaired health status are not well understood. Investigators have suggested that the relationship of SES to health may be mediated by psychosocial factors including negative mood and hostility. This study examines the association of different components of SES to negative mood and hostility. Participants included 64 men and 146 women (68% Black, mean age=39) drawn from Community Health Centers in New York. Participants completed a detailed interview assessment of education, income and assets, and occupational prestige for the individual, parent and family. Measures of occupational prestige were based on the Nakao and Treas' Socioeconomic Index of Occupations. Negative mood was operationally defined as high baseline negative affect at baseline. Positive affect, exercise played a protective role being related to higher antibody response. For individuals low in positive affect, exercise played a protective role being related to higher antibody responses. These data provide initial evidence that individual differences in dispositional positive affect may be of health significance, as they show an in vivo immune response relevant for protection against infection.

Individual Abstract Number: 1707
SUBJECTIVE SOCIAL STATUS, PERCEIVED RACISM, AND SELF-REPORTED HEALTH IN A SAMPLE OF HISPANIC AMERICAN IMMIGRANTS
Marcus Green, Patrick Steffen, Department of Psychology, Brigham Young University, Provo, UT

Subjective social status has been shown to be a stronger predictor of health than objective measures of SES; however, it has not been carefully studied in minority populations. The current study presents data on the relationship between both subjective social status and perceived racism, and self-reported health and somatic symptoms in a Hispanic American immigrant sample. Questionnaires were administered to 151 Hispanic American immigrants (55% female, average age 25, average of 5 years living in the United States). Subjective SES was measured using a simple drawing of a ladder in which individuals place themselves according to their perceived social status in the community. Perceived racism was measured with 1 question that asked frequency of exposure to racist experiences. The self-reported health question asked participants to rate their health from excellent to poor. Somatic symptoms were measured using the Physical Health Questionnaire (PHQ). Results: Higher subjective social status was found to be related to better self-reported health (r = .24, p < .01), as were higher income (r = .17, p < .05) and...
greater education ($r = .17$, $p < .05$). When these measures were included together in a regression model, only subjective social status remained significant. Subjective social status was also negatively related to perceived racism ($r = -.17$, $p < .05$). Subjective and objective measures of SES were not related to somatic symptoms; however, perceived racism was related to higher levels of somatic symptoms ($r = .39$, $p < .0001$). Number of years lived in the US was positively related to perceptions of racism ($r = .21$, $p < .01$) and negatively related to subjective social status ($r = -.19$, $p < .05$). Subjective social status is a stronger predictor of self-reported health than objective SES in Hispanic American immigrants, and low subjective social status predicts increased perceptions of racism. Increased length of time in the US is related to negative outcomes.

**Individual Abstract Number: 1708**

STRIVING FOR THE AMERICAN DREAM BUT NOT SUCCEEDING: ACHIEVEMENT ORIENTATION CONTRIBUTES TO THE NEGATIVE EFFECTS OF LOW SES ON HEALTH IN HISPANIC AMERICAN IMMIGRANTS

Patrick Steffen, Marcus Green, Department of Psychology, Brigham Young University, Provo, UT

In spite of having lower SES, Hispanic American immigrants have been shown to have better health than European Americans and US born Hispanic Americans. As Hispanic American immigrants acculturate to an American lifestyle, however, they report worse health. Acculturation to an American lifestyle is also related to increased levels of individualistic cultural values such as achievement orientation. Questionnaires were administered to 167 Hispanic American immigrants (54% female, average age 32, average of 5 years living in the United States). Objective SES was measured using income which was assessed across 9 income categories. Achievement orientation was measured using the Schools and Family Value Survey. Psychosocial health was assessed using measures of depressive symptoms, perceived stress, optimism, and positive emotions. Self-reported health was measured using questions rating overall health and number of sick days in the past month. Achievement orientation moderated the effects of SES on psychosocial health such that low SES was related to worse psychosocial health only in the presence of high achievement orientation. Specifically, low SES was significantly related to more depressive symptoms and less perceived stress ($r = .54$, $p < .05$), and less optimism ($F = 3.92$, $p < .05$) and positive emotions ($F = 7.80$, $p < .01$) in the high achievement orientation group. Low SES was not related to psychosocial health in the low achievement orientation group. Achievement orientation did not interact with SES in predicting self-reported physical health. However, depressive symptoms and perceived stress were positively correlated with worse self-reported health ($r = .28$, $p < .0001$; $r = .18$, $p < .05$) and number of sick days ($r = .23$, $p < .01$; $r = .19$, $p < .05$). Specifically, lower SES is most strongly related to negative outcomes in the presence of high levels of achievement orientation.

**Symposium 1402**

GENETIC EXPLORATION OF INDIVIDUAL DIFFERENCES

John J. Sollers III, Emotion & Quantitative Psychophysiology Section, National Institute on Aging, NIH, Baltimore, MD; Redford Williams, Jr., Behavioral Psychiatry, Duke University, Durham, NC; Jeanne McCaffery, Centers for Behavioral and Preventive Medicine, Brown Medical School and The Miriam Hospital, Providence, RI; Andrey Anokhin, Department of Psychiatry, Washington University School of Medicine, St. Louis, MO; Marcellus M. Merritt, Emotion and Quantitative Psychophysiology Section, National Institute on Aging, NIH, Baltimore, MD

The objective of this symposium is to examine genetic contributions related to individual differences in cardiovascular disease (CVD) risk and morbidity. There are large individual differences in both the genetic markers for CVD and the psychosocial influences. The assessment of these differences are important for psychosomatic medicine, and with advent of new techniques and developments in the area of genetics, understand the relationships between these complex factors has become more feasible. These talks will highlight some of the recent findings in this emerging area. The first talk will discuss the relationships between two hypertension related candidate genes (eNOS, ACE) and heart rate variability (HRV) in African-Americans. The next talk will examine the influence of education level on hypertension risk using a classic twins design. The third presentation will assess the heritability of HRV in a random sample of female twins. The final talk discusses the role of the promoter polymorphism of the MAOA gene and its effect on the relationship between glucose metabolism and central nervous system serotonin function.

**Individual Abstract Number: 1549**

CENTRAL NERVOUS SYSTEM (CNS) SEROTONIN FUNCTION AND GLUCOSE METABOLISM

Redford Williams, Jr., Behavioral Psychiatry, Duke University, Durham, NC

To test the hypothesis that reduced CNS serotonin function could account for clustering of biobehavioral characteristics that mediate increased CVD risk in persons with psychosocial risk factors, we evaluated associations between CSF 5HIAA and indices of glucose metabolism -- fasting glucose and insulin and an index (HOMA) of insulin resistance -- in a sample of 92 healthy community volunteers with about equal numbers of men and women and blacks and whites. Contrary to prediction, higher HOMA levels were associated increased fasting glucose ($r = .25$, $P = .02$), insulin ($r = .28$, $P = .01$) and HOMA ($r = .30$, $P = .01$) in the entire sample. However, the positive correlations between CSF 5HIAA and glucose, insulin and HOMA were present only in subjects with the more active 3/4 repeats alleles of a functional promoter polymorphism of the MAOA gene (MAOA-uVNTR): glucose, $r = .40$ ($P = .004$); insulin, $r = .44$ ($P = .001$); HOMA, $r = .46$ ($P = .0007$). In subjects with the less active 2/3/5 repeats alleles, there was no association between 5HIAA levels and glucose ($r = - .12$), insulin ($r = .04$) or HOMA ($r = .09$). Genotype suggests that in persons with a genotype associated with increased CSF 5HIAA levels and an adverse personality profile -- high Neuroticism (N) and low Conscientiousness (C) -- only subjects with the more active MAOA-uVNTR alleles. White high CSF 5HIAA has been viewed as an index of high CNS serotonin turnover, our findings that high 5HIAA is associated with an adverse biobehavioral profile -- high N/low C plus high glucose, insulin and HOMA -- only in subjects with more active MAOA-uVNTR alleles suggests that persons with a genotype associated with increased MAOA activity, high CSF 5HIAA levels may reflect decreased functional serotonin in the CNS, due to increased enzymatic breakdown. Supported by NIH/NIH grant P01HL36587 Richard S. Surwit, Psychiatry, Cynthia M. Kuhn, Pharmacology, Michael J. Helms, Ilene C. Siegel, John C. Barefoot, Psychiatry, Allison Ashley-Koch, Medicine, Douglas A. Marchuk, Molecular Genetics, Duke University Medical Center, Durham, NC

**Individual Abstract Number: 1552**

EDUCATION LEVEL MODERATES THE HERITABILITY OF HYPERTENSION AMONG MALE VIETNAMESE-TWINS

Jeanne McCaffery, Centers for Behavioral and Preventive Medicine, Brown Medical School and The Miriam Hospital, Providence, RI; George D. Papandonatos, Brown Medical School, Providence, RI; Michael J. Lyons, Boston University; Raymond S. Niaura, Brown Medical School; Providence, RI

In twin studies, it has frequently been found that hypertension is highly heritable with little contribution of environmental factors that are common across twins (shared environment). Nonetheless, in epidemiological studies, hypertension is often associated with factors commonly thought to be environmental in origin, including socioeconomic status. In this study, we evaluate this apparent discrepancy by examining the effect of one indicator of socioeconomic status, education level, in the context of a twin design to evaluate both main effects on hypertension prevalence and interaction with genetic vulnerability to hypertension. Participants were 2208 monozygotic and 1756 dizygotic male-female Vietnam-era twins, mean age=41.07, who provided data on education (in years; mean=13.85, SD=2.04; range=6-20) and hypertensive status (Have you been told by a MD that you have hypertension? Prevalence=19%) in 1990. Consistent with prior results, education had a small main effect on the prevalence of hypertension (p = .05), such that lower levels of education were associated with a higher prevalence of hypertension. In addition, a significant moderation of total variance in hypertension by educational level was observed, driven by a significant moderation of genetic variance (p < .03). Specifically, heritability increased as a function of education level, ranging from approximately .45 among persons who did not complete high school to approximately .65 among those with a minimum of a college degree. Although limited by self-report of hypertensive status, these results indicate that heritability of hypertension can vary as a function of environmental factors, including education level, highlighting the importance of stratifying by socioeconomic status in molecular genetic studies of hypertension. Supported by HL-72819.

**Individual Abstract Number: 1576**

HERITABILITY OF HEART RATE VARIABILITY IN YOUNG WOMEN

Andrey Anokhin, Department of Psychiatry, Washington University School of Medicine, St. Louis, MO
Heart rate variability (HRV) is a predictor of morbidity and mortality. There is a growing body of research suggesting that women have greater HRV than men. To further explore this finding we examined heart rate variability in a population-based random sample of young adult female twins (age 18-29) using an EKG recording during rest. A total of 46 monozygotic (MZ) and 36 dizygotic (DZ) twins were included in the analysis (total participants = 164). The R-peaks were automatically detected and the timing of each peak was recorded. Automatic detection was followed by visual inspection. HRV analyses were performed on the interbeat interval time series and standard time and frequency domain measures were computed. Intrapair correlations with respect to the HRV indices were computed separately for MZ and DZ twins. For the main HRV indices of the vagal tone (log high frequency power, %BB50, and RMSSD), MZ correlations were substantial and highly significant (.57 - .63), whereas DZ correlations were modest and only one of them reached significance (.19-.30), suggesting that 50-60% of interindividual variance in HRV scores can be attributed to genetic factors. These results are the first from a population-based random sample and confirm previous results that have suggested a significant genetic contribution to individual differences in HRV. These findings may have implications for the understanding of the etiology and treatment of cardiovascular disease in women.

Individual Abstract Number: 1580
ENDOTHELIAL NITRIC OXIDE SYNTHASE AND ANGIOTENSION CONVERTING ENZYME I/D POLYMORPHISMS GENOTYPES AND RESTING HEART RATE VARIABILITY AMONG AFRICAN AMERICANS
Marcellus M. Merritt, Emotion & Quantitative Psychophysiology Section, National Institute on Aging, NIH, Baltimore, MD

Two candidate genes, Endothelial Nitric Oxide Synthase (eNOS) and Angiotensin Converting Enzyme (ACE) I/D Polymorphisms have been shown to be important in the regulation of vascular tone and blood pressure. Impaired eNOS and ACE functioning as well as reduced heart rate variability (HRV) have been associated with various cardiovascular disease (CVD) risk factors (e.g. atherosclerosis, diabetes). Although mixed, previous studies suggest that the GT (vs. GG) allele of the eNOS genotype and the DD (vs. DI or II) allele of the ACE genotype are related to reduced endothelial-mediated vasodilation. However, the roles of these particular genotypes on resting HRV have not been systematically examined in African-American populations, for whom genetic factors have been proposed as mechanisms for excess rates of CVD. As part of a larger study of older African-Americans, we examined the roles of eNOS and ACE on resting HRV. Participants were 79 African-Americans (37 males, 42 females; age 65±8) who are part of the Healthy Aging In Nationally Diverse Longitudinal Samples Study (HANDLS). Participants rested for five minutes while blood pressure (BP) and heart rate were obtained continuously using a Portapres beat-to-beat BP monitor. Measures of log-transformed high frequency HRV (HF-HRV) were computed to assess vagal response. The results show that increasing age (p < .002) and female gender (p < .06) were associated with higher HF-HRV scores. The DD genotype was associated with lower HF-HRV scores than the DI (p < .10) or II (p < .007) genotypes. The eNOS genotype did not significantly predict HF-HRV scores. These findings suggest that the DD allele of the ACE genotype may be a unique predictor of reduced vagal response among African-American adults. Future studies with larger samples may provide more information on genotype effects on HRV.

Symposium 1640
STRESS AND THE IMMUNE RESPONSE: THE SUPPRESSION PARADIGM REVISITED FROM LAB BENCH TO REAL LIFE
Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland, Firdaus S. Dhabhar, College of Dentistry & College of Medicine, Ohio State University, Columbus, OH

The bi-directional effects of stress on the immune system and the regenerative capacity of the organism have well been explored in animal experiments. The first paper revisits the stress-suppression paradigm. Evidence suggests that moderate stress exposure induces a large and long-lasting enhancement of skin cell-mediated immune reactivity. The second paper investigates cytokine secretion under mild to moderate acute psychosocial stress in humans. Data reveal a time delayed increase in plasma concentrations of interleukin-6 towards the end of the post-stress observation at t + 1.45 h. The third paper relates to withdrawal of the parasympathetic activity - a mechanism that has been implicated as a possible cause of immune modulation under moderate stress. The study involved 24-hour heart rate variability recordings from 613 individuals. The paper reveals an inverse relation between plasma levels of C-reactive protein and heart rate variability, supporting the existence of an anti-inflammatory cholinergic pathway. The fourth presentation reports on an inverse association between adverse psychosocial working conditions (effort-reward-imbalance) and the organisms capacity to repair endothelial lesions (endothelial progenitor cells), which is aggravated by adverse health behaviour (smoking). The last paper shows that subclasses of cytotoxic T-cells are differentially affected by biological risk factors, health behaviour and adverse psychosocial working conditions. In summary these data bridge the gap from human laboratory evidence suggesting immunomodulatory-enhancing effects of moderate stress to field conditions.

Individual Abstract Number: 1665
DELAYED RESPONSE AND LACK OF HABITUATION IN PLASMA INTERLEUKIN-6 TO ACUTE MENTAL STRESS IN MEN
Roland von Kanel, Division of Psychosomatic Medicine, Department of General Medicine, University Hospital, Brigitte M. Kudielka, Daniel Preckel, Dirk Hanebuth, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

Acute mental stress induces a significant increase in plasma interleukin (IL)-6 levels as a possible mechanism for how psychological stress might contribute to atherosclerosis. We investigated whether the IL-6 response would habituate in response to a repetitively applied mental stressor and whether cortisol reactivity would show a relationship with IL-6 reactivity. Study participants were 21 reasonably healthy men (mean age 46±7 years) who underwent the Trier Social Stress Test (combination of a 3-min preparation, 5-min speech, and 5-min mental arithmetic) three times with an interval of one week. Plasma IL-6 and free salivary cortisol were measured immediately before and after stress, and at 45 min and 105 min of recovery from stress. Cortisol samples were also obtained 15 and 30 min after stress. IL-6 significantly increased between rest and 45 min post-stress (p<.022) and between rest and 105 min post-stress (p<.001). Peak cortisol (p<.034) and systolic blood pressure (p<.008) responses to stress both habituated between weeks one and three. No adaptation occurred in diastolic blood pressure, heart rate and IL-6 responses.
to stress. The areas under the curve integrating the stress-induced changes in cortisol and IL-6 reactivity were negatively correlated at visit three (r = -0.54, p = 0.011), but not at visit one. The IL-6 response to acute mental stress occurs delayed and shows no adaptation to repeated moderate mental stress. The hypothalamus-pituitary-adrenal axis may attenuate stress reactivity of IL-6. The lack of habituation in IL-6 responses to daily stress could subject at-risk individuals to higher atherosclerotic morbidity and mortality.

**Individual Abstract Number: 1667**

**EVIDENCE FOR THE CHOLINERGIC ANTI-INFLAMMATORY PATHWAY IN HEALTHY HUMAN ADULTS**

Julian F. Thayer, Intramural Research Program, National Institute of Aging, Baltimore, MD, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

Inflammation has been implicated in a wide range of disease processes. One such marker of systemic inflammation, C-reactive protein, has been identified as an independent predictor of all cause mortality and morbidity in population based studies 1-3. Recent advances in the understanding of inflammation have suggested a prominent role for the autonomic nervous system in the regulation of inflammation. In humans, the analysis of heart rate variability (HRV) has suggested a prominent role for the autonomic nervous system in the regulation of inflammation. In humans, the analysis of heart rate variability (HRV) has proven to be a reliable, non-invasive method to index neural control of the heart. We report here for the first time, in a large sample of healthy human adults, evidence supporting the hypothesis regarding the cholinergic anti-inflammatory pathway. The study population comprised 613 apparently healthy employees of an airplane manufacturing plant in Southern Germany. The sample spanned the entire age of the workforce (18-63 years) and all levels of socioeconomic status (from the general manager to unskilled workers). The results showed that HRV was a significant predictor of CRP values. Importantly, HRV remained a significant independent predictor of CRP in multivariate models that included hypertension status, previous anti-inflammatory pathway, and are associated with impaired endothelial function. It remains unknown whether psychosocial risk factors and health behaviour affecting circulating EPC counts. This cross-sectional study enrolled a random sample of 548 predominantly male adult industrial employees (mean age 41.9 years). Cardiovascular risk factors (blood pressure, LDL, HDL, C-reactive protein), health behaviour (smoking, alcohol, physical exercise), adiposity, and fatigue (effort-reward imbalance) and psychological risk factors (depression, Type-D personality) were assessed by medical examination and by validated questionnaires. Circulating CD34+CD31+ progenitor cells were enumerated by flow cytometry and served as a proxy measure for true EPCs. Psychosocial risk factors, in particular violation of reciprocity as evidenced by effort-reward imbalance showed an independent association with progenitor cell counts after controlling for other risk factors. The association with risk factors increased with age. In subjects older than 42 years, the prediction model explained 27% of the variance in progenitor cell counts. A powerful interaction between smoking and effort-reward imbalance emerged. Participants who smoked 10 cigarettes or more per day and who reported effort-reward imbalance had odds of 8-2 (95% CI 1.3 - 50.5) on their cell counts being in the lowest quintile, as compared to non-smokers without effort-reward imbalance. Thus, in working men of advanced midlife (> 42 years), the simultaneous presence of adverse psychosocial working conditions and adverse health behaviour (smoking) is associated with impeded capacity to repair endothelial lesions.

**Individual Abstract Number: 1671**

**ACUTE MENTAL STRESS, ADVERSE WORKING CONDITIONS AND VITAL EXHAUSTION AFFECT CYTOTOXIC T-CELL SUBPOPULATIONS AFTER CONTROLLING FOR DEMOGRAPHIC AND BIOMEDICAL VARIABLES.**

Johannes C. Fischer, ITZ, University-Hospital, Duesseldorf, Germany, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

During primary infection, a significant number of effector-like virus-specific cytotoxic CD8+ T cells present an early differentiated phenotype (CD27+CD28-), with high ability to proliferate. As CD8+ T-cells mature to the late phenotype (CD27-CD28+) they lose their ability to proliferate and increase their cytotoxic potency. We investigated the relationship between CD8+ T-cell subpopulation counts and conditions of acute or chronic stress. In both studies lymphocytes were studied by 4-color Flow-cytometry. In the acute stress study, 21 reasonably healthy men (mean age 46±7 years) underwent the Trier Social Stress Test three times with an interval of one week. In the field study, we enrolled participants of the EADS-ETH Cohort Project (n=484, mean age =41.1 years, 88% males). Immediately after stress, counts of the intermediate and late phenotype (CD8+CD27+CD28+) decreased with recovery after 1.45 h. In the field study, we regressed the CD8+ T-lymphocyte subclasses against a model comprising a) demographic variables b) the Framingham cardiovascular risk index c) health behavior (smoking, exercise, alcohol intake sleep) and d) work related characteristics (exhaustion, effort-reward imbalance, job demands, social support). Older subjects had fewer cells of the early phenotype (DR2=-1.46, DF(4,479)=-22.8, p=0.001). Summarizing the observed associations, early cytotoxic T cells were related to health behavior and biological factors but only marginally to psychosocial factors. Intermediate cytotoxic T cells were related to health behavior, biological factors and psychosocial factors, while late cytotoxic T cells were associated with psychosocial factors in particular effort-reward imbalance but not with health behavior or biological factors. The data support the notion of a stress-modulatory effect on cytotoxic T-cell subpopulations.

**Symposium 1137**

**TRAUMA, DEPRESSION, COPING AND BEHAVIORAL TREATMENT AFFECT HIV DISEASE COURSE**

Jane Leserman, Psychiatry, University of North Carolina at Chapel Hill, Chapel Hill, NC, Deidre B. Pereira, Clinical and Health Psychology, University of Florida, Gainesville, FL, Jane Leserman, Psychiatry, University of North Carolina at Chapel Hill, Chapel Hill, NC, Gail Ironson, Conall O'Cleirigh, Psychology, Univ. of Miami, Coral Gables, FL, Michael Antoni, Department of Psychology, University of Miami, Coral Gables, FL

Despite the availability of highly active antiretroviral therapies (HAART) for HIV, there is still great variation in HIV progression. Before the era of HAART, studies demonstrated a relationship of stress and depression with HIV disease change. Questions still remain. Do these psychoimmune relationships hold even in the era of HAART, and are they mediated by dysfunctional coping? Do trauma, stress and coping affect adherence to HIV medications, and ultimately HIV disease? And will cognitive behavioural therapies affect the course of HIV? This symposium will address these questions. In the first presentation, Dr. Ironson examines whether dispositional optimism predicts slower HIV disease progression in a diverse cohort followed for 2 years. Optimists have greater decreases in viral load and increases in CD4, partly due to less depression and avoidant coping. In studying the same cohort, Dr. O'Cleirigh finds that baseline depression predicts greater decline in viral cells and faster viral load; Cocaine use mediates the relationship between depression and viral load. The third presentation (Leserman) shows that lifetime trauma, recent stress, and dysfunctional coping (e.g., substance abuse, self-blame) are related to non-adherence of antiretroviral medications, and ultimately HIV disease course, among HIV-infected rural southerners. Finally, Dr. Pereira reports a randomized study of cognitive behavioral stress management (CBSM) for HIV positive women with human papillomavirus. CBSM subjects were more likely to be free or have regression of cervical dysplasia at 9-month follow-up compared to controls. Dr. Antoni will draw upon his vast experience conducting trials of CBSM in HIV to discuss the clinical implications of these studies.

**Individual Abstract Number: 1152**

**CUMULATIVE CARDIOVASCULAR RISK IS ASSOCIATED WITH REDUCED CIRCULATING ENDOTHELIAL PROGENITOR CELLS IN MIDDLE-AGED ADULTS**

Joachim E. Fischer, Brigitte M. Kudielka, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland, Julian F. Thayer, NIA, NIH, Baltimore, MD, Roland von Känel, Psychosomatic Medicine, University Hospital, Bern, Bern, Switzerland, Johannes C. Fischer, ITZ, University Hospital, Duesseldorf, Germany

Circulating endothelial progenitor cells (EPC) are crucial for maintaining vascular integrity. Low EPC counts are found in adults with a high cardiovascular risk index and are associated with impaired endothelial function. It remains unknown whether psychosocial risk factors and health behaviour affect circulating EPC counts. This cross-sectional study enrolled a random sample of 548 predominantly male adult industrial employees (mean age 41.9 years). Cardiovascular risk factors (blood pressure, LDL, HDL, C-reactive protein), health behaviour (smoking, alcohol, physical exercise), adiposity, and fatigue (effort-reward imbalance) and psychological risk factors (depression, Type-D personality) were assessed by medical examination and by validated questionnaires. Circulating CD34+CD31+ progenitor cells were enumerated by flow cytometry and served as a proxy measure for true EPCs. Psychosocial risk factors, in particular violation of reciprocity as evidenced by effort-reward imbalance showed an independent association with progenitor cell counts after controlling for other risk factors. The association with risk factors increased with age. In subjects older than 42 years, the prediction model explained 27% of the variance in progenitor cell counts. A powerful interaction between smoking and effort-reward imbalance emerged. Participants who smoked 10 cigarettes or more per day and who reported effort-reward imbalance had odds of 8-2 (95% CI 1.3 - 50.5) on their cell counts being in the lowest quintile, as compared to non-smokers without effort-reward imbalance. Thus, in working men of advanced midlife (> 42 years), the simultaneous presence of adverse psychosocial working conditions and adverse health behaviour (smoking) is associated with impeded capacity to repair endothelial lesions.
COGNITIVE BEHAVIORAL STRESS MANAGEMENT (CBSM) EFFECTS ON REGRESSION OF CERVICAL DYSPLASIA AMONG HIV+ WOMEN
Deidre Pereyra, Clinical & Health Psychology, U of FL, Gainesville, FL, Michael Antoni, Psychology, U of Miami, Coral Gables, FL, Mary Ann Fletcher, Medicine, U of Miami, Miami, FL, Mary Jo O’Sullivan, OB/GYN, U of Miami, Coral Gables, FL

Immunosuppressed HIV+ women with poorly controlled HIV viral load are at risk for Human Papillomavirus (HPV) induced cervical dysplasia, the precursor to cervical cancer. We previously reported high life stress increases odds of progressive/persistent cervical squamous intraepithelial lesions (SIL) in HIV+HPV+ women, possibly via effects on cellular immunity or health behaviors. CBSM has positive effects on emotional/physical well being in HIV and cancer. However, no research has examined CBSM effects on the health and well being of HIV+ individuals with a premalignancy, e.g., cervical dysplasia. We examined effects of a 10 wk CBMS intervention (n=12) vs a 1-day CBMS workshop (n=16) on cervical dysplasia among 28 HIV+HPV+ women (M age=30 yrs, SD=7 yrs) with recent low-grade SIL. Ss underwent a baseline psychosocial interview, blood draw, and colposcopic exam (Pap smear, cervical biopsy, and cervical swab to assess for HPV). These procedures were repeated 9 months post-baseline. Mean baseline CD4+CD3+ cell count was 433 cells/mm3 (SD=296 cells/mm3).13 Ss had a history of either a clinical AIDS dx or a CD4+CD3+ cell count<200 cells/mm3. At baseline, 23 Ss (16 CBMS, 13 control) had evidence of low-grade SIL by Pap or biopsy-proven mild dysplasia; 22 were positive for HPV DNA. At 9-month follow-up, 50% of CBMS Ss experienced dysplasia regression or remained free of dysplasia compared to 19% of control Ss. A multivariate logistic regression analysis adjusting for CD4+CD3+ cell count, HIV viral load, presence of oncogenic HPV DNA, and pack years of cigarette smoking demonstrated that CBSM Ss were more likely to experience dysplasia regression or remain free of dysplasia at 9-month follow-up than control Ss (OR: 10.77, 95% CI for OR: 2.90-41.11) controlling for CD4+CD3+ cell count, HIV viral load, presence of oncogenic HPV DNA, and pack years of cigarette smoking. These results highlight the potential benefits of CBMS in improving the health and well being of HIV+HPV+ women.

OPTIMISM PREDICTS SLOWER DISEASE PROGRESSION IN HIV THROUGH INCREASED PROACTIVE BEHAVIOR, DECREASED AVOIDANT COPING, AND LOWER DEPRESSION
Gail Ironson, Elizabeth Balbin, Richard Stuezele, Psychology, Univ. of Miami, Coral Gables, FL, Mary Ann Fletcher, Medicine, Univ. of Miami, Miami, FL, Jean-Phillippe Laurenceau, Conall O’Cleirigh, Neil Schneiderman, Psychology, Univ. of Miami, Coral Gables, FL

The issue of whether optimism may prospectively protect against disease progression is one that has generated much interest, with mixed results in the literature. The purpose of this study was to determine whether dispositional optimism (measured by the LOT) predicts slower disease progression in HIV. Two indicators of disease progression, CD4 counts and viral load were followed over two years (every six months) in a diverse group (men, women, Caucasian, African American, Hispanic) of 177 people with HIV in the mid-range of disease at entry to the study (CD4 between 150 and 500, no prior AIDS defining symptom). A statistical model (HLM, Bryk and Raudenbush, 2002) that allows for the control of time varying covariates (i.e. antiretroviral medication at every time point), and predicts to slope rather than a single point was used. Optimism predicted slower disease progression (less decrease in CD4 \( t = 7.10, p = .01 \) and less increase in log viral load \( t = -2.20, p = .03 \)) controlling for antiretroviral treatment, gender, race, education, and drug use. Optimists had higher proactive behavior (\( r = .36, p < .01 \)), less avoidant coping (\( r = .29, p < .01 \)), and less depression (\( r = -.66, p < .01 \)); these variables mediated the optimism-disease progression relationship. Thus, optimists may reap health benefits partly as a by-product of remaining engaged in life, and through protection against depression.

Individual Abstract Number: 1235
AN EXAMINATION OF DRUG/ALCOHOL USE AS A MECHANISM RELATING DEPRESSION TO HIV DISEASE PROGRESSION (CD4 AND HIV-1 VIRAL LOAD) OVER 2 YEARS IN A DIVERSE HIV+ SAMPLE
Conall O’Cleirigh, Gail Ironson, Psychology, Univ. of Miami, Coral Gables, FL, Mary Ann Fletcher, Medicine, Univ. of Miami, Miami, FL, Elizabeth Balbin, Neil Schneiderman, Psychology, Univ. of Miami, Coral Gables, FL

This study examined the role of drug and alcohol use as mediators of the relationship between depression and HIV disease progression over 2 years in a diverse, multi-ethnic HIV positive sample. HIV positive subjects (n = 177) in the mid-range of illness at study entry were followed longitudinally every 6 months for 2 years. The sample was 70% male, and 30.5% Caucasian, 36.2% African American and 28.2% Hispanic. The average age was 37.5 years with 80% completing high school. At each assessment participants underwent a blood draw, completed the Beck Depression Inventory and a questionnaire of drug and alcohol use, and reported their antiretroviral medication regimen. Linear rates of change for CD4 cell number and log HIV-1 viral load over 2 years were analyzed using Hierarchical Linear Modeling. A priori, covariates controlled for included time since entry to the study, prescribed treatment (antiretrovirals as a time dependent covariate) and demographic variables. There was a significant linear decrease in CD4 over time (t (171) = -2.791, p = .006), and a significant increase in viral load (t (171) = 1.984; p = .047), controlling for other significant covariates. Baseline measures of depression predicted a significantly faster rate of CD4 decline (t (171) = -2.456, p = .014) and significantly faster viral load increase over 2 years (t (171) = 3.010, p = .003). Depression was significantly related to both tobacco use (r = .19, p = .013) and to cocaine use (r = .37, p < .001). Cocaine use significantly predicted faster increase in log Viral Load (t (171) = 3.498, p = .001), and mediated the relationship between depression and viral load change. These results underscore the importance of identifying depression in people with HIV and providing effective treatments for depression and related drug use issues.

Individual Abstract Number: 1233
THE ROLE OF TRAUMA, STRESS AND COPING IN ADHERENCE TO HIV MEDICATIONS
Jane Leserman, Psychiatry, Univ. of North Carolina at Chapel Hill, Chapel Hill, NC, Nathan M. Thielman, Medicine, Kathryn Whetten, Public Policy, Community & Family Medicine, Duke University, Durham, NC, Marvin Swartz, Psychiatry, Duke University, Michael Mougavero, Medicine, Duke University, Durham, NC

Despite simplified medication regimens, adherence to HIV therapies continues to be problematic; non-adherence leads to drug resistance and disease progression. The current study examines how lifetime trauma, recent stressful events and coping strategies are related to non-adherence of antiretroviral medications among HIV-infected men and women in the rural south. We collected data from 8 rural HIV clinics in 5 southern states obtaining a consecutive sample of 474 patients taking at least one antiretroviral medication. Reporting skipped doses of HIV medications within the previous 3 months was coded as non-adherent. We examined number (0-11) of lifetime traumas (e.g, abuse, neglect), number (0-5) of recent severe stressful events, and coping strategies (COPE). Using stepwise logistic regression to predict non-adherence, variables were tested in this order: 1) controls (demographic, sexual identity, medication schedule, poor county clinic), 2) number of traumas, 3) number of recent stresses, and 4) coping. In our sample, 55.1% reported non-adherence. Trauma was associated with greater risk of non-adherence (OR=1.14, CI=1.05-1.24, p=.002). For each 4-point increase in trauma, the risk of non-adherence was increased by 68%. Having more recent stressful events was related to non-adherence (OR=1.28, CI=1.06-1.54, p=.01). Non-adherence was also related to coping by using drugs or alcohol (OR=1.83, CI=1.35-2.46, p=.0001), by blaming oneself (OR=1.27, CI=1.03-1.58, p=.03), and by less emotional support coping (OR=.84, CI=.70-1.00, p=.05). These relationships were unchanged when controlling for lowest CD4 count or highest viral load in the previous year. Trauma was also related to higher average logged viral load in the subsequent year, even controlling for adherence (STB=.13, p=.02). Trauma, recent stress and dysfunctional coping may affect poor adherence to medication therapy and ultimately impact HIV disease.

Individual Abstract Number: 1180
THE RELATIONSHIP BETWEEN DEPRESSION AND HIV DISEASE PROGRESSION: AN EXAMINATION OF DRUG/ALCOHOL USE AS A MECHANISM
Conall O’Cleirigh, Gail Ironson, Psychology, Univ. of Miami, Coral Gables, FL, Mary Ann Fletcher, Medicine, Univ. of Miami, Miami, FL, Elizabeth Balbin, Neil Schneiderman, Psychology, Univ. of Miami, Coral Gables, FL

This study examined the role of drug and alcohol use as mediators of the relationship between depression and HIV disease progression over 2 years in a diverse, multi-ethnic HIV positive sample. HIV positive subjects (n = 177) in the mid-range of illness at study entry were followed longitudinally every 6 months for 2 years. The sample was 70% male, and 30.5% Caucasian, 36.2% African American and 28.2% Hispanic. The average age was 37.5 years with 80% completing high school. At each assessment participants underwent a blood draw, completed the Beck Depression Inventory and a questionnaire of drug and alcohol use, and reported their antiretroviral medication regimen. Linear rates of change for CD4 cell number and log HIV-1 viral load over 2 years were analyzed using Hierarchical Linear Modeling. A priori, covariates controlled for included time since entry to the study, prescribed treatment (antiretrovirals as a time dependent covariate) and demographic variables. There was a significant linear decrease in CD4 over time (t (171) = -2.791, p = .006), and a significant increase in viral load (t (171) = 1.984; p = .047), controlling for other significant covariates. Baseline measures of depression predicted a significantly faster rate of CD4 decline (t (171) = -2.456, p = .014) and significantly faster viral load increase over 2 years (t (171) = 3.010, p = .003). Depression was significantly related to both tobacco use (r = .19, p = .013) and to cocaine use (r = .37, p < .001). Cocaine use significantly predicted faster increase in log Viral Load (t (171) = 3.498, p = .001), and mediated the relationship between depression and viral load change. These results underscore the importance of identifying depression in people with HIV and providing effective treatments for depression and related drug use issues.
Symposium 1165

ALTERNATIVE TREATMENTS FOR TARGETING DEPRESSION, STRESS AND CARDIOVASCULAR RISK FACTORS

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Depression is a cardiovascular risk factor in search of effective interventions to reduce its negative impact on cardiac outcomes. Although antidepressants and psychotherapy are obvious candidates for event trials, these treatments are not without limitations. There is a paucity of trial data documenting that antidepressants or psychotherapy have favourable impacts on the presumed mechanisms linking depression and cardiac outcomes, such as heart rate variability, inflammation, endothelial function or platelet activation. In contrast, there is research data documenting the cardiovascular benefits of omega-3 free fatty acids and various forms of exercise, and promising preliminary clinical studies showing that these types of treatments are effective, and well-tolerated. Two other alternative interventions, self-regulated vaginal control of heart rate and Tai Chi Chih, may have very positive effects on immune regulation and possibly on autonomic control, and also be of potential cardiac benefit. None of these treatments are overtly psychological in nature, and thus may be acceptable for even the least psychologically minded patients. This symposium will review the scientific rationale and emerging clinical data for evaluating omega-3 supplementation, exercise, regulation of vaginal activity and Tai Chi Chih as candidates of choice for reducing the negative impact of depression in patients with coronary artery disease.

Individual Abstract Number: 1248

EFFECTS OF A BEHAVIORAL INTERVENTION, TAI CHI CHIH, ON ELEVATED PLASMA LEVELS OF INTERLEUKIN-6 IN OLDER ADULTS

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Background: Aging is accompanied by an increased expression of proinflammatory markers, which is thought to influence the onset and course of a wide spectrum of age-associated diseases including cardiovascular disease. In this study, we tested whether circulating levels of IL-6 are influenced by a relaxation-response based intervention in older adults. Specifically, we asked whether elderly with elevated levels of IL-6 would show declines in cytokine levels after the practice of Tai Chi Chih (TCC). Methods: Sixty-nine men and women (age > 60 years) were randomly assigned to a 16 week program of TCC instruction (n=38) or health education (HE; n=31). Blood samples were taken in the morning at baseline, week 8, and postintervention for assay of plasma levels of IL-6. The cutoff, IL-6 > 3.0 pg/ml, identified elderly with elevated IL-6 levels. Analyses were performed using an intent to treat approach in a mixed-model ANOVA with four groups: TCC - high IL-6; TCC - low IL-6; HE-high IL-6; HE-low IL-6. Results: IL-6 was found to change differentially across the four groups (group x time interaction: F=2.2; p<0.05). In older adults with high levels of IL-6, planned comparisons revealed a significant decline from baseline to postintervention in the TCC group (F=8.2; p<0.01), but not in the HE group (F = 0.9, p = 0.34) with similar findings at week 8. In the TCC-high IL-6 group, the average absolute decline of IL-6 was 1.5 pg/ml. Conclusions: Administration of TCC was associated with declines of IL-6 in older adults who had elevated levels of this proinflammatory cytokine. Such declines of IL-6 might have salutary effects on cardiovascular disease risk in aging. Supported in part by grants A13239, DA16541, MH55253, AG18367, T32-MH19925, AR/AG18467, AR 49840-01, M01-RR00865, General Clinical Research Centers Program, and the Cousins Center for Psychoneuroimmunology.

Individual Abstract Number: 1337

EFFECTS OF OMEGA-3 FATTY ACIDS ON CARDIOVASCULAR DISEASE MECHANISMS AND A PUTATIVE MODEL LINKING DEFICIENT DIETARY OMEGA-3 FATTY ACID INTAKE TO HEART DISEASE AND DEPRESSION

Matthew F. Muldoon, Medicine, Stephen B. Manuck, Psychology, University of Pittsburgh School of Medicine, Pittsburgh, PA, Joseph R. Hibblen, Laboratory of Membrane Biochemistry and Biophysics, National Institute of Alcohol Abuse and Alcoholism, Jeffrey Yao, Psychiatry and Pharmaceutical Sciences, University of Pittsburgh School of Medicine, Pittsburgh, PA

It is now well established that deficient dietary consumption of fish oil and other sources of omega-3 polyunsaturated fatty acids (PUFAs) is a modifiable risk factor for coronary heart disease (CHD). Increasing fish oil intake can decrease CHD mortality, as well as have salutary effects on cardiac arrhythmias, serum lipids, heart rate variability, endothelial function, and hemostasis. Recent research also indicates that low dietary omega-3 PUFA intake is associated with several psychological characteristics -- depression and hostility -- that are themselves associated with heightened CHD risk. However, the biological mechanism(s) through which omega-3 PUFAs relate to CHD and psychological disorders remains poorly understood. PUFAs are the essential precursors of the eicosanoids, important mediators of inflammatory processes, and omega-3 fatty acid-derived eicosanoids are less pro-inflammatory than those produced from omega-6 fatty acids. Inflammation, in turn, is implicated in the pathogenesis of both CHD and psychological disorders, particularly depression. This presentation will review these findings and propose a path model in which the dual clinical effects of omega-3 PUFAs on cardiovascular as well as psychological health are mediated by reduction in chronic systemic inflammation.

Individual Abstract Number: 1435

EXERCISE AND DEPRESSION: MEETING STANDARDS TO ESTABLISH TREATMENT EFFICACY

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There are an increasing number of epidemiological and experimental studies demonstrating that physical activity is associated with reducing symptoms of depression. The purpose of this symposium is to briefly review the epidemiology of physical activity and depressive symptoms and to discuss recent randomized clinical trials of exercise as a treatment (alone or in combination with other antidepressants) of major depressive disorder (MDD). Special emphasis will be placed on issues of the dose-response relationship between exercise and depressive symptoms and on how response and remission rates compare with accepted pharmacological and psychotherapeutic treatments. Our recently conducted study, Depression Outcomes Study of Exercise (DOSE) will be highlighted. In this study, participants (n=80) between the ages of 20 to 45 years and diagnosed with mild to moderate Major Depressive Disorder (MDD) were randomized to 1 of 4 aerobic exercise treatment groups. Treatments varied by total energy expenditure (7.0 kcal/kg/week) or 17.5 kcal/kg/week) and by frequency (3 days/week or 5 days/week). The control group was an exercise placebo (3 days/week flexibility exercise). The main effect of energy expenditure in reducing the Hamilton Rating Scale for Depression (HRSD) at 12 weeks was significant. Adjusted HRSD scores at 12 weeks were reduced 47% from baseline for the 17.5 kcal/kg/week group compared with 30% for 7.0 kcal/kg/week and 29% for exercise placebo. There was no main effect for exercise frequency. The 17.5 kcal/kg/week dose is consistent with public health recommendations for physical activity. We will also discuss issues of adherence to exercise treatment. Hypothesized biological mechanisms will be outlined and directions for future research will be suggested. Supported in part by MH57031 and MH067692
Individual Abstract Number: 1446
A PILOT STUDY OF OMEGA-3 SUPPLEMENTS FOR DEPRESSION
Francois Lesperance, Psychiatry, University of Montreal, Montreal, QC, Canada, Nancy Frasure-Smith, Psychiatry, McGill University, Montreal, QC, Canada

A few small clinical trials suggest that omega-3 fatty acid (fish oil) supplements may be efficacious for the treatment of major depressive disorder. However, a double-blind, randomized trial is necessary to establish its efficacy. To guide the design of such a trial and assess its feasibility, we completed an open-label, 12-week study of 1000 mg of EPA per day in patients with depressive symptoms of sufficient severity, duration or impact on daily functioning to warrant treatment. Concurrent use of antidepressants was permitted. We recruited 63 unipolar patients from specialty clinics and advertisements (39 women). 64% met research criteria for major depression, 79% had SCL-Dep scores > 1.5, and 44% were taking antidepressants. By 8 weeks, only 6 patients stopped or reduced the supplement because of poor tolerance and side-effects. Overall, after 4 weeks of supplementation, 44% of the subjects did not report any significant side-effects. Only 24% reported a fishy taste, and 17% had loose stools. Thus, the tolerability of EPA was excellent. The pilot data also suggest that 8 weeks of treatment with 1000 mg per day of EPA may have a marked impact on depressive symptoms. Results were virtually identical at 8 and 12 weeks. Some 54% of the subjects (59% of those with baseline SCL-Dep > 1.5) experienced more than a 50% drop in their level of depressive symptoms. Overall, the mean score on the SCL-Dep scale declined from 2.00 to 0.97, a drop of about 1.6 times the standard deviation (SD). Improvement was significantly greater in those with baseline SCL-Dep scores > 1.5 (p<0.01). Their mean scores dropped from 2.23 to 1.00, a drop of about 2.7 times the SD. Changes in depression were similar for the patients receiving EPA as monotherapy and those receiving co-treatment with antidepressants (p=0.68), and for men and women (p=0.56). Although impressive, without a placebo-controlled condition, it is unclear how much of this impact could be attributed to the placebo effect. We hope to be able to undertake such a trial.

Individual Abstract Number: 1586
SELF-REGULATION OF VAGAL EFFERENT CONTROL OF HEART RATE AND THE POTENTIAL FOR BEHAVIORAL NEUROCARDIAC INTERVENTIONS TO AUGMENT THE ANTI-INFLAMMATORY REFLEX
Robert P. Nolan, Behavioural Cardiology Research Unit, University Health Network, Toronto, ON, Canada, Robert G. Maunder, Mount Sinai Hospital, Toronto, ON, Canada, Graham J. Reid, Univ. of Western Ontario, London, ON, Canada, Herbert Lau, St. Michael’s Hospital, Toronto, ON, Canada

This presentation addresses 2 questions: (1) Do clinical samples demonstrate a nascent ability to self-regulate vagal efferent control of heart rate (HR) following acute stress; and (2) Is there an association between vagal-HR recovery and the inflammatory response? We conducted 2 investigations where C-reactive protein was the primary index of inflammation, given its association with impaired coronary endothelial function and cardiac mortality. Vagal-HR control was assessed with the high frequency bandwidth from spectral analysis of RR variability. In the first study, 161 patients with Ulcerative Colitis completed a stress reactivity protocol. Following instruction, self-regulated vagal-HR recovery after stress exposure increased relative to the pre-stress baseline: F(5,779) = 7.8, p<.001. In a hierarchical linear regression, vagal-HR recovery was independently and inversely associated with CRP after controlling for age, gender, BMI, smoking, medication, and disease severity: Adj.R^2 = .326%, Std. Beta = -.19, p = .02. Similar findings regarding self-regulation of vagal-HR recovery were observed in 68 CHD patients: F(2,132) = 3.8, p < .05. Vagal-HR recovery was again associated with CRP after controlling for age, gender, BMI, and smoking: Std. Beta = -.27, p < .05. In both studies CRP was associated with depressed mood. These data indicate a nascent ability to enhance vagal efferent control of HR following acute stress, and also that behavioral priming of vagal-HR modulation is independently and inversely associated with a prognostic index of the inflammatory response. Clinical implications will be discussed in view of recent research on the cholinergic anti-inflammatory reflex, and the development of HR variability biofeedback as a behavioral neurocardiac intervention.
PSYCHOLOGICAL DISTRESS AND HIV DISEASE PROGRESSION: ROLE OF NATURAL KILLER CELL IMMUNITY
Jeffrey Greason, Maria Llabre, Nancy Klimas, Peter Lawrence, Alex Gonzalez, Pedro Martin, Neil Schneiderman, Barry Hurwitz, Behavioral Medicine Research Center, University of Miami, Miami, FL

This study examined natural killer (NK) cell immunity as a potential mechanism through which psychological distress may increase vulnerability to accelerated HIV disease progression. Structural equation modeling was used to analyze cross-sectional data from 134 HIV+ adults residing in South Florida (mean age = 41±7 yrs; 67% men). Psychological distress was operationalized as a latent predictor variable, defined by the shared variance among a conceptually related set of self-report instruments (Perceived Stress Scale, Beck Depression Inventory, and Impact of Events Scale). HIV progression was specified as a latent outcome variable, defined by the shared variance among two diagnostic indicators of HIV infection (HIV-1 plasma viral load and CD4+ helper T-cell count). NK cell number (CD3-CD56+) and NK cell cytotoxicity (NKCC) were included as hypothesized mediators of the anticipated positive relationship between psychological distress and HIV disease progression. Statistical models controlled for potentially confounding effects of age, sex, and adherence to antiretroviral medication. Greater psychological distress was directly associated with more advanced HIV progression (beta = -.30, p<.05). Distress also predicted fewer NK cells (beta = -.17, p<.05), which in turn related to more progressed disease (beta = -.20, p<.05). In addition, increased distress was associated with a decrement in NKCC as a function of diminished NK cell number. NKCC did not, however, mediate the path from NK cell count to HIV disease progression. The overall model produced a good fit (Chi² (27) = 34.06, p = .16; CFI = .96; RMSEA = .17, p<.05). Importantly, individual differences in systolic pressure, fibrinogen and interleukin-6 stress responses, independently of previous ambulatory blood pressure, acute blood pressure stress responses, age, gender, body mass and smoking.

Conclusion: Given the important roles of interleukin-6 and fibrinogen in hypertensive pathophysiology, these results indicate that psychological stress could promote hypertension through stimulating these inflammatory proteins.

Abstract 1684
THE EFFECT OF PRE-TRANSPLANT DISTRESS ON IMMUNE RECONSTITUTION AMONG ADULT HEMATOPOIETIC CELL TRANSPLANTATION PATIENTS
Bonnie A. McGregor, Public Health Sciences Division, Shelby L. Langer, Karen L. Syrjala, Clinical Research Division, Fred Hutchinson Cancer Research Center, Seattle, WA

Myeloablative hematopoietic cell transplantation (HCT) is a common treatment for many hematological malignancies. Delayed or dysfunctional immune reconstitution following HCT is a major impediment to recovery with patients being most vulnerable during the first month after transplant. HCT is quite stressful for the patient and their family. Because primary immune organs such as the bone marrow are innervated by noradrenergic nerve fibers, and innervation of the bone marrow has been linked developmentally to hematopoiesis, it makes sense that stress might play a role in immune reconstitution after HCT. However, PNI studies are difficult with this population because most patients have an allogeneic HCT and receive immunosuppressive therapy as prophylaxis for graft versus host disease (GVHD) early in their treatment. To test the effect of distress on immune reconstitution after HCT, we examined the effect of pre-transplant distress on white blood cell (WBC) counts among 71 adult autologous HCT patients during the first 3 weeks after their transplant. Autologous HCT patients receive their own hematopoietic cells after myeloablative treatment so are not at risk for GVHD. The participants were on average 38 years old, 93% were Caucasian, and 55% were male. Pre-transplant distress was measured 2-14 days before admission using the Cancer and Treatment Distress (CTXD) scale, and the anxiety and depression subscales of the Symptom Checklist-90-R (SCL). WBC count was measured on days 5 through 21, the point by which most patients have initial immune recovery. Repeated measures ANCOVA controlling for medical prognosis, revealed a significant interaction between pre-transplant CTXD score and WBC count on days 5, 9, 13, 17, and 21, F(2,53) = 9.6, p = .01. Similar results were found for SCL Depression score (F(2,64) = 10.4, p = .001), and SCL-90 Anxiety score (F(2,64) = 1.9, p < .05). Although greater depression predicted slower immune recovery, either too high OR too low distress predicted slower recovery. In conclusion, stress modulates immune recovery during HCT and appropriate levels of stress may be more protective than either too much or too little stress.
Abstract 1570

ACTIVATION OF THE COMPLEMENT CASCADE BY ACUTE PSYCHOLOGICAL STRESS IS NOT POTENTIATED BY THE PRESENCE OF AN INDWELLING CATHETER
Victoria E. Burns, Christopher Ring, Kate M. Edwards, Sportex, Mark Drayson, Immunology, Douglas Carroll, Sportex, University of Birmingham, Birmingham, UK

Psychological stress has been implicated in the exacerbation of many inflammatory disorders characterised by activation of the complement cascade. Complement constitutes a major antimicrobial defense system, but in these disorders is misdirected at self, leading to tissue damage. Our previous findings that complement is activated by acute laboratory stress suggest a potential mechanism for stress-induced disease exacerbation. Given evidence that the complement cascade can be activated in vivo by biomaterials, such as catheters, the current study examined whether psychological stress and intravenous catheterisation interact synergistically to activate complement more than observed with either stress and venepuncture, or catheterisation alone. Healthy adults (10 men, 10 women) attended 2 counterbalanced sessions (stress, control). C3a was assessed as a marker of complement activation after 20 min of rest and after an 8 min task. The stress task was time-pressured, socially evaluated, mental arithmetic and the control task was quiet relaxation. Ten participants gave blood via an indwelling venepuncture and ten gave blood by repeated venepuncture. ANOVA revealed a significant session (stress, control) by period (rest, task) interaction for c3a (F(1,18)=10.59, p<0.004); c3a increased significantly from rest to task in the stress session and did not change significantly in the control session. There were no main or interaction effects for blood collection method. The results support our previous findings that the complement cascade is activated following acute psychological stress. They also indicate that neither catheterisation nor venepuncture alone activated complement, and importantly, that complement activation by stress was not moderated by the blood collection method. It is possible, however, that stress may interact with more potent activators of complement or with more prolonged exposure to activators of complement. As the diseased tissues of those with inflammatory disorders constitute such a potent and prolonged activator, clinical studies are required to compare the effect of stress on complement cascade activation in patients and healthy controls.

THE IMPACT OF DEPRESSION: MECHANISMS AND OUTCOMES

Abstract 1585

DEPRESSION SYMPTOMS PREDICT MORE RAPID PROGRESSION OF CAROTID ATHEROSCLEROSIS
Jesse C. Stewart, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA, Denise L. Janicki, Psychology, University of Pittsburgh, Pittsburgh, PA, Matthew F. Muldoon, Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA, Kim Sutton-Tyrrell, Epidemiology, Thomas W. Kamarck, Psychology, University of Pittsburgh, Pittsburgh, PA

Few studies have simultaneously investigated the influence of depression, anxiety, and hostility on cardiovascular outcomes or evaluated their relative importance for predicting measures of early cardiovascular disease. We examined the associations between depression, anxiety, and hostility and 3-year progression of carotid intima-media thickness (IMT), a measure of subclinical atherosclerosis. Participants were 357 healthy, older adults (48% male, 84% white, mean age=60.5 years) involved in the Pittsburgh Healthy Heart Project, an ongoing prospective study. At baseline, participants completed the Beck Depression Inventory-II (BDI-II), Beck Anxiety Inventory (BAI), and Cook-Medley Hostility Scale (CMHS). Carotid IMT was evaluated using ultrasound at baseline and at 3-year follow-up. The average 3-year change in IMT was 0.09 mm. Regression analyses indicated that, after adjustment for significant covariates (baseline IMT, age, sex, and race), higher BDI-II scores at baseline were associated with greater 3-year increases in carotid IMT (p<0.01). The average change in IMT was 0.11 mm for participants in the highest quartile of BDI-II scores as compared to 0.06 mm for those in the lowest quartile. Scores on the BAI (p<0.38) and CMHS (p=0.59) were not related to 3-year changes in IMT. Analyses comparing the predictive utility of the two BDI-II subscales indicated that the somatic-vegetative subscale score (p=0.01), but not the cognitive-affective subscale score (p=0.26), was a significant predictor of 3-year change in IMT. The present findings suggest that depression symptoms, especially the somatic-vegetative symptoms, may play an important role in the early stages of atherosclerosis. This research was supported by NIH HL56346 and HL07560.

Abstract 1584

ATYPICAL DEPRESSION, BODY MASS, AND LEFT VENTRICULAR MASS: ANALYSIS OF DATA FROM CARDIA
Sari D. Schwartz, David S. Kranz, Willem J. Kop, Dept of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD

Depression is predictive of coronary artery disease (CAD) risk, but associations with left ventricular mass (LVM) are not well understood. We investigated possible relationships among subtypes of depression (typical vs. atypical), body mass, and LVM. It was hypothesized that only atypical depression (AD) would be related to LVM and that this relationship would be mediated by increased body mass that is associated with atypical depression. Longitudinal data from the CARDIA study (years 5 and 10) were used to investigate the proposed pathway (644 males, 789 females, year 5 mean age 30.08 ± 3.51). Depression subtype was determined from CES-D scores at year 5 identifying atypical depression specifier symptoms. 90 participants had AD, 94 had typical depression (TD), and 1094 were not depressed (ND; CES-D<16). Body mass index (BMI) was calculated at years 5 and 10 (kg/m2). M-mode echocardiography was used to ascertain LVM at years 5 and 10. Those with AD had greater BMI across both time points as compared to the ND group (p<0.001). There was a significant correlation between BMI and LVM at baseline (r=0.36, p<0.001) and 10 years later (r=0.38, p<0.001). After entering age and sex, AD significantly predicted LVM at Year 10 (p=0.006). Accounting for age and sex, AD significantly predicted LVM at Year 10 (p=0.021) compared to ND, whereas TD did not predict LVM at Year 10 (p>0.10). Mediation analyses revealed that neither AD nor TD compared to ND predicted LVM at Year 10 (p>0.10) when BMI was included in the model along with age and sex. Conclusion: These data demonstrate a relationship between depression and LVM in healthy young adults. This relationship is accounted for by the atypical depression subtype and is mediated by BMI. Depression subtypes and BMI may be important variables to examine in studies of depression and cardiovascular disease outcomes.

Abstract 1065

DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH INCREASED SYSTEMIC VASCULAR RESISTANCE TO STRESS
Scott C. Matthews, Richard A. Nelsen, Joel E. Dimsdale, Psychiatry, University of California San Diego, La Jolla, CA

Major depressive disorder (MDD) and depressive symptoms are associated with altered cardiovascular (CV) functioning and increased CV morbidity. However, the mechanism(s) underlying these associations remain incompletely understood. MDD is associated with altered autonomic nervous system (ANS) functioning. Depressive symptoms have been associated with increased baseline systemic vascular resistance (SVR). The purpose of the current study was to examine the relationship between depressive symptoms and CV reactivity to stress. Ninety-one healthy volunteers with varying degrees of depressive symptoms performed the mirror star tracing task while measures of impedance cardiography and ANS function were obtained. We hypothesized that depressive symptoms would be associated with decreased parasympathetic tone, and increased sympathetic tone and SVR during stress. Subjects completed the Center for Epidemiological Studies Depression Scale (CES-D) and were categorized into either the high (i.e. CES-D 16 or greater) or low depressive (i.e. CES-D < 16) symptoms group. The high and low depressive symptoms groups were not significantly different in age, gender, ethnicity, screening mean arterial pressure (MAP) (p>0.38, p>0.01). These results suggest a mechanism that may partially explain the increased CV morbidity associated with depressive symptoms. Future studies might profitably examine if treatment of depression alters the SVR response to stressors.
Abstract 1062

DEVELOPMENT OF DEPRESSIVE SYMPTOMS IN RESPONSE TO EXERCISE WITHDRAWAL
Ali A. Berlin, Willem J. Kop, Medical and Clinical Psychology, Patricia A. Deuster, Military and Emergency Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD

Transient periods of inactivity have been associated with depressive symptoms (DS), but most research is limited by cross-sectional designs. This study used controlled withdrawal of regular physical activity to determine the effect on DS. Regularly active participants (N=40; age 31±8; 55% female) were randomly assigned to either withdraw from or to continue their usual physical activity for two weeks. Participants visited the laboratory on three occasions: baseline, week 1, and week 2. Depression was assessed using the Beck Depression Inventory-II, examining cognitive-affective (CAS) and somatic (SS) symptoms. DS increased in the exercise withdrawal group compared to the control group (4.5±3.3 vs. 1.7±2.6; p<0.01). Regression analysis revealed that SS at week 1 (but not CAS at week 1) predicted CAS at week 2 (R² change=0.09; p<0.05) after adjustment for group condition, baseline SS, and baseline CAS (see Table). Thus, SS occur first after exercise withdrawal, followed by CAS. This new information may be of value in determining individuals at risk for developing depressive episodes in response to a lack of exercise caused by injury, professional requirements, or recovery from medical procedures.

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Abstract 1269

DOES HISTORY OF DEPRESSION AFFECT YOUR WAISTLINE?
E. Goldbacher, Psychology, K. Matthews, Psychiatry, University of Pittsburgh, Pgh, PA, J. Bromberger, Epidemiology, University of Pittsburgh, Pittsburgh, PA

There is substantial evidence for a role of depression in the pathogenesis of CHD and Type 2 diabetes, but little is known about potential pathways. Although central adiposity has been identified as a possible link between depression and disease, only one study has examined its relationship with depressive illness. Our objective was to examine the association between lifetime history of depression and central adiposity over time in a sample of middle-aged women. Participants consisted of 270 women (31% Black) from the Pittsburgh cohort of The Study of Women's Health Across the Nation, a study of the menopausal transition. General linear modeling repeated measures ANOVAs, controlling for age and education, were used to evaluate the association between lifetime history of depression, measured at baseline by the SCID, and central adiposity measured by waist circumference (WC) across baseline and five annual visits. Results showed significant main effects of race F (1, 264) = 23.47, p < .001 and depression F (1, 264) = 9.37, p < .01 on WC across time, and a significant race by depression interaction F (1, 263) = 11.64, p < .01. Analyses stratified by race showed an effect of depression history in Blacks only F (1, 80) = 14.39, p < .001. Similarly, analyses of WC across follow-up visits only, controlling for baseline WC, showed a main effect of depression, F (1, 263) = 5.75, p < .05 and a trend for an effect in Blacks but not Whites. Results were independent of baseline BMI. Analyses also showed an association between depression history and BMI across time, but it was not independent of baseline WC. This study is the first to demonstrate that a lifetime history of depressive illness is associated with elevated central adiposity across time in middle-aged Black women. Black women may be vulnerable to the physiological sequelae of depression over time. SWAN was funded by the National Institute on Aging, the National Institute of Nursing Research, and the NIH Office of Research on Women's Health.

Abstract 1422

EFFECTS OF ENHANCED DEPRESSION CARE ON DIABETES SELF-MANAGEMENT: A RANDOMIZED-CONTROLLED TRIAL
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Depression is associated with poor diabetes outcomes including hyperglycemia, complications, and less diabetes self-care activities. A randomized controlled trial assessed whether enhancing depression treatment would improve diabetes self-management. A population-based study identified primary care patients with diabetes and co-existing depression, and randomized 329 patients. Intervention patients received enhanced depression care including pharmacotherapy, problem-solving therapy or a combination. Controls received usual care. Depressive symptoms (SCL-20), Summary of Diabetes Self care Activities, and self-efficacy for diabetes management were measured at baseline, 6 and 12 months. Automated pharmacy refill information provided medication adherence data. Mixed regression models compared intervention and control groups at baseline, 3, 6 and 12 months. The mean age was 58.4 years (SD = 11.8) and 65.2% were women. Enhanced depression care increased patient adherence to antidepressant medications in the first 6 months [OR = 4.15 (95% CI 2.28, 7.55)] and second 6-month period [OR = 2.90 (95% CI 1.69, 4.98)]. Compared to usual care controls, intervention patients had less depression severity over time (z = 2.84, p < .004). However, the intervention group did not experience better glycemic control (HbA1c). Enhanced depression care did not improve diabetes self-care behaviors such as healthy nutrition, exercise, checking blood glucose, adherence to oral hypoglycemic, lipid lowering and antihypertensive medications, or self-efficacy for managing diabetes. These results suggest that, in addition to depression treatment, better health outcomes are likely to require direct targeting of specific behaviors tailored to individual patient's role in diabetes management.

PSYCHONEUROIMMUNOLOGY: BIOBEHAVIORAL INFLUENCES ON INFLAMMATION
Abstract 1227

PERCEIVED STRESS PREDICTS INCREASED INFLAMMATION AND COAGULABILITY
Shamini Jain, Paul J. Mills, Roland von Kanel, Susan Hong, Joel E. Dimiduk, Psychiatry, University of California, San Diego, CA

Patients with major depression or high distress show elevations in inflammatory and procoagulant markers, which are in turn associated with atherosclerotic risk and disease progression. We investigated whether depressed mood, chronic hassles and uplifts, and perceived stress predict increases in proinflammatory markers D-Dimer, type-1 plasminogen activator inhibitor (PAI-1), and the proinflammatory cytokine interleukin-6 (IL-6) in healthy individuals. 105 African-American and Euro-American men & women (mean age = 40) were studied. Data were analyzed via hierarchical linear regression, with each inflammatory marker as the dependent variable and independent variables within blocks analyzed in stepwise fashion. Block 1 included ethnicity, age, BMI, smoking status, gender, hypertension diagnosis, and social class. Block 2 included the Center for Epidemiological Study of Depression (CESD), the four subscales of the Chronic Hassles and Uplifts Scale (CHUS), & the Cook-Medley Stress Questionnaire (CMS). Decreased uplifts intensity and increased hassles frequency predicted elevated D-Dimer levels, as did increasing age & female status. The total model (p < .0005) explained 31.6% of the variance in D-Dimer, with 7.8% explained by hassles & uplifts. Decreased uplifts intensity also predicted elevated IL-6 levels, as did increasing age, smoking, and being African-American. This model (p < .0005) explained 21.1% of the variance in IL-6, with 3.3% explained by uplifts. Finally, increased hassles severity and frequency, as well as increased CMS-rated stress, predicted increased levels of PAI-1, along with BMI. This model (p = .025) explained 48% of the variance in PAI-1, with 13.4% explained by hassles & stress. Depression ratings did not significantly predict levels of any dependent variable. These findings suggest that for even relatively healthy persons, increased perceptions of stress are associated with greater hypercoagulability and inflammation, independent of sociodemographic factors and ratings of depression.
MAJOR DEPRESSION, DEPRESSIVE SYMPTOMS AND INFLAMMATION
Viola Vaccarino, Medicine, Andrew H. Miller, Psychiatry, Jerome L. Abrahamson, Carisa A. Maisano, Olga Novik, Medicine, James D. Bremner, Psychiatry, Emory University, Atlanta, GA, Jack Goldberg, Vietnam Era Twin Registry, Seattle, WA

Depression is a risk factor for coronary heart disease (CHD) and chronic inflammation may be a mechanism, but few controlled studies are available in apparently healthy individuals. We examined 194 male twins aged 47 to 57 years, free of symptomatic CHD. Current depressive symptoms were measured with the Hamilton Depression Scale (HamD), and lifetime history of major depression (MD) with the Structured Clinical Interview for Psychiatry Disorders (SCID). Interleukin-6 (IL-6) was measured by ELISA. Data were log-transformed and expressed as geometric means. Mixed-effects regression was used to account for intra-pair correlations. There was a graded association between levels of depressive symptoms and IL-6, which persisted after adjusting for CHD risk factors (Table). In contrast, lifetime MD was not associated with IL-6.

No. of Subjects IL-6 (mg/L), adjusted P

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<th>HamD Score</th>
<th>0</th>
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<th>4-8</th>
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<td>HamD Score</td>
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<td>0.008 (trend)</td>
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HIGH JOB DEMANDS PREDICT CIRCULATING C-REACTIVE PROTEIN RESPONSES TO MENTAL STRESS
Mark Hamer, Raisa Vuononvirta, Andrew Steptoe, Psychobiology, University College London, London, London, UK

High job demand has been associated with an increased risk of coronary heart disease (CHD) in recent prospective cohort studies. The mechanisms may involve exaggerated biological responses to repeated acute stressors. The inflammatory marker C-reactive protein (CRP) is an established risk marker for CHD although presently the effect of acute mental stress on circulating CRP is undetermined. Repeated stress-induced increases in CRP may provide a link between high job demands and CHD risk. Thus the aim of the present study was to examine the relationship between job demand and circulating CRP response to mental stress. Sixty-seven healthy, non-smoking, males (mean age +/- SD: 32.4 +/- 8 yrs), in full-time employment were recruited. Work characteristics were measured through self-administered questionnaire that contained items derived from the central components of the job strain model. Following a baseline period, participants were required to complete a 3-min speech task followed by a 5-min mirror tracing task. Blood pressure (BP) was monitored continuously using a Finapres BP device. Blood samples were drawn from the antecubital fossa during baseline and immediately post-task for the assessment of CRP that was performed using a standard ELISA kit. CRP was significantly elevated by 8.6% following the stress period [t (1,60) = 3.67, p<0.01] and BP was significantly increased during both tasks [p<0.001]. Standard multiple regression analysis was employed to predict the CRP stress response from the variables job demand, BMI, systolic BP reactivity, and age. The model predicted 12.2% of the variance for the CRP stress response, that was mainly accounted for by job demand [b=0.28, p<0.05]. Neither job strain nor job control was associated with the CRP stress response and there was no association between baseline CRP and any work stress measures. Thus, in healthy men higher job demands predicted higher CRP responses to acute mental stress. These findings support a link between work stress and acute inflammatory responses.

SOCIAL-EVALUATIVE THREAT AND PROINFLAMMATORY CYTOKINE RESPONSES TO ACUTE STRESS: AN EXPERIMENTAL LABORATORY INVESTIGATION
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We have proposed that threats to the social self (i.e., social evaluation, rejection) can lead to increased proinflammatory cytokine production, and these changes may occur in concert with the emotion of shame. The goal of the study was to experimentally test if performance stressors characterized by social-evaluative threat, where the self could be negatively judged by others, provide one set of conditions that could elicit shame and proinflammatory cytokine activity. Thirty-nine healthy females were randomly assigned to deliver a speech and perform a math task in the presence or absence of an evaluative audience (SET or non-SET). Emotion was assessed pre- and post-task, and LPS-stimulated proinflammatory cytokine production (II-6, TNF) was assessed at baseline, immediately post-task, and after a 40-minute recovery. Consistent with hypotheses, those performing the tasks under social-evaluative threat showed greater increases in shame compared to those performing in the absence of SET (time x condition interaction, p<0.05). However, sadness, anger and fear were not as sensitive to the social context; the time x condition interaction was not significant for these emotions (p>0.10). The assays for the majority of participants (N=25) have been run to date. As hypothesized, TNF and II-6 production increased from pre- to post-task for those in the SET condition (p<0.05), and tended to remain elevated 40 minutes post-task (TFN, p<0.05). However, there were no increases in proinflammatory cytokine production for those in the non-SET condition (p>0.20). Taken together, these findings underscore the importance of social evaluation as a threat capable of eliciting proinflammatory cytokine activity, and these immunological changes may hinge on the experience of shame.

COCAIN INFUSION INDUCES A SUSTAINED SUPPRESSION OF MONOLOCYTE PROINFLAMMATORY CYTOKINE EXPRESSION
Michael R. Irwin, Tom Newton, Cousins Center for Psychoneuroimmunology, Psychiatry, UCLA Neuropsychiatric Institute, Los Angeles, CA, Anthony Butch, Department of Pathology, Gayle Baldwin, Department of Medicine, Hematology and Oncology, UCLA, Los Angeles, CA, Luis Olmos, Cousins Center for Psychoneuroimmunology, Psychiatry, UCLA Neuropsychiatric Institute, Los Angeles, CA

Cocaine is one of the most frequently abused substances in the United States, and its use is a significant risk factor for the spread of HIV-1 infection. However, few studies have examined the in vivo effects of cocaine on human immune responses. In this study, the effect of acute cocaine administration on the intracellular production of proinflammatory cytokines, interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF), was investigated. IL-6 and TNF play a critical role in regulating differentiation of B cells and activation of T cells. Subjects included 15 cocaine-dependent men (mean age 42.5 ± 6.2 years); all subjects were actively using cocaine and were not treatment seeking. Following three days of monitored abstinence, cocaine (40 mg) vs. placebo was administered in a randomized, double blind crossover design at 17:00 h on days 1 and 3 of the protocol. Repeated blood sampling was taken every 3 hours over 48 hours during each infusion condition. Stimulated intracellular production of IL-6 and TNF by monocytes was assayed by flow cytometry. For production of TNF, a 2 condition (cocaine, placebo) x 17 (time) repeated measures ANOVA showed a significant condition effect (F=31.5, p<0.001) and a condition x time interaction (F=2.4, p<0.01). Cocaine administration induced acute (within 30 minutes) and persistent (>15 hours) suppression of TNF expression by monocytes. Similar results were found for monocyte expression of IL-6 and monocyte co-expression of IL-6 and TNF. This is one of the first controlled human studies showing that in vivo cocaine has acute and protracted suppressive effects on immune responses. Given the central role that monocytes/macrophages play in regulating cytokines and cellular immune responses, these findings have implications for increased incidence of HIV-1 and other infections in association with cocaine dependence. Supported in part by grants AA13239, DA16541, T32-MH19925, GCRC M01-RR00865, and the Cousins Center for Psychoneuroimmunology.
PSYCHOLOGICAL WELL-BEING AND PRO-INFLAMMATORY FACTORS IN A SAMPLE OF AGING WOMEN

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Inflammatory factors are linked to a range of age-related disorders, including Rheumatoid Arthritis and Alzheimers Disease, and while negative affective states have been shown to influence markers of inflammation, such as interleukin-6, less is known about the relationship between these factors and positive well-being. This study assessed the impact of psychological well-being on the pro-inflammatory factors interleukin-6 (IL-6) and soluble IL-6 receptors (sIL-6R) in a sample of 135 aging women. We hypothesized that circulating levels of both factors would be lower in women with higher levels of well-being. Eudaimonic well-being was measured using 14-item scales of six dimensions of well-being (Ryff, 1989). Hedonic well-being was determined using 10 items from the Positive and Negative Affect Schedule (PANAS) and by 14 items from the short form of the Mood and Anxiety Symptom Questionnaire (MASQ). General health was assessed by self-report. Blood and urine samples were obtained from the participants during an overnight stay at the General Clinical Research Center on the University of Wisconsin-Madison campus. All participants were also given a physical examination. IL-6 and sIL-6R were determined by enzyme-linked immunosorbent assay (ELISA). As hypothesized, regression analyses showed that serum IL-6 was significantly negatively related to scores on the Personal Relationships Eudaimonic well-being scale and positively related to scores on the Loss of Interest MASQ scale ($P<0.01$); collectively, well-being measures accounted for $16\%$ of the variance in serum IL-6 (adjusted $R^2 = .163$, $P<0.001$). Similarly, sIL-6R was negatively correlated with scores on the Purpose in Life Eudaimonic well-being scale ($P=0.01$). These significant relationships remained after the inclusion of control variables - age, self-reported health, smoking, and alcohol consumption - in statistical models. These data show that measures of positive well-being are significantly related to circulating levels of specific pro-inflammatory factors in aging women and suggest potential mechanistic links between psychological well-being and health in later life.

Abstract 1375
IMPACT OF A BEHAVIORAL INTERVENTION ON INFLAMMATION IN CORONARY PATIENTS

Martijn Kwatraal, Medical Microbiology, Roh van Diest, Psychiatry, Ad Appels, Medical Psychology, Maastricht University, Maastricht, Limburg, The Netherlands

Purpose of the study: Atherosclerosis is an inflammatory disease. Therefore, we determined the impact of a behavioral intervention on inflammatory markers in exhausted percutaneous coronary intervention (PCI) patients. The immunological study was part of a randomized controlled trial (the EXhaustion Intervention Trial; EXIT) designed to test the hypothesis that a reduction of exhaustion in PCI patients by a behavioral intervention reduces the risk of new coronary events. In EXIT, a beneficial effect was observed of the behavioral intervention on the risk of "late cardiac events" in PCI patients ($P<0.01$). These significant relationships remained after the inclusion of control variables - age, self-reported health, smoking, and alcohol consumption - in statistical models. These data show that measures of positive well-being are significantly related to circulating levels of specific pro-inflammatory factors in aging women and suggest potential mechanistic links between psychological well-being and health in later life.

SUBSTANCE ABUSE: EPIDEMIOLOGY AND INTERVENTION

Abstract 1151
ASSOCIATIONS AMONG MARKERS OF SOCIO-ECONOMIC STATUS AND SUBSTANCE USE BEHAVIORS IN ADOLESCENTS

Margaret Hanson, Edith Chen, Psychology, University of British Columbia, Vancouver, BC, Canada

Physical health varies widely between people of different socio-economic groups. Past research has demonstrated that detrimental health behaviors such as substance use are more prevalent in low socio-economic status (SES) adults, but associations among adolescents are less well-understood. In addition, the role of different types of SES measures in health behaviors is not known. Associations may be stronger with SES measures of financial resources (e.g., income) or with measures of prestige (e.g., occupational status), and each type of SES measure would suggest different pathways to health. The aim of this study was to understand the types of SES markers that are associated with substance use in teens. 112 participants (mean age 17) from a public school in the Midwest reported on their cigarette, alcohol, and drug use. Parents provided information on family income, savings, occupation, and education. A composite SES variable of family prestige was computed by combining parental occupational and education. A composite SES variable of financial resources was computed by combining family income and savings. Logistic regression analyses indicated that teens with greater financial resources and higher family prestige were more likely to have tried substances than low SES teens ($OR=1.86$, $p<.05$; $OR=1.04$, $p<.05$ respectively). In bivariate correlations, greater financial resources and higher family prestige were both related to more substance use in teens ($r=0.20$, $p<0.05$; $r=-0.23$, $p<0.05$ respectively). Simultaneous linear regression analyses revealed that financial resources were a stronger predictor of teen substance use than family prestige ($ß=0.37$, $p<0.01$; $ß=-0.22$, $p>0.25$). Results from this study reveal that high SES teens engage in more substance use than lower SES teens. Financial markers of SES were more strongly associated with substance use than family prestige scores, indicating that one important pathway to teen substance use may be the resources available to teenagers.

Abstract 1049
INTELLIGENCE IN RELATION TO LATER BEVERAGE PREFERENCES AND ALCOHOL INTAKE

Laust H. Mortensen, Center for Alcohol Research, National Institute of Public Health, Copenhagen, Denmark, Thorkild I. Sorensen, Danish Epidemiology Science Centre, Copenhagen University Hospital, Copenhagen, Denmark, Morten Gronbaek, Center for Alcohol Research, National Institute of Public Health, Copenhagen, Denmark

The health effects of drinking may be related to personality characteristics influencing both health and drinking habits. The objective of this study was to examine the relationship between intelligence, later beverage preference and alcohol intake. This study is a prospective cohort study of 900 obese men and a random population sample of 899 of young men, who underwent intelligence testing at the draft board examinations in 1956-1977 in Sjælland, Denmark and was followed up in 1981-83 and 1992-94 with regards to intake of beer, wine, spirits, income, vocational education, and smoking habits. The main outcome measures were percentage of wine of total alcohol intake (wine pet), preference for wine (wine pet >50), heavy drinking (>21 drinks per week), and non-drinking (<1 drink per week). The results show a strong dose response-like relationship was found between intelligence quotient (IQ) in young adulthood, and beverage preferences later in life in both the obese and the random population sample. At the second follow-up a 30-point advantage in IQ (two standard deviations) was found to be associated with an odds ratio for preferring wine over beer and spirits of 2.8 (2.0 to 3.9). The association remained statistically significant when adjusted for socio-economic position (SEP). A 30-point advantage in IQ was found to be associated with an odds ratio for being non-drinker of 0.5 (0.3 to 0.8), but the association disappeared when controlling for SEP. IQ was not associated with heavy drinking. Irrespective of socio-economic position, high IQ was associated with preference for wine than for other beverages, but IQ was not similarly related to alcohol consumption as such.
CONTEMPLATING TO QUIT CURRENT SMOKING STATUS: DIFFERENCES IN BEHAVIOURAL AND PSYCHOSOCIAL PATTERNS OF IMMOTIVE AND ACTIVELY CONTEMPLATING SMOKERS

Karl H. Ludvig, Institute of Epidemiology, GSF Nat. Research Center for Environment and Health, Neuherberg, Germany; Jens J. Baumert, Hannelore Loewel, Heine E. Wichmann, Institute of Epidemiology, GSF Nat Research Center for Environment and Health, Neuherberg, Germany

Little is known about factors that initiate the decision to stop smoking. We aimed to identify smokers completely unwilling to change smoking habits with those who actually considered to quit and assessed the long term effect on subsequent smoking status and total mortality. Data were derived from three population-based MONICA/KORA Augsburg surveys covering 13,428 persons aged 25 to 74 years, randomly drawn between 1984 and 1995. The follow-up smoking status after an average of 7.6 years was available in 9276 (69.1%) participants. Current regular smokers were defined as active contemplators (AC) when they tried to stop smoking and to smoke less in the past year as well as planed to change smoking habits in the future. In case of denying all items, smokers were labeled as immotive (IS). Among 3,229 of current regular smokers in the study population, a subgroup of 18.3% (n=592) were AC while 22.5% (n=726) totally rejected any attempt to change smoking. No group differences were observed for sex, age, education, occupational status, somatic risk factors. However, AC were suffering significantly more often from anxiety, from premonitory signs of a disease and sleeping disturbance. They expressed an impaired self perception of health and suffered significantly more often from a depressed and exhausted mood. Cox regression revealed a hazard ratio of 1.44 (95% CI 0.98-2.12) for total mortality for the IC compared to the AC group. Logistic regression revealed that the relative risk (chance) of contemplators compared to immotives to stop smoking was 1.77 (95% CI 1.25-2.50). Perceived mood. Cox regression revealed a hazard ratio of 1.44 (95% CI 0.98-2.12) for smoking cessation.

Abstract 1512

BIOREGULATORY CONCOMITANTS OF EMOTION (DYS)REGULATION IN MUSCULOSKELETAL PAIN PATIENTS

Psychological, clinical, and physiological effects of home-based emotional disclosure in rheumatoid arthritis

Henriët van Middendorp, Rinie Gemen, Marjolijn J. Sorbi, Lorenz J. P. van Dooren, Health Psychology, Johannes W. J. Bijlsma, Rheumatology and Clinical Immunology, Utrecht University, Utrecht, The Netherlands

Emotional disclosure interventions have shown health benefits potentially mediated by physiological processes. We developed a home-based emotional disclosure intervention tailored to exercise components and the induction of cognitive restructuring. In a randomized controlled trial, 68 patients with rheumatoid arthritis (mean age 59.1, 44 female) performed 4 weekly talking exercises on an important emotional event (n=40) or a neutral topic (time management control; n=28). Perceived health (negative and positive affect, social and physical functioning, disease activity), clinical outcome (joint score, erythrocyte sedimentation rate), and physiology (24-h urinary cortisol, noradrenaline, adrenaline, dopamine; serum levels of the cytokines IL-6, TNF-α, IFN-γ, IL-8, IL-10) were assessed at baseline, 1 week after the intervention. Compliance and feasibility of the protocol were high, suggesting easy applicability in home-based settings. Analyses of emotional and cognitive word use, and immediate mood change implied that the intended emotional and cognitive processing was induced. There were large individual differences in emotional engagement and evaluation of the intervention. The control group showed an increase of cortisol at 1 week and IL-6 at 3 months, while the experimental group showed no changes (p=.01 and p=.04). IFN-γ decreased at 3 months in the experimental group, but not in the control group (p=.02). Physiological effects were not strong enough to affect clinical status. No beneficial effects on perceived health and clinical outcome were observed at 1 week and 3 months (all p-values>.10). Although our study indicates individual differences and some potentially relevant physiological concomitants of health effects, it does not offer support for widespread implementation of home-based emotional disclosure in rheumatoid arthritis.

Abstract 1373

POSITIVE AFFECT AS A BUFFER IN THE PAIN-NEGATIVE AFFECT RELATIONSHIP IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Chronic pain is reported as the most widespread, challenging symptom and as a potential stressor for patients with rheumatoid arthritis (RA). The association between pain and negative affect is well documented also for this group of patients. Positive affect are seen as key factors in the people’s experience of well being and may act as buffers against stress and negative affect. In this study we wanted to test the relationship between pain and negative affect (NA) and positive affect (PA) in a sample of patients with rheumatoid arthritis (RA) and we asked whether the stressful impact of chronic pain was lessened by the presence of positive emotions for patients with RA. Forty-three patients (30 women; mean age 57) included in a 10-years follow-up study, were interviewed by telephone once a week on negative affect, positive affect and pain during eight weeks. Multilevel modeling was applied using the SAS PROC MIXED software to study the within-week relationships among the variables. Positive and negative affect schedule (PANAS) was used measuring the patient’s weekly affect. The mean level of negative affect was 1.44 (SD=0.6) and 3.19 (SD=0.76) for positive affect on a scale from 1 to 5. Their weekly most intense pain level was 4.64 (SD=2.76) on an eleven point’s numerical rating scale from 0 to 10. We also controlled for depression (BDI) and perceived stress. Both weekly pain and weekly PA had a main effect upon weekly NA (t = 2.89, p<.01, t = -2.90, p<.01). There was also a pain x PA interaction effect on weekly NA (t=-3.12, p<.01) indicating a weaker relationship between pain and NA in weeks with more PA. PA seems to be most influential in reducing NA during weeks of higher pain indicating that patient’s experiences of high PA may help them perceive pain as less distressful than in weeks with less PA.
Fibromyalgia is a chronic pain condition that has remained enigmatic despite its widespread prevalence reaching 2%-6% in adults. Although now accepted as a valid disorder, the common pain and fatigue symptoms have defied attempts to ascribe biological causation. Two studies investigated whether in depth immune assessments would reveal an underlying dysfunction. The first study compared T cell subsets, natural killer cell activity, and cytokine release in 60 women with fibromyalgia (FM) to 48 age-matched healthy controls between 21-45 years of age. Pain symptoms were assessed on two occasions, and blood collected for immune assays. Leukocytes were activated in culture with 3 stimulants, and 6 cytokines measured. The a priori hypothesis of lower interleukin-2 activity was confirmed because cells from FM women produced significantly less IL-2 following stimulation with PHA, ConA, and LPS (p<.05). The value of determining the anti-nuclear antibody titer (ANA) was evaluated as a means of distinguishing between FM subgroups. A high ANA titer (>320) found in 1/3 of FM women was associated with fewer NK cells and lower lytic activity (p<.05), and with more pain and disability (p<.05). The second study used 3-color flow-cytometry to look for a more-sensitive enumeration of distinctive and activated cell subsets, including monocytes expressing chemokine and adhesion markers, in 20 new FM and 7 patients with neuropathic pain (NP). Women with FM were distinguished by more activated CD4+ lymphocytes and a higher percent of a unique NK/T cell population, whereas NP patients were notable for high numbers of CD16+ monocytes expressing chemokine and adhesion markers. These two studies indicate that pain may be as much a disease of the immune system in FM as it can be discerned only with the most recent methodologies. Employment of these techniques enables one to find immune markers that appear to be specifically associated with two different pain disorders and for some measures linked to symptom severity.

HEART RATE AND FACIAL EMG RESPONSES TO AFFECTIVE STIMULI IN WOMEN WITH FIBROMYALGIA AND OSTEOARTHRITIS
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Accruing data suggest that chronic pain patients with fibromyalgia (FM) show a diminished capacity to mobilize sources of positive affect that can neutralize their experiences of pain and stress. The current study was designed to examine whether heart rate (HR) and facial EMG responses to standardized affective stimuli show a similar pattern of deficits in positive affect among FM patients relative to pain patients with osteoarthritis (OA). A sample of 63 women aged 38 to 72 years (M=57), with FM or OA (n=32 FM) was recruited from the community to participate in laboratory testing. HR and facial EMG activity were recorded during exposure to 36 standardized slides of different affective valence (12 pleasant, 12 neutral, and 12 unpleasant). Each slide was viewed for 6 seconds, and change scores for EMG and HR were computed by subtracting the average value for the .5 sec just prior to slide onset from the average value for each .5 sec segment of the slide viewing period. Change scores for each .5 sec increment were then averaged across slides of each valence. Repeated measures ANCOVAs were conducted, with change scores for each .5 sec increment during slide viewing for EMG or HR changes as the dependent measures and level of activity for the .5 sec interval prior to slide onset serving as the covariate. Diagnostic groups (DX) were similar in facial EMG during exposure to positive and negative slides (Period X DX, Fs < 1, ps > .5), and in their HR responses to the unpleasant slides (Period X DX, F = 1.1, p = .44), with both groups exhibiting sustained deceleration. However, the groups did show differences in their HR responses to pleasant slides (Period X DX, F = 4.42, p < .04). The OA group showed an initial HR deceleration, followed by HR acceleration between 3 and 5 seconds into positive slide viewing. In contrast, the FM group continued to show HR deceleration throughout the positive slide viewing period, a pattern that was similar to the one evident during display of the unpleasant slides. These data suggest that FM and OA patients do not differ in their HR responses to aversive stimuli, but do seem to vary in their ability to orient to pleasant stimuli, with FM patients showing a deficit.

MONTHLY AND MOMENTARY POSITIVE AFFECT RELATES TO DEGREE OF CEREBRAL BLOOD FLOW ACTIVATION
J. Richard Jennings, Christopher M. Ryan, Psychology, Matthew F. Muldoon, Medicine, Carolyn C. Meltzer, Radiology, University of Pittsburgh, Pittsburgh, PA

Task engagement is both cognitive and affective. Both contribute to an enhancement of regional cerebral blood flow (rCBF), which is typically identified by a comparison between, e.g., working memory and a control task with similar stimuli and responses. Brain regions with rCBF responses correlating with performance level likely reflect cognitive contributions. We sought to identify affective aspects of task engagement by correlating rCBF responses to affective traits and states. Participants were 96 adults between 50 and 70 years of age. Positive and negative affect were assessed with the PANAS. On three separate days, participants rated affect over the last month, rated current affective state prior to, and after completion of, a four-hour neuropsychological battery, and underwent measurement of quantitative rCBF estimated from positron emission tomography images following 15O water infusions. PANAS ratings were correlated with 15O water estimates of rCBF changes, which were calculated as the differences between scans obtained during a control condition and during a spatial and a verbal 2-back working memory task. Regions of interest were sections of the prefrontal lobes, posterior parietal lobes, and the amygdala/hippocampus. Positive, but not negative, affect was negatively and consistently related to rCBF response in the amygdala/hippocampal and posterior parietal regions. High positive affect was related to task-induced decreases in amygdala/hippocampal rCBF and minimal increases in the control rCBF. The relationships remained after statistical control for age, hypertension, education, gender, overall cerebral blood flow, performance and race. Positive affect may generally be related to blunted blood flow responses in areas activated during task performance. These findings may be attributable to individual differences in effort expended, but warrant replication and further study.

DEGREE OF CEREBRAL BLOOD FLOW ACTIVATION
J. Richard Jennings, Christopher M. Ryan, Psychology, Matthew F. Muldoon, Medicine, Carolyn C. Meltzer, Radiology, University of Pittsburgh, Pittsburgh, PA

The present study used covariate analyses to examine the neural correlates of arousal during a grief-eliciting paradigm. We attempted to isolate areas of the demonstrated functional neural network that pertained to the arousal dimension of grief. Eight bereaved participants were shown picture-word composites in a 2x2 factorial design. The Person Factor contrasted photographs of participants' deceased loved one and a stranger. The Word Factor contrasted grief-related and neutral words. Respiratory sinus arrhythmia (RSA), skin conductance responses (SCR), and subjective grief ratings were entered as covariates. RSA correlated positively with fMRI BOLD activity in bilateral cuneus and parahippocampal gyrus (PHG), and correlated negatively with BOLD activity in posterior cingulate cortex (PCC). SCR correlated positively with BOLD activity in the pons, PCC and fusiform gyrus and self-reported grief correlated positively with BOLD activity in the right anterior insula. All clusters were significant at p<.05, corrected, and all Z scores were significant at p<0.001, uncorrected. This study provides evidence for a functional neural network for emotional arousal during the grief response, including areas that participate in generating emotional arousal, visual imagery, establishing a new meaning of familiar stimuli in a new context and the laying down of newly revised memories. As such, this study demonstrates the neural correlates of the dynamic process of grief at work in healthy individuals. Further imaging research may identify the patterns of neural activation that distinguish grief in resilient bereaved individuals, as in the present study, from those patterns that characterize bereaved individuals who develop clinical depression, anxiety, or complicated bereavement.
BRAIN-IMMUNE ASSOCIATION IN UNCONTROLLABLE STRESS: A PET STUDY
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Studies in psychoneuroimmunology have revealed that psychological acute stress can change autonomic and immune functions. To investigate such brain-immune associations in uncontrollable stress, we recorded simultaneously brain activity with 15O water positron emission tomography (PET), autonomic activity with heart rate (HR), blood pressure (BP), and immune activity by measuring proportions of subsets of lymphocytes (CD3+, T cell, CD3+CD4+ helper T cell, CD3+CD8 cytotoxic T cell, CD19+ B cell, and CD16+CD56+ natural killer (NK) cell) in peripheral blood during a mental arithmetic task under uncontrollable and controllable conditions. Eleven right-handed male undergraduates conducted the task for 2 minutes in 8 blocks; half controllable and the remaining half uncontrollable. Controllability of the task was manipulated by correct and bogus feedbacks about performance of the task. Significant activation in the orbitofrontal cortex (OFC) and in the medial prefrontal cortex (MPFC) was observed in a contrast of the uncontrollable minus the controllable conditions (p < .001, uncorrected). Most importantly, significant positive correlations between cerebral activity and the changes of HR, BP, and NK cell were found commonly in the right lateral OFC in the uncontrollable condition but not in the controllable condition (p < .001, uncorrected). These results are consistent with previous findings that the OFC evaluates contingency between stimulus, behavior, and reward/punishment. Considering anatomical evidence that the OFC has connections with the hypothalamus and the periaqueductal gray, the present study suggested that the OFC should be a pivotal area for top-down regulation by brain over autonomic and immune activities during acute stress especially when it is uncontrollable.

ROLE OF HISTAMINE IN BRAIN PROCESSING OF INTEROCEPTION
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Background: The brain forms emotion by integration of interoception signal. We previously described experimental evidence involving the release of neurotransmitter histamine in response to colonic distension. Purpose: We tested our hypothesis that histamine antagonist alters changes in regional cerebral blood flow (rCBF) and interoception induced by colonic distension in humans. Methods: Subjects were 20 healthy male and divided into placebo group (n=10) or histamine H2 antagonist group (n=10). Barostat bag was inserted to the descending colon with colonoscope. The intracolonic bag was intermittently inflated with no (0 mmHg), mild (20 mmHg), or intense (40 mmHg) inflation after the intravenous injection of either placebo or d-chlorpheniramine maleate (5 mg). Radioactive H2[15O] saline was injected at the bag inflation and positron emission tomography was performed. Changes in rCBF were interpreted using statistical parametric mapping. Interoception was assessed with graded (0-10) ordinate scale and plasma adrenergocorticotropic hormone (ACTH). Results: Histamine H2 antagonist significantly inhibited increase in rCBF during mild distension in the anterior cingulate cortex, insula, and thalamus compared with placebo (p < 0.0001). Histamine H2 antagonist significantly suppressed increase in rCBF during intense distension in the anterior cingulate cortex (p < 0.0001). Urgency for defecation in response to colonic distension was significantly attenuated by the administration of d-chlorpheniramine (ANOVA, stimuli x drug F=3.36, df=7, p = 0.0041). Distension-induced secretion of ACTH was significantly reduced by the administration of d-chlorpheniramine (drug 13.5 +/- 2.3 pg/ml vs placebo 25.5 +/- 4.6 pg/ml, p = 0.032). Conclusion: These data suggest functionally crucial role of brain histaminergic projection in interoception of humans.

VIScerAL DISCOMFORT IN IBS PATIENTS IS ASSOCIATED WITH ABNORMAl FUNCTIONAL CONNECTIVITY OF PERIAQUEDUCTAL GREY (PAG) WITH ANTERIOR CINGULATE (ACC) AND PREFrontAL (PFC) CORtICES
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IBS patients show altered responses to visceral stimuli, which may be related to altered response of the emotional motor system (EMS). The PAG (an EMS structure) processes nociceptive input, is modulated by ACC and PFC, and mediates responses to noxious stimuli. We contrasted IBS patients' and controls' (Ctrl) responses to visceral distension by examining covariation of PAG with ACC and PFC activity. 12 non-constipated, ROM+ IBS patients (10 M; age=39) and 12 Ctrl were studied using H2[15O]-PET. PET scans were taken during rest and rectal distension (45mm Hg, 60 sec). SPMM99 evaluated a priori regions of interest for response to rectal distention, and did a random effects assessment of covariation of PAG with dorsal ACC and PFC. Across all subjects visceral distension activated PAG (t=4.91, p=0.0005), PFC (t=3.13, p=0.003), and ACC (t=3.04, p=0.003). Ctrl showed stronger activation in the PAG in response to noxious visceral sensation. IBS patients more effectively use dorsal ACC to activate PAG when IBS patients may inhibit their antinoceptive brainstem centers. Greater PAG connectivity with RV PFC in Ctrl is consistent with disruption theory which posits right PFC subserve metacognitive functions that can inhibit pain. Supported in part by NIH grants P50 DK64539 (EAM), R24 AT002681 (EAM) and NR007768 (BN)

A-28
The dispositional tendency to experience negative emotions (trait negative affect) may underlie several correlated psychological risk factors for coronary heart disease (CHD), including depression, anxiety, and anger. Here, we examined the variance shared by these three psychological factors in predicting high frequency heart rate variability (HF-HRV; a putative marker of cardiac vagal control) in 658 community volunteers (ages 30-54, men 49.8%, white 84.2%). The Beck Depression Inventory, State-Trait Anxiety Inventory, and the State-Trait Anger Expression Inventory were administered to assess depression, trait anxiety, and trait anger, respectively. Spectral estimates of HF-HRV (respiratory frequency [Hz] \textsuperscript{1.0} \pm .015) were derived from a 5-min segment of continuous ECG recording. Principal components analysis of the psychological measures revealed a single factor of trait negative affect, accounting for 64.8% of total variance, on which all variables loaded >.660. The factor score was then used in hierarchical linear regression to test (1) whether trait negative affect was associated with HF-HRV, (2) whether this association persisted after controlling for covariates (sex, age, education, smoking, BMI, SBP, DBP), and (3) whether the predictor for trait negative affect and anger were independently associated with HF-HRV after controlling for their common variance. Results indicated that higher trait negative affect was associated with reduced HF-HRV (beta = -.112, p < .01); this association persisted after covariate-adjustment (beta = -.156, p < .001). Only trait anger (residualized for negative affect factor score) was independently associated with reduced HF-HRV (beta = -.183, p < .001). In conclusion, variance shared by psychological risk factors for CHD (trait negative affect) predicted reduced HF-HRV, and trait anger was independently associated with HF-HRV after adjustment for negative affect. These findings support speculation that negative emotions may increase CHD risk by reducing cardiac vagal control, as indexed by HF-HRV.

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Abstract 1275

STRESS-INDUCED BLOOD PRESSURE REACTIVITY AND COGNITIVE FUNCTION
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Stress-induced blood pressure (BP) responses (i.e., reactivity) and other indexes of autonomic dysregulation have been associated with increased carotid atherosclerosis, stroke, and silent cerebrovascular disease. Here we examined the relation of stress-induced BP reactivity to cognitive function in 94 healthy, stroke and dementia-free older adults (ages 54-79; 62% male; 90% White). BP was monitored at rest and during angry recall, speech/role play, and mental arithmetic tasks. Cognitive tests included: Digit Span, Logical Memory, Visual Reproductions, Trail Making A and B, Stroop Color-Word Test, Grooved Pegboard, Judgment of Line Orientation, and Block Design. Antihypertensive medications were withdrawn for two weeks prior to BP reactivity and cognitive testing. Systolic and diastolic BP reactivity were examined in separate multiple regression models. After statistical adjustment for age, education, state anxiety, fasting glucose levels, and resting systolic or diastolic BP (depending on the model), greater systolic BP reactivity was associated significantly with decreased performance on Logical Memory - Immediate Recall \( (r^2 = .08; p < .001) \), Logical Memory - Delayed Recall \( (r^2 = .06; p < .02) \), and Stroop interference scores \( (r^2 = .04; p < .05) \). Enhanced diastolic BP reactivity was similarly associated with significantly decreased performance on Logical Memory - Immediate Recall \( (r^2 = .06; p < .02) \), and Stroop interference scores \( (r^2 = .06; p < .02) \) and was marginally related to Logical Memory - Delayed Recall \( (r^2 = .03; p = .08) \). Independent of resting clinic BP and other potential confounders, systolic and diastolic BP reactivity was associated with diminished performance on tests of immediate and delayed verbal memory, and executive function (i.e., response inhibition) accounting for 3-8% of the variance in these measures. Enhanced stress-induced BP reactivity may be a biobehavioral risk factor for decreased cognitive performance.

Abstract 1450

TRAIT NEGATIVE AFFECT PREDICTS VARIATION IN CARDIAC AUTONOMIC FUNCTION
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Elevations of sustained blood pressure (BP) have been related to job strain. In this study, SBP and DBP were assessed at baseline and at one year. Subjects were unmedicated male or female workers in cohabiting relationships. Measures were SBP by Job Content Questionnaire, MC by Dyadic Adjustment Scale and 24 hr ABP. Independent variables were JS, MC and usual predictors at baseline and antihypertensive medication at follow up. There were 248 subjects (54.4% women) with mean age 50.8; 34% had 24 hr ABP over 130/80 mmHg. At one year, there were 201 subjects, 7% on antihypertensives. Both at baseline and at one year, in the main effects multiple regression analyses, controlling for usual predictors, JS (but not low MC) was positively associated with 24 hr systolic BP (SBP) \( (p = .023; p < .033) \). At baseline, JS was also associated with SBP and DBP during work and with 24 hr systolic BP (DBP). At one year JS was associated with SBP and DBP during spousal contact and during sleep \( (p < .05) \). Testing for an interaction between SBP, JS and marital cohesion at baseline, found that (high) marital cohesion moderated SBP during work hours, spousal contact and sleep, in those with JS \( (all \ p < .05) \). Testing for an interaction over time between SBP and JS and MC at baseline, found that (high)MC moderated the change of SBP over one year in those with JS \( (p = .008) \). Job strain had a robust effect to elevate ABP at baseline and at one year in female and male workers in cohabiting relationships. In this sample of normotensive and hypertensive subjects, marital cohesion was not directly related to ABP but did moderate the elevation of ABP associated with job strain.

Abstract 1163

MARITAL COHESION MODERATES THE ELEVATION OF AMBULATORY BLOOD PRESSURE DUE TO JOB STRAIN
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Strain in close relationships confers increased risk of cardiovascular disease (CVD), perhaps through the mechanism of cardiovascular reactivity (CVR) during stressful dyadic interactions. Prior research demonstrates that a) relationship conflicts evoke increases in blood pressure over resting levels, b) the magnitude of these changes is positively correlated with negativity during the interaction, and c) that these effects may be larger for women than men. However, because conflict and negativity are not manipulated experimentally in such studies, these findings are open to alternative interpretations. Speech artifacts and generally emotional rather than specifically negative discussions could contribute to CVR during conflict and related sex differences. To address this issue, we randomly assigned 55 married or cohabiting couples to a positive (discuss a very positive event), neutral (a mediocre movie), or negative (an on-going conflict or disagreement) structured interaction task equating speaking across tasks for both partners, and assessed SBP, DBP, and state anger changes during the interactions, as well as perceptions of partner behavior during the interaction. Compared to the neutral and negative tasks, the negative couple interaction evoked ratings of the partner as more hostile, F(2,52) = 9.3, p < .001, and larger increases in anger, F(2,52) = 4.6, p < .02, SBP, F(2,52) = 4.1, p < .03, and DBP, F(2,52) = 8.7, p < .001. Women displayed larger increases in SBP, F(1,52) = 4.4, p < .04, and DBP, F(1,52) = 7.2, p < .01, overall, and these sex differences tended to be largest in the negative interaction condition. Hence, stressful couple interactions evoke heightened CVR that cannot be explained by speech artifacts or generally emotionally charged discussions. Further, women are generally more reactive to interactions with close relationship partners, a difference that may be most apparent in negative interactions. These findings may help to explain the effects of relationship stress on CVD.
Depression and perceived social support (LPSS) are established risk factors for morbidity and mortality after myocardial infarction. Few studies have simultaneously investigated these factors in the same cohort. We hypothesized that: 1) depression and LPSS independently predict the combined endpoints of reinfarction and mortality, and 2) depression and LPSS interact such that patients with both are at higher risk than expected if the effects are simply additive. The sample consisted of 2,889 post-MI patients recruited for the Enhancing Recovery in Coronary Heart Disease (ENRICHD) trial or for an ENRICHD ancillary study. 978 patients had depression only, 647 had LPSS only, 856 had both, and 408 had neither condition. Measures included the DISH interview for depressive disorders, the Beck Depression Inventory (BDI), and the ENRICHD Social Support Instrument (ESSI). Cox regression was used to model the effects of depression and LPSS on time to reinfarction or all-cause mortality. All groups of depression and LPSS on time to reinfarction or all-cause mortality. All groups

Abstract 1401

ELECTRONIC EVENT MONITORING OF ADHERENCE TO ASPIRIN IN REMITTING VS. PERSISTENTLY DYSPHORIC POST-ACUTE CORONARY SYNDROME PATIENTS

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Low adherence to medication may be one of the mechanisms by which the presence of depressive symptoms increases the mortality risk in post-Acute Coronary Syndrome (ACS) patients. The mortality risk is highest for patients whose depressive symptoms persist over months after the ACS. We hypothesized that adherence to medication in persistently dysphoric post-ACS patients would be lower than in non-dysphoric patients and in patients whose depressive symptoms spontaneously remit. We recruited 24 non-dysphoric patients with a Beck Depression Inventory (BDI) score of 0-4, and 29 dysphoric patients with a BDI score >=10, assessed within a week after the ACS. BDI status was re-assessed after 3 months. We used electronic event monitoring [Medication Event Monitoring System (MEMS)] of patients' adherence to aspirin over the 3 month period. Upon hospital discharge, patients were provided with a 90-day supply of aspirin in a MEMS bottle that records the date and time whenever the bottle cap is opened. Data from the caps was collected 1 and 3 months after hospital discharge. After 3 months, 3 patient groups were formed: persistently dysphoric (BDI >=10 at baseline and 3mo; N=14), remitted dysphoric (BDI =0 at baseline and <10 at 3mo; N=15) and non-dysphoric (N=21; 3 newly dysphoric patients were omitted from the analyses). The three groups did not differ on age (p=0.36) or other sociodemographic variables. The mean percentage of correct number of dosage taken was significantly lower in the persistently dysphoric patients (M=66%, SD=28%) as compared to the remitters (M=84%, SD=24%) and the non-dysphorics (M=90%, SD=11%; Chi-Square [Kruskall-Wallis]=7.66; p=0.02). These data suggest that medication adherence may be a mechanism through which excess mortality risk is conveyed by persistent depressive symptoms in post-ACS patients.

Abstract 1669

DEPRESSION AND MEDICATION NON-ADHERENCE IN OUTPATIENTS WITH CORONARY HEART DISEASE: THE HEART AND SOUL STUDY

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Depression is associated with adverse outcomes among patients with coronary heart disease (CHD). Medication non-adherence may contribute to this association, but it is not known whether depression is associated with medication non-adherence in patients with CHD. To determine whether depression is associated with medication non-adherence, we performed a cross-sectional study of 1024 patients with stable CHD. Of these, 84 were excluded because they were not taking a cardiac medication (beta blocker, renin-angiotensin system inhibitor, aspirin, or statin), leaving 940 participants for the analysis. We assessed current major depression using the Diagnostic Interview Schedule, and asked participants, "Overall, in the past month, how often did you take your medications as the doctor prescribed?" We considered participants who responded "all of the time (100%)" or "nearly all of the time (90%)" to be adherent. Those who responded "most of the time (75%)", "about half the time (50%)", or "less than half the time (<50%)" were considered non-adherent. A total of 204 (22%) participants had major depression. Of these, 14% (28/204) were non-adherent, compared with 5% (46/916) of those without depression (p=0.034). The odds ratio (OR) for interaction = 0.0002). Depression was associated with non-adherence among the 590 participants who were taking beta blockers (OR 6.3, 95% CI, 2.9-13.7; p<0.0001), but not among the 344 participants who were not taking beta blockers (OR 0.6, 95% CI, 0.2-1.5; p=0.25). CONCLUSION: Depression is associated with medication non-adherence in outpatients with CHD. Medication non-adherence may contribute to the adverse cardiovascular outcomes associated with depression.

Abstract 1618

TELEPHONE-BASED STRESS MANAGEMENT FOR PATIENTS AWAITING LUNG TRANSPLANTATION: THE INSPIRE STUDY

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The INSPIRE Study was a dual-site, randomized clinical trial of stress management training (SMT) in 389 patients with pulmonary disease awaiting lung transplantation. Patients completed a battery of psychometric tests at baseline and after 12 weeks of treatment. During the course of treatment, 13 patients died, 44 were transplanted, and 4 became ineligible for transplant. Among the remaining 328 patients, 273 patients (85%) completed the full treatment protocol and post-treatment assessment battery, 27 (8%) completed treatment but not the post-treatment assessment due to illness or logistic difficulties, and 28 (9%) left treatment before it was complete. We conducted an intent-to-treat analysis using the 328 eligible patients who had survived and not been transplanted during the treatment period. Compared to patients receiving usual care (UC) (N=162), patients randomized to SMT (N=166) obtained lower scores on the Beck Depression Inventory (9.3 vs 10.5, p=0.031), lower (better) scores on the General Health Questionnaire (36 vs 40.2, p=.026), and higher (better) scores on the SF-36 Mental Health subscale (24.5 vs 23.5, p=.002). Patients with poorer pulmonary quality of life (PQoL) before entering the trial also exhibited larger improvements in PQoL after receiving SMT compared to similar patients in UC (p=.025). These findings suggest that SMT is a cost effective treatment that can be easily delivered by telephone to patients with end-stage lung disease.
GENDER SPECIFIC EFFECTS OF A TELEPHONE COUNSELING INTERVENTION FOLLOWING CARDIAC REHABILITATION
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A telephone-mediated secondary prevention program for patients suffering from coronary heart disease (CHD) was evaluated in a prospective, randomized multicenter-trial. 343 consecutive patients (18 % female, age M = 60, range: 32-87) following cardiac events were included. Main goals were the effective and lasting reduction of coronary risk factors (eg. smoking, sedentary life style, fat intake) as well as adherence to medical treatment. The program was conducted by specially trained nurses. Patients in the treatment group were contacted monthly by phone over one year. The control group received written information only (attention placebo). The nurses followed a manual including guidelines for coaching and behavior change. Primary outcome was the global coronary risk using the Framingham risk score. (FRAM). 297 patients (87 %) completed the follow-up examination. Results of the FRAM-Score after one year yield a non-significant trend for the intervention group (M = 5.96/6.5; p = .08, one tailed; SES = .19). Separate analyses for women and men reveal a statistically significant benefit for men (M = 5.3/6.2; p = .01, SES = .30), but not for women (M = 8.4/8.6; p = .45, SES = .06). Men in the treatment group were statistically more active as compared to the usual care group (p = .03, two tailed), but not so women (p = .16). On the other hand, anxiety had decreased significantly in women (p = .03, two tailed), but not in men (p = .14). No differences were yielded between the groups as far as smoking (p = .68), diet (p = .87), and medication (p = .81) are concerned. The main result of the study is that the program seems to work for men, but fails to do so for women. Null or even adverse results of long-term interventional cardiac events following cardiovascular events in women has been previously observed in other studies, too. As of yet we do not know the definite reasons for the observed gender differences. The failure) to increase physical exercises in women may play a role. The results are highly disturbing, though, and require further research.

IMPACT OF TRANSCENDENTAL MEDITATION ON VASCULAR FUNCTION IN AFRICAN AMERICAN ADOLESCENTS
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Diminished endothelium-dependent vasodilation to reactive hyperemia (EDAD) is indicative of endothelial dysfunction. In youth and adults, decreased EDAD of femoral or brachial arteries to reactive hyperemia has been associated with elevated resting blood pressure, smoking, hypercholesterolemia, cardiovascular disease (CVD) and essential hypertension (EH). African Americans (AAs) exhibit decreased EDAD of femoral or brachial arteries to reactive hyperemia has been observed in men and women. The current study was to determine the impact of TM on EDAD in AA adolescents with high normal BP. One hundred-eleven (57 TM; 75 male) AA adolescents (age 16.2±1.3 years) with high normal systolic BP, were randomly assigned to either 4-month TM or health education control (CTL) groups. Echocardiographically-derived measures of EDAD data were collected at pre-, post-intervention and 4-month follow up. Right brachial arteries were scanned in longitudinal section using a Hewlett-Packard 5500 with a 7.5 MHz ultrasound vascular transducer for 2 minutes following 4 minutes of arterial occlusion, induced by inflating a BP cuff to 200 mmHg. EDAD was calculated as the percent change from the baseline diameter to the maximum post-cuff release diameter. The TM group exhibited a significant increase in percent change in EDAD adjusted for pre-occlusion arterial diameter compared to the CTL group from pre-intervention to 4 month follow-up (+3.25% vs. -0.82%, p<.009). This finding indicates significant improvement in EDAD suggesting improved endothelial function in the TM group compared to CTL in AA adolescents at risk for EH. If this improvement is replicated among other at-risk groups and in cohorts of CVD patients, it will have important implications for inclusion of TM in the efforts to prevent and treat CVD and may impact favorably on CVD vascular and myocardial complications.

Fibromyalgia syndrome (FM) is a chronic, musculoskeletal pain disorder often not resolved by pharmacological treatment. A recent metaanalysis supports the use of nonpharmacological approaches in FM. Because FM is a mind/body disorder, integrative medicine approaches may be suitable, yet few studies have examined these. This controlled clinical study examined the effects of yoga on health status in FM. Adult patients (N = 29; 26 women, 3 men) at the Naval Medical Center in San Diego, who met ACR criteria for FM, volunteered for a gentle yoga intervention, and were alternately assigned to yoga or waiting list control conditions as an adjunct to their regular medical treatment. Participants attended 90-minute, instructor-led yoga sessions twice weekly for 8 weeks and practiced yoga at home using an instructional video. All participants completed reliable, valid measures of pain (VAS; PRI-R), fatigue (MAF), sleep quality (PSQI), disability (HAQ), anxiety (AIMS2 subscale), and depression (CES-D) at baseline and 4 and 8 weeks later. A treatment main effect was found for anxiety (F(2,52) = 4.12, p = .02), with a medium effect size of .38. On average, VAS ratings, used as a manipulation check, revealed significant improvement across sessions in participants' ability to perform the postures. An overall MANOVA on health outcomes yielded a significant group X time interaction, F(11, 41) = 2.24, p = .03, effect size of .38. Follow-up ANOVAs indicated greater improvement for yoga participants, relative to controls, in VAS pain, F (2,52) = 4.12, p = .02, PRI-R pain, F (2,52) = 7.54, p = .002, fatigue, F (2,54) = 4.97, p = .01, sleep quality, F (2,54) = 4.76, p = .01. Changes in pain from 1 to 4 weeks were associated with subsequent 4-8 week anxiety changes in the yoga group. Depression and disability were not differentially affected by yoga and may be more amenable to cognitive-behavioral approaches. This initial study strongly supports the efficacy of yoga as an adjunct to medical treatment in this population.
SOCIAL SUPPORT, DISTRESS AND NATURAL KILLER CELL ACTIVITY IN THE OVARIAN CANCER MICROENVIRONMENT

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Although psychosocial stress has been related to impaired immunity in cancer patients, the extent to which these relationships exist in lymphocytes in the tumor microenvironment in humans is not known. We examined relationships among distress, social support, and natural killer cell activity (NKCC) in lymphocytes isolated from 3 compartments (peripheral blood [PBL], ascites fluid, tumor infiltrating lymphocytes [TIL]) in patients with ovarian cancer. Patients awaiting surgery for a pelvic mass suspected for ovarian cancer completed psychological measures and gave a pre-surgical sample of peripheral blood. Samples of tumor and ascites were taken during surgery. Lymphocytes were isolated using a magnetic bead separation, and NK cell activity and percentage were determined. The final sample included 42 patients. Peripheral NKCC was significantly lower among ovarian cancer patients than in benign patients (p = .025). Among ovarian cancer patients, NKCC in TIL was significantly lower than that in PBL (p < .001) or in ascites (p = .019). Social support was related to higher NKCC in PBL (p = .024) and in TIL (p = .016), adjusting for stage. NKCC in TIL was positively associated with social support (p = .013) and negatively related to distress (p < .01). These findings demonstrate psychosocial-immune relationships in the tumor microenvironment and suggest that psychosocial factors may play a role in impaired host resistance to ovarian carcinoma.

MECHANISMS OF FATIGUE DURING RADIATION THERAPY FOR BREAST AND PROSTATE CANCER

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Fatigue is one of the most common side effects of cancer treatment, yet the mechanisms underlying cancer-related fatigue are unknown. The purpose of this study was to identify predictors of fatigue in breast and prostate cancer patients undergoing radiation therapy. Based on research showing that circulating proinflammatory cytokines can signal the brain to induce fatigue and other behavioral changes, we hypothesized that activation of proinflammatory cytokines would lead to increased fatigue during treatment. Study participants included 28 breast cancer patients and 20 prostate cancer patients who completed questionnaires and provided blood samples at 5 assessments conducted before and during radiation therapy. Hierarchical linear modeling was used to evaluate the association between predictor variables and fatigue. Consistent with hypotheses, results showed that fatigue was positively associated with cumulative levels of serum IL-1B (for breast: B = 0.19(0.09), ps < .05; for prostate: B = 0.51(0.18), p < .01) and IL-6 (for breast: B = 0.13(0.04), p < .01; for prostate: B = 0.18(0.06), p < .01). As cumulative levels of cytokines increased, number of days fatigued also increased in both patient groups. Fatigue was also positively associated with other sickness behaviors, including depressed mood and sleep disturbance (ps < .01); however, the association between fatigue and cytokines remained significant in multivariate models that included these predictors. Overall, results support the hypothesis that cancer-related fatigue is driven, at least in part, by activation of proinflammatory cytokines.

RISK FACTORS FOR NEUROPSYCHOLOGIC DEFICITS FOLLOWING HIGH DOSE CHEMOTHERAPY AND CRANIAL IRRADIATION

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Our aim was to define risk factors for deficits we have documented before high dose hematopoietic stem cell transplant (HSCT) and 3 and 12 months after HSCT. Adult (mean age = 41, SD = 9.3, range 22-61) allogeneic HSCT recipients with malignancies completed neuropsychological testing and medical histories along with self-reported depression, anxiety and transplant specific distress measures before HSCT. Repeat testing occurred for all surviving and available adults: n = 120 pretransplant, 90 at 3 months, 78 at 12 months. Scores for 6 neuropsychological tests were transformed to standardized T scores adjusted for age, gender, and education. Impairment was defined as scores one standard deviation below the normative score of 50. Logistic regression was used to identify risk factors for having two or more impaired tests. Pretransplant risk factors included: history of cranial irradiation or intrathecal chemotherapy (Odds Ratio [OR] = 3.60, Confidence Interval [CI] 1.12 to 11.59, P = .03) and elevated depression and anxiety score on the Symptom Checklist-90-R (OR = 2.14, CI 1.05 to 4.36, P = .04). Risk factors at 3 months were: total body irradiation (including cranial) as part of the treatment regimen (OR = 4.78, CI 1.49 to 15.33, P = .009), and distress (OR = 3.48, CI 1.02 to 11.81, P = .05). At 12 months, the only risk factor identified was impairment before transplant (OR = 4.78, CI 1.71 to 13.36, P = .003). However, on the Grooved Pegboard test of fine motor coordination, risk for impairment at 12 months was increased if survivors were on immune suppressant medications (OR = 2.76, CI 1.01 to 7.55, P = .05). Thus risk factors for neuropsychological deficits differed over time based on both type of treatment received and psychological status. Most patients recovered to pretransplant levels of function by one year, with an exception for coordination in those remaining on immune suppressant medication.

SOCIOABILITY IS RELATED TO EMOTIONAL-SUPPORT COPING, WELL-BEING, AND 24-HOUR URINARY FREE CORTISOL LEVELS IN MEN RECOVERING FROM TREATMENT FOR PROSTATE CANCER: A STRUCTURAL EQUATION MODELING ANALYSIS

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Prostate cancer (PCa) is the most prevalent (nonskin) cancer in men and standard treatments are associated with psychosocial and physical impairments. Past research has found that men who cope with PCa by focusing on self to the exclusion of others report worse quality of life, an effect mediated by reduced emotional expressiveness. Structural equation modeling was used to test a model predicting emotional well-being and the stress hormone cortisol from men’s specific beliefs about social interactions and use of emotional-support coping. Participants were 125 partnered men age 50 or older who underwent radical prostatectomy or external beam radiation in the last 18 months for localized PCa. Beliefs about social interactions were assessed with the Inventory of Interpersonal Problems, emotion-focused coping with the Brief Cope, Emotional Well-Being with the Functional Assessment of Cancer Therapy (FACT), and free cortisol levels from 24-hour urinary samples using radioimmunossay. Indicators of model fit (i.e., chi square, CFI> .95, RMSEA<.06) and path coefficients (all p < .05) indicate that among men recovering from treatment for prostate cancer, rating social interactions as threatening and difficult was related to poorer emotional well-being and higher levels of cortisol, an effect partially mediated by the use of emotional-support coping. Competing models, methodology, and treatment implications are considered.
ALEXITHYMY IN 3486 WOMEN TREATED FOR BREAST CANCER - ASSOCIATIONS WITH DISTRESS

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PURPOSE: To investigate the prevalence of alexithymia and its association with distress in women treated for breast cancer. METHODS: As a part of an ongoing nation-wide, population-based prospective study of psychosocial factors and prognosis of breast cancer, baseline data were analyzed for the 3486 women (median age 55; range: 26-70 yrs) included in the study (Response rate: 68%). At 12 weeks after surgery the women completed the Toronto Alexithymia Scale (TAS-20) and questionnaires measuring depressive symptoms (BDI-II), anxiety and intrusive thoughts about cancer (IES), social support (SSQT), and social constraint (SC). RESULTS: 229 women (6.6%) were classified as alexithymic (Score > 60), 291 (8.4%) had moderate to severe depression (p < 0.0001). Logistic regression showed alexithymia to be associated with depression (B: 1.8; p < 0.0001). More alexithymic women (4.6%) had moderate to severe depression (p < 0.0001). Similar results were found for avoidance (OR: 3.0) and intrusion, with 252 (7.3%) having high scores on both subscales. Alexithymic women had higher mean scores than non-alexithymic on all distress measures and social constraint, and lower scores on social support (p < 0.0001), with effect sizes (Cohen’s d) ranging from 0.54 (SC) to 0.81 (Avoidance). More alexithymic women (4.6%) had moderate to severe depression (p < 0.0001). Logistic regression showed alexithymia to be associated with depression (B: 1.8; p < 0.0001; OR: 6.3) when controlling for age, marital status, social constraint, and social support. Similar results were found for avoidance (OR: 3.0) and intrusive thoughts about cancer (OR: 3.3). CONCLUSIONS: Identifying and expressing emotions are important means of coping with stressful experiences such as cancer, and our results confirm that inhibited emotional processing may be associated with adverse psychological consequences of stressful experiences.

Abstract 1607

A RANDOMIZED TRIAL OF A TIBETAN YOGA INTERVENTION FOR BREAST CANCER PATIENTS

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A 7-week Tibetan yoga program was developed including controlled breathing, visualization/meditation, and postures from the Tibetan yoga practices of Tsung Lung and Trul khor. Fifty-eight women with stage I-III breast cancer were randomly assigned to either the Tibetan yoga group or a waitlist control group. Patients completed measures of intrusive thoughts and avoidance behaviors (Impact of Event Scale-IES), cancer-related symptoms (M. D. Anderson Symptom Inventory), mood, sleep disturbances, and quality of life at baseline, 1 week, and 1 and 3 months after the last yoga session. Forty-eight percent were undergoing active treatment. The two groups did not differ with respect to medical or demographic characteristics or the baseline dependent measures. Sixty-three percent said they found the yoga program useful or very useful, and over 70% said they practiced at least once a week. A mixed model analysis, controlling for the dependent variable at baseline, revealed a group by time effect with respect to IES total scores (p<.03). Descriptive statistics and a graphical display of the data indicated that the yoga group reported lower IES scores than the control group by the 3-month assessment (adjusted means: 17.12 vs. 20.14). A multivariate linear regression, controlling for baseline, revealed that the yoga group reported lower scores for cancer-related symptoms at the 1-week follow-up than the control group (change in means: -8.05 vs. 3.95, p=.04). There were no significant group differences in measures of mood, quality of life, or sleep disturbances. The results indicated that the Tibetan yoga program was feasible and well-liked and associated with a reduction in avoidance behaviors and intrusive thoughts as well as cancer-related symptoms. Improving coping mechanisms in managing cancer and treatment may prove useful in helping patients adjust to their disease and treatment. Integrating programs, such as Tibetan yoga, into the treatment trajectory may reduce cancer-related symptoms.

Abstract 1241

CORTISOL RHYTHM IN HEALTHY STUDENTS: POSITIVE BUT NOT NEGATIVE EMOTIONS MATTER

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Cortisol has a characteristic daily rhythm, peaking shortly after an individual wakes and then falling throughout the day. This rhythm has been shown to be disrupted by psychological stress and negative affect (NA) which may set the stage for pathogenic processes that predispose an individual to illness. There is, however, little evidence as to whether positive affect (PA) is associated with cortisol rhythm. The purpose of the current study was to examine whether trait PA is associated with differing daily cortisol levels, and whether these associations are independent of the influence of NA. Eighty-three healthy college freshmen underwent 13 days of ambulatory mood assessment as well as five concurrent days of cortisol evaluation on days 2-6. Cortisol was sampled at 1, 4, 9, and 11 hours after waking-up (20 assessment points). Affect was sampled at the same time points on each of the 13 days (52 total assessments) using a hand-held palm computer. Separate PA and NA trait scores were calculated by creating daily affect scores and averaging across all sampled days. Repeated measures ANOVA revealed that low levels of trait PA were associated with a dysregulation of the cortisol rhythm. Specifically, those with low levels of PA had elevated afternoon and evening cortisol levels as compared to those with high PA (F=2.3, p=.05). Trait NA, however, was not associated with cortisol levels nor with the slope of the cortisol rhythm (F=1.3, p=.28). Additionally, when NA was included as a covariate, PA remained significantly associated with cortisol levels (p=.05). These results indicate that healthy individuals with low levels of positive emotions have a dysregulated cortisol rhythm and that this effect is independent of negative affect. This suggests that future cortisol research should include PA assessment in addition to the widespread focus on NA and stress.

Abstract 1250

THE EFFECT OF STRESS AND ENDOGENOUS CORTISOL ON DISTINCT MEMORY PROCESSES

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Research suggests that stress and the subsequent rise in cortisol can affect neurocognitive function, particularly memory. Human studies have generally found a negative effect; however, these studies often manipulate cortisol levels prior to encoding, consolidation and retrieval, confounding these processes. The animal literature suggests that stress effects may be more nuanced, possibly enhancing consolidation but impairing retrieval. The purpose of the current study was to parse the effects of an acute psychosocial stressor on separate memory processes in humans by varying the timing of the stressor. 208 college students were randomly assigned to a no-stress control group (n=51) or one of three groups stressed at different times: prior to stimuli presentation (encoding+ consolidation, n=51), immediately after (consolidation, n=56), or just before memory testing 48 hours later (retrieval, n=50). Salivary cortisol was measured at baseline and 20 minutes after the stressor. Both verbal and visual memory was measured at the 48-hr delay using a computerized memory task. The WMS-III narrative. The group stressed prior to consolidation significantly outperformed controls on the film recognition test at delay for verbal and total scores (p<.05). This effect may have been related to cortisol response, as this was the only stress group to exhibit a significant increase in cortisol (40%) following the stressor. No significant differences in memory were found for the encoding or retrieval groups compared with controls. Within-group correlations between change in cortisol and memory were not significant, but exploratory analyses revealed a small but significant positive correlation for cortisol and verbal scores on the film recognition test across all groups (r=.18). Results support the hypothesis that stress enhances consolidation of new information, and provides the first evidence of this for verbal memory.
LIFE STRESS AND STRESS REACTIVITY ARE LINKED TO MARKERS OF CELL AGING


Links between chronic stress with risk for cardiovascular disease and poorer immune function have been well established. The exact mechanism remains elusive, and may be illuminated by examining cellular level markers of aging. We tested whether stress impacts the rate of cellular aging, by examining telomeric DNA length, telomerase activity (the enzyme that protects telomeres), and oxidative stress, known determinants of cell senescence and longevity, in peripheral blood mononuclear cells from 62 healthy premenopausal women, caregivers and controls. Blood was drawn in a fasting state during the follicular stage of menstrual cycle. Participants were then exposed to a modified Trier Social Stress Test to examine autonomic reactivity. Perceived life stress was significantly associated with lower telomerase, shorter telomere length, and greater oxidative stress. Women with the highest levels of perceived stress have telomeres shorter on average by the equivalent of at least one decade of additional aging compared to low stress women (Epel et al., 2004). Newer findings show that lower telomerase activity is significantly associated with smoking, poorer lipid profile, greater resting sympathetic arousal, fasting glucose, visceral adiposity, negative mood, and exaggerated autonomic reactivity (heart rate variability and pulse pressure) to laboratory stress. All reported findings have p's < .05, adjusted for age. These novel findings have implications for understanding how, at the cellular level, stress may promote earlier onset of age-related diseases. Epel et al, Accelerated telomere shortening in response to exposure to life stress. in press, PNAS 2004.

DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH BLUNTED CORTISOL STRESS RESPONSES IN VERY LOW-INCOME WOMEN.

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The purpose of this study was to examine the association between depressive symptoms and salivary cortisol responses to stress in a high-risk population of very poor Mexican women. Adult women (N = 1109) between the ages of 18 and 44 (mean age = 29) were identified in a house-to-house survey in low-income areas (income < 20th percentile nationally) of urban Mexico. An interview containing the Spanish version of The Center for Epidemiologic Studies - Depression Scale (CES-D) was administered to all women. The naturalistic stressor was defined as the unexpected arrival of a team of researchers at the participants' homes. Saliva samples were taken at 0 minutes (baseline), 25 minutes, and 50 minutes after arrival. The mean CES-D score was 19.42 (range: 0 to 53). Results of hierarchical linear modeling (HLM) analyses revealed no effect of depressive symptoms on baseline salivary cortisol levels. However, a significant depressive symptom by time interaction (p < .05) revealed that women with elevations in depressive symptoms (CES-D scores = 35) failed to exhibit a cortisol response to the stressor. In contrast, in women with lower CES-D scores, cortisol levels significantly increased in response to the stressor. Consistent with research on individuals with major depressive disorder, results of this study demonstrate that women with very high levels of depressive symptoms exhibit blunted cortisol responses to a naturalistic psychological stressor. Results also contribute to prior research by generalizing findings to a high risk, underserved population of women.
In this paper we describe the medium term impact (3 to 6 years) of the Mexican poverty-alleviation program (Oportunidades) on physical and mental health in a large sample of adults. Oportunidades is unique in that it combines a traditional cash transfer program with financial incentives for positive behavior in health, education, and nutrition. Specifically, cash transfers are disbursed conditional on the household engaging in a set of behaviors designed to improve health and nutrition. At the inception of the program, and with the purpose of conducting a rigorous evaluation, subsets of eligible communities in rural areas were randomly assigned to treatment and control groups. Adults (N = 2795 treatment, N = 1870 control) between the ages of 18 and 65 were identified in a house-to-house survey in low-income areas (income < 20th percentile nationally) of rural Mexico. An assessment was administered, which included the Spanish version of a depression scale (CES-D), and the Perceived Stress Scale. Participants were also weighed and measured, and blood pressure was obtained. We used multivariate regression and matching methods to control for observed differences in individual and community characteristics across the study groups that might confound and bias the estimated impacts. Our analyses indicate that the Oportunidades program significantly reduced the prevalence of obesity by 6.4% (p < 0.01) in the treatment areas, with a corresponding decrease in body mass index (BMI) (p < 0.05). The program decreased the prevalence of hypertension by 7.2 percent in the treatment groups (p < 0.01). Oportunidades also significantly decreased scores on the depression scale (p < 0.01) and also decreased perceived stress levels (p < 0.05) in the treatment groups. The program had no impact on the perception of social status. We are currently exploring the contributions of various individual, family and community characteristics to the outcome measures.

Abstract 1705

THE ACCULTURATION GRADIENT: ACCULTURATION IMPACTS THE RELATIONSHIP BETWEEN SES AND AMBULATORY BLOOD PRESSURE

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Purpose: In Western countries there is a social gradient in health with lower SES related to higher blood pressure (BP). Studies comparing Hispanic American immigrants with European Americans have found a reversed social gradient between the groups with the Hispanic American immigrants having lower SES and lower BP as compared to the European Americans. As Hispanic Americans acculturate to the United States and increase in SES, however, their BP tends to rise. It was hypothesized that there is an acculturation gradient for BP in Hispanic American immigrants, with increasing acculturation related to a shift in the social gradient, such that lower SES predicts lower BP in the low acculturation group, and lower SES predicts higher BP in the high acculturation group. Method: To test this hypothesis, a sample of 30 Hispanic American Immigrants (average age 32, 33% female) and 47 European Americans (average age 33, 37% female) was studied. Participants wore an Accutracker II ambulatory blood pressure monitor (SunTech, Cary, NC) for 24 hours and filled out questionnaires regarding demographics and acculturation (ARSMa-II). Results: Hispanic American immigrants (HA) reported less education (p < .05) and less income (p < .01) as compared to European Americans (EA). HA had lower waking SBP (p < .05) than EA. The interaction between ethnic group and level of education on BP was significant for both waking BP (F = 6.98, p < .05) and sleeping SBP (F = 8.18, p < .01). Specifically, it was found that as HA rose in education, so did their waking and sleeping SBP, whereas for EA, higher education was related to lower waking and sleeping SBP. Among HA, acculturation was positively related to waking SBP (r = .44, p < .01), and acculturation mediated the relationship between education and BP.

Conclusions: The social gradient appears to vary as a function of acculturation in Hispanic American immigrants, with a reversed gradient being seen in those less acculturated.

Endogenous catecholamines act on beta-2 adrenergic receptors (ADRB2) to mediate peripheral vasodilation. Alterations in the ADRB2 gene coding region have been associated with increased risk for essential hypertension (EH), though findings have been mixed. Thirteen common SNPs have been found to comprise 4 common ADRB2 haplotypes. The objective of this study was to determine the role of ADRB2 haplotype status on hemodynamics at rest and in response to behavioral stress. Study participants included 222 African American (AA) and 228 European American (EA) young adults (18.5±2.7 yrs). Based on the combination of 3 common ADRB2 polymorphisms (G65A, G66A, C79G), subjects were grouped into 4 ADRB2 haplotypes (Haplotype 1 [GGG], Haplotype 2 [GGC], Haplotype 3 [AAC], and Haplotype 4 [GAC]). Hemodynamic measurements (i.e., systolic/diastolic BP, total peripheral resistance) were completed at rest and during a 10 minute competitive video game challenge and a 1 minute cold pressor task. Reactivity was defined as change scores (peak stressor value minus pre-stressor value). A regression model was built that included terms for main effects of haplotype, sex, obesity (body mass index greater than 85th Sexile), and socioeconomic status (educational attainment) as well as two- and three-way interactions involving ADRB2 haplotype status. EA carriers of Haplotype 1 had higher resting SBP (p = .007) and DBP (p = .03). Significant interactions involving obesity and Haplotype 1 were observed in EA such that obese carriers of Haplotype 1 showed the greatest SBP and DBP reactivity (p = .04, .03) to the video game stressor. Among AAs, carriers of Haplotype 2 showed higher resting SBP (p = .01), while obese carriers of Haplotype 2 showed greater SBP reactivity to the cold pressor task (p = .04). These findings demonstrate the efficacy of haplotype analysis in ADRB2 gene association studies. Further work is needed to determine 1) the functionality of these haplotypes in relation to BP control and 2) how haplotype status may differentially act in the obese to mediate exaggerated hemodynamic reactivity to stress.

Abstract 1455

THE EFFECTS OF A WORKBOOK-JOURNAL IN REDUCING DEPRESSION AND POSTTRAUMATIC STRESS DISORDER IN RURAL/SOCIOECONOMICALLY ISOLATED WOMEN NEWLY DIAGNOSED WITH BREAST CANCER

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This study evaluated the effectiveness of a workbook-journal "One In Eight" in reducing depression and posttraumatic stress disorder (PTSD) symptoms in women newly diagnosed with primary breast cancer. We recruited 150 women with primary breast cancer from three medical facilities. The sample was predominantly comprised of women from groups that tend to be socially isolated and underserved, such as age 65 or older (32%), living over 20 miles from their health care facility (35%), and disabled with a hearing loss (17%) or other physical impairment (18%). Seventy-six women were randomized to receive One in Eight in addition to educational materials, and 74 women were randomized to receive the educational materials only. Each participant completed at baseline and 3- and 6-month follow-ups the Center for Epidemiologic Studies-Depression scale, and Posttraumatic Stress Disorder Checklist-Specific at baseline and at 3- and 6-month follow-ups. Women assigned to receive the workbook-journal, compared to those assigned to usual care, reported significantly greater reductions in depression (p < .05). Among women with greater PTSD symptoms at baseline, those who received One in Eight had greater decreases in PTSD symptoms at the three-month follow-up (p = .001). These results suggest that a low-technology, community-based intervention such as the workbook-journal "One in Eight" can significantly reduce depression and PTSD symptoms in women diagnosed with primary breast cancer.
Abstract 1626

ACCEPTANCE BY SOCIETY CORRELATES WITH IMMUNE AND ENDOCRINE MEASURES (CYTOTOXIC CD8 CELLS, NATURAL KILLER CELLS, AND CORTISOL) THAT PROTECT THE HEALTH OF NON-PROGRESSORS WITH HIV

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A comparison of 33 non-progressors with HIV (NPG; defined as persons who had been HIV positive for more than eight years and still had CD4 cell counts above 500 without the help of antiretroviral medications) were compared to 125 normal course (NC) people who were HIV positive and had progressed to lower CD4 counts between 150-500/mm3, but who had not yet had any serious AIDS symptoms. The NPG group was significantly higher than the NC group on two immune measures controlling for CD4 number, NK number [mean NPG = 670.2 (sd = 393.7) vs. mean NC = 390.7 (sd = 237.5); t = 3.95, p<.000], and CD8+ HLA-DR+: CD38− [mean NPG = 155.1 (sd = 147.6) vs. mean NC = 69.34 (sd = 105.4); t = 4.00, p<.001]. A larger number of CD8+CD38− cells in non-progressors is consistent with literature showing that CD8+CD38−+ cells are increased in individuals with faster disease progression. The NPG group was also significantly lower than the NC group on cortisol concentration measured by 15 hour samples [mean NC = 43.606 (sd = 40.81) vs. mean NPG = 21.89 (sd = 11.18); t = 3.69, p<.000].

Different aspects of acceptance (acceptance by partner, family, friends, coworkers, and society) were correlated with the two immune protective measures, and cortisol concentration within the NC sample. Of the five types of acceptance tested, only acceptance by society was significantly (and positively) correlated with the immune protective measures (r = .26 with CD8+CD38−HLADR+; r = .57 with NK number). Acceptance by society was also significantly (r = .57) correlated with low cortisol (r = -.22) as was acceptance by family (r = -.18) and acceptance by friends (r = -.19). Thus, specific aspects of acceptance relate to disease-relevant biological measures in non-progression with HIV as compared to a group of persons with progressive HIV disease. Societal tolerance for and acceptance of people with HIV may have an impact on their biological health.

Abstract 1437

COGNITIVE BEHAVIORAL STRESS MANAGEMENT (CBSM) EFFECTS ON SOCIAL SUPPORT & POSITIVE AFFECT AMONG HIV+ WOMEN AT RISK FOR CERVICAL CANCER

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HIV+ women often report inadequate social support availability and unsupportive social interactions with friends and family. Importantly, poor social support may be associated with distress, nonadherence to medical advice, poor immunity, and possibly poor health outcome. The present study examined effects of a 10-wk group-based CBSM intervention vs a 1-day CBSM workshop on (a)frequency of emotional support provided by partners and (b)frequency of feelings of affection among HIV + women at risk for cervical cancer. Ss had psychosocial assessments at study entry and were randomized to the 10-wk group (n=18) or 1-day workshop (n=16). Ss had repeat assessments 3- and 9-mos following study entry. The Sources of Social Support Survey and the Affects Balance Scale assessed emotional support and affection, respectively. Mean age was 30 yrs (SD=9 yrs). Mean yrs of education was 12(SD=1 yr); mean yearly income was $12,418(SD=$7,695). Repeated measures analysis of variance showed that CBSM Ss reported greater increases in frequency of emotional support received from partners, F(2,56)=3.84, p<.05, and greater increases in frequency of feelings of affection, F(2,32)=6.09, p<.01, than workshop (control) Ss across the follow-up period. Increases in emotional support from partners were significantly correlated with increases in affection, r=+.46, p<.05. We examined whether increases in emotional support mediated the relationship between CBSM condition and increases in affection. Using the methods outlined by Baron and Kenny(1986), mediation was not supported. These results suggest that CBSM interventions can independently improve indicators of both emotional and social well-being among HIV+ women at risk for cervical cancer. Future research will examine which components of our CBSM intervention (e.g., assertiveness/anger management training) may account for these improvements.

Abstract 1675

SOCIABILITY, INTERFERON-GAMMA, AND SIV DISEASE IN RHEUS MONKEYS

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Rhesus monkeys infected with simian immunodeficiency virus (SIV) develop AIDS similar to humans infected with HIV-1. A previous study of the influence of social stress on SIV disease in monkeys revealed substantial individual variation in disease progression. Using a prospective design, we examined whether variation in the personality dimension Sociability (high vs. low) in adult male rhesus macaque monkeys (N=36) was related to the production of IFN-gamma (a cytokine that is both stress-responsive and a marker of SIV/HIV disease progression) during SIV disease and social stress. Subjects were inoculated with either SIV (n=24) or saline (n=12), and socialized daily in stable (n=18) or unstable (i.e., stressful, n=18) social groups. Blood samples were obtained pre-inoculation, 5 weeks post-inoculation (p.i.), and every 4 weeks thereafter. Whole blood was incubated with either staphylococcal enterotoxin B (SEB) alone or SEB and dexamethasone for 24 hours, and supernatant was extracted for later assay. Concentrations of IFN-gamma were determined by ELISA for pre-inoculation, weeks 5 and 9 p.i. (Early Phase), and for the last two time points post-inoculation (Late Phase) for SIV-inoculated animals, and corresponding time points for controls. There were no pre-inoculation differences. For the SEB-stimulated condition, MANOVA revealed that IFN-gamma increased from Early Phase to Late Phase for all subjects, with controls having higher concentrations than SIV-inoculated animals overall (p<.05). High Sociable subjects had higher IFN-gamma concentrations than Low Sociable animals (p<.05). The increase of IFN-gamma from Early to Late Phase suggests that the proposed Th1 to Th2 shift (which would be indicated by a decline in IFN-gamma) was not observed. The higher IFN-gamma observed in High Sociable animals is consistent with other data suggesting greater glucocorticoid responsiveness. Together, these data suggest that personality factors can mediate an individual's response to infection.

Abstract 1564

SEX DIFERENCES IN PAIN SENSITIVITY: INTERACTIONS WITH SOCIAL SUPPORT

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The present study examined the interaction of social support and sex on pain sensitivity. A total of 68 individuals (32 women, 36 men) were studied; 34 participated alone while 34 participated with a same sex friend. Individuals were exposed to a cold pressor challenge, then rated pain sensitivity using the Short-Form McGill Pain Questionnaire (MPQ), and rated Overall Social Support (OSS). Results revealed significant sex main effects on the affective and sensory subscales of the MPQ showing that females reported greater pain than males (p<.05). A significant interaction on the present pain subscale of the MPQ revealed females participating with a friend reported greater pain than males (p<.05). Systolic Blood Pressure (SBP) reactivity results revealed a significant condition main effect, showing participants in the support condition had significantly greater increases in SBP during the cold pressor (p<.01). Further analyses revealed significant OSS main effects on each of the four MPQ subscales and the MPQ total score, showing that individuals who reported higher overall support in their lives also reported higher pain sensitivity (p<.05). Significant interactions on the present pain and visual analog subscales and the MPQ total score revealed that individuals who reported higher OSS and participated with a friend indicated higher pain sensitivity than individuals who reported lower OSS (p<.05). Blood pressure results revealed a significant condition main effect where those who participated with a friend had higher increases in SBP (p<.01). The significant OSS main effect showed that individuals who reported lower overall support had greater SBP reactivity (p<.05). These data indicate that greater OSS is associated with higher reports of pain, but lower SBP reactivity. Moreover, persons with greater OSS reported more pain with a friend present, than alone. As in chronic pain, these results may reflect effects of social reinforcement on pain behavior. Supported by NIH HL32738 to Dr. McCubbin.
Guided imagery (GI) is a mind-body intervention aimed at decreasing an individual’s response to psychological stress. GI has been reported to ameliorate the post-operative length and cost of hospitalization for patients undergoing cardiothoracic surgery. This study evaluated whether GI was associated with a decrease in pain perception, length of hospital stay, and frequency of post-operative atrial fibrillation among cardiothoracic patients. One hundred twenty-two cardiothoracic patients were randomly assigned to either the control (43) or intervention (79) group. Patients in the intervention group had the opportunity to listen to an entire guided imagery tape at home, in the hospital prior to surgery, in the intensive care unit after surgery and on each post-operative day until discharge. The McGill Pain Questionnaire (MPQ) was administered to patients daily after surgery. The intervention patients listened to the guided imagery tape an average of 66% (+/-32%) of their opportunities. Intervention group patients reported significantly less perceived pain after the third post-operative day (p value=.037). There was no significant difference between the control and intervention patients with respect to length of hospitalization (p value=.55) or occurrence of atrial fibrillation (p value=.476). Thus, the results of this study failed to replicate previous reports of GI’s beneficial effect on the length of post-surgical hospitalization. As the surgical techniques and post-operative care of cardiothoracic patients have evolved and improved, length of stay is no longer found to be influenced by listening to GI. Although GI may decrease pain perception, it is unlikely that there will be cost benefits associated with the routine use of GI in post-surgical care of patients.
Abstract 1644

SLEEP QUALITY AS A FUNCTION OF PSYCHOsocial RISK FACTORS IN A POPULATION-BASED SAMPLE OF OLDER ADULTS: LONELINESS AS A PROXIMAL AND DISTAL PREDICTor

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We have previously shown that loneliness is associated with poor sleep quality in young adults and elderly individuals (Cacioppo et al., 2002). In a population-based sample of 229 ethnically diverse older adults (50-68 yrs), we employed survey methodology to examine whether loneliness (R-UCLA Loneliness), relative to depressed affect, perceived stress, social support, and hostility, is a proximal predictor of sleep quality (Pittsburgh Sleep Quality Inventory). Linear regression analyses revealed that standardized loneliness scores were associated with poorer global sleep quality (b = 0.66, p < .05), that reflected longer sleep latency (b = 0.15, p < .05), poorer subjective sleep quality (b = 0.12, p < .05), and greater daytime dysfunction (b = 0.24, p < .01), net of gender, ethnicity, age, education, household income, and body mass index. Depressed affect and perceived stress were also significantly associated with global sleep quality, and perceived stress proved the proximal predictor (b = 0.72, p < .05) independent of remaining psychosocial risk factors. Depressed affect predicted sleep latency (b = 0.28, p < .01) independent of the other psychosocial variables, and loneliness (b = 0.18, p < .05) and perceived stress (b = 0.16, p < .05) were independent predictors of daytime dysfunction. Results indicate that depressed affect and stress may be proximal causes of poor sleep quality in lonely individuals, and that feelings of loneliness and stress determine the degree to which poor sleep quality affects daily functioning.

Abstract 1530

DEPRESSION IS RELATED TO POLYMORPHIC VARIATION IN THE CHOLINE TRANSPORTER GENE

Serina A. Neumann, Janine D. Flory, Psychology, Robert E. Ferrell, Human Genetics, Stephen B. Manuck, Psychology, University of Pittsburgh, Pittsburgh, PA

Given evidence of heritable risk and altered cholinergic activity in depression, we asked whether genetic variation in the acetylcholine (ACh) system is associated with depressive symptoms (Sx's). High-affinity choline uptake/transport is mediated by the choline transporter, which is rate-limiting for the biosynthesis of ACh and encoded by the choline transporter gene (CHT1). Here, we investigated the relation between depressive Sx's and alleles (labeled G and T) of a single nucleotide polymorphism located in the 3' untranslated region of CHT1. Previously, we showed potential functionality of the CHT1 (G/T) polymorphism using high-frequency heart rate variability (parasympathetic tone) as an "in vivo" index of cholinergic function. Participants of European ancestry were derived from a community sample (N=400; 50% men; age 30-54 (M=44 yrs); education 6-24 (M=16.8 yrs)). To assess depressive Sx's, participants completed the Center for Epidemiologic Studies of Depression Scale (CES-D). The distribution of CHT1 (G/T) genotypes (GG=236, GT=138, and TT=26) conformed to Hardy-Weinberg equilibrium (Chi-square=1.7, n.s.) and did not differ by sex (Chi-square=0.43, n.s.). GT and TT genotypes were combined for analysis. ANCOVAs were performed to determine the effects of the CHT1 genotypes (GG v. GT/TT) on CES-D scores (In) (covarying for age, education, and body mass index). We found a significant effect of CHT1 genotype on depressive Sx's [p<.007]. Compared to GG homozygotes (M±SE: 1.92±0.09), participants having any T allele had fewer depressive Sx's (1.37±0.10). No significant effects of sex were noted. Considered together with our previous findings, middle-aged men and women who possess a T allele exhibited less depressive Sx's and greater parasympathetic tone than subjects homozygous for the G allele. These results provide preliminary support that genetic variation in choline transport may promote depressive symptomatology via disruption of the ACh system.

Abstract 1041

HISTORIES OF DEPRESSION IN WOMEN ARE ASSOCIATED WITH ALTERATIONS IN ALLOPREGNANOLONE STRESS REACTIVITY

Rebecca R. Klatzkin, Leslie A. Morrow, Beth Mechin, Kathleen C. Light, Susan S. Girdler, Psychiatry, University of North Carolina, Chapel Hill, NC

Allopregnanolone (ALLO), a metabolite of progesterone (PR), modulates GABA(A) receptors. Animal models show that ALLO increases with stress. Our prior study was the first to examine ALLO stress responses in women, finding blunted ALLO responses in PMDD vs controls. However, ALLO is reduced in patients with depression (DEP) and our study did not examine ALLO as a function of prior DEP. Thus, our recent study extends this earlier work by examining prior DEP and ALLO reactivity to stress. Twenty-six women meeting DSM criteria for PMDD (14 with prior DEP) and 39 controls (17 with prior DEP) completed the Trier Social Stress Test (TSST) during the luteal phase of confirmed ovulatory cycles. All women were free of medication and current Axis I disorders, though prior histories were confirmed with SCID interview. ALLO was sampled 4 times: immediately after iv venipuncture, after an extended baseline rest, and also 30 and 60 minutes following the onset of the TSST. Results indicated that all women with histories of DEP, regardless of PMDD vs control status, showed a blunted ALLO stress response at both 30 and 60 minutes post-stress, relative to women with no prior DEP (F=4.1, p < .05). Women with prior DEP also tended to show lack of recovery from venipuncture stress since their ALLO levels did not show the decrease from venipuncture to baseline rest that was seen in women with no prior DEP (F=3.2, p<.08). Additionally, only women with no prior DEP showed the expected positive correlation between luteal PR levels and luteal ALLO levels (r=.37, p<.05) while no relationship was found in women with prior DEP (r=.16, p<.NS). The results indicate that even in women without current DEP, a history of DEP is associated with alterations in ALLO reactivity to stress. Additionally, the absence of a correlation between ALLO and PR in women with prior DEP suggests that there may be alterations in the conversion of PR to ALLO in this subgroup of women.

Abstract 1198

RUR AND EWRU, NEW MARKERS OF ENDOTHELIAL FUNCTION

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Poor endothelial function (EF) is a risk factor for coronary heart disease (CHD). EF has been shown to improve following behavioral interventions and maybe responsive to acute stress. However, current methods of assessing EF are problematic due to their invasive nature or poor test-retest reliability. The current study describes a new method of measuring EF and shows its sensitivity and specificity of predicting CHD. CHD patients (n=21) were compared to low-risk (LR) participants (n=21). The hyperaemic response to 5 min of arm ischemia (in the right arm) was measured using a planar dynamic one frame per second first-pass acquisition of 10 minutes. Two measures of EF were derived from the first-pass activity-time curves (ATC). The Rate of Uptake Ratio (RUR) compared the ATCs between the hyperaemic and non-hyperaemic arms, and the Elbow to Wrist Relative Uptake (EWRU) compared the ATCs at the elbow and wrist within the hyperaemic arm. Discriminant and ROC analyses were used to estimate the diagnostic performance of RUR and EWRU. RUR (r=.57, p<.001) and EWRU (r=.36, p<.001) were significantly higher in the LR group (6.1 ± 0.4 and 23.2 ± 2.2%) compared to the CHD patients (3.4 ± 0.3 and 11.7 ± 2.4%). The correlation between RUR and EWRU was low (r=0.3, p=n.s.). Both RUR (F=27.0, p<.001) and EWRU (F=10.0, p<.004) were retained as independent predictors of CHD in the discriminant analyses. The combination of the two parameters yielded an area under the ROC curve of 0.95 in the ROC analysis, with a sensitivity of 95% and specificity of 90%. CHD patients had poorer EF compared to LR participants. The new measures of EF, RUR and EWRU, both were independent predictors of CHD, with the combination of the two providing CHD discrimination with high sensitivity and specificity. This study suggests that RUR and EWRU maybe a reliable tool to measure EF in behavioral research.
Abstract 1143
INCREASED GLUCOCORTICOID SENSITIVITY OF LYMPHOCYTE PROLIFERATION IN PATIENTS WITH ATOPIC DISEASES
Nicolas Rohleder, Jutta M. Wolf, Clemens Kirschbaum, Biopsychology, TU Dresden, Dresden, Germany

Atopic diseases such as allergic asthma (AA) and atopic dermatitis (AD) often exacerbate when patients experience psychosocial stress. A decreased cortisol response to stress has been discussed as a possible mediator, however the underlying mechanisms are not fully understood so far. We therefore set out to investigate the sensitivity of immune cells to the suppressive effects of glucocorticoids. Twenty-four patients with atopic diseases (AA or AD) and 23 healthy controls were subjected to the psychosocial stress test TSST (Trier Social Stress Test). Salivary cortisol, epinephrine, and norepinephrine were measured repeatedly before and after stress. Peripheral blood mononuclear cells (PBMC) were obtained by density gradient centrifugation before, as well as at 10 and 60 min after stress. Proliferation was induced by incubation with phytohemagglutinin (PHA) and subsequently inhibited by co-incubation with different concentrations of dexamethasone (DEX; 0 M to 10-6 M). Stress induced significant increases in cortisol in healthy subjects and male patients, but not in female patients; E and NE also increased after stress but did not differ between patients and controls. Glucocorticoid (GC) sensitivity of PHA induced lymphocyte proliferation showed marked differences between patients and controls: DEX suppression of proliferation was significantly higher in patients with atopic diseases; GC sensitivity increased after stress in all groups, but not in atopic men. In summary, there appears to be a different picture in atopic men and women. While atopic women have a blunted cortisol response to stress, their GC sensitivity further increases after stress, similar to healthy controls. Atopic men in contrast do have a normal cortisol response to stress, but fail to increase GC sensitivity. These data show that different endocrine-immune dysregulations can be observed in male vs. female patients suffering from atopic diseases.

Abstract 1554
CORONARY ARTERY DISEASE PATIENTS WITH HIGH DEPRESSION SCORES HAVE LOWER CARDIOVASCULAR REACTIVITY DURING LAB MENTAL STRESSORS
Srikanth Ramachandruni, Clay Sizemore, Sue Mc Gorray, Roger Fillingim, Amanda Pusey, David Sheps, University of Florida, Gainesville, FL

Background: Exaggerated cardiovascular reactivity to psychological stress is a potential pathophysiological mechanism linking behavior and cardiovascular disease. Depression is relatively common in patients with coronary artery disease (CAD) and is associated with increased risk of mortality and morbidity. However, the mechanisms by which depression adversely affects clinical outcomes of patients with CAD are unknown. This study examined the relationship between depression and cardiovascular reactivity during mental stress testing in patients with stable CAD. Methods: 62 subjects (41 males, 21 females) with a mean age of 64 years were studied. Entry criteria included age above 18 years and documented history of CAD defined by >50% major coronary artery stenoses or documented coronary intervention or previous myocardial infarction. The Beck’s Depression Inventory (BDI) questionnaire was administered before the mental stress testing. Cardiac medications were stopped 1 day prior to testing. Participants performed a 3 minute public speaking task with monitoring of HR, BP, and ECG. Results: Systolic blood pressure (SBP) increased from 124 (+/- 16) mm Hg at rest to 170 (+/-28) mm Hg at peak stress. Heart rate increased from 63 (+/- 10) BPM at rest to 80 (+/-16) BPM at peak stress, and the double product difference (peak minus rest) was 5878 (+/- 3279) (mean +/- s.d., all changes p <0.0001). The mean BDI score was 8.3 (s.d. 6.4, range 0 - 30). BDI score was negatively correlated with peak SBP, r=-.25 (p=0.0485), change in SBP, r=-.29 (p=0.0213), and double product difference, r=-.29, (p=0.0251). BDI score was a significant predictor (p=0.0264) in a linear regression model of log double product difference, adjusted for log resting double product, age, and anti-depression medication use. This model accounted for 25% of the variability of log double product difference. Conclusion: BDI scores were negatively correlated to cardiovascular reactivity to mental stress. The underlying mechanism is unknown but could be due to blunted sympathetic nervous system response to stress secondary to chronically increased sympathetic tone. The clinical significance of these findings remains to be determined.

Abstract 1379
MECHANISMS UNDERLYING MENTAL STRESS-INDUCED HEMOCONCENTRATION: MICROVASCULAR PERMEABILITY AND SYSTOLIC BLOOD PRESSURE
Jet Veldhuijen van Zanten, Douglas Carroll, Christopher Ring, Margaret Brown, School of Sport and Exercise Sciences, University of Birmingham, Birmingham, UK

Anecdotal and epidemiological evidence suggest that stressful events may act as triggers for myocardial infarction (MI). Hemoconcentration, measured by a decrease in plasma volume, in response to mental stress may mediate the triggering of MI by stress. Although stress-induced hemoconcentration is well documented, its underlying mechanisms are poorly understood. Factors influencing shifts in plasma volume are described by the Starling equation for fluid movement across the vascular wall. This study explored the association between stress-induced hemoconcentration and two factors of the Starling equation: microvascular permeability and hydrostatic pressure, as estimated by blood pressure reactivity. Microvascular permeability was assessed during rest using venous congestion plethysmography. Seven plasma volume and associated systolic blood pressure (SBP) measurements were taken during a 20-min rest, a 32-min mental arithmetic task, and a 30-min recovery in 17 healthy young men. The stress task elicited a decrease in plasma volume (M = -6.57 ml/kg) and an increase in SBP (M = 13 mmHg, p<.05). Participants with more permeable microvasculature tended to show greater hemoconcentration (r = -.44, p<ns). Within-subject correlational analyses on the task and recovery measurements indicated that SBP reactivity was associated with hemoconcentration (average r = -.50, p<.001): the higher the increase in SBP, the bigger the shift in plasma volume. In conclusion, stress-induced hemoconcentration was mediated by an increase in hydrostatic pressure and, to a lesser extent, the permeability of the microvasculature. Thus, large pressor responses to stress and a highly permeable microvasculature might be risk factors for MI by exacerbating the rheological effect of a stressful trigger.

Abstract 1425
NEIGHBORHOOD, FAMILY, AND SUBJECTIVE SOCIOECONOMIC STATUS: HOW DO THEY RELATE TO ADOLESCENT HEALTH? Laurel Q. Paterson, Melissa J. Griffin, Edith Chen, Psychology, University of British Columbia, Vancouver, BC, Canada

Lower socioeconomic status (SES) has a robust association with poorer health outcomes. One way to better understand how SES impacts health is to examine its influences at multiple levels, such as neighborhood, family, and individual. The objective of this study was to investigate the relative importance of neighbourhood, family, and subjective SES in predicting physical health and psychological outcomes in youth. 315 adolescents from 3 public high schools (mean age 16.6) underwent assessments of body mass index (BMI), cortisol levels, and blood pressure, and completed questionnaires on psychological traits and subjective SES perception. Parents were also interviewed to obtain family SES data on resources (income, assets) and prestige (education, occupation). Corresponding neighborhood SES data was obtained from 2000 U.S. Census data at the block-group level. Multiple regression analyses revealed that both lower family and neighborhood resources predicted higher BMI (6’s from -.15 to -.27; p’s <.05); however, only lower neighborhood prestige predicted higher BMI (6’s = -.34; p’s <.001). All measures of lower neighborhood SES, but not family SES, predicted lower basal cortisol levels (6’s from .14 to .17; p’s <.05). Although subjective SES was not significantly associated with any physical health outcomes, higher subjective SES was correlated with positive psychological variables such as optimism, self-esteem, and control (r’s from .19 to .33, p’s <.05). The strong association between neighborhood characteristics and BMI and cortisol levels suggests a mechanism through which social contexts may influence physical health by determining community resource availability. Overall, results from this study indicate the importance of deconstructing SES to target adolescent health interventions at the appropriate SES level.
RELATIONSHIP BETWEEN AUTONOMIC FUNCTION AND TEMPERAMENT IN PREADOLESCENTS

Children's behavioral reactivity and self-regulation may be related to autonomic function. This study investigates the relationship between temperamental and heart rate (HR), heart rate variability (HRV), and baroreflex sensitivity (BRS) in a community-based sample of Dutch preadolescents (n=926). Temperament was evaluated by the parent-version of the Revised Early Adolescent Temperament Questionnaire. Four subscales were selected pointing to either temperamental inhibition (shyness, fear) or activation (high-intensity pleasure-seeking, low) effortful control. Autonomic function was assessed by short-term non-invasive supine and standing measurements of systolic blood pressure and HR. HRV and BRS were determined using power spectral analysis. Data were analyzed by means of GLM repeated-measures, with each of the physiological measures (supine and standing) as dependent variables and gender, age, temperament, as well as interactions between gender and temperament as independent variables. Main effects of pleasure-seeking, shyness, and fear (but not effortful control) were found for all physiological variables: pleasure-seeking was negatively associated with HR (F=6.48, p=0.011) and positively with HRV (F=9.19, p=0.003) as well as BRS (F=4.44, p=0.035). Also, higher scores on shyness and fear were related to higher BRS values (F=3.95, p=0.047; F=4.00, p=0.046). In addition, reactivity effects were found: higher pleasure-seeking was related to greater decreases in HRV upon standing (increased HRV reactivity; F=4.04, p=0.044), while higher shyness was associated with greater decreases in BRS only in girls (increased BRS reactivity; F=4.18, p=0.042). In contrast, none of the temperamental variables were related to HR reactivity. In conclusion, this study demonstrates that both temperamental inhibition and activation are associated with increased vagal activity. Thus, more extreme temperamental characteristics -in both directions- may be related to a more active or regulative autonomous system.

POSTER SESSION I

CANCER PREVENTION WITH THE HELP OF BREATHING PROCESSES: SUDARSHAN KRIYA (SK) AND PRANAYAM (P)
Vinod Kuchipudi, Manisha Bhutani, Medical Oncology, Satya N. Das, Biotechnology, Institute Rotary Cancer Hospital, AIIMS, New Delhi, India, Devender Singh, Medical Oncology, Institute Rotary Cancer Hospital, AIIMS, New Delhi, Indiq, Pratik Kumar, Medical Physics, Institute Rotary Cancer Hospital, AIIMS, New Delhi, India

Tobacco consumption and stress are known risk factors for cancer. SK&P rhythmic breathing processes, introduced through a structured 24-hour (spread over 6 days) Art of Living program (AOL), are known to eliminate stress. We studied the effect of SK&P on immune system in normal individuals and cancer patients, and on smoking habits. Immune study: Natural killer (NK) cells in the peripheral blood were compared among 17 AOL teachers (regular practitioners for at least 2 years), 17 cancer patients in remission, and 63 normal subjects using 2-color flow-cytometer. Subsequently 21 cancer patients (in remission or having stable response, who had practiced SK&P for 6 months) and 6 cancer patients (controls) underwent serial NK cell estimation at day 0, day 8, week 12 and week 24. The tobacco study included 82 current tobacco users who underwent AOL. NK cells were significantly higher (p<0.05) in AOL teachers compared to normal controls and cancer patients. In cancer patients who practiced SK&P regularly, at 6 months follow-up, 16(20%) continued to be tobacco-free. Tobacco cessation in 20% individuals and significant increase in NK cells in regular practitioners indicates that inexpensive, easy to practice and harmless breathing processes (SK&P) may be used as a cancer preventive strategy.

THE EFFECT OF SOCIAL SUPPORT ON CANCER CAREGIVERS’ MENTAL AND PHYSICAL FUNCTIONING
Youngmee Kim, Behavioral Research Center, American Cancer Society, Atlanta, GA, David Wellisch, Psychiatry, University of California, Los Angeles, Los Angeles, CA

The buffering effect of social support (SS) against the adverse effect of stress has been well-documented. However, the unique contribution of each SS source (relative SS from family, friends, significant others), compared to that of total SS source (global SS) in the context of cancer care remains unknown. Thus, this study investigated the effects of SS on the relations between care-related burden and mental and physical functioning among cancer caregivers. An Implementation Pilot Caregiver Survey was mailed to family caregivers nominated by survivors who participated in a national longitudinal study of cancer survivors. The caregiver survey included measures of social support (MSPSS), care-related burden (a stress-overload subscale of the Pearlin Stress Scale), and mental functioning (MF) and physical functioning (PF: MOS SF-36). A total of 667 caregivers provided valid information on these measures, which underwent two sets of general linear modeling. Results from the 1st set of analyses including the global SS score revealed no significant main or interaction effects of global SS. In the 2nd set of analyses, the global SS score was replaced with 3 individual scores of relative SS. The significant moderating effects of each relative SS indicated that receiving support relatively more from friends or significant others buffered the adverse impact of care-related burden on PF (F=3.78, 7.42, p<.01). However, receiving support relatively more from family aggravated the adverse impact of care-related burden on PF (F=7.72, p<.01). Furthermore, the moderating effect of relative support from family was more prominent among spousal caregivers (F=11.95, p<.001), whereas the moderating effect of relative support from friends was more prominent among non-spousal caregivers (F=4.03, p=.05). The findings highlight the importance of the unique contributions of each source of SS relative to that of global SS on caregiver’s PF. Caregivers may benefit from community-based programs designed to facilitate the involvement of non-family members in cancer care by reducing their physical burdens of providing care.
THE EFFECTS OF THERAPEUTIC YOGA ON SALIVARY CORTISOL, STRESS SYMPTOMS, QUALITY OF LIFE AND MOOD STATES IN CANCER OUTPATIENTS: A RANDOMIZED CONTROLLED STUDY
Linda E. Carlson, Oncology, Nicole Culos-Reed, Lisa M. Darou, Kinesiology, University of Calgary, Calgary, AB, Canada

Yoga as a therapeutic intervention for the reduction of stress in cancer patients has not been rigorously explored in the literature, nor have its potential effects on salivary cortisol (CRT). This pilot study explored the effects of a 7-week therapeutic yoga intervention on salivary cortisol, quality of life, stress symptoms and mood states in a group of mixed-diagnosis cancer patients who had completed medical treatment. A total of 20 patients were randomized (10 yoga, 10 wait-list controls), and assessed both before and after the intervention. Salivary CRT was assessed at 08:00h, 16:00h and 20:00h on both assessment days. Interestingly, prior to any intervention there were significant positive correlations between afternoon CRT levels and two different measures of fatigue, overall stress symptoms and mood disturbance, as well as negative correlations with quality of life (all p < .05). The total stress score was also significantly correlated with evening CRT (p < .01) and the overall mean CRT level (p < .05). Although there were no group differences pre-intervention, participants in the yoga group reported significantly better quality of life (p < .05) and less mood disturbance (p < .05) following the intervention. There were no group differences in mean CRT levels at either time period, or in the slope of diurnal levels. Nor were change scores from pre- to post-testing different on any of the CRT measures between the two groups. However, although means were not different, there was less variance in the morning CRT scores in the yoga group post-intervention, indicating that extreme low or high scores had moved toward the mean value, whereas this did not occur in the control group. These results are limited due to the small sample size, but do indicate positive psychological and potentially positive neuroendocrine effects of yoga in cancer survivors.

Abstract 1617
POST-TREATMENT DISTRESS IN A GROUP OF CANCER SURVIVORS
Kristin M. Kilbourn, Community and Behavioral Health, AMC Cancer Research Center, Denver, CO; Patricia E. Ewing, Clinical and Health Psychology, University of Florida, Gainesville, FL

Despite the fact that there are 10 million cancer survivors, we know very little about the psychosocial impact of treatment on cancer survivorship. This study examined 211 mixed diagnosis cancer patients (mean age 60; 94% Caucasian, 72% married, 59% male) who underwent radiotherapy (RT) at the University of Florida. Participants completed the Psycho-Onconeology Screening Tool (POST) prior to beginning RT and after completing RT. Comparisons of pre and post-RT measures showed significant decreases in anxiety (t = 3.81; p < .001) and anger (t = 2.14; p < .05) and increases in fatigue (t = -2.68; p < .01) and depressive symptoms (t = -2.67; p < .01). The number of patient concerns was significantly associated with the number of post-RT depressive symptoms after controlling for pre-RT number of symptoms (r = .42, p < .001). Lower total fatigue, better quality of life (p < .05) and less mood disturbance (p < .05) following the intervention. There were no group differences in mean CRT levels at either time period, or in the slope of diurnal levels. Nor were change scores from pre- to post-testing different on any of the CRT measures between the two groups. However, although means were not different, there was less variance in the morning CRT scores in the yoga group post-intervention, indicating that extreme low or high scores had moved toward the mean value, whereas this did not occur in the control group. These results are limited due to the small sample size, but do indicate positive psychological and potentially positive neuroendocrine effects of yoga in cancer survivors.

MULTIPLE CONDITIONED RESPONSES DEVELOP IN CHEMOTHERAPY PATIENTS DURING TREATMENT: INDEPENDENT EFFECTS ON FATIGUE, NAUSEA, AND EMOTIONAL DISTRESS
Dana Bovbjerg, Guy Montgomery, Oncological Sciences, Mount Sinai School of Medicine, NY, NY, George Raptis, Medicine, Columbia University, NY, NY, Brett Stoudt, Oncological Sciences, Mount Sinai School of Medicine, NY, NY

All the elements required for classical conditioning are present during cancer chemotherapy. Repeated outpatient infusions are administered in a distinctive clinic environment (conditioned stimulus); the cytotoxic agents used (unconditioned stimuli) have multiple consequences including fatigue, nausea, and emotional distress (unconditioned responses). Conditioned responses, evident when patients return to the clinic environment, have been extensively documented in previously separate lines of research. Our purpose was to examine the specificity of such conditioned responses within a single study. Breast cancer patients (n=65; 80% white; 75% married; 62% Stage I) scheduled for a standard chemotherapy regimen (77% CMF) were recruited. Post-infusion side effects were assessed across infusions with the Memorial Symptom Assessment Scale. Fatigue, nausea, and distress levels in the clinic prior to the 5th infusion were assessed with visual analog scales. Consistent with selective conditioning effects, general linear modeling analyses revealed significant group differences in the following measures: fatigue (t = 3.81; p < .001), nausea (t = 2.68; p < .01) and anger (t = 2.14; p < .05) and increases in fatigue (t = -2.68; p < .01) and emotional distress (t = -2.67; p < .01). The number of patient concerns was significantly associated with the number of post-RT depressive symptoms after controlling for pre-RT number of symptoms (r = .42, p < .001). Lower total fatigue, better quality of life (p < .05) and less mood disturbance (p < .05) following the intervention. There were no group differences in mean CRT levels at either time period, or in the slope of diurnal levels. Nor were change scores from pre- to post-testing different on any of the CRT measures between the two groups. However, although means were not different, there was less variance in the morning CRT scores in the yoga group post-intervention, indicating that extreme low or high scores had moved toward the mean value, whereas this did not occur in the control group. These results are limited due to the small sample size, but do indicate positive psychological and potentially positive neuroendocrine effects of yoga in cancer survivors.

Abstract 1342
STRESS SYMPTOMS, QUALITY OF LIFE AND MOOD STATES IN POST-TREATMENT DISTRESS IN A GROUP OF CANCER SURVIVORS
Kristin M. Kilbourn, Community and Behavioral Health, AMC Cancer Research Center, Denver, CO; Patricia E. Ewing, Clinical and Health Psychology, University of Florida, Gainesville, FL

Despite the fact that there are 10 million cancer survivors, we know very little about the psychosocial impact of treatment on cancer survivorship. This study examined 211 mixed diagnosis cancer patients (mean age 60; 94% Caucasian, 72% married, 59% male) who underwent radiotherapy (RT) at the University of Florida. Participants completed the Psycho-Onconeology Screening Tool (POST) prior to beginning RT and after completing RT. Comparisons of pre and post-RT measures showed significant decreases in anxiety (t = 3.81; p < .001) and anger (t = 2.14; p < .05) and increases in fatigue (t = -2.68; p < .01) and depressive symptoms (t = -2.67; p < .01). The number of patient concerns was significantly associated with the number of post-RT depressive symptoms after controlling for pre-RT number of symptoms (r = .42, p < .001). Lower total fatigue, better quality of life (p < .05) and less mood disturbance (p < .05) following the intervention. There were no group differences in mean CRT levels at either time period, or in the slope of diurnal levels. Nor were change scores from pre- to post-testing different on any of the CRT measures between the two groups. However, although means were not different, there was less variance in the morning CRT scores in the yoga group post-intervention, indicating that extreme low or high scores had moved toward the mean value, whereas this did not occur in the control group. These results are limited due to the small sample size, but do indicate positive psychological and potentially positive neuroendocrine effects of yoga in cancer survivors.

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Abstract 1342
STRESS SYMPTOMS, QUALITY OF LIFE AND MOOD STATES IN
EMOTION-FOCUSED COPING PREDICTS DISTRESS DURING CHEMOTHERAPY FOR BREAST CANCER
Valerie A. Bussell, Psychology, Houston Baptist University, Houston, TX, Mary J. Naus, Psychology, University of Houston, Houston, TX

The purpose of this study was to examine coping and control as predictors of psychological and physical distress in women undergoing adjuvant chemotherapy for breast cancer. Fifty-two women currently undergoing adjuvant chemotherapy treatment for breast cancer completed a mailed comprehensive questionnaire on control, coping, and distress. Results indicated that there was no difference in the level of distress reported as a function of age, stage of breast cancer, type of surgery, or type of chemotherapy protocol. However, older women reported using less problem-focused coping (PFC) than younger women (p < .05). As predicted, emotion-focused coping (EFC) positively related to depression (BDI: F (1, 51) = 4.10, p < .05, pr = .28), anxiety (BAI: F (1, 51) = 6.28, p < .05, pr = .33), perceived stress (PSS: F (1, 51) = 5.58, p < .05, pr = .32), distressed mood (POMS: F (1,51) = 6.94, p = .01, pr = .35), and fatigue (BFI: F (1,51) = 4.40, p < .05). Unexpectedly, PFC did not relate to any measure of distress. A predicted relation for perceived control and coping was also supported. Perceiving control over cancer positively related to PFC (Internal MHLC: F (1,51) = 5.10, p < .05, pr = .31) and negatively related to EFC (personal control over cancer outcome: F (1,51) = 5.34, p < .05, pr = .32; and a combined index of internal control: F (1,51) = 4.47, p < .05, pr = .28). These findings support Lazarus and Folkman’s theory of stress and coping and related research. This was the first study to examine both control and coping for chemotherapy treatment and breast cancer. Coping and control offer two ideal entries for clinical intervention and both are included in many current cognitive-behavioral therapies.

Abstract 1076

CORRELATES AND PREDICTORS OF FEAR IN MOTHERS OF PEDIATRIC TRANSPLANTATION PATIENTS

Our research has found that mothers’ fear during their child’s hematopoietic stem cell transplantation (HSCT) is associated with their distress. This longitudinal study investigated the associations of prior negative life events, optimism, and event characteristics with mothers’ fear during their child’s HSCT. 140 mothers were interviewed at 3 time points: during their child’s hospitalization for HSCT, and approximately 3 and 6 months later. A path model of hypothesized relations among negative life events, optimism, and fear was tested using EQS. Based on standard parameters, the study model provided a good fit, X2 (37) = 50.28, p = .07, CFI = .96, and RMSEA = .05. Results indicated that a greater number of negative life events prior to the child’s HSCT was associated with greater maternal fear during the child’s hospitalization. Higher maternal optimism was associated with less fear at the same time point. Mothers’ fear during the child’s hospitalization was, in turn, associated with mothers’ fear at the follow-up assessments. Mothers’ sociodemographic characteristics, the number of other children in the family, and the child’s age and disease status were also related to mothers’ fear. These results suggest that negative life events and maternal optimism play a critical role in mothers’ fear and have implications for interventions with mothers during this stressful time.

Abstract 1566

FEAR OF HEAD AND NECK CANCER RECURRENT RELATES TO TOBACCO AND ALCOHOL USE
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Tobacco and alcohol use are leading etiologies of head and neck cancer (HNC). Continued use post-treatment increases the risk of recurrence, secondary tumors, and death. Furthermore, evidence suggests that continued use during cancer treatment is related to higher patient anxiety and fear of recurrence. Evidence examining these factors in survivors is limited. We hypothesized that HNC survivors who continued to use tobacco and alcohol would experience higher fear of recurrence when compared to patients who abstained. We used a stratified, random sample of 89 HNC survivors who participated in a larger quality of life study 2-3 years post-treatment. The participants reported a mean age of 64 years. The sample can be described as 52% female, 52% high school education or less, and 87% white race (9% black, 4% other). A history of smoking and alcohol use was respectively reported by 56% and 73% of participants. Approximately 1 of 4 patients reported continued smoking and 1 of 5 reported continued alcohol use (with and without imputed data). Approximately half of survivors reported some fear of recurrence. Preliminary analyses indicated trends for higher fear of recurrence associated with specific cancer sites and patient education levels (p< .10), but not stage. In multivariate primary analyses, no effect was found for continued tobacco and alcohol use (p > .05). A history of alcohol use, but not tobacco, was related to higher fear of recurrence (p< .05). Given the cross-sectional nature of this study, patients with higher fear of recurrence may have quit tobacco and alcohol use closer to time of treatment; lessening any potential relationship between continued use and fear of recurrence in survivors. However, providers should ensure that patients understand the link between HNC and tobacco and alcohol use. If possible, future studies should include biochemical validation of continued substance use status. Additionally, the relationship between alcohol history and fear of recurrence cannot be interpreted as causal. This finding might reflect a history of self-medication by anxious patients who generally fear negative events (such as recurrence).
Distress is an important marker of quality of life and has been associated with poorer recovery from surgery. The current study examined distress in 138 women undergoing surgery for a potential ovarian malignancy. Surgical diagnosis indicated that 70 women had ovarian cancer and 68 had benign disease. Prior to surgery, participants completed measures of distress (IES, POMS), depression (CES-D), life events (LES), physical well-being (FACT), social support (SPS), and perceived control. Distress and depression measures were also completed by 88 healthy women at routine gynecology visits. Women undergoing surgery had significantly elevated distress on all measures as compared to healthy women, ps<.05. There were no differences in intrusion, avoidance, or distressed mood between women who were ultimately diagnosed with malignant versus benign disease. However, women with ovarian cancer reported significantly elevated depressive symptomatology as compared to women with benign disease, F(1,135)=4.1, ps<.05. Despite findings that benign patients were twice as likely to have a history of depression and reported twice as many stressful life events. Among ovarian cancer patients, poorer physical well-being, more stressful life events, and less perceived control over disease and treatment, but not social support or a history of depression, were significant predictors of exceeding the CES-D cutoff score for major depression after adjusting for stage, ps<.05. Physiological processes associated with tumor development or poor physical well-being may account for findings that ovarian cancer patients, while reporting similar levels of presurgical distress as benign patients, experience more depression. Physical problems and stressful life events may be risk factors for depression in ovarian cancer patients while a sense of control may be protective.

Abstract 1634

THE TRANSTHEORETICAL MODEL PREDICTS MAMMOGRAPHY SCREENING: A PROSPECTIVE POPULATION-BASED STUDY
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In cross-sectional studies the Transtheoretical Model (TTM) has been found to explain lack of adherence to recommended mammography screening guidelines. The present study used a prospective, population based approach to test the TTM, using nation-wide clinical databases to document mammography adherence. Two TTM constructs were examined: 1) Stages of Change (readiness to adopt the screening behavior) and 2) Decisional Balance (the relative strength of perceived positives vs. perceived negatives of screening). A randomly selected sample (n=1000) of Icelandic women, aged 40-70 years, was recruited by mail. Participants without cancer (n=562) completed questionnaires assessing stages of readiness and decisional balance. Mammography adherence was determined 3 years later. Stages of readiness were: 1) precontemplation/relapse (no prior mammograms or off schedule - no intention within 2 years), 2) contemplation (no prior mammograms or off schedule - intention within 2 years), 3) action (one mammogram on schedule - intention within 2 years), 4) maintenance (two prior mammograms on schedule - intention within 2 years). Univariate analyses indicated that readiness stage predicted mammogram adherence (p ≤0.001). For adherent women stages were: maintenance, 87.6%; action, 70.1%; contemplation, 50%; precontemplation, 29.9%. Women above the median for decisional balance were 2.7 times more likely to undergo mammography screening (p=0.001). Multiple logistic regression analyses, controlling for demographic variables revealed that stages of readiness and decisional balance independently predicted mammogram adherence (p > 0.01). The results provide the first prospective population-based study supporting the utility of the TTM in understanding mammography adherence. Findings suggest that stage-matched interventions may facilitate efforts to increase adherence to breast cancer screening guidelines.

Abstract 1408

PSYCHOLOGICAL VULNERABILITY PREDICTS POOR PSYCHOLOGICAL AND PHYSICAL OUTCOMES: A LONGITUDINAL STUDY
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Various theories have been proposed about differential psychological vulnerability, including developmental theories about attachment, separation, and the formation of psychopathology. Research in the area of psychosomatic medicine suggests an association between attachment style and illness, with stress as a mediator. Vulnerability was defined as the combination of lack of resilience (insecure attachment and/or negative expectations about oneself) and exposure to stressful experiences over time, moderated by social support. We hypothesized that individuals with low resilience would be more likely to experience symptoms of anxiety and depression, as well as physical complaints cumulative over the observation period. Eighty-two individuals living with HIV participated in a study investigating adherence to HAART, and were followed for up to 9 months, receiving up to 14 assessments. Measures were the Revised Adult Attachment Scale (RAAS), Dysfunctional Attitude Scale (DAS), Provision of Social Relations Scale (PSRS), Responses to Stressful Life Events scale (RSLES), State-Trait Anxiety Inventory (STAI), Beck Depression Inventory (BDI), and a 21-item physical symptoms inventory. At baseline, 55% of participants were classified as having low resilience (RAAS score≥35 and/or DAS score≥120). Focusing on anxiety, the average cumulative STAI score of the low-resilience group was significantly higher than that of the high-resilience group (18.45 SD=10.6 versus 9.57 SD=8.6; F(1,80)=14.6, p<.001). Similar results were obtained for BDI and physical symptoms (respectively F(1,80)=14.65, p<.001 and F(1,80)=5.50, p<.05). After controlling for resilience, the effects of variance in life events and social support averaged over time became negligible (<2% of variance explained).

Abstract 1402

ALCOHOL USE DISORDERS AND RISK OF NEUROCOGNITIVE IMPAIRMENT ASSOCIATED WITH HIV: IS THERE A RELATIONSHIP?
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HIV-infection is associated with neurocognitive (NP) impairment in up to 50% of seropositive individuals, but risk factors for this complication are unclear. Because alcohol use disorders are commonly comorbid with HIV, there is concern, and some evidence, that HIV and alcohol may interact to heighten likelihood of cognitive deficit. To examine this question in a larger sample, we assessed NP performance in 4 groups of participants (N=267) with and without HIV (HIV-+/–) or history of alcohol abuse/dependence (ETOH+/–). HIV+/ETOH– (N=96); HIV–/ETOH+(N=29), and demographically comparable controls (HIV–/ETOH–, N=107). To guard against confounding by effects of other drugs or recent alcohol, we excluded participants with past histories of non-alcohol substance use disorders, current alcohol use disorder, or moderate to heavy drinking (>30 grams/day) within the past 12 months. Standardized assessment of psychiatric diagnosis (SCID) and NP function (expanded Halstead-Reitan Battery) were conducted. Global NP impairment was determined by composite deficit scores based on published norms. Chi-square analyses demonstrated that NP impairment was elevated in HIV+ independent of past history of alcohol use disorder (X2=15.4, p<.05). Using nominal logistic regression to control for age effects, past alcohol abuse/dependence did not predict NP impairment, nor was there an interaction with HIV status. To examine the relation of degree of immersion with alcohol to NP performance, we repeated these analyses for those with lifetime alcohol dependence, which yielded similar results. Likewise, estimates of lifetime quantity-frequency-duration of alcohol intake did not predict NP deficit. Contrary to expectations, and some prior studies using similar methods, alcohol use disorder did not elevate risk of neurocognitive impairment associated with HIV. Further research is needed explain these discrepancies and to evaluate the relationship of alcohol and other substance use disorder to HIV-related brain disease.
IDENTIFYING POTENTIAL BIOPSYCHOSOCIAL MECHANISMS OF HIV PROGRESSION
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We report on correlations among baseline psychosocial, psychophysiological, and immune measures as part of a 5-year longitudinal study of biopsychosocial mechanisms of immune functioning and medical outcomes in 200 HIV-infected adults (91% African American, 44% female) being treated at an inner-city HIV clinic. Assessments include Type C and other coping styles, adjacent constructs (e.g., alexithymia), autonomic measures of stress reactivity, diurnal cortisol profiles, antigen-induced beta-chemokine production (MIP-1 alpha and beta), Th1 and Th2 cytokines, T-cell activation markers, and clinical variables including CD4+ cell count and viral load. In a preliminary study of 50 HIV+ patients, Type C coping was significantly negatively correlated with the 3-day MIP-1 alpha stimulation index (SI) to the HIV core protein p24 antigen (r = -0.493, p < .001), as well as with the MIP-1 beta SI (r = -0.338, p = 0.16). We hypothesize that in the larger sample, Type C coping will be associated with more dysregulated immune parameters: decreased production of beta-chemokines (which inhibit HIV replication by interfering with binding to the CCR5 co-receptor involved in transmission of R5 strains of HIV); lower production of Th1 cytokines that are mediators of protection from HIV progression; overproduction of the Th2 cytokines IL-6 and IL-10 associated with HIV progression; and with increased markers of T-cell activation (long proposed as a mechanism by which HIV infection leads to CD4+ T-cell depletion, as well as increased CD4+ and CCR5 expression, facilitating HIV entry). These hypotheses are based on the theory and our previous research that maladaptive Type C coping instigates an inappropriate stress response characterized by a psychological reduction of awareness of the stressor combined with autonomic hyperactivation associated with immune dysfunction and HIV progression. This line of reasoning suggests that biopsychosocial interventions to change maladaptive Type C coping may have a beneficial effect upon immune functioning and HIV status.

THE RELATIONSHIP BETWEEN PTSD, DEPRESSION, AND URNARITY CORTISOL IN PEOPLE LIVING WITH HIV
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People living with HIV (PLWH) report disproportionately high rates of trauma and posttraumatic stress disorder (PTSD). In addition, diagnostic levels of depression are prevalent in PLWH and often occur comorbidly with PTSD. PTSD and depression have both been associated with abnormalities in cortisol levels, although often in opposite directions. Most research has examined the independent impact of these often comorbid diagnoses without examining the extent to which presence of both may impact physiology. The present study prospectively examined the relationship between PTSD and depression in PLWH with a specific focus on how comorbid disorders impact HPA axis function. Fifty PLWH (81% male; 44% African-American) were recruited from a local AIDS service organization and completed the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997) and Center for Epidemiology Studies - Depression Scale (CES-D: Radloff, 1977) for baseline assessments of PTSD and depressive symptoms, respectively. Three months later, participants provided a 15-hour overnight urine sample for analysis of cortisol levels. PTSD and depressive symptoms were highly correlated (r = .765, p < .001). Furthermore, after entering control variables and main effects, the interaction between PTSD and depressive symptoms continued to significantly predict urinary cortisol levels at follow-up (F(6,47) = 3.8, p < .01). Decomposition of the interaction revealed that, among participants reporting lower levels of depression, higher levels of PTSD symptoms were associated with lower urinary cortisol levels. The current study demonstrates that examination of independent diagnoses does not adequately address biological consequences of psychopathology in PLWH, and highlights the extent to which comorbid diagnoses impact the immunosuppressive hormone cortisol.

AFFECTIVE DIFFERENCES BETWEEN PRIMARY AND SECONDARY FIBROMYALGIA
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Fibromyalgia Syndrome (FMS) is characterized by chronic widespread pain without observable pathological signs, and is often accompanied by high levels of neuroticism and psychological disturbance. Recent evidence suggests that FMS patients also report low levels of positive affective resources compared to other chronic pain populations. However, research studies examining FMS often utilize samples confounded by the inclusion of both primary FMS (PFS) and secondary FMS (SFS), which includes the presence of another musculoskeletal pain disorder. This study sought to explore differences in the affective profiles of PFS, SFS with osteoarthritis (OA), and OA (without FMS) patients. Female participants (35 PFS, 33 SFS, 37 OA) completed a questionnaire assessing neuroticism, and were then interviewed weekly by phone for up to 12 weeks regarding pain, positive affect (PA), negative affect (NA), serenity, and frequency of positive (PE) and negative interpersonal events (NE). Data were analyzed using independent samples t-tests for neuroticism and the aggregated weekly variables. Compared to the SFS group, the PFS group reported higher levels of neuroticism [M = 3.58 for PFS; M = 3.08 for SFS; t(85) = 3.19, p < .01], a greater frequency of NE [M = 8.61 for PFS; M = 5.56 for SFS; t(86) = 2.23, p < .03], and marginally greater NA [M = 1.90 for PFS; M = 1.72 for FMOA; t(86) = 1.70, p = .09]. The PFS group also evidenced significantly lower positive affect [M = 2.64 for PFS; M = 2.99 for SFS; t(86) = -2.87, p < .01] and serenity [M = 2.43 for PFS; M = 2.81 for SFS; t(86) = -2.76, p < .01]. However, there were no significant differences in these variables when the SFS group was compared to the OA group. The different affective profiles of the PFS and SFS groups suggest possible etiological differences between these conditions that warrant further inquiry, and caution future studies to be mindful of potential heterogeneity in FMS samples.
ANGER, PAIN, AND SYMPTOM-SPECIFIC REACTIVITY AMONG CHRONIC LOW BACK PAIN PATIENTS  
John W. Burns, Brandy Wolff, Philip Quartana, Psychology, Rosalind Franklin University of Medicine & Science, North Chicago, IL

Anger is an important emotion in the experience of chronic pain. However, the mechanisms by which anger may worsen such conditions are unclear. A symptom-specific reactivity model holds that arousal of anger may amplify pain through increased muscle tension near the injury site. For chronic low back pain (CLBP) patients, anger may induce greater tension in muscles of the low back (lower paraspinals; LP)-- symptom-specific reactivity -- than arousal of other negative emotions, whereas such differences would not emerge in muscles distant from the low back (trapezius). 90 CLBP patients engaged in 5-min Anger Recall (ARI) and 5-min Sadness Recall (SRI) interviews (counterbalanced) while pain and emotion reports, and LP and trapezius EMG, SBP, DBP and HR levels were recorded. Within-subject ANOVAs showed that both the ARI and SRI produced significant increases from baseline on anger and sadness (F> 10.5), and on all physiological indexes (F> 10.4). However, the ARI produced a significant increase in pain (F=5.1), whereas the SRI did not (F>1). The ARI also induced greater anger and LP, SBP and DBP reactivity than the SRI (ps<.01), whereas the SRI induced greater sadness than the ARI (p<.01). The ARI and SRI did not differ significantly on trapezius reactivity (F=1.9, ns). Correlations among change scores showed that: pain and anger changes correlated significantly (r=.34) during the ARI but not the SRI (r=.09); pain and sadness changes did not correlate significantly in either ARI or SRI (r=.09); physiological index changes did not correlate significantly with self-reports of pain and emotion. Results support a unique link between anger arousal and pain aggravation for CLBP patients. First, pain and anger increases were correlated significantly during ARI but not during SRI. Second, tension in LP muscles (near injury site) was increased more by anger- than sadness-induction, whereas this difference did not emerge for trapezius tension (distant from injury site).

THE EFFECT OF BIOFEEDBACK TREATMENT IN PATIENTS WITH TENSION HEADACHE  
Jooyeun Ahn, Bumhee Yu, Psychiatry, Samsung Medical Center, Sungkyunkwan University, Seoul, Republic of Korea

The subjects were 31 patients who visited the psychiatric outpatient clinic of Samsung Medical Center in Seoul and met the criteria of the International Headache Society for migraine headache. They were randomly assigned to either treatment group (n=15) or control group (n=16). The treatment group received 8 sessions of biofeedback treatment including temperature trainings for 4 weeks, whereas the control group received no therapeutic intervention. We used the McGill pain questionnaire sensory and affective (MPQ-S, MPQ-A), visual analogue scale (VAS), and clinical global impression scale (CGI) to assess the headache severity and used the Hamilton depression and anxiety rating scales (HAM-D, HAM-A), and Spielberger state and trait anxiety inventory (STAI-S and T) to assess mood symptoms before and after treatment. Before treatment, there were no significant differences in demographic variables, headache severity and psychological mood states between the treatment group and control group. After treatment, patients in the treatment group showed significant improvement in the pain severity scales such as VAS(t=4.06, p=0.0005) and CGI(t=3.12, p=0.005), although they showed no significant improvement in MPQ-S and MPQ-A. Patients in the treatment group also showed significant improvement in the mood scales such as HAM-D(t=2.40, p=0.0256), HAM-A(t=2.49, p=0.0208), and STAI-S(t=2.08, p=0.0491) compared with those in the control group. These results suggest that biofeedback treatment is effective not only for the reducing pain severity, but also improving mood symptoms in patients with tension type headache.

THE ASSOCIATION BETWEEN GENDER, ANXIETY AND CHRONIC PAIN AFTER WHIPLASH INJURY  
Ask Elklit, Allan Jones, Psychology, University of Aarhus, Aarhus, Denmark

Purpose of study: There is increasing evidence to suggest that anxiety is related more strongly to chronic pain experience in men relative to women. The aim of the present study was to examine gender specific associations between anxiety and chronic pain experience in men and women exposed to whiplash trauma. Subject sample and statement of methods: 1709 sufferers of whiplash (1349 women, 360 men) belonging to the Danish Society for Polio Traffic and Accident Victims completed a battery of questionnaires measuring demographic, psychological and pain related factors (inc. prevalence of painful episodes, level of pain interference, number of anatomical regions in which pain was felt and level of general disability). Summary of results: Significant differences between men and women were found on the following measures: Women reported significantly higher anxiety [F (1, 1632) = 7.688, p < 0.01] and significantly greater levels of general disability following whiplash injury [F (1, 1640) = 7.742, p < 0.01] compared to men. Men reported higher pain prevalence [F (1, 1666) = 6.607, p < 0.05] and pain interference as a result of whiplash injury [F (1, 1597) = 9.033, p < 0.01] compared to women. Tests of differences between gender groups in correlation coefficient magnitude revealed that anxiety in men was found to be related more strongly to prevalence of painful episodes (p = 0.07) and level of general disability (p < 0.05) compared to women. The stronger association between anxiety and symptoms of whiplash trauma in men compared to women may be due to gender differences in the attribution of anxiety related autonomic arousal as pain. Alternatively, anxiety may differentially effect the willingness of men and women to report pain and other health indices. Anxiety is an important factor in understanding gender differences in whiplash related chronic pain and requires further investigation.
**Abstract 1301**

**EFFECTS OF INFORMATION AND STRESS REDUCTION ON PLACEBO ANALGESIA: INTERACTIONS WITH GENDER**

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The present experiment investigated whether the effect of expectancy on pain is mediated via affective mechanisms, by recording pain as well as subjective and physiological stress responses after positive or neutral information about the effects of a painkiller. Additionally, stress was manipulated by informing subjects about the effects of the pain stimulus. Methods: Eighty-four healthy volunteers (47 women) between the ages of 19 and 40 years participated. The volunteers were randomised to four groups where neutral or positive information about a painkiller was crossed with stress-reducing information, or no information, about the pain stimulus. After receiving information about the drug, the subjects ingested one crushed tablet (500 mg) of the mild painkiller acetaminophen (Paracetamol, Dumex®). Immediately afterwards, the sub maximum torniquet test was applied, and the subjects who received stress reduction received an assurance that the torniquet procedure, although painful, was completely without risk and would cause no harm to the arm. The participants reported pain intensity on a scale from 0 (no pain) to 10 (unbearable pain) every five minutes. The experiment was terminated at a maximum of 45 minutes after the start of pain induction. Results: The Test x Information x Gender (p < .05) and Test x Stress x Gender (p < .05) interactions were significant. Males who had received positive information about the painkiller displayed less pain than males who had received neutral information. Males who received stress reducing information about the pain stimulus displayed less pain than males who received no such information. There were no effects of the cognitive or affective manipulations on pain in women. Conclusion: Both information and stress reduction promoted pain reduction, but only in male subjects.

**Abstract 1538**

**DIABETES RETINOPATHY AND DEPRESSION IN AFRICAN AMERICAN PATIENTS**

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An increased prevalence of depression generally occurs in patients who suffer complications of their diabetes, e.g. symptomatic neuropathy. We sought to determine the relationship of depressive symptoms to diabetic retinopathy in 338 African American patients receiving treatment at an urban diabetes clinic. Depressive symptoms were measured with the Zung Depression Rating Scale. Logistic regression analyses revealed that the probability of retinopathy was significantly increased with poorer near vision, worsening albumin:creatinine ratio, and the longer the duration of diabetes. Increasing Zung score was significantly related to increasing probability of retinopathy in patients with higher body mass index greater than 45. Future studies will determine whether depression is a risk factor for onset/progression of diabetic retinopathy.

**Multivariate Analysis of the Probability of Retinopathy**

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**Abstract 1693**

**HELP OR HINDERANCE? THE COMPLEX ROLE OF FATHER INVOLVEMENT IN DIABETES CARE AMONG ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS**

Carolyn D. Korbel, Deborah J. Wiebe, Cynthia A. Berg, Renn Upchurch, Ryan Beveridge, Katie Fortenberry, Psychology, University of Utah, Salt Lake City, UT

Father's involvement in the diabetes care regimen of their children has become an area of increased examination as investigators have begun to probe broader systemic influences on diabetes care. 83 adolescents with type 1 diabetes mellitus (aged 11-17 years) and their mothers each completed questionnaires as part of a larger follow-up study to evaluate perceived father involvement with important diabetes care predictors. Measures of maternal behavioral involvement, children's appraisals of the form of maternal involvement in diabetes, adherence, and depression were provided by mothers and adolescents. Mothers and teens each reported the average weekly frequency of father involvement. Reports converged, r = .70, p < .001, indicating father is involved approximately 3-4 days/week. Father involvement decreased with child age, r = -.23, p<.05, with no differences by sex. Greater father involvement reported by both mother and child was associated with higher levels of maternal behavioral involvement, rs = -24 to -.34, ps < .05, lower levels of perceived uninvolvement, rs = .22 to -.33, ps < .08, and higher levels of intrusive support. Heightened father involvement may be beneficial as it was associated with lower child depression, r = -.22, and better adherence (reported by both mother and child, rs > .27, ps < .05). It is important to note, however, that heightened father involvement may not be uniformly positive. Father involvement was associated with children's reports of more family conflict around diabetes, r = -.26, p < .05. In addition, when fathers were highly involved, appraised maternal control was associated with lower child efficacy, appraised control and child efficacy were not related when fathers were less involved (B = -.36, t = -2.38, p < .05). Thus, father's heightened involvement may exacerbate adverse aspects of maternal control. Future research that examines these associations more fully is advised.

**Abstract 1569**

**DYADIC COPING AND EMOTIONAL ADJUSTMENT IN CHILDREN WITH DIABETES AND THEIR MOTHERS**

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The family context is important for understanding how children appraise and cope with diabetes and their emotional adjustment (Hauser et al., 1993; Seiffge-Krenke-1998). In the present study we explore the ways that parents and children may be mutually engaged as they cope with stressors surrounding the child's type 1 diabetes across adolescence and the association between forms of dyadic coping and emotional adjustment. One-hundred twenty-seven children (ages 10-15 years, M=12.85) and their mothers separately described the two most stressful events of the week regarding diabetes and coping responses. Children appraised mother's involvement in their coping efforts (uninvolved, supportive, collaborative, and controlling); mothers appraised their child's involvement in her coping efforts via the same categories. Children and mothers completed measures of emotional adjustment and family functioning. Perceptions that mothers and children were uninvolved with each other's stressors were associated with greater child depression (p < .01) and less positive maternal mood (p < .01); collaborative involvement was associated with less child depression (p < .05) and more positive maternal mood (p < .05). Children's perceptions that mothers were involved in a controlling manner were associated with child depression largely for older females (p<.01). Mother's perceptions that children were involved in a controlling manner were associated with less positive emotion for mothers of younger children (p < .01). Greater mutual involvement in coping strategies occurred more frequently in cohesive families (ps < .01), but family functioning did not moderate the effects of coping on mood. The results suggest that dyadic coping is a way that children and mothers remain connected during adolescence as they cope with difficult stressful life events surrounding chronic illness that is associated with better emotional adjustment.
THE QUALITY OF THERAPEUTIC ALLIANCE PREDICTS GLYCEMIC CONTROL IN TYPE 1 DIABETICS ONE YEAR LATER
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Objective: To study in type 1 diabetic patients whether glycemic control is predicted by therapeutic alliance, respectively assessed by patients and their diabetologist. Methods: Baseline data on 99 type 1 diabetics (42 males; mean age 38.1±8.1) and biological data at one year for 86 patients were collected. The baseline quality of glycemic control was defined as the average of all the glycosylated hemoglobin levels (HbA1c) during the last year. HbA1c was again measured the day of the visit one year later. Therapeutic alliance was assessed via two self-administered questionnaires, the Penn Helping Alliance Questionnaire (HAQ) and the Working Alliance Inventory (WAI), both in a patient and a doctor version. Results: Therapeutic alliance assessed by the diabetologist was negatively correlated with baseline HbA1c (r=-0.32, p=0.003; and r=-0.23, p=0.04 respectively for HAQ and WAI) and with HbA1c level measured one year later (r=-0.46, p<0.001 and r=-0.36, p=0.002 respectively for HAQ and WAI). No significant correlations were found between HAQ measures and the patient version of the questionnaires. Glycemic control was impaired in patients presenting with at least one complication of diabetes, and in diabetics with less than 12 years of education. After controlling for baseline HbA1c, educational level, and the presence of at least one complication due to diabetes, therapeutic alliance as assessed by the diabetologist still predicted HbA1c level one year later (p<0.03 and p<0.05 respectively for HAQ and WAI). Conclusions: Therapeutic alliance, as assessed by the diabetologist, predicts the quality of current as well as further glycemic control. This results stress the importance of physician-patient relationship on the therapeutic efficiency in a chronic disease like diabetes.

WHERE IS THE PATIENT? THE ROLE OF DEPRESSION AND ATTACHMENT STYLES IN MISSED AND ATTENDED APPOINTMENTS IN PATIENTS WITH DIABETES

Purpose of Study: Missed medical appointments are associated with less efficient health care and poorer outcomes. We predicted that major depression and specific maladaptive attachment styles would be associated with number of attended and missed primary care visits in patients with diabetes. Subject Sample and Statement of Methods: A mail survey was sent to 3,923 diabetic patients from nine health maintenance organization primary care clinics. We collected data on major depression status, patient attachment style and determined number of attended and missed primary care appointments from automated data. We used Poisson and logistic regression analyses to determine if major depression and attachment style were associated with number of attended and missed primary care visits in patients with diabetes. Results Summary of Results: Patients with major depression had more scheduled office visits (p<0.001) and same day appointments (p<0.0001) as compared to non-depressed patients. Patients with preoccupied attachment style had more scheduled office visits (p<0.05) and same day appointments (p<0.05) and patients with fearful attachment style had more same day appointments (p<0.05) but were less likely to have scheduled preventative care visits (OR=75; 95% CI: 61.92) as compared to patients with secure attachment style. Among non-depressed patients, there were more missed scheduled office visits (RR=1.46; 1.18, 1.81) among those with dismissing compared to secure attachment style. Among patients with fearful attachment style, depressed patients were more likely to have missed same day appointments compared to non-depressed patients (p<0.01).

CONGRUENCE IN DAILY STRESSORS OF ADOLESCENTS WITH DIABETES AND THEIR MOTHERS
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Recent research explores the social nature of type 1 diabetes through the stress life of adolescents with the disease and their mothers. The literature suggests that congruent perceptions of illness-related issues may be associated with positive outcomes (Law, 2002). However, research is equivocal as to whether congruence is associated with better or poorer outcomes (Revenson, 1994). The study examined at a daily level the extent to which adolescents and mothers report similar stressors and whether congruence is associated with better metabolic, emotional, and competence outcomes. Twenty-six adolescents (age range 13-18) and mothers individually filled out daily diaries for 14 days regarding their most stressful event of the day. Stressors were coded into 14 categories developed from prior research (Beveridge et al., 2003; 96% agreement), and a judgment was made as to whether the dyad mentioned the same event (i.e., congruence). Mothers and children rated their daily positive and negative mood and the child’s competence at performing 10 daily management tasks. Adolescents recorded daily blood glucose levels. Adolescents and mothers were congruent on 21% of the days. Hierarchical Linear Modeling showed that congruence on days when high levels were congruent, adolescents reported higher blood glucose levels (p<0.05) and both mothers (p<0.1) and adolescents (p<0.05) viewed the adolescent as less competent. Congruence was not associated with positive or negative emotion for children, but was associated with higher levels of negative mood for mothers (p<0.05). When mothers and adolescents were congruent they were more likely to mention metabolic control stressors than when they were not congruent. Results suggest that congruence in daily illness stressors may reflect salient metabolic control events, associated with high blood glucose levels, and feelings that the child is not competent. Although congruence is associated with poorer outcomes, future work will examine whether congruence is beneficial in the long-term in managing diabetes.

DOES STRESS MODIFY THE PATH FROM DIABETES TO LOWER EXTREMITY FUNCTIONAL LIMITATION?
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Using the DisabIlity Process Model as a framework, this study examined whether components of the path from diabetes to lower extremity functional limitation differ depending on the level of perceived daily stress. Subjects were 749 Mexican American and European American elders, 65+ years old, who participated in the San Antonio Longitudinal Study of Aging (SALSA). Lower extremity functional limitation was measured with the Lower Extremity Physical Performance Battery (LEPPB). Stress was assessed with the 4-item Reeder scale (range: 4-16), and stress levels were dichotomized based on a median split (average stress score: low stress group = 4.3, high stress group = 8.2). Potential path components included cardiovascular diseases (hypertension [HTN], myocardial infarction [MI], angina, stroke), cardiopulmonary impairments (left ventricular hypertrophy, peripheral vascular disease [PVD], forced expiratory volume at 1 second [FEV1]), and musculoskeletal impairment in lower extremity strength [LW_STR]. A structural equation modeling approach identified pathway variables in the two stress groups. A model in which structural weights and intercepts were constrained to be equal in the two groups fit the data as well as an unconstrained model (CFI = .967; RMSEA = .064 [.90 CI = .049-.080]), indicating that stress did not modify pathway components. Diabetes was associated with LEPPB through a cardiovascular path comprising HTN, MI, PVD, and LW_STR; and a pulmonary path comprising FEV1 and LW_STR; and a pulmonary path comprising FEV1 and LW_STR. Analysis of direct effects of stress on path components showed an indirect association with LEPPB via the direct effect of stress on HTN. If confirmed by longitudinal data, findings suggest that while it is not necessary to tailor interventions to impede progression toward diabetes-related lower extremity functional limitation according to stress levels, interventions to reduce stress may have indirect effects on improved LEPPB.
Abstract 1597

PRELIMINARY RESULTS OF A STUDY FOR THE DEVELOPMENT OF A MANUALIZED PSYCHOLOGICAL TREATMENT FOR COMORBID ASTHMA AND PANIC DISORDER (PD)
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High comorbidity exists between asthma and panic disorder (PD). Approximately 10% of asthmatics have panic disorder. This symptomatic overlap leads to misidentification, improper interventions and exacerbations of either comorbid condition, sometimes with deadly consequences. The study examines the use of a combined psychoeducational treatment for the comorbid asthma and PD, comprising materials from the National Asthma Education Program and Barlow’s Panic Control Therapy. The purpose of the study was (1) to teach patients to differentiate between asthma and panic symptoms (2) to assist patients in managing asthma to avoid exacerbations with both medical and behavioral methods (3) to provide self care skills for panic symptoms, and (4) to prevent symptomatic interference with daily functioning. We began using a 14-week protocol, for which 10 subjects were accepted. Data were collected on sessions 1, 5, 10, 14, and 2 follow-up sessions. Five participants completed the entire protocol. Problems with attrition (i.e., a high drop-out rate after session 8) persuaded us to reduce the length of the protocol to 8 weeks and sessions 2 follow-up sessions, with data collected on sessions 1, 4, 8, and 10. Six participants have completed the modified protocol to date, with no dropouts. Participants for both groups met NHALBI criteria for asthma and DSM-IV criteria for panic disorder. Daily documentation included self-report ratings of physical symptoms, mood symptoms, number of panic and asthma attacks, daily peak flow readings and daily dosage of medication. Testing sessions included structured interviews, self-rated questionnaires and pulmonary function assessment. A decline in panic severity occurred with both protocols, as assessed by the Panic Disorder Severity Scale (PDSS): 85% decrease (14-week protocol) and 80% decrease (8-week protocol). There was a drop in albuterol usage: 72% under 14-week and 77% under the 8-week protocol. Use of oral steroids and levels of pulmonary function remained approximately constant. Thus our protocol appears to be effective for treating this comorbid population. A controlled trial is warranted.

Abstract 1218

DOES LABORATORY STRESS INFLUENCE IMMUNE MEDIATORS OF AIRWAYS INFLAMMATION IN ADOLESCENTS WITH ASTHMA?
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We investigated whether laboratory stress influences immune mediators of airways inflammation in adolescents with asthma. Patients with asthma often report that stress exacerbates their symptoms, and laboratory stress increases bronchoconstriction in some asthma patients. Since stress is also associated with immune changes, and airways inflammation, regulated by TH1- and TH2-type cytokines, is a key feature of asthma, we hypothesized that stress may influence asthma through immunological changes. Adolescents participated in a day-long protocol which included a 10-15 minute laboratory stressor (the Social Competence Interview). Blood samples were drawn via catheter prior to the stressor and periodically up to 7 hours thereafter. Using intracellular staining and flow cytometry (FACS analysis), the percentages of cells staining for TH1 and TH2-type cytokines (e.g., IL-4, 5, 13, IFN-gamma) were calculated. Subjects reported more anxiety during the stress interview than during other portions of the protocol, including catheter insertion (F(4,33)=27.8, p<.001), and 83% of subjects showed either a decrease in peripheral temperature and/or increase in skin conductance during the stress interview. Preliminary FACS analysis revealed that subjects with asthma had a greater percentage of cells staining for IL-5 than did controls at the outset of the protocol and throughout the day. (F(1,11)=7.1, p<.05). Although the group by time interaction indicating an increase in this percentage over time in the asthma group and a decrease in the control group was not significant, effect sizes for the group effect and the group by time interaction were moderate to large (4-6). Data collection is ongoing; results from FACS analysis, as well as from ELISA of stimulated cell supernatant, for additional TH1 and TH2-type cytokines in a larger sample will be presented.

Abstract 1520

FATIGUE PREDICTS QUALITY OF LIFE IN CROATIAN SARCOIDOSIS PATIENTS
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Fatigue is one of the core symptoms in sarcoidosis patients. Although fatigue affects quality of life (QOL) in other patient groups, this relationship has hardly been studied in sarcoidosis patients. The present cross-sectional study among 150 Croatian sarcoidosis patients attempted to get more insight in this relationship. The patients completed the Fatigue Assessment Scale and the WHOQOL-100 to measure fatigue and QOL, respectively. It appeared that fatigue was strongly associated with the QOL domains Physical health, Psychological health, and Overall QOL (all r/s > .50, p < .001). Regression analyses showed that fatigue (β ranging from -.49 to -.65, all p/s < .001) was an independent predictor of each QOL domains, after controlling for demographical (gender, age, and smoking) and clinical parameters (time since diagnosis, DLCO, FEV1, FVC, and radiographical stage). Gender, age, and time since diagnosis were independent predictors of QOL. Adjusted R² ranged from 34% to 54%. In conclusion, lung function and disease stage were not related to QOL. Fatigue was an important predictor of QOL in sarcoidosis patients. Treatment of sarcoidosis patients should not only be aimed at improving health, but should also be aimed at reducing fatigue and, thereby, optimizing QOL.

Abstract 1573

NONINVASIVE MEASUREMENT OF AIRWAY INFLAMMATION USING EXHALED NITRIC OXIDE: TEMPORAL STABILITY, AND RELATIONSHIP WITH CLIMATE, AIR POLLUTION, AND LUNG FUNCTION
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Background: Exhaled nitric oxide (NO) has recently been used as a noninvasive measure of airway inflammation in respiratory disease. Measurements have been shown to be sensitive to changes in the inflammatory status of the airways. However, an evaluation of spontaneous variability or temporal stability of values is critical if short- or long-term psychosocial influences on the inflammatory status of the airways are to be explored. Measurements can be taken from a single breath with a standard flow rate, but typically repeated measurements are recommended for a valid assessment. Therefore, we sought to study the stability of exhaled NO measurements within and between sessions, as well as the potential influence of climate and air pollution levels on the assessment day, and the relationship with more common indices of lung function assessment. Methods: We measured exhaled NO on two separate occasions 3-8 days apart in a mixed sample of healthy and asthmatic individuals using a chemiluminescence gas analyzer. On each occasion, NO was measured from 9 separate standard breaths. Outside climate and air pollution indices were recorded for the hour before arrival at the laboratory. Lung function was measured from forced expiratory maneuvers using spirometry. Results: Exhaled NO levels showed a wide variation between individuals, which contributed to a good to excellent (> .90) stability of measurements within and between sessions. Mean levels were higher in asthma patients than in healthy individuals. No significant relationship was found with climate, levels of air pollution, or lung function. Conclusion: Exhaled NO measurements show an excellent repeatability within and between sessions even between single breaths. Influences of climate and air pollution are not substantial. Individual differences in exhaled NO are not reflected in other indices of airway status such as mechanical lung function measurements.

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COMORBIDITY BETWEEN ASTHMA ATTACKS AND INTERNALIZING DISORDERS AMONG PUERTO RICAN CHILDREN AT ONE-YEAR FOLLOW-UP
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The association between internalizing symptoms and pediatric asthma has been well documented. However, there have been few longitudinal studies that have examined this relationship. Previous findings from the first wave of this study showed that there was an association between internalizing disorders at baseline and lifetime history of asthma attacks. The purpose of this paper was to examine whether this association between internalizing disorders and asthma attacks was replicated at one-year follow-up and whether asthma attacks were associated with the persistence of internalizing disorders. This study was conducted on the island of Puerto Rico. A community sample of 1,789 children ages 5-18 years and their primary caregivers participated. The families completed measures at baseline and at one-year follow-up, with a retention rate of 94.9 percent. The Diagnostic Interview Schedule for Children (DISC) was administered to assess DSM-IV internalizing disorders during the past year. Caregivers reported whether their children had ever experienced an asthma attack. Approximately 10% of children with asthma attacks at baseline met criteria for an internalizing disorder at one-year follow-up. Children with a lifetime history of asthma attacks at baseline had greater odds of having an internalizing disorder at one-year follow-up (OR = 2.1, 95% CI, 1.2 - 3.8), independent of sociodemographic measures. This association was no longer significant after controlling for internalizing disorders at wave one (OR = 1.5, 95% CI, 0.8 - 2.9). These findings show that the association between internalizing disorders and asthma attacks was replicated one year later in the same sample. However, an association was not found between asthma attacks and the persistence of internalizing disorders.

Body Mass Index Is Associated With Worse Asthma Control and Quality of Life Among Adult Asthma Patients
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Background: Several studies have found evidence of an association between asthma and obesity (measured using body mass index: BMI) in children and adults. Few studies have examined associations between BMI and actual measures of asthma morbidity, such as levels of asthma severity, asthma control, and quality of life. Objective: To evaluate associations between BMI and asthma severity, levels of asthma control and quality of life in a Canadian sample of adult outpatients. Method: 382 adult asthma patients underwent a demographic and medical history interview on the day of their clinic visit. Patients' self-reported height and weight were used to calculate BMI (kg/m2). Patients completed the Asthma Control Questionnaire (ACQ) and Asthma Quality of Life Questionnaire (AQLQ) and underwent standard pulmonary testing (spirometry). Results: 139 (36%) asthma patients had a normal BMI (M = 22.3); 149 (39%) patients were overweight (M = 27.3); and 94 (25%) patients were obese (M = 33.9). There was no relationship between BMI and asthma severity, controlling for age, sex and asthma duration (p = .21). Patients with higher BMI scores had higher ACQ and lower AQLQ scores (p's<.01), even after controlling for age, sex and asthma severity. Conclusions: Results suggest that a high BMI and obesity are not only common among adult asthmatics, but are associated with worse asthma control and quality of life. This study links increasing BMI with clinically relevant asthma morbidity and is a potential target for behavioral interventions.
Prenatal stress is associated with poor birth outcomes such as prematurity and low birthweight. Despite clinical literature documenting this, no prospective studies have identified how these effects occur. This study explored the hypothesis that stress alters neural-immune parameters during pregnancy in a manner which may contribute to poor outcome. A sample of 79 pregnant women and 43 nonpregnant women was recruited through the University of Colorado. Pregnant subjects completed assessments of stress, coping, and social support and provided blood samples at 12-16, 22-26, and/or 36-40 weeks of pregnancy, and control subjects were assessed one time. Serum levels of TNF-α, IL-4, IL-6 and IL-10 were determined via ELISA (Biosource Europe). Estriol was assessed via an EIA (DSL, Webster, TX). Independent t-tests revealed increases in TNF-α for all trimesters, and IL-6 and IL-4 for the 3rd trimester in pregnant women compared to controls. Stress measures revealed that pregnant women had higher stress levels in the 2nd trimester only compared to the nonpregnant group, although low stress was reported for all subjects overall. Correlational analyses showed a negative relationship between stress and IL-4 (r = −.511, p = .011) for the 1st trimester and a positive relationship between stress and IL-6 during the 3rd trimester of pregnancy (r = .335, p = .038), although these were the only significant relationships between the psychosocial and immune variables in this sample. Our prior work showed not only that high stress is related to high IL-6 but also to high TNF-α and to poor pregnancy outcome. Differences in the populations of women studied may account for this discrepancy; our prior work was conducted in a high-stress, low SES population and the present sample of women had very low stress and was high SES. These data suggest a complex relationship between stress, neural-immune factors, subject characteristics, and pregnancy outcome which require further careful study.

Abstract 1266

MEDICAL PATIENTS’ ATTITUDES TOWARDS DEPRESSION AND ITS TREATMENT
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The understanding of medical patients' views of depression is crucial to overcoming obstacles to efficient depression treatment. This study aimed to investigate attitudes towards depression and its treatment in depressed and non-depressed medical outpatients. Eighty-seven depressed subjects (mean age, 41.0 years; 66% female) and 91 non-depressed subjects (mean age, 41.4 years; 67% female) from 7 internal medicine outpatient clinics and 12 family practices participated in this cross-sectional study (participation rate, 91%). Depression diagnoses were established using a structured diagnostic interview and patient attitudes were investigated with open-ended interview questions regarding treatment preferences, factors improving and impairing emotional well-being, and patients' self-management to improve well-being. Among the depressed patients, psychotherapy was the most frequently preferred treatment (29%) and most common factor reported to improve emotional well-being (36%). Twenty-two percent of the depressed patients desired depression treatment within their current medical system, but suggested substantial improvements needed to be made. One-fourth of the depressed patients (25%) did not want any depression treatment at all. Antidepressants were rarely mentioned as a preferred treatment (6%) or factor improving well-being (11%). Thirty-eight percent of the depressed patients attributed their impaired mood to health problems. Compared to the depressed patients, the non-depressed controls preferred significantly less frequent depression specific therapies and were less aware of factors impairing emotional well-being. For the treatment of depressed medical patients, health care providers might consider the strong preference for psychotherapy, obstacles to depression treatment within the current medical system, and an appropriate treatment of comorbid physical conditions.

Abstract 1261

DETECTING DEPRESSION AND MONITORING OUTCOMES OVER TIME WITH A 2-ITEM SCREENER: THE PATIENT HEALTH QUESTIONNAIRE-2 (PHQ-2)
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This study evaluates the two-item Patient Health Questionnaire (PHQ-2) as a measure for diagnosing and monitoring depression. We assessed construct validity in a cross-sectional sample of 1619 medical outpatients (mean age 43 years, SD 14 years, 64% female) by comparing the PHQ-2 to four longer self-report questionnaires. Criterion validity was established in a subsample of 520 subjects with reference to the Structured Clinical Interview for DSM-IV (SCID). Sensitivity to change was investigated in a prospective study of 167 patients who completed the SCID both at baseline and the 1-year follow-up. With reference to the SCID, the PHQ-2 had a sensitivity of 87% and a specificity of 78% for major depressive disorder, and a sensitivity of 79% and a specificity of 86% for any depressive disorder. Its diagnostic performance was comparable to that of longer depression scales. PHQ-2 change scores accurately reflected improved, unchanged, and deteriorated depression outcomes. The PHQ-2 performed favorably with respect to a standard diagnostic interview as well as established depression scales and proved sensitive to change. Thus, the PHQ-2 appears promising as a brief multipurpose measure for detecting depression, grading its severity, and monitoring outcomes over time.

Abstract 1146

DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH DIMINISHED PRODUCTION OF PROINFLAMMATORY CYTOKINES BY PERIPHERAL BLOOD MONONUCLEAR CELLS IN MIDLIFE WOMEN
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Depression is associated with a number of indicators of impaired immune function, such as lowered proliferative response of lymphocytes to mitogens and lowered natural killer cell activity. An underutilized approach to assessing immunocompetence includes examination of the ability of white blood cells to produce cytokines following mitogen stimulation. We examined associations between depressive symptoms and proinflammatory cytokine production within a community-based sample of midlife women. Premenopausal women aged 42-52 participating at the Pittsburgh site of the Study of Women's Health Across the Nation (SWAN) provided blood samples following a 12-hour fast, obtained during the early follicular phase of the menstrual cycle. Peripheral blood mononuclear cells (PBMC) were isolated and incubated in medium alone or in the presence of PHA (for IL-6 production) or LPS (for IL-1β and TNF-alpha production). Log-transformed values of mitogen-stimulated cytokine production following subtraction of non-stimulated (spontaneous) cytokine production were obtained. Results indicated diminished cytokine production among women with higher CESD depression scores, greater BMI, poorer exercise habits, and recent sleep difficulties. Associations between depressive symptoms and cytokine production were partially attenuated following control for sleep and exercise. However, higher depression scores continued to show significant associations with decreased production of IL-6 (r=-.30, p<.01), IL-1β (r=.25, p<.05) and TNF-alpha (r=-.26, p<.05) following control for age, BMI, sleep, exercise, alcohol and psychotropic medication use. Results support reduced immunocompetence within depressed samples, and provide further evidence regarding potential mechanisms driving depression-immune relationships.
Intramuscular antipsychotics are often first line treatment for acute agitation in hospitalized patients with schizophrenia. After patients are stabilized, they are transitioned to oral medication. The objective of this analysis was to assess the relationship between total 24-hour intramuscular (IM) olanzapine (OLZ) or haloperidol (HAL) dose and subsequent daily oral dosing. This was a post hoc analysis of subsequent daily oral antipsychotic dose per IM dose group in a double-blind, randomized study. Over 24 hours, agitated inpatients with schizophrenia received 1, 2, or 3 injections of IM OLZ 10 mg (n=92, 26,3, respectively); HAL 7.5 mg (n=32, 1, respectively), or placebo (PBO, n=24, 21, 2, respectively) followed by 4 days of oral treatment with 5-20 mg/d OLZ for IM OLZ and PBO patients and 5-20 mg/d HAL for IM HAL patients. Treatment subgroups were also assessed for continued reduction in agitation measured by Positive and Negative Syndrome Scale-Excited Component (PANSS-EC). Group median/means of mean oral daily doses in patients receiving 1, 2, and 3 injections, respectively, were 10.0/12.0 mg, 13.8/13.8 mg, and 20.0/18.3 mg OLZ for OLZ IM patients; 10.0/9.9 mg, 11.3/11.8 mg, and 10.0/10.0 mg HAL for HAL IM patients; and 10.0/10.6 mg, 11.3/10.5 mg, and 8.8/8.8 mg OLZ for PBO IM patients. Reduction in agitation continued during the transition to oral antipsychotic for each IM dose subgroup. OLZ patients who received >1 injection had no significant change in PANSS-EC during the oral treatment phase, while mean PANSS-EC scores were significantly further reduced during oral treatment phase (p<.05) for all HAL and PBO patients and for OLZ patients receiving 1 IM dose. Reduction in agitation was maintained following the transition from IM to oral therapy. Transitional oral doses increased with the number of OLZ injections. This trend was less apparent in patients treated with HAL and PBO.

High levels of inflammatory markers have been associated with depression, but it is unclear whether the strength of these associations varies with the severity of the depression. We determined whether in a random population based sample, elevated levels of pro-inflammatory cytokines and acute phase proteins are associated with minor and major depression in late life, independent of co-morbid chronic diseases. The study was performed in 1285 participants from the Longitudinal Aging Study Amsterdam aged 65 and over. Plasma concentrations of Interleukin-6 (IL-6), C-reactive protein (CRP) and alpha-1-antichymotrypsin (ACT) were measured. Major depression was established according to criteria of the Diagnostic Statistical Manual (DSM)-IV scheme and overall study quality, accounted for a considerable portion of this variance in effect sizes. Results suggest an effect of moderate magnitude. In addition, statistically significant heterogeneity in effect sizes was observed across the entire sample of studies. Moderator analyses revealed that several study characteristics, including EEG reference scheme and overall study quality, accounted for a considerable portion of this variance in effect sizes. Results seem to warrant continued investigation of not only EEG asymmetries in depression, but also brain research that utilizes newer, more sophisticated approaches. Criticisms of existing research and directions for future research are offered. Finally, treatment implications of the current data abound. As one example, research into repetitive transcranial magnetic stimulation (rTMS), a new clinical tool that owes much of its rationale to the literature outlined herein, shows early promise in decreasing depressive symptomatology.

The mortality from anorexia nervosa (AN) in long-term follow-up studies is about 10%. The major cause of death from AN is thought to be cardiac arrhythmias. It has been shown that QT interval, which is associated with ventricular arrhythmias, is significantly longer not only in AN but also in bulimia nervosa (BN) patients than in controls. Recent literature has shown the possible utility of QT interval variability as a noninvasive marker of cardiac repolarization. And a higher QT interval variability is associated with sudden death in cardiac patients, and also decreased in heart rate variability (HRV) is associated with increased cardiac mortality in patients with cardiac disease as well as normal controls. Therefore, the aim of this study was to investigate HRV and QT interval variability in eating disorders. The subjects consisted of 26 AN (23.1 ± 6.7 years; body mass index (BMI), 14.5 ± 4.5 kg/m2) and 31 BN (23.9 ± 4.0 years; BMI, 20.3 ± 3.3 kg/m2) female patients and 34 female healthy controls (23.4 ± 2.9 years; BMI, 20.0 ± 2.2 kg/m2). QT interval variability was measured by QT variability index (QTVI) proposed by Berger et al. (1999). HRV was calculated using spectral analysis of time series RR interval data. The QTVI in AN (-0.38 ± 0.52) as well as in BN (-0.42 ± 0.54) was significantly greater than in controls (-0.78 ± 0.40) (p <0.05), although HRV was similar in those groups. Therefore, patients with both AN and BN might suffer from arrhythmias, regardless of malnutrition.
Comorbidity of psychiatric disorders, e.g., depression and anxiety with each other and with cardiac disease, is common. There are few studies of biological abnormalities associated with comorbidity, and almost none investigating relationships among biological systems showing abnormalities. Abnormal systems include hypothalamic-pituitary-adrenocortical (HPA) in major depression (MDD), and CNS system involving alpha2-adrenoceptor control of growth hormone in both anxiety disorders and MDD. Animal research has shown these systems to interact in mammalian brain. Few studies have isolated effects of co-morbidity per se. We assessed functions of both systems (Trier Social Stress Test-HPA, and clonidine stimulation-noradrenergic system) in 15 subjects with pure MDD, 15 with pure anxiety (social phobia or panic), 18 with comorbid MDD and anxiety, and 48 matched controls. We already reported that HPA hyperactivity occurred only with comorbidity (not pure MDD or anxiety), and blunted growth hormone responses occurred (with or without comorbidity) only in predominantly anxious subjects (not predominantly MDD). We now report assessment of the interaction of these systems. In controls, there was a significant negative correlation (r = -0.425, p = 0.004) between challenge results--greater HPA activation associated with smaller growth hormone responses and a similar pattern in pure anxiety (r = -0.563, p = 0.04), but no significant relationship in pure or comorbid MDD. Thus, a complex relationship pattern was observed, including an HPA abnormality related specifically to comorbidity, and confirmation that these systems do interact in healthy humans, and in pure anxiety. Future studies should investigate these systems in individuals comorbid for psychiatric and medical disorders.

Abstract 1217

HEART RATE VARIABILITY AND CORTISOL RESPONSE TO A STRESSOR IN PSYCHIATRICALLY HEALTHY PREPUBERTAL CHILDREN AT HIGH AND LOW GENETIC RISK FOR PANIC DISORDER

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We examined autonomic nervous system (ANS) activity and HPA axis function during a stress task in 37 prepubertal psychiatrically healthy children at high (n=22) and low (n=15) genetic risk for panic disorder (PD). Subjects underwent an impromptu speech task in which they were given 2 minutes to prepare a 10 minute speech on a topic of their choice. Salivary cortisol, a measure of HPA axis function, was measured 5 mins prior to and 30 mins following the speech task. Heart rate variability, a measure of ANS activity, was measured for 20 minutes at rest and continuously during the 10 minutes speech task. Radioimmunoassay was used to measure salivary cortisol. Power spectral analysis measured the following cardiac parameters: low frequency (LF) which reflects mainly sympathetic activity, high frequency (HF) which reflects mainly parasympathetic activity and the LF:HF ratio which reflects sympathovagal balance. Repeated measures ANOVA revealed a significant time (p<0.001) and group (p<0.05) main effect and significant group X time interaction (p<0.05) for the LF:HF ratio. The group X time interaction reflects the decreased LF:HF ratio during the speech task in the high risk group (1.82±0.9 vs 3.05±2.0). There was a significant time main effect for cortisol secretion (p<0.05) and HF (p<0.001) with a similar trend noted for LF (p=0.09). However, none of the group main effects or group X time interactions were significant. These preliminary results indicate that children at genetic risk for PD exhibit decreased sympathovagal balance in response to a stressor. This may be an early appearing marker of risk for psychopathology in these children. Further exploration of the ANS in high risk children is warranted.
Abstract 1099

EFFECTS OF WILLIAMS LIFESKILLS TRAINING ON ANGER REDUCTION IN AFRICAN AMERICAN ADOLESCENTS
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The Williams LifeSkills Workshop (WLS) provides training in stress-related coping skills. These include strategies which enhance awareness and evaluation of thoughts and feelings in stressful situations, deflection strategies, assertiveness, and problem solving skills. Stress-prevention skills include speaking clearly, listening, empathy and building supportive relationships. The purpose of this study was to determine the effect of school-based Williams LifeSkills training on anger in adolescents. Thirty-two African American youth (mean age±SD = 16±1.5 years, approximately 50% males) were randomized to WLS (n=14) or CTL (n=18) groups. The WLS group engaged in twelve 50-min training sessions at school. Subjects completed the Spielberger State-Trait Anger Scale at pre- and 10 weeks post-intervention. Primary outcome measures were changes in self-reported State-Trait anger and anger control. Controlling for pre-test measures, changes were observed such that the WLS group increased in anger control compared to a decrease in the CTL group (-2.23 vs. -0.77, p<.05, R²=.16), and decreased in Trait anger compared to an increase in the CTL group (2.0 vs. 0.89, p=.02, R²=.13). A trend was observed for a decrease in the WLS group in State anger compared to controls (-1.51 vs. -0.08, p=.07, R²=.09). These findings demonstrate the feasibility of conducting the Williams LifeSkills program in the school setting and its potential beneficial impact upon reducing self-reported anger and increasing anger control levels in African American adolescents. Replication and verification is warranted.

Abstract 1093

MARKERS OF INFLAMMATION MAY MEDIATE DEPRESSION OUTCOME IN ADULTS WITH RHEUMATOID ARTHRITIS (RA) AND MAJOR DEPRESSIVE DISORDER (MDD) FOLLOWING ANTIDEPRESSANT TREATMENT
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It has been proposed that immune activation is involved in the pathogenesis of MDD. MDD occurs in 17-27% of patients with RA, a known systemic inflammatory disorder. However, the role of immune inflammation in patients with RA and MDD is not clear. Our purpose was to examine the effects of antidepressant treatment on markers of inflammation (TNF-alpha, IL-1Ra, CRP) and MDD in patients with RA and MDD. We previously reported successful (p<.001) treatment of MDD in patients with RA (Parker, et al., 2003). We now report on a subset of these subjects treated for 15 months with sertraline. Serum TNF-alpha, IL-1Ra, and CRP levels were obtained at baseline and following antidepressant treatment. High sensitivity assays were used to obtain serum levels of TNF-alpha and IL-1Ra (enzyme-linked immunosorbent assay) and CRP (chemiluminescent immunoassay). Following antidepressant treatment TNF-alpha levels decreased (p=.06). However, IL-1Ra and CRP levels remained unchanged (p=.62, p=.97, respectively). Multiple regression analysis revealed that baseline serum TNF-alpha and IL-1Ra levels predict the amount of reduction in depression severity (R²=.35, p=.001). Subjects with lower baseline serum levels of the inflammatory cytokine TNF-alpha had greater reductions in depression severity scores; subjects with higher baseline serum levels of the anti-inflammatory cytokine IL-1Ra had greater reductions in depression severity scores. This study provides preliminary evidence that markers of systemic inflammation (TNF-alpha and IL-1Ra) in people with RA and MDD predict the amount of improvement in depression severity following antidepressant treatment. Decreasing levels of serum TNF-alpha suggest that antidepressant medication may act via a reduction in systemic inflammation. These findings suggest reductions in depression severity may be mediated by antidepressant effects on inflammatory markers.

Abstract 1200

PHYSIOLOGICAL REACTIVITY OF INSOMNIACS DURING WRITTEN DISCLOSURE: SALIVARY CORTISOL AND CARDIOPULMONARY FUNCTION
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The aim of the current study is to measure physiological arousal during written disclosure. 10 insomniacs (6 female) meeting DSM-IV criteria participated in a writing task. The average age of the participants was 36.6 (4 Caucasian, 6 African-American.) Six experimental (emotional disclosure) and 4 control (neutral time management topic) participants completed the task. Salivary cortisol was measured before and immediately after each writing session using a salivette technique (Salimetrics,Inc.; State College, PA).

Participants wore the Vivotrics LifeShirt for continuous ambulatory monitoring of heart rate, respiratory rate, rapid shallow breathing, change in end-expiratory lung volume, and activity level for one baseline and 4 writing sessions. Salivary cortisol levels of experimental participants increased significantly during writing on day 3 only (p<.0001). An index of change in end-expiratory lung volume differed significantly from baseline for experimental but not control subjects on days 3 and 4 of writing (p=.05 and .04 respectively.) Rapid shallow breathing tended to be higher for experimental subjects than controls on day of writing 3 (p=.06), this difference became significant on day 4 (p=.05). Groups did not differ in their perception of the credibility of the intervention for application as an insomnia treatment. In the current study individuals participating in a written emotional disclosure task secreted higher levels of salivary cortisol as compared to controls on only one day of writing, but had significantly greater levels of rapid shallow breathing changes on 2 of 4 days of writing. Changes in end expiratory lung volume differentiated the groups on 2 of 4 writing days as well. This report is based on preliminary data from a study that aims to include a total of 40 insomniacs. Further analyses include comparing groups at baseline and 1- and 2-months of follow up on sleep quality (PSQI), physical health (SF-36), and mood (PANAS-X).

Abstract 1226

IMPACT OF ASTHMA ON THE CLINICAL COURSE OF PANIC DISORDER
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Panic disorder and asthma are significant health problems that share many overlapping symptoms. Rates of panic disorder in asthma populations range from 6.5% to 24% and are higher than the rates of panic disorder in the general population. Little is known about how asthma impacts panic disorder. The purpose of this study is to examine the impact of asthma on the clinical course of panic disorder. This study reports on data from the Primary Care Anxiety Disorders Project, an on-going naturalistic, longitudinal study of anxiety disorders in primary care patients. Participants were admitted into the study if they met SCID-IV diagnostic criteria for at least one anxiety disorder. Subjects were assessed at 6, 12, and 24 months post intake to evaluate psychiatric diagnoses, psychosocial functioning, and other clinical variables. Intensity of panic symptoms were assessed at intake using the Sheehan Patient Rated Anxiety Scale (SRA). A total of 539 subjects were enrolled into the study. At intake, 235 patients were diagnosed with panic disorder or panic disorder with agoraphobia. An asthma diagnosis was self-reported in 57 (24%) of these patients and 35 (54%) indicated that asthma was onset prior to panic disorder. Mean SRA scores were 78.75 (SD = 24.4) for those with panic and asthma and 72.9 (SD = 23.5) for those without asthma (t = -1.55 (230), ns). Survival analyses indicated that the probability of remitting from panic disorder with asthma at the end of two years (.17) was significantly less than panic without asthma (.39; Wilcoxon chi-square = 9.27, d.f. = 1, p = .002). Tobacco use was not related to course of illness. Results indicate that presence of asthma in panic disorder was associated with a more chronic course of illness in this primary care sample.
Vascular inflammation often accompanies high blood pressure (BP) and is strongly predictive of future clinical events. Anger has previously been found to predict PEP, a regression model was used to determine fatigue (general fatigue subscale). Anger was assessed by the Anger Expression Inventory. Resting PEP, an inverse measure of cardiac contractility, was determined using impedance cardiography. Because trait anger has previously been found to predict PEP, a regression model was used where ethnicity was entered first, followed by anger and fatigue. The overall model was a significant predictor of PEP (p<0.01). Ethnicity (p < .01) and general fatigue (p < .02) were independent predictors of PEP. Individuals reporting more fatigue had lower cardiac contractility; thus indicating that fatigue may have an impact on the heart that is not observed with examination of heart rate and blood pressure. As contractility assesses the ability of the heart to pump blood, this may be related to the feelings of tiredness expressed by fatigued individuals.

Abstract 1150

PLASMA SICAM-1 LEVELS ARE ELEVATED IN LOW SOCIAL CLASS
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Vascular inflammation often accompanies high blood pressure (BP) and is strongly predictive of future clinical events. Although several psychosocial factors are shown to influence BP and vascular inflammation, the association between social status and sICAM-1 levels is not known. We have examined the associations of blood pressure and social status with sICAM-1 levels in 121 European American and African American men and women (mean age of 36 ± 8 years). Social status was determined by using the Hollingshead Two Factor Index of Social Position scale. Plasma levels of sICAM-1 were assessed using ELISA. Correlation analyses revealed positive correlations between plasma sICAM-1 levels and BP, sICAM-1 levels and social status, and blood pressure using multiple hierarchical regression analyses, social status still accounted for significant additional variance ($R^2$ change= 0.048) of plasma sICAM-1 levels (p< 0.05). These results suggest that low social status individuals may incur risk for future vascular diseases through elevated vascular inflammation regardless of gender and ethnicity.

Abstract 1246

THE RELATIONSHIP OF SELF-REPORTED FATIGUE AND CARDIAC CONTRACTILITY
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We examined the relationship of self-reported fatigue and anger with cardiac contractility (beta-adrenergic tone), as indexed by pre-ejection period (PEP). One hundred fifty healthy employed subjects participated in the study. The Multidimensional Fatigue Symptom Inventory-Short Form was used to determine fatigue (general fatigue subscale). Anger was assessed by the Anger Expression Inventory. Resting PEP, an inverse measure of cardiac contractility, was determined using impedance cardiography. Because trait anger has previously been found to predict PEP, a regression model was used where ethnicity was entered first, followed by anger and fatigue. The overall model was a significant predictor of PEP (p<0.01). Ethnicity (p < .01) and general fatigue (p < .02) were independent predictors of PEP. Individuals reporting more fatigue had lower cardiac contractility; thus indicating that fatigue may have an impact on the heart that is not observed with examination of heart rate and blood pressure. As contractility assesses the ability of the heart to pump blood, this may be related to the feelings of tiredness expressed by fatigued individuals.

Abstract 1148

PAPER VERSUS ONLINE DAILY LOG FOR MEASUREMENT OF HEADACHES IN ADOLESCENTS
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A great deal of stress-related symptom research involves the use of self-report daily logs. However, the feasibility and validity of this method of measurement may be negligible for certain populations. The purpose of this study was to compare the usefulness and feasibility of an online daily log versus a paper daily log for a daily measure of stress and headache in the adolescent population. Nineteen adolescents from a public high school were enrolled in the study investigating the relationship between headaches and stress, and were given the choice to complete six consecutive weeks of either a paper or online daily log measuring perceived stress and headaches. Overall, participants who chose the online format completed more daily logs. Of the 42 possible daily entries, paper log participants (N=13) completed more daily log entries (M=12.7) than online participants (N=6) (M=18.3). Participants who neglected to complete any daily logs (N=3) were all in the paper log group. In addition, possible threats to the validity of the paper logs were identified such as hoarding, missing data, and invalid and illegible entries. Although the paper method was preferred by most study participants, using an online daily log greatly increases the validity of a daily measure in this population. By discouraging hoarding, validating time of entry, and reducing participant error it appears that an online data collection method is more feasible and enforces greater adherence to study protocols in this population. Further research investigating the use and accuracy of paper daily headache logs for clinical and diagnostic use is recommended, specifically in the adolescent population.
Atherosclerosis is recognized as a chronic inflammatory process. It has been proposed that chronic inflammation subsequent to chronic psychological stress may explain the apparent association between stress and coronary artery disease (CAD) risk. The goal of the present review is to provide a critical evaluation of empirical studies that have examined the association between chronic stress and basal circulating inflammatory marker levels. Our review revealed 14 published articles that met pre-specified criteria. Among these, 5 specific chronic stressors were explored as correlates of inflammatory outcomes: caregiving (2); PTSD (5); vital exhaustion (3); burnout (1); fear of terror (1). Two additional studies employed various self-report indices of perceived stress, with the first examining each measure separately as correlates of inflammatory outcomes, and the second examining a single, composite psychosocial adversity score. Several investigations examined multiple immune and inflammatory markers. The present review discusses only findings involving inflammatory markers which may be most closely linked to CAD risk: IL-6 (6); IL-1β (2); sIL-6r (3); CRP (8); TNF-α (4); IL-1ra (1). Fourteen of 24 studies revealed significant positive associations between chronic stress and inflammatory outcomes. IL-6 showed the most reliable association with chronic stress (5/6 positive findings), whereas CRP showed the least reliable association (3/8 positive findings). Methodological and analytic inconsistencies between studies may account for some of the apparent differences in findings. We conclude that an association between chronic stress and inflammation is likely. However, that association may be complex, and limited to specific markers of inflammation and specific operationalizations of stress. Future work should focus on (1) standardizing the measurement of inflammatory markers; (2) enhancing the precision of current chronic stress definitions; and (3) determining possible causal mechanisms.

Abstract 1333

CHRONIC STRESS AND CHRONIC INFLAMMATION: CRITICAL REVIEW OF A NEW LITERATURE
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Thirty-one SLE patients with overt neuropsychiatric symptoms (NPSLE), 22 SLE patients without overt neuropsychiatric symptoms (non-NPSLE), and 25 healthy controls completed the following measures at baseline and one month follow-up: ACR-SLE neuropsychology battery, depression, fatigue, pain and perceived cognitive dysfunction. Patients with SLE (both NP and non-NP) showed higher symptoms of depression (CES-D; Center for Epidemiological Studies-Depression), higher levels of fatigue (Fatigue Severity Scale and Multidimensional Assessment of Fatigue), greater pain (McGill Total, Pain Intensity Index and VAS), and more perceived cognitive problems (Cognitive Failures Questionnaire and Patient Assessment of Own Functioning) compared to controls. All measures except the CES-D showed adequate reliability across the SLE groups at rest. Only the NPSLE patients had significant correlations between the cognitive impairment index from the ACR-SLE battery (CII) and measures of depression, fatigue and pain. Reliability for all measures except the CES-D was established in the SLE group, a finding that suggests the CES-D is not an ideal measure for depressive symptoms in these patients and other tests should be considered. Pain, fatigue and depression were highly associated with cognitive impairment in only the NPSLE group. This suggests that cognitive impairment and psychological/behavioral problems are likely to be higher and influence one another to a greater degree in NPSLE compared to non-NPSLE.

Abstract 1139

ASSOCIATION OF DEPRESSION, PAIN, FATIGUE AND PERCEIVED FUNCTIONING TO THE ACR-SLE NEUROPSYCHOLOGY BATTERY
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A-55
RELATIONSHIP BETWEEN PATTERNS OF BRAIN ORGANIZATION AND MIGRAINE WITH AND WITHOUT AURA

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Prior research has shown that different patterns of brain organization were significantly related to the prevalence of migraine. The present study investigates the relationships between patterns of brain organization, family history of migraine, and the prevalence of migraine with and without aura. Different patterns of brain organization were defined by the presence of different number of anomalous brain conditions or phenomena (ABCP). ABCP are behavioral phenomena clearly associated with CNS functioning (e.g. left or mixed handedness, dyslexia) which deviate from the statistical mean for the general population. Eighteen ABCP were used in this study. Each was considered to be a "marker" for the particular pattern of brain organization with which it is associated. The study group (N=426) were female non-bipolar I patients who had one or more lifetime major depressions and were derived from the author's private psychiatric practice (1961-2003). The diagnosis of depression, migraine with and without aura, and number of ABCP were derived from data obtained from the patients during their initial clinical interviews. The number of ABCP was significantly related (r=-.001), in the predicted direction, with the prevalence of migraine with aura (Pearson correlation=-36, CL -26.46) and migraine without aura (r=-.32, CL -22.41). The number of ABCP and family history of migraine were both found to make significant (p<.001) independent contributions to the prediction of migraine, both with and without aura, but do not distinguish between them.

Abstract 1416
NEUROPSYCHOLOGICAL AND PSYCHIATRIC SYMPTOMS IN CLINICALLY ISOLATED SYNDROME

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Multiple sclerosis (MS) is a disabling disease, in which depression, anxiety and cognitive impairment are common. The presence of early symptoms characteristic of MS is considered Clinically Isolated Syndrome (CIS). The presence of CIS plus neuroimaging markers can help to accurately identify those at risk for developing MS. The objective was to determine prevalence of cognitive deficits and psychiatric symptoms, explicitly depression and anxiety, and the relationship between them in CIS patients with MRI markers. CIS patients (n=20) were evaluated using instruments of anxiety and depression including the BDIT Hamilton Rating Scale Depression (HRSD), Hamilton Anxiety Rating Scale (HARS), and Hospital Anxiety and Depression Scale-Aggravation (HADS). Neuropsychological tests administered included the North American Adult Reading Test to estimate IQ (FSIQ), Delis-Kaplans Executive Function System (D-KEFS) Card Sort (CST), D-KEFS Color Word Test (CWT), Phonemic Fluency (PF), Hopkins Verbal Learning Test Learning (HVLT-L) and delayed recall (HVLT-R), Digit Symbol Modalities Test-Oral Version (DSMT), and the Digit Span Test (DST). Mean estimated FSIQ was 108.0 (SD=9.21). Eleven (55%) participants exhibited cognitive impairment as defined by performance 1 SD below population norms on 2 or more cognitive indices. The highest rates of impairment were on the PF (30%), SDMT (25%), HVLT-R (25%), CWT (20%), and CST recognition (20%). Symptom elevations were present among 40% of patients on the HRSD, 35% on the BDIT, 25% on the HARS, and 40% on the HADS. Depression and anxiety measures were significantly associated with decreased performance on an index of executive measures (PF, CWT, CST) [i.e., HRSD r = -.57, p < .05; HADS r = -.49, p < .05; HARS r = -.26, p = .055 (trend)], but were not associated with indices of learning and memory (HVLT-L, HVLT-R), and attention and speed of information processing (SDMT, DST) (all ps > .30). These data provide evidence to suggest that cognitive and psychiatric symptoms may present very early in the disease, even before a diagnosis of MS can be made. Consistent with findings in patients with more advanced MS, psychiatric symptoms appear to be uniquely related to executive functioning.

Abstract 1680
WEEKEND ALCOHOL USE AND EARLY WEEK HYDRATION MEASUREMENT

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Adequate hydration being essential to healthy physiological and psychological functioning, determining hydration levels has taken greater importance in behavioral medicine research. Bioelectrical Impedance Analysis (BIA) has been used successfully to estimate total body water in multiple populations including university students. Given the level of alcohol use among university students, hydration levels may fluctuate, particularly after weekend bingeing. This study investigated differences in naturally occurring hydration levels between groups depending on whether they were measured early in the week (Monday or Tuesday) or later in the week (Thursday or Friday). Participants were 91 university students (44 female, 18-22 years old). They were divided into early week (EW, n = 51) or late week (LW, n = 40) groups depending on when their hydration status was measured. As part of a larger study, participants completed hydration measurement (using BIA), answered questions about typical fluid consumption, and completed a record of the food and beverages consumed 48 hours before hydration measurement occurred. Results indicated that the EW group (Mean: 50.4 L/kg; SD: 7.6 L/kg) had significantly lower levels of hydration than the LW group (Mean: 55.9 L/kg; SD: 10.0 L/kg), p = .004. Self-reported beverage intake 48 hours prior to testing indicated that both groups consumed similar amounts of beverages. However, alcohol consumption 48 hours before hydration testing was higher for the EW (Mean: 29.3 US ounces, SD: 48.0) as opposed to LW (Mean: 6.6 US ounces, SD: 21.4), p < .009. These results suggest that hydration measurements, taken early in the week, may not be fully reflective of general hydration levels in university students and that alcohol use should be considered when evaluating hydration status of this population.
FEAR OF PROGRESSION (FOP): A DIAGNOSIS AND THERAPY
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The fear of progression of disease is one of the most important causes of distress in patients with chronic illness. This fear of progression (FOP) has to be differentiated from irrational fears. It can affect the quality of life in such an enduring way, that it has to be treated. The constructs great relevance led to the development of a self-assessment instrument to measure FOP: the fear of progression questionnaire (FOP-Q). Furthermore a specific therapy of dysfunctional FOP has been composed and evaluated. The FOP-Q is based on the examinations of 914 rehabilitation patients with cancer, diabetes mellitus and rheumatism. It consists of 43 Items, grouped into 5 scales: affective reactions, partner/family, work, loss of autonomy and coping with fears (Cronbachs alpha .70 -.95). Standardised validation measures showed moderate correlation with HADS- and SCL-anxiety scales, which indicates that the FOP-Q assesses the distinct fear of progression, aside from general anxiety. The FOP-Q is a valid, feasible and useful tool to identify patients with pronounced FOP. Two different FOP-therapy concepts have been designed and are evaluated. Both aim at enabling the patient to cope with his fear in everyday life, rather than eliminate the FOP. One concept is client-centred and non-directive. The therapeutic topics are selected by the patients, who share emotional experiences and support each other. The second therapy is based on the principles of cognitive-behaviour therapy. It is characterised by directivity and specificity. A patient learns to confront himself with his fear, learns to think it out and to cope with it. The evaluation is based on a prospective control group design with external randomisation. We shall present the data from 174 cancer- and 174 rheumatism-patients.

ISCHEMIA, PAIN, AND BLOOD PRESSURE RESPONSE TO EXERCISE STRESS TESTING
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Silent myocardial ischemia is a common phenomenon in heart disease. Nearly 80% of all ischemic episodes are silent. However, little is known about the mechanisms behind these bouts of silent ischemia. There are a number of studies that have noted significant reductions in sensitivity to acute experimental pain stimuli in hypertensive animals and humans. It is possible that blood pressure-related hypoalgesia might be related to silent ischemia. A total of 1355 patients underwent a SPECT treadmill exercise stress test. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and rate pressure product (RPP) were measured at rest and during peak exercise. Self-report chest pain was recorded during the exercise test. Patients with reversible myocardial perfusion defects during peak exercise were considered to have ischemia. GLM analyses revealed no main effects of either pain or ischemia on the baseline cardiovascular variables. Peak exercise data revealed main effects of pain on SBP (F=5.1, p<.03), RPP (F=7.8, p<.01), and HR (F=7.6, p<.01), and main effects of ischemia on SBP (F=4.0, p<.05) and RPP (F=4.3, p<.04). There were no other main effects and no interaction effects. Age, sex, medication status, cardiac history, and, for peak data, exercise duration and baseline CV levels were included as covariates in the models. Patients who did not experience pain had higher peak exercise SBP, RPP, and HR compared to those patients who did have pain. Patients who had ischemia also had lower peak SBP and RPP compared to non ischemic participants. These findings suggest that acute stress related increases in BP, rather than baseline trait levels, maybe one mechanism to explain the phenomena of silent myocardial ischemia in cardiac patients.

ELECTROCARDIOGRAPHY (ECG) IS THE MOST COMMONLY USED TEST FOR THE ASSESSMENT OF ISCHEMIC HEART DISEASE. THIS TEST APPEARS TO BE LESS ACCURATE IN WOMEN DUE TO AN INCREASED RATE OF FALSE POSITIVES. THE FACTORS ASSOCIATED WITH THIS ARE STILL UNKNOWN. THIS STUDY Sought to determine the profile of gender differences in socio-demographic variables, cardiac history, exercise parameters, and psychological factors in 1367 patients (n = 420 women) undergoing standard treadmill exercise stress testing with SPECT imaging. Psychiatric interview (PRIME-MD), Beck Depression Inventory (BDI), Anxiety Sensitivity Index (ASI), and standard demographic data were collected. Though there were no differences in the proportion of men and women with ECG ischemia (M=46%, F=45%, p<.09) or reported chest pain (M=21%, F=17%, p<.10), women were less likely to have ischemia on SPECT (M=55%, F=19%, p<.01). Women also had a greater rate of ECG false positives (M=18%, F=9%, p<.01). Women who exercise for less time (M=450s, F=375s p<.01) they were more likely to reach target heart rate (M=52%, F=72%, p<.01). Compared to men, women were more likely to be unemployed and living alone but less likely to have a history of smoking, high cholesterol, myocardial infarction, and taking cardiac medication (all p<.05). Finally, women exhibited more psychiatric morbidity than men, with higher prevalence of mood and anxiety disorders, and higher BDI and ASI scores (all p<.05). Results suggest that the presence of social and economic and psychosocial morbidity among women, but less classical cardiac risk factors and disease severity. These findings may partially explain the lack of positive SPECT results among women, though the reason for the high rate of false positive ECG results remains unclear.

EXERCISE STRESS TESTING: WHY AREN’T WOMEN ISCHEMIC?
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Caffeine’s (C) pressor effect has been shown in young men and premenopausal women. However, the effect of C on blood pressure (BP) at rest and during stress remains unknown in postmenopausal women and in relation to hormone therapy. In a randomized, 2-week cross over design, we studied 180 healthy men and women in 6 groups of 30 subjects each: men and premenopausal women (35-49 yrs) vs. men and postmenopausal women (50-64 yrs), with postmenopausal women divided into those taking no hormone replacements (NHRT), estrogen (ERT), or estrogen and progesterone (HRT). One week involved a placebo (P) home maintenance for 6 days and a 7th day of P lab challenge. The other week involved a C home maintenance (3 x 80 mg/day) and C lab challenge (250 mg). On both weeks, following P or C lab challenge, subjects were exposed to either exercise or psychological stress. BP responses were measured using automated monitors and cardiovascular hemodynamics were assessed using impedance cardiography. C challenge increased BP (+4/+2.4 mmHg, p<0.0001) and total peripheral resistance (TPR) (p = .02). C caused the NHRT women and older men to have a decrease in cardiac contractility in this older age group after C consumption. On the other hand, young men and women, and postmenopausal women on ERT or HRT, showed increases in HI after C consumption (F 5,155 = 4, p = .002). In response to exercise, men had the largest increase in systolic BP, on C week (p = .05). The effects of both exercise and psychological stress were otherwise additive to the effects of C on all other hemodynamic measures with no differences between groups. The differential effect of C on cardiac contractility and TPR in NHRT postmenopausal women suggest an altered cardiovascular regulation and may further explain the higher prevalence of CVD in that population.
Patients with highly symptomatic AF randomly assigned to one ablation technique for atrial fibrillation (AF) on illness related quality of life and depressive symptoms in peripheral arterial disease.

The ankle-brachial pressure index (ABPI) has been associated with functional status, but factors associated with impaired quality of life (QOL) and depressive symptoms in patients with peripheral arterial disease (PAD), are not fully understood. We therefore examined the role of PAD severity and personality as predictors of these clinically significant outcomes. Participants were 150 PAD patients from a teaching hospital. ABPI and treadmill-walking distance were used to assess PAD severity, and the SF-12, WHOQOL and CES-D scales to assess "distressed" (Type D) personality, QOL and depressive symptoms, respectively. After six months follow-up, the patients completed the QOL/depression scales again. The six-month follow-up indicated that Type D personality predicted poor physical health (OR=3.94;CI=1.60-9.67;p=.003), decreased level of independence (OR=4.26;CI=1.69-10.73;p=.002) and increased risk of depressive symptoms (OR=8.95;CI=3.21-24.97;p<.001), after controlling for age, sex, and cardiovascular risk factors. Indices of PAD severity (ABPI, walking distance) did not predict QOL or depressive symptoms at follow-up. Type D personality, but not ABPI, independently predicted individual differences in QOL and depressive symptoms in patients with PAD. Psychological factors may be associated with inadequate response to treatment in patients with PAD.

LONGTERM IMPACT OF DIFFERENT INTERVENTIONAL ABLATION TECHNIQUES FOR ATRIAL FIBRILLATION (AF) ON ILLNESS RELATED QUALITY OF LIFE: A STUDY OF 79 INITIALLY HIGHLY SYMPTOMATIC AF PATIENTS SIXTEEN MONTHS AFTER ABLATION

Atrial fibrillation (AF) is the most common arrhythmia. Circumferential pulmonary vein (circ-PCA) and segmental PV (seg-PCA) ablations are important interventional techniques for treatment of AF. We sought to weigh the subjective patient-perceived dimensions of these approaches. From 100 patients with highly symptomatic AF randomly assigned to one ablation procedure, quality of life (QoL) was assessed in 79 patients (44 (54%) circ-PCA, 35 (46%) seg-PCA) after a mean 16 months follow-up period. Standardized psychodiagnostic data assessment covered different features of health perception, negative affectivity and QoL (SF12). Patient groups did not differ in mean age (59 years, range 27-74 yrs.), marital status, social support and educational level (26% with university degree). Perceived severity of disease status was more improved in seg-PCA (n=25, 62.5%) compared to circ-PCA (n=15, 37.5%) as was in all further health perception measures. However, differences did not reach significance. Group differences in negative affectivity (vital exhaustion, depression), heart pain, symptom reporting, sleeping disorders and SF12 subscales were marginal. Also, sex stratification yielded no differences. However, when we stratified the study group according to the degree of perceived disease severity, highly significant differences (p=0.0001) were observed in most domains. Regression analysis revealed that depression had the most significant adverse impact on a positive health perception (Odds ratio 0.87; 95%CI 0.81-0.94, p=0.0001). The study shows no superiority of circ-PCA over seg-PCA. QOL features were unable to support the choice between the two ablation techniques. Patient-perceived dimensions of QoL in AF patients after ablation may be more influenced by intrinsic patient characteristics apart from treatment modalities.

QUALITY OF LIFE AND ANGINA PECTORIS SYMPTOMS BEFORE AND AFTER TRANSMYOCARDIAL LASER REVASCULARISATION (TMLR)

For patients with severe heart failure due to advanced, usually coronary heart disease, transmyocardial laser revascularization (TMLR) is the only possibility other than cardiac transplantation or an artificial heart. The objective of this study was to clarify whether and how TMLR improves the quality of life and angina pectoris symptoms in these patients after the procedure. Moreover, the influence of age, sex, preoperatively-experienced myocardial infarction and the preoperative assignment to the CCS and NYHA classes on changes in the quality of life was also examined. In a follow-up study, a total of 59 patients underwent TMLR at four different hospitals. For assessment of quality of life, the patients filled out a generic SF-36 to record health-related quality of life and the specific SAQ for evaluation of the physical and emotional effects of coronary heart disease on the patients. These questionnaires were completed by each patient preoperatively, and again 3, 6 and 12 months after the operation. Compared to other chronic diseases, the quality of life in the TMLR-patients at time T0 was extremely poor. It could be demonstrated that the quality of life after successful TMLR was significantly improved in the SF-36 subscales "Physical role function", "Physical pain", "General health perception" and "Vitality", and also in the SAQ subscales "Physical impairment", "Angina pectoris frequency", "Angina pectoris stability" and "Illness perception". Moreover, it was shown that gender and patient gender had only a relatively small effect on the change in quality of life. Patients with myocardial infarction, and those assigned to the CCS-classes 3 or 4 or to the NYHA-classes 3 or 4 documented a smaller improvement in quality of life after TMLR than patients without infarction and those assigned to the CCS-classes 1 and 2 or NYHA-classes 1 and 2. TMLR leads to significant improvement in quality of life and angina pectoris symptoms. The mechanisms of action of this procedure remain unclear. In addition to destruction of the nerve fibers responsible for angina pectoris symptoms, a placebo effect is also discussed.

RELATIONSHIPS BETWEEN COPING STRATEGIES AND EMOTIONAL DISTRESS AND QUALITY OF LIFE IN ONE YEAR OF ICD IMPLANTATION

The life-prolonging effect of the implantable cardioverter defibrillator (ICD) has been proven. However, the patients are faced with several changes in their lives and must cope with these challenges. In a prospective study of subjective well-being and objective course of the disease, 286 patients with life-threatening cardiac arrhythmias were recruited while awaiting implantation of a cardioverter defibrillator. Patients completed well-validated self-assessment questionnaires (FKV, PLC, GBB, B-L, HADS) before implantation, as well as three months and one year (n=233) after implantation. In addition, cardiac findings were documented. Depressive coping (range Beta: .291-.554) was found to be a stable multivariate predictor for all variables of emotional distress and quality of life. This effect was independent of psychosocial distress at T0 and cardiac findings. A broad range of coping strategies was related to decreased quality of life, increased physical symptoms, increased anxiety and depression. More flexibility is related to increased quality of life, decreased cardiac symptoms due to shocks and decreased physical symptoms. Depressive coping is a risk factor for emotional distress and bad quality of life after ICD implantation. This group of patients should be identified early and be offered supportive psychotherapy.
Abstract 1066

EFFECTS OF STRESS AND DEPRESSION ON STRESS-INDUCED MYOCARDIAL ISCHEMIA
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Although an increase in mortality in heart disease patients with depression is well established, the mechanism by which this occurs is unknown. Mechanisms connecting stress, depression, and cardiovascular mortality have not been previously explored in detail. The purpose of this study was to assess the effects of stress and depression on myocardial perfusion and plasma cortisol in heart disease patients. Subjects with coronary heart disease (CHD) (N=26) underwent single photon emission computed tomography (SPECT) imaging of myocardial perfusion and plasma measurement of cortisol at rest and during a stressful cognitive challenge. Subjects with CHD, depression, and a history of psychological trauma (N=5) were compared to subjects with CHD and depression without psychological trauma (N=8), and subjects with CHD without depression or psychological trauma (N=13). Subjects with CHD, depression and psychological trauma had increased stress-induced ischemia (measured by number of segments and severity) (7 (5 SD)) compared to CHD patients with depression without a history of psychological trauma (2 (2 SD)) and CHD patients without depression or psychological trauma (1 (2 SD) F=8.51; df=2,23; p=0.007). Eighty percent of CHD/depression trauma exposed subjects had stress-induced ischemia as opposed to 38% of CHD/depression non-trauma exposed subjects and 23% of CHD non-depressed non-trauma subjects. There were no differences in the effects of stress and depression on myocardial perfusion and plasma cortisol in heart disease patients.

Abstract 1102

GENERALIZED ANXIETY DISORDER PREDICTS CORONARY HEART DISEASE RISK INDEPENDENTLY OF MAJOR DEPRESSIVE DISORDER
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Anxiety symptoms are associated with elevated coronary heart disease (CHD) risk, but it is not known whether such associations extend to anxiety disorders or if anxiety effects are independent of depression. We sought to determine if generalized anxiety disorder (GAD) is associated with elevated CHD risk, and whether this association is independent of or interacts with major depressive disorder (MDD). Generalized anxiety and major depressive disorders were assessed via structured clinical interview in a cross-sectional survey of a representative sample of U.S. adults aged 25-74 (N=3032). An aggregate coronary heart disease risk score was derived from self-reported smoking status, body mass index, and recent medication use for hypertension, hypercholesterolemia, and diabetes. After adjusting for gender, age, education level, marital status, ethnicity, MDD, and the GAD by MDD interaction, participants with GAD (N=89; 72% female) had significantly elevated CHD risk (F(1, 3018)=5.14, p<0.05; b=0.39; 95% CI=0.05-0.72). The interaction term revealed that GAD denoted the greatest risk in the absence of comorbid major depressive disorder (p=0.065). This increased CHD risk among GAD cases was explained primarily by elevated hypertension medication use (p<0.05) and smoking prevalence (p<0.05), individual risk factors previously shown to be associated with anxiety. Generalized anxiety disorder appears to be associated with elevated CHD risk in the general population, and this risk is not explained by comorbid major depressive disorder.

Abstract 1113

CULTURAL DIFFERENCES IN FACTORS RELATED TO DEPRESSION IN AFRICAN AMERICAN AND WHITE FEMALE HEART PATIENTS
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The purpose of this study was to examine the relationship between depression and psychosocial and physical factors that may affect cardiac outcomes in a minority sample. Forty urban women (73% African American) who were admitted to the emergency unit hospital with symptoms of an acute myocardial infarction (AMI) were interviewed in the hospital. The mean age of this sample was 60.5 years (s.d.=15.4; range 32-89 years). The CES-D was used to measure depressive symptoms. Mean CES-D score for this sample was 15.5 (African American CES-D=16.2 and White CES-D=13.7). There were no significant differences in age, education, insurance, employment, caregiving roles, social support from friends and family, delay in seeking medical attention for symptoms, number of AMI symptoms, and severity of pain from AMI. However, correlational analyses indicated a significant association between depression scores and the following variables in African American women, but not White women: younger age (r=-.56, p=.002), delay to seek emergency medical attention for acute symptoms of an AMI in <1 hour (r=-.51, p=.005), belief that they don’t have time to go to medical check-ups (r=.48, p=.01), and greater number of physical symptoms of AMI (r=.70, p<.001). Variables correlated with depression scores in White women but not African American women were: caregiving duties (r=.69, p=.02) and the greater severity of pain associated with the acute event (r=.78, p=.02). In summary, among African American female heart patients, depression scores were associated with younger age, delaying treatment, and greater physical symptoms. White females heart patients, depression scores were related to greater pain from AMI and caregiving duties. Depression is a common problem among patients post-AMI and should be treated. These findings indicate that treatment for depression should take cultural beliefs and concerns into account.
CYNICAL HOSTILITY AND CAROTID ATHEROSCLEROSIS IN A BIRACIAL SAMPLE OF MID-LIFE WOMEN
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Hostility has been associated with increased risk of cardiovascular (CV) and all-cause mortality and incident coronary heart disease. Emerging evidence suggests hostility also may be related to subclinical CV disease. The majority of studies have been limited to Caucasian men; thus, less is known about the impact of hostility on CV risk or subclinical disease in women or minority populations. This study examined the association between low, moderate and high scores on a 13-item measure of cynical hostility and carotid atherosclerosis, assessed by B-mode ultrasonography, in a middle-aged sample of Caucasian and African-American women (N=553) from the Chicago and Pittsburgh sites of the Study of Women's Health Across the Nation (SWAN). SWAN is an ongoing, multi-ethnic, multi-site, longitudinal study of the impact of the menopausal transition on CV risk and other health outcomes. With adjustment for age, study site, race, and education, high hostile women had higher levels of overall intimal-medial thickening (IMT) and maximal IMT compared to low hostile women (overall IMT means=0.693 and 0.671 mm, respectively, P=0.044; maximal IMT means=0.902 and 0.863 mm, respectively, P=0.014). Moderately hostile women did not differ from low hostile women. Further adjustment for body mass index and standard CV risk factors, as indexed by the Framingham Risk score, did little to diminish the observed associations. African-American women had significantly higher hostility scores and greater IMT than Caucasians but no race by hostility interactions were noted. Findings indicate that high levels of cynical hostility are related to greater subclinical atherosclerosis in women at mid-life.

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Abstract 1502

A CARDIAC DEPRESSION VISUAL ANALOGUE SCALE FOR THE BRIEF AND RAPID ASSESSMENT OF DEPRESSION FOLLOWING ACUTE CORONARY SYNDROMES.
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Although depression following acute coronary syndrome (ACS) has been widely reported, neither the natural course of depression nor any indication of temporal fluctuations of depression in this population has been measured. It appears that depression following an ACS is not a transitory phenomenon. Up to half of those depressed after an AMI remain depressed 12 months later, especially if initial levels of depression are high. Of the published longitudinal studies, depression has been measured on 1 to 3 time points only, without any indication of the natural fluctuation of depression between these assessments. These fluctuations might have implications for the treatment of depression following an ACS. A 6-item Cardiac Depression Visual Analogue Scale (CD-VAS) was developed as a rapid method of assessing depressed mood. 13 females and 45 males, whose mean age was 59 ± 11 years (range 38-79), participated in the study. 60% were Australian born and 40% were overseas born. Participants completed the Beck Depression Inventory-II (BDI) and the Cardiac Depression Scale (CDS) 2 weeks post-ACS and then completed the CD-VAS for 14 consecutive days. Using mean weekly scores, the CD-VAS had strong internal reliability (.91) and strong test-retest reliability (85–97). Principal components analyses of CD-VAS extracted one component, accounting for 55% of the variance. The 6 items had loadings > .67. The CD-VAS had strong concurrent validity with the BDI (r = .81) and the CDS (r = .82), and was able to differentiate between depressed and non-depressed groups, F(7,47) = 8.26, P < .0001. The CD-VAS has strong reliability and adequate construct, concurrent, and predictive validity. The CD-VAS is a global measure of depression. Thus, it appears to be a suitable instrument for the repeated measurement of depression following an ACS. It provides a rapid, sensitive, and reliable subjective measure of depressed mood in longitudinal studies of depression in ACS populations. The CD-VAS could be valuable for monitoring patients at risk of unfavourable physical and psychological prognostic outcomes following a major cardiac event.

Abstract 1495

DEPRESSIVE SYMPTOMS FOLLOWING ACUTE CORONARY SYNDROMES: THE ROLE OF COPING AND TRAIT ANXIETY
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Depression is three times higher than in the general population in patients following acute coronary syndromes (ACS). These patients have increased morbidity and health care costs, worse quality of life, and are less likely to take prescribed medication or modify cardiovascular disease risk factors. The prognostic impact of depression can be as large as other major prognostic factors. Given the detrimental effect of depressed mood post-AMI it is important to be able to predict those most at risk of long-term depression post-ACS. Psychological variables were assessed in an Australian sample consisting of 15 females and 66 males (mean age = 57±12 years; range 29-79) 2, 12, and 24 weeks post-ACS. Depression, anxiety, perceived stress, and coping resources were determined by the Beck Depression Inventory-II (BDI), the Cardiac Depression Scale (CDS), the Spielberger State Trait Anxiety Inventory, the Perceived Stress Scale, and the Coping Resources Inventory (CRI). Depression, anxiety, and perceived stress remained elevated in the depressed group across time. Elevated trait anxiety and low coping resources moderated BDI depression scores at 2 weeks post-ACS (Table 1). CRI scores at 2 weeks post-ACS predicted BDI scores, F(4, 43) = 12.62, P < .001; beta=.42, r=.28, P=.007, r²=.45 and CDS scores F(4, 43) = 16.86, P < .0001, beta =.61, r=.44, P < .001, r²=.58, at 24 weeks post-ACS. It appears that trait anxiety and coping resources play a key role in the development of depressive symptoms post-ACS.

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Abstract 1493

DEPRESSION FOLLOWING ACUTE CORONARY SYNDROMES: A COMPARISON BETWEEN THE CARDIAC DEPRESSION SCALE AND THE BECK DEPRESSION INVENTORY-II.
Mirella Di Benedetto, Helen Lindner, Stephen Kent, Psychological Science, La Trobe University, Melbourne, Victoria, Australia, David L. Hare, Cardiology, Austin Health, Melbourne, Victoria, Australia

In patients following acute myocardial infarction symptoms of depression affect prognosis. However, these patients do not always meet the criteria for major depression, but often only have mild depression. Depression has been typically assessed in cardiac populations using standard measures without reference to the reliability and validity of these scales in these specific populations. 15 females and 66 males participated in the study (mean age = 57±12 years; range 29-79). 52% participants were Australian born and 40% were overseas born. Depression was assessed, 2 weeks post-acute coronary syndrome, using the Composite International Diagnostic Interview and the Beck Depression Inventory-II (BDI). Participants also completed the Cardiac Depression Scale (CDS), the Spielberger State Trait Anxiety Scale (STAI), and the Coping Resources Inventory. 11% (9) had a current MDE. 32% (26) of participants had BDI scores greater than 9. Linear regression modelling revealed that a CDS score ≥ 80 was equivalent to a BDI score greater than 9. The CDS classified a further 12 (15%) participants as having depressive symptoms that were not classified as such by the BDI. The CDS had a strong concurrent validity with the BDI (r = .69, P < .001). Both scales had moderately strong correlations with the state and trait subscales of the STAI (r = .68-.83, P < .001). Cross validation of the BDI and the CDS with the structured interview demonstrated the ability of both measures to detect severe depressive symptoms. Detecting the range of depressive symptoms typically seen in a cardiac population is important as depression not only affects mortality and prognosis, but also affects quality of life. The CDS, which is easily and quickly administered and scored, appears to be a more suitable psychometric scale for detecting the range of depressive symptomatology, from mild to severe depression, often observed in a cardiac population.
Our behavioral intervention, in combination with standardized cardiological care (SCC plus intervention=INT), had small, favorable effects on myocardial perfusion (MP) in patients with CHD compared to SCC alone (=CO) over a period of 3 years, but there was no effect on cardiac events. Aim of the actual study was to evaluate the effects on MP and cardiac events after 7 years of follow up. At baseline, 77 patients (age 54±6.9 y, male 87%) with stable CHD were randomly assigned to INT (n=39) or CO (n=38). The behavioral intervention consisted of group-psychotherapy, relaxation and exercise training, and information sessions, for one year (total 77.5 h). SCC consisted of 6 monthly contacts with a cardiologist, comprising guideline oriented care, over a period of 3 years. A Thallium myocardial perfusion (MP) scintigraphy (after exercise test; quantitative analysis of MP) was performed at baseline, after 2, 3, and 7 y, respectively. Results were analyzed using mixed models. All subsequent cardiac events (MI, PCA, CABG) were obtained from the cardiologists charts. Mean f/u time was 6.9±0.8 y. At the end of f/u, MP could be assessed from 65/77 patients (84.4%). One patient died of MI, 3 died of other somatic reasons, and 8 dropped out of the study (CO n=5, INT n=6). Incidence of cardiac events significantly favored INT (6 vs. 14; p=0.04). Irrespective of subsequent PCA/CABG, the course MP was significantly better in INT than in CO (estimate±SE: -5.5±1.8%; group*time p=0.013), which was true also in patients without subsequent PCA/CABG (estimate±SE: -5.1±2.0%; group*time p=0.04). Our recent results demonstrate increasing long term benefits of a multimodal, behavioral intervention, compared to SCC, on MP and cardiac events in patients with CHD.

Abstract 1201

RETENTION IN A BEHAVIORAL CLINICAL TRIAL
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The Heart Failure Adherence and Retention Trial (HART) is a single site, multi-hospital, partially blinded, randomized behavioral clinical trial of 902 participants with moderate heart failure. Four hundred and fifty-one participants were randomized to receive a Self-Management intervention of 18 group sessions aimed at preventing heart failure progression. This paper describes barriers to retention and strategies implemented to retain participants in the intervention arm of the trial. Midway through the study, several problems with retention of participants in the intervention arm of the study had emerged. A Case Manager (CM) worked to identify retention barriers and develop strategies that were implemented and evaluated in weekly Intervention meetings. We identified barriers at two stages: (1) barriers to placing participants into a group; (2) barriers to retaining participants once assigned to a group. First, we developed a personal connection by initiating and maintaining a relationship with participants and family members. Secondly, we problem-solved with participants to identify and overcome personal barriers to attendance. Following group assignment, the CM maintained a relationship with the participant via follow-up phone calls until the participant was actively engaged and logistical issues resolved. A supportive network of group leaders, physicians, nurses, and family members provided additional help with treatment adherence and retention. After we started using a CM, there was a significant decline in wait time until initiation of treatment (6.6 vs 14.2 weeks, p<0.001), and a marginally significant improvement in group attendance during treatment (74.6% vs 70.1%, p=0.10). Active participation and retention in a behavioral clinical trial requires ongoing, individually-tailored case management. This strategy appeared particularly important to placing individual patients in a group, and reducing the time until the first group session. It may also benefit adherence to group-based interventions.
Cardiac patients who continue to be depressed 3 months after an Acute Coronary Syndrome (ACS) episode are at increased risk for recurrent coronary events. Identifying these patients at the time of the initial ACS event could focus intervention efforts appropriately. The purpose of this study was to assess psychosocial vulnerabilities of depression and sociodemographic factors as predictors of having a diagnosis of major depression (MD) 3 months post-ACS. ACS patients (N=287) were recruited as inpatients, screened for depressive symptoms and completed standard questionnaires for cognitive, behavioral, and interpersonal vulnerabilities. Depression diagnosis was assessed with the Diagnostic Interview Schedule (DIS). Depressive status was reassessed at 3-month follow-up. Of 37 people with MD at baseline, 21 still had MD at 3 months. A multivariate logistic regression analysis, being younger, female and Hispanic increased the likelihood for MD at 3 months (all p < .02). Among the vulnerabilities, reporting fewer pleasant events, more rumination, more dysfunctional attitudes, more dyadic adjustment problems, and experiencing grief all significantly predicted MD at 3 months (p < .001). In a logistic regression modeling of MD at 3 months, the significant predictors were baseline depression diagnosis (B = 1.35, p < .001), and dysfunctional attitudes (B = 1.52, p < .001). At baseline, MD cases had a mean score of 107 on the DAS, vs. 76 in patients without MD. In summary, identifying patients with high dysfunctional attitudes after an ACS adds to the identification of those at risk for meeting MD criteria 3 months later, independent of their baseline depression status.

Survivors of an acute myocardial infarction (MI) may develop full-blown posttraumatic stress disorder (PTSD) in the months following infarction. Whether PTSD is a risk factor for recurrent cardiac events and/or first-time MI and what biological mechanisms above and beyond changes in blood pressure and heart rate possibly contribute to the PTSD-coronary artery disease (CAD) link (e.g. inflammation, coagulation, endothelial dysfunction) are largely unknown. We performed a critical review of the English literature with a PubMed electronic library search (dating from 1980 to October 2004) applying weighted sample size procedure where indicated to pursue three aims: 1) to estimate the prevalence of PTSD after MI, 2) to investigate the association of PTSD with symptoms and signs of cardiovascular diseases (CVD), and 3) to search for biological (other than hemodynamic) alterations pertinent to atherosclerotic disease in patients with PTSD. The weighted prevalence of PTSD after MI was 14.3% (range 0-22%; 10 studies, total of 657 patients). One study found PTSD predictive of cardiovascular readmissions at one-year follow-up. Six studies investigated the association between either clinically diagnosed PTSD (n=4), or PTSD as a symptom in questionnaire cut-off level (n=2), and symptoms or signs of CVD. Patients with PTSD had increased rates of self-reported circulatory disease, heart disease, cardiovascular symptoms, and angina pectoris, as well as of physician diagnosed arterial disease and ECG signs of infarction. Inflammatory activity (cytokines, C-reactive protein) was investigated in a total of five studies, but was not significantly different in PTSD patients compared to controls. Other biological changes were individual. While PTSD is impressively frequent in patients after MI, it’s role as a risk factor for CAD has rarely been investigated and needs to be established in prospective studies. Current studies are too few in number to allow relating PTSD to any of the newer biological surrogate markers of atherosclerosis.
DYSPHORIC POST-ACUTE CORONARY SYNDROME PATIENTS HAVE HIGHER WAIST-TO-HIP RATIOS CROSS-SECTIONALLY AND LONGITUDINALLY COMPARED TO NON-DYSPHORIC POST-ACS PATIENTS

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Abdominal obesity, as estimated by waist-to-hip ratio (WHR), is a powerful predictor for cardiovascular disease. It is also associated with depression, which is another predictor for occurrence and recurrence of cardiovascular disease. We hypothesized that dysphoric post-ACS patients would have higher WHRs at baseline compared to non-dysphoric post-ACS patients. We further examined changes in WHRs in the dysphoric group compared to the non-dysphoric group 3 months later. ACS patients were recruited at 3 major medical centers and centers for the index hospitalization. 176 post-ACS patients [84 dysphoric (BDI e 10; 61.3+10.9) and 92 non-dysphoric (BDI < 5; age=64.0+12.5)] who had complete waist and hip measurements obtained at baseline and 3 months later. Except for gender, demographic and health-related variables (e.g., age, ethnicity, education, marital status, smoking, hormone intake, menopausal status) were not significant confounders. Repeated Measures ANCOVA with dysphoria status as a fixed factor and time (baseline and 3-months) as a repeating factor revealed that post-ACS patients with dysphoria had higher WHRs at baseline (adj. M=1,100; F[2,173]=5.560, p<0.02) and at 3-months (adj. M=0.95; F[2,173]=6.509, p<0.01) compared to non-dysphoric ACS patients (adj. Mbaseline=0.97; adj. M3-months=0.92). Although there was a significant time effect, with both groups showing a WHR decrease, no group by time effect was found. Further subdividing the dysphoric group into those with mild dysphoria (BDI 10-16; n=53) or moderate to severe dysphoria (BDI>16; n=29) revealed a significant gradient in WHRs at baseline across highest to lowest dysphoria (adj. Means: 1.01, 0.99, 0.97; p=0.03) that was maintained at 3 months (adj. Means: 0.96, 0.94, 0.92; p<0.03). These findings provide the first evidence in the literature that being dysphoric at hospitalization for ACS is associated with increased WHRs both cross-sectionally and longitudinally.

Abstract 1440

TYPE D PERSONALITY AND 30-YEAR PREDICTION OF ALL-CAUSE AND CVD MORTALITY: THE WESTERN ELECTRIC STUDY

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It has been hypothesized that multiple negative psychosocial traits have a synergistic impact. Thus, Type D personality, involving the coexistence of both neurotic affect and social inhibition has been reported to predict cardiovascular and non-cardiovascular mortality in patients diagnosed with coronary disease. However, this has not been tested in healthy populations. The Minnesota Multiphasic Personality Inventory (MMPI) encompasses measurement of several dimensions of personality, including neuroticism (N) and (E) extraversion. These items overlap substantially with the traits used to define Type D. In 1958, the Western Electric Study used random sampling to identify 3,102 men ages 40-55; 2,107 agreed to participate. Baseline characteristics including the MMPI were assessed; the cohort has been followed longitudinally for 30 years for mortality endpoints (1,247 total deaths, 693 CVD deaths). Men scoring above the median on N and below the median on E (surrogate for social inhibition) were classified as Type D (N=681, 33%). For the two strata (Type D vs. non-Type D), there were no meaningful differences in baseline characteristics. Three Cox proportional hazard models evaluated the relationship of type D status to total and CVD mortality: model 1 (unadjusted), model 2 (adjusted for age), and model 3 (adjusted for age, BMI, cholesterol, systolic blood pressure, prior coronary disease status, smoking, and alcohol consumption). Hazards were not significantly > 1 (all-cause mortality: hazards ratio [HR] 0.96+/-.012; 0.95+/-.012; and 0.95+/-.013; and CVD mortality: HR 0.95+/-.016; 0.94+/-.016 and 0.96+/-.017 for models 1, 2, 3, repectively). These findings place limits on the claim that the combination of neuroticism and social introversion (Type D personality) predicts total and CVD mortality.

Abstract 1524

SOCIAL INHIBITION, NEGATIVE AFFECT AND RISK OF CARDIAC EVENTS FOLLOWING PERCUTANEOUS CORONARY INTERVENTION (PCI)

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Little is known about psychological factors that may modulate the impact of negative emotions on cardiac prognosis. This sub-study of the Ramapycin-Eluting Stent Evaluated At Rotterdam Cardiology Hospital (RESEARCH) registry investigated the modulating effect of social inhibition (inhibition of self-expression in social interaction) on prognosis following PCI. 875 consecutive PCI patients undergoing bare or sirolimus-eluting stenting completed the HADS depression/anxiety scales and DS14 negative affectivity/social inhibition scales 6 months post-treatment. The endpoint was major adverse cardiac events (MACE - death, myocardial infarction, CABG or PCI) 9 months post-psychological assessment. At follow-up, there were 100 MACE. Factor analysis confirmed that social inhibition represented a psychological factor that was distinctly different from negative affect (depression, anxiety, social inhibition, negative affectivity). The rate of MACE was significantly higher in patients who were high in both negative affectivity and social inhibition (i.e., Type D personality; HR=1.64, 95%CI 1.09-2.47, p=0.018) as compared to patients who were high in negative affectivity but low in social inhibition. HADS scores of depression (p<0.23) or anxiety (p<0.63) did not explain away this association between high negative affectivity/inhibition and MACE. The final Cox regression model retained high negative affectivity/high inhibition (HR=2.11, 95%CI 1.28-3.48, p=0.004), history of CABG (p=0.017) and diabetes (p=0.06) as independent predictors of MACE; high negative affectivity/low inhibition was not significantly associated with outcome (HR=1.22, 95%CI 0.63-2.39, p=0.56). These findings indicated that social inhibition is a distinctly different psychological factor that modulates the impact of negative emotions on cardiac prognosis in post-PCI patients.

Abstract 1543

TREATING DEPRESSION IN POST-ACS PATIENTS IN THE AFTERMATH OF ENRICH-D: COPEs PHASE-1 RCT

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Comorbid depressive disorders in patients after acute coronary syndromes (ACS) are associated with poorer medical prognosis, and even sub-threshold levels of depressive and distress symptoms incur increased risk for death and myocardial infarction in this population. Clinical trials directed to improving medical prognosis by treating depression in the immediate post-ACS period have shown only moderate effect on these symptoms and no effect on medical outcomes, compared to usual cardiologic care (UC). Possibly for many patients the specific interventions were not acceptable, so that many randomized patients did not receive the "full dose" of treatment, and possibly the high rate of spontaneous remission among those enrolled in UC were associated with these disappointing findings. Project COPEs is designed to address these problems. The specific aims of this multi-center RCT are to explore in a depression intervention trial patient satisfaction and acceptability of a 6-month, patient preference, stepped-care intervention compared to UC. 100 patients will be randomized to each arm. Only patients who demonstrate continued threshold elevations on the Beck Depression Inventory (BDI>10) for 3-months post-ACS will be enrolled. The intervention arm has two treatment options: brief, problem solving therapy and antidepressant medication. Patients randomized to treatment are educated about their treatment choices and make their selection. Standard assessments are repeated at 2-month intervals, with treatment "stepping-up" if the patient is not on the appropriate improvement trajectory; stepping up can include switching intervention components, changing medication, and/or augmenting treatment with the other component. A "Monitoring Phase" is initiated when the patient's BDI falls below 7 for 2 consecutive weeks, with active treatment reinstated if the score goes above 9. The results of this trial will inform the design of subsequent, larger trials powered for an effect on depressive symptoms and post-ACS medical outcomes.
Behavioral cardiac interventions often advise patients to change many health behaviors. However, the relative contribution of individual behaviors to reduction in coronary risk is unclear. We examined the association of changes in health behaviors to changes in medical and psychosocial characteristics in the Multisite Cardiac Lifestyle Intervention Program, an ongoing program conducted at 22 sites aimed at improving diet (10% calories from fat, plant-based), exercise, and stress management. Patients (N=1245; 48% female) had at least 3 risk factors (45%) or CHD. Significant improvements (ps <.001) in dietary fat (from 26% to 9% of total calories), exercise (from 94 to 222 min/week), and stress management (from 25 to 357 min/week) were noted at 12 weeks. Medical risk factors and psychosocial characteristics also improved significantly [e.g., body weight: 204 to 192 lbs; total cholesterol: 189 to 165 mg/dl; depression (CES-D): 12 to 7; all ps <.001]. Forward regression was used to predict percent reduction of each risk factor and psychosocial variable from changes in health behaviors. Results revealed additive effects for body weight, depression, and perceived stress. For example, for body weight, changes in dietary fat entered first into the model (beta=.25, p <.001), followed by improvements in stress management (beta=-.13, p <.001) and improvements in exercise (beta=-.08, p <.001). Results for depression and perceived stress were similar. After dietary fat entered the model (beta=.11, p <.001), no other health behavior added significantly to the variance in total cholesterol. Similarly, exercise was the only significant predictor of METs (beta=.08, p <.05). These results suggest that changes in diet, stress management, and exercise may be related individually as well as additively to improved coronary risk status.

Before the age of 65, mortality in coronary heart disease (CHD) is 3 to 5 times higher in men than in women. Once a woman of this age has a heart attack, however, she has a worse prognosis than a man. Standard coronary risk factors do not provide an explanation and specific psychosocial influences in women are implicated. In the Stockholm Female Coronary Risk Study we demonstrated the need to alleviate the effects of marital- and work stress, to strengthen social supports and to improve the capacity for coping with both the daily stressors and with chronic life threatening illness. However, woman patients are less likely to be offered a rehabilitation program and available programs have proven less beneficial, sometimes even harmful, in women.

We have developed an intervention program for women with CHD. The program was based on previously reported experiences from the north of Sweden but tailored for urban and professionally active women. We have initiated a randomised Behavioural Intervention Trial for Coronary Health in Women (the BITCH-STUDY). Subjective reports from women patients, who attended the ten-month group based stress reduction program, suggest their improved quality of life and reduction of symptoms. After the two-year follow-up, the rate of re-hospitalisations in the intervention group was about half of that of the control group. In a five-year follow-up of the first 94 patients' mortality was 4.3% in the intervention and 21.3% in the control group.

Context: The reporting of depressive symptoms following MI may be confounded by complaints originating from the MI itself. As a result, it is difficult to estimate the effects of post-MI depression on cardiovascular prognosis. Objective: We studied the relationship between dimensions of post-MI depressive symptoms with baseline somatic health status and prospective cardiovascular prognosis. Methods: Beck Depression Inventory (BDI) was used to explore and validate the dimensional structure of post-MI depressive symptoms. The resulting dimensions (somatic/affective, cognitive/affective and appetitive symptoms) were related to baseline LVEF, Charlson co-morbidity index, Killip class and previous MI, and to prospective cardiovascular mortality and cardiac-related readmissions with a mean follow up duration of 2.5 years. Results: Somatic/affective symptoms were associated with poor baseline health status (LVEF (P<0.001), Charlson co-morbidity index (P<0.001), Killip class (P<0.001) and previous MI (P<0.001)) and predicted cardiovascular mortality (P<0.001) and cardiac events (P<0.001). Cognitive/affective symptoms only marginally associated with somatic health status and not to cardiovascular death (P=0.97) and cardiac events (P=0.13). Appetitive symptoms were related to somatic health status, but did not predict cardiovascular death (P=0.15) or cardiac events (P=0.10). Conclusions: Somatic/affective symptoms of post-MI depression are confounded by baseline somatic health status, yet prospectively associated with cardiac prognosis even after controlling for somatic health status. Cognitive/affective symptoms of depression are only marginally related to health status and not to prognosis. These findings suggest that treatment of post-MI depression may only improve cardiovascular prognosis when focused on reducing somatic/affective symptoms.
RELATIONSHIPS BETWEEN CARDIOVASCULAR AND PSYCHOLOGICAL REACTIVITY: CONSIDERING EFFORT AND EMOTION SIMULTANEOUSLY
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One mechanism thought to link stress to disease is frequent, large-magnitude increases in blood pressure and heart rate (Krantz & Manuck, 1984). Although it is believed that harmful cardiovascular reactivity (CVR) is related to negative emotions such as anxiety, anger, and depression, research has been unable to consistently correlate emotions and CVR (Feldman et al., 1999). Therefore, it is not clear if there is a negative emotion-CVR association and if such a relationship differs from a presumably less-harmful physiological demand-CVR link. The goal of the present work is to identify the psychological correlates of CVR. Previous investigations have considered independent emotion-CVR links and have generally failed to find significant relationships. Because emotion and effort are not independent of one another (e.g., the more a person cares about doing well, the more she will try to succeed), it is likely the relationships between physiological responses and these psychological variables are likewise not independent. Data from 5 different experiments suggest that psychological reactions to laboratory stressors are significantly related to cardiovascular reactivity when measures of emotion and effort are considered simultaneously. In stress speech-task studies and a competitive logic-task study we found that self reports of negative emotions such as nervousness and stressfulness during a task were not independently related to CVR. However, interaction terms created with an emotion variable and a measure of how much effort was exerted by the participant were significantly related to CVR (all ps<.04). The patterns of these relationships depended on the emotions being measured, the tasks, and individual factors such as self-efficacy. Different combinations of effort and emotion during a task were associated with similar increases in blood pressure and heart rate. We may not have been able to relate anxiety to CVR in the past because we have not been reliably eliciting harmful anxiety-related CVR or accounting for simultaneous effort-related CVR. Future directions include systematic manipulation of these psychophysiological patterns and investigating autonomic correlates of the patterns.

HYDRATION STATUS IS A FACTOR RELATED TO CHANGES IN RESTING SYSTOLIC BLOOD PRESSURE DURING THE MENSTRUAL CYCLE
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The purpose of this study was to determine if hydration status changes during the menstrual cycle are related to changes in cardiovascular parameters at rest and during psychological stress. Forty healthy adult women participated in the study which included sessions during the follicular and luteal phases of the menstrual cycle. Participants’ hydration status was assessed during each phase. The study protocol included a 10-min baseline period, a 6-min serial subtraction math task, and a 10-min recovery period. Heart rate, systolic blood pressure, diastolic blood pressure, cardiac output, and stroke volume were measured during the stress protocol. All p’s<.05. Repeated measures ANOVA were conducted to determine whether resting cardiovascular means differed across the menstrual cycle phases. Results revealed that heart rate [F(1,39)=5.631] and systolic blood pressure [F(1,39)=4.476] increased during the luteal phase of the menstrual cycle. Change in hydration status was then used as a covariate and only SBP varied over the menstrual cycle as a function of hydration status [F(1,38)=5.259]. Participants with large changes in hydration status also showed larger changes in baseline SBP during the menstrual cycle. Repeated measures ANOVAs were also conducted to determine whether cardiovascular reactivity differed across the menstrual cycle phases. The results indicated that diastolic blood pressure [F(1,39)=4.43] and cardiac output [F(1,29)=4.03] reactivity was greater during the follicular phase than the luteal phase. The results also indicated larger decreases in stroke volume [F(1,29)=5.05] reactivity during the luteal phase than the follicular phase. Again, change in hydration status was used as a covariate, however it was not a significant factor in the relationship between menstrual cycle phase and cardiovascular reactivity. Overall, the results indicate that resting systolic blood pressure changes over the menstrual cycle and hydration status may be an important contributing factor in this relationship.

EVALUATION OF COGNITIVE FLEXIBILITY IN ANOREXIA PATIENTS USING THE WISCONSIN CARD SORTING TEST
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Low cognitive flexibility in anorexia nervosa (AN) causes clinical problems such as resistance to treatment. The purpose of this study was to evaluate cognitive flexibility in AN patients using the Wisconsin Card Sorting Test (WCST). We hypothesized both a lower task performance and emotional hyperarousal during the task in AN. Eleven female AN inpatients (all restrict type) and 10 healthy control women (CW) participated in this study. Computerized WCST, which contained 128 trials, records the number of correct responses, the number of category achievement, perseverative errors of Milner’s (PEM) and of Nelson’s (PEN) as indices of persistency. During the task, heart rate was monitored to evaluate physiological response. Difference of mean heart rates (HR) of the first and the last 20 trials were used as an index of autonomic arousal. Statistical evaluation was performed by Mann-Whitney’s U test. We found that AN patients showed significantly poorer performance in the number of correct responses (AN 95.1 ± 14.9 vs. CW 107.7 ± 7.2, p<.001) and the number of category achievement (AN 6.8 ± 1.8 vs. CW 9.0 ± 1.6, p<.05). PEM tended to be higher in AN than that in CW (AN 15.3 ± 10.6, CW 8.2 ± 10.1, n.s.). PEN was not significantly different (AN 6.8 ± 1.8 vs. CW 9.0 ± 1.6, p<.05). HR change compared the first and the last trials did not reduced in the patients (AN -1.1 ± 3.0, CW -3.4 ± 5.4, p<.05). AN patients showed low performance in WCST. Diminished HR change in the patients may suggest that AN patients are emotionally hyperaroused and not habituated to the psychological stress because of the low cognitive flexibility. We conclude that WCST offers promise as a method to evaluate cognitive flexibility in AN.

CELLULAR IMMUNE RESPONSES TO ACUTE STRESS IN OLDER INDIVIDUALS
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It is widely accepted that acute laboratory stress alters both quantitative and functional aspects of cellular immunity. However, the majority of studies have focused on young, healthy populations and it remains unclear whether these findings generalize to older populations who are more vulnerable to immune-related disease. To evaluate effects of acute psychological stress on aspects of cellular immunity among an older population, lymphocyte populations, phytomaglutamin (PHA)-stimulated T-cell proliferation and serum levels of interleukin 6 (IL-6) were measured in 20 healthy volunteers between the ages of 40 and 60 years, before, during and for 30 minutes following a 5 minute laboratory speech task. Consistent with findings from younger populations, the speech task was associated with an increase in circulating numbers of T-cytotoxic (CD8+) and NK (CD56+) cells (p<.01 &.001). In contrast to prior findings showing no reliable stress-induced change in numbers of B cells (CD19), we found a significant increase in numbers of B cells from baseline to task measures (p<.02). There were no stress-related changes in T-helper (CD4+) cell numbers. During the recovery period, T-cytotoxic cell numbers rapidly returned to baseline while NK and B cell numbers, although in decline, remained elevated 30 minutes following the end of the task(p<.02 &.03). In regard to functional measures, we observed the expected decrease in PHA-stimulated proliferative responses from baseline to task periods (p<.001). Interestingly, this measure continued to decline over the course of the 30 minute recovery period. Finally, while there was no change in circulating IL-6 levels from baseline to task measures, we observed a significant increase in IL-6 during the recovery period (p<.04). Overall, these data raise the possibility that older individuals may demonstrate an immune response to laboratory challenge that continues beyond the stress period and may have implications for susceptibility to immune-related disease.
Abstract 1209

EVIDENCE FOR A STRESS INDUCED IMMUNOLOGICAL ORDER TRANSITION IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS
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Background: The concept of dynamic diseases (Glass and Mackay, 1988) suggests that order transitions to disease exacerbations are preceded by critical fluctuations in central disease parameters. This study tested this assumption through reevaluation of one of our integrative single-case studies. Methods: The 40 year-old woman with systemic lupus erythematosus (SLE) collected her overnight urine over a period of 63 days for the determination of neopterin (HPLE), a cellular immune parameter. Additionally, on a daily basis, she answered questions about her emotional state (mood, irritation, mental activity), subjective SLE activity, and daily routine (e.g. medication).

Moreover, she was interviewed on a weekly basis in order to determine the past week's daily stressful incidents. Statistical time series analyses consisted of linear (ARIMA modeling, cross correlational analysis) and non-linear (local complexity coefficient) analyses. Results: Non-linear analysis revealed that one everyday incident, the departure of the patient’s son, was associated with critical fluctuations changes in the patient’s mood (increase), irritation (decrease) and urine neopterin levels (increase). Furthermore, these critical psycho-immunological fluctuations were associated with an order transition in the patient's psychosomatic dynamics: the son’s departure was followed by symptoms of increased SLE activity and by a change in the immunological response to the weekly interviews. Cross-correlational analyses showed that before the departure of the son, weekly interviews were associated with an increase in urine neopterin (lag 1: +0.426, p<.05), and after the son's departure with a decrease (lag 1: -0.326, p<.05). Conclusion: This study showed that non-linear approaches to psychoneuroimmunology (PNI) could be an important means for detecting clinically relevant psychosomatic phenomena.

Abstract 1563

THE ROLE OF INFLAMMATION IN NEURODEGENERATIVE DISEASES: THE THERAPEUTIC EFFECTS OF N-3 FATTY ACID EPA
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In the immune and central nervous systems, significant increased autoimmune and inflammatory responses have been reported in patients with neurodegenerative diseases. These include increases in the activities of T-lymphocytes and macrophages (microglia), the release of proinflammatory cytokines, the synthesis of antibodies and prostaglandin (PG) E2. Furthermore, a reduced risk of developing neurodegeneration, such as Alzheimer's disease (AD), is associated with the previous use of anti-inflammatory drugs or fish intake. Recently, many studies have shown that n-3 fatty acids can modulate both cellular and humoral immunities and improve the symptoms of depression and AD. The aim of this series of studies was to determine the role of inflammation in neurodegeneration and therapeutic mechanism of n-3 fatty acid treatment in a brain inflammation model of rodents. Results from these studies have shown that central and sub-chronic administration of proinflammatory cytokine interleukin-1beta (IL-1) directly induces the gene expressions related to brain inflammation, increases the synthesis of proinflammatory cytokines and PG2E2 and reduced IL-10. These changes are associated with the impairment of cognitive performance. Chronic feeding animals with an n-3 fatty acids, ethyl-eicosapentaenoic acid (EPA), enriched diet are able to reverse IL-1-induced anxiety-like behavior, improved learning and memory in Morris water maze and radial arm maze, significantly increased IL-10 release and prevented PG2E2 elevation in both the brain and the blood. In an in vitro study, EPA incubation with hippocampal neurons largely increases neuronal proliferation and blocks lipopolysaccharide-induced hippocampal cell death. In an in vivo microdialysis study, IL-1-induced changes in the release of noradrenergic, serotonergic and dopaminergic monoamines and their metabolites from the hippocampus, were also modulated by EPA diets. These results suggest that a new therapeutic option for neurodegenerative diseases could be n-3 fatty acid EPA. (Author's work was supported by Laxdale Ltd, UK and CIHR, Canada)

Abstract 1214

THE NEURAL SUBSTRATE FOR THE SOMATIC MARKER - [15O] H2O PET STUDY ON PERFORMANCE ON A DECISION-MAKING TASK.
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Purpose: According to the somatic marker hypothesis by Damasio, emotional signaling accompanied with somatic activities (somatic state) guides judgment in decision-making, especially in the social realm. The neural mechanism of this system is quite interesting in psychosomatic field. In the complex social situation, emotion and somatic (visceral) activation are provoked and bias human behavior, which might represent the affinity between mind and bodily state, affecting social behavior. We tested the hypothesis that the brain activity during performance on the Iowa Gambling Task reflects the neural substrate of somatic marker. Method: The neural correlates of performance on the decision-making task and a control task were compared in 11 adults right-handed healthy male volunteers by using [15O] H2O positron emission tomography. The decision-making task is computerized card game and tests the ability to weigh short-term rewards against long-term losses. Results: All subjects showed a progressive increase in advantageous selection of cards gradually. The right middle frontal gyrus (Brodmann s Area; BA 9,10), right insula, left caudate, right inferior parietal cortex (BA 40) and bilateral cerebellum were activated during performance of the decision-making task (p<0.001, uncorrected). The delay time before the card selection was correlated with the regional cerebral blood flow in the bilateral orbitofrontal cortex (BA 11). Summary: A neural network for somatic marker has been reported by the studies in patient in focal brain damage, which is the ventromedial frontal cortices, central autonomic effecter such as amygdala, and somatosensory cortices including insula, SII, and SI, especially right hemisphere. Our finding confirms the earlier lesion studies by neuroimaging technique and provides a framework for future investigations of somatic marker in psychosomatic disease.

Abstract 1632

AGE AND GENDER EFFECTS ON HPA AXIS RESPONSE TO STRESS
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The hypothalamic-pituitary-adrenal (HPA) axis is known to be highly responsive to psychological stress. However, most studies have tested only younger male subjects. The effects of age and gender on stress-related HPA axis functioning remain unclear. We examined the impact of age and gender on HPA axis response to acute mental stress in 71 healthy men and women: men (YM) and premenopausal women (YW) ages 35-49 years vs. men (OM) and postmenopausal women ages 50-64 years. Postmenopausal women were divided into those taking no hormone replacements, estrogen, or estrogen and progesterone. Salivary cortisol (CORT) levels were measured at rest and in response to public speaking followed by mental arithmetic, Stress response was defined as the difference in CORT at rest and post-stressors. Postmenopausal groups (OW) showed no difference in CORT responses, thus, they were collapsed leaving 4 groups: YM, YW, OM, and OW. Cortisol levels increased for the entire sample from baseline to poststress (p = .03). However, there was a significant difference between the groups in their responses (p = .02). Only YM showed a significant elevation in CORT following stress (p = .004), and the magnitude of this response was significantly greater than that of the remaining groups (ps < .05). Despite these differences in CORT response, SBP, DBP, and HR were similar and significantly elevated in all groups in response to stress (all p < .05) suggesting that the stressors were effective. The majority of studies on HPA axis responses to stress have been conducted with YM. Our findings suggest that YM have a unique endocrine response to psychological stress as compared to OM and women in general. Examination of the mechanisms involved in differential stress reactivity in aging and gender is warranted.
ATTITUDE TOWARDS PSYCHOTHERAPEUTIC TREATMENT IN THE RUSSIAN POPULATION, IN A GERMAN SAMPLE, AND IN THE POPULATION WITH A RUSSIAN/SOVIE T CULTURAL BACKGROUND IN GERMANY, A PILOT STUDY

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The purpose of this study is to compare the attitude towards psychotherapy of persons with a Russian/Soviet cultural background and of persons with a German background. We examined the views of Russian patients (N = 40), in Germany living Russian migrants (N = 65) and German probands (N = 70) with the German Questionnaire on Attitudes towards Psychotherapeutic Treatment (QAPT) and a Russian translation. The QAPT includes 2 scales: Positive Attitudes towards Psychotherapy and Acceptance in Society. The psychometric examination predominantly suggests the quality of the Russian version of the QAPT. We could not reveal any significant difference in relation to the second dimension anticipated social acceptance concerning the participation in psychotherapy. Women had a fewer20-0.6 faster pace at the scales 1 and 2 in the Russian (t-test, p = 0.04, t = -3.25 and p = 0.48, t = 2.12) and in the scale 1 in the German sample (p = 0.04; t = -3.10). Russian patients showed few20-0.6 higher Positive Attitudes towards Psychotherapy (2.93 +/- 0.69) compared to the German sample (3.33 +/- 0.50); the migrants had tended to more negative attitude (3.15 +/- 0.53) than the Germans and a more positive attitude than the Russians (ANOVA, p = 0.002, F = 0.34). The results suggest the relevance of culture specific factors in the psychotherapy and an increased information need of persons with a Russian/Soviet cultural background about psychotherapy.

The EFFECT OF INTEGRATION ON TREATMENT OUTCOME AND QUALITY OF LIFE IN PATIENTS WITH PSYCHOSOMATIC DISORDERS AND A HISTORY OF MIGRATION

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Patients with psychosomatic disorders and a history of migration have less satisfactory treatment outcomes than native Swiss patients. Socio-cultural factors are supposed to play an important role. We investigated whether migrant patients who have a higher degree of integration in Switzerland respond more favourably to the treatments offered. 745 consecutive in-patients (mean age 46.7, range 16-88, 55.4% females, 43.5% Swiss) suffering from psychosomatic disorders such as somatoform disorders, bodily symptoms related to mood, or anxiety disorders were enrolled in the study. Quality of life (QOL) was prospectively assessed using the WHO-QOL bref questionnaire at the beginning and end of the in-patient treatment, and after 6 months follow up. Treatment outcome at the six months follow up was predicted by the satisfaction with QOL at discharge (all p < 0.001) but not by the degree of integration (all n.s.) (i.e. physical component score of the WHOQOL bref [F(3,148)=55.5; p<.001], psychological [F(3,144)=48.8;p<.001], social [F(3,154)=32.7;p<.001]). Quality of Life seems to be associated with the degree of integration of patients in their country of residence. However, treatment outcome seems not to be affected by the degree of integration leaving the question unanswered how socio-cultural factors may interfere with treatment outcome.

DOES EXPRESSIVE WRITING REDUCE HEALTH CARE UTILIZATION?: A META-ANALYSIS OF RANDOMIZED TRIALS

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Research on the effects of written emotional expression has increased dramatically in recent years. Most influential has been the experimental protocol developed by Pennebaker and Beall (1986), in which participants are randomly assigned to write about either stressful/upsetting experiences or to a neutral-writing control group, typically for 20 minutes for three or four days. The most commonly reported longer-term effect of this simple and inexpensive intervention has been reduced health care utilization (HCU), often framed as a proxy for better health. The studies in this literature vary greatly in the nature of the samples examined, methodological and reporting quality, operationalization of HCU, and statistical significance of findings. Quantitative synthesis, therefore, may aid meaningful evaluation of this evidence. Accordingly, this meta-analytic review examined whether writing about stressful experiences affects health care utilization (HCU) compared to writing on neutral topics or no-writing control groups. Randomized controlled trials (RCTs) of 31 independent samples representing 1780 participants were located that contained sufficient information to calculate estimates of effect magnitude. The effects were combined within three homogeneous groups: healthy samples (13 studies), samples with pre-existing medical conditions (6 studies), and samples pre-screened for psychological criteria (11 studies). Combined effect sizes (Hedges’s g) and 95% confidence intervals were 0.24 [95% CI: 0.09, 0.38], 0.26 [95% CI: 0.02, 0.50], and 0.04 [95% CI: -0.15, 0.23] respectively. Writing about stressful experiences reduces health care utilization in healthy and medical samples, but not in samples defined by exposure to stress, high somatization, or other psychological factors. Because decreases in HCU cannot be considered a proxy for better health, the significance of these effects for individuals’ health is unknown.

SOCIOECONOMIC AND ETHNIC GRADIENTS IN CUMULATIVE BIOLOGICAL RISK

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Studies from the National Health and Nutrition Examination Survey (NHANES) III were used to examine socio-economic and ethnic gradients in cumulative biological risks based on measures of cardiovascular (SBP, DBP, pulse), metabolic (lipids, glycosylated hemoglobin, waist/hip ratio), and inflammation (CRP, albumin) risk. Clinical guidelines were used to define ‘high risk’ values for each parameter. Summary indices of cardiovascular, metabolic and inflammation risk were created, reflecting the number of parameters with high risk values in each category. Lower education and income were associated with significantly higher levels of cumulative risk for each of these indices and for overall cumulative risk (adjusted for age, all p<0.001). All major ethnic groups exhibit these same SES gradients, though the patterns are strongest among Whites (see tabled data for education). These results underscore the cumulative burden of biological risk associated with lower SES, highlighting the range of biological systems which exhibit increased evidence of dysregulation among those with lower SES for all major ethnic groups examined.
LONELINESS MEDIATES THE RELATION BETWEEN PERCEIVED STRESS AND ANXIETY AMONG PATIENTS WITH HEMATOLOGIC MALIGNANCIES

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Although stress has been consistently linked to psychological symptom intensity in a number of patient populations, specific psychological factors that mediate the stress-symptom relation are unclear. To explore psychological mechanisms responsible for the relation between stress and psychological symptoms, self-reported measures of perceived stress, psychological symptoms, loneliness, and both emotion- and problem-focused coping were obtained from 44 hematologic malignancy patients undergoing inpatient treatment on an oncology unit. Patients completed the Perceived Stress Scale (PSS), the Brief Symptom Inventory (BSI)-18, the Revised UCLA Loneliness Scale, and the Brief COPE. Results were analyzed through regression analyses conducted using tests for mediation outlined by Baron and Kenny (1986). PSS predicted global psychological symptoms on the BSI-18 (beta = .308, p = .042). While neither emotion- nor problem-focused coping met criteria for mediation, the Loneliness Scale emerged as a significant partial mediator of the stress-symptom relation, as evidenced by the reduced beta weight of the PSS-BSI-18 relation after accounting for loneliness (beta = .12, ns). To examine whether specific subscales of the BSI-18 exerted differential effects, depression, anxiety, and somatization scales of the BSI-18 were subjected to the same analytic plan. Like the global symptom index, loneliness was shown to mediate the relation between PSS and anxiety symptoms on the BSI-18. No relations were observed between PSS and either emotion- or problem-focused coping (Brief COPE). These findings suggest that interventions aimed at reducing psychological symptoms that patients with hematologic malignancies experience when confronting the stress of their medical condition may best focus on decreasing feelings of loneliness.

DEPRESSIVE SYMPTOMS PREDICT SURVIVAL FOLLOWING TREATMENT FOR HEMATOLOGIC MALIGNANCIES

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Psychological distress has emerged as a significant risk factor for a number of medical problems including heart disease and cancer. To examine the predictive role of a range of psychological risk factors on the course of disease progression and survival among patients with hematologic malignancies, 48 hospitalized patients completed self-reported measures of perceived stress (Perceived Stress Scale; PSS), psychological symptoms (Brief Symptom Inventory; BSI-18), loneliness (Revised UCLA Loneliness Scale), and both emotion- and problem-focused coping (Brief COPE). Thirty patients received high levels of problem-focused coping, they experienced more positive affect when their wives were involved in their coping efforts (p=0.036). When patients were using high levels of emotion-focused coping, they experienced more positive emotion when their wives were involved in their coping efforts (p=0.004) when their wives were involved in their coping efforts. These results suggest that the traditional method of measuring problem and emotion-focused coping may not adequately capture the ways in which significant others are involved in the coping efforts of patients, which have important implications for adjustment to chronic illness.

ILLNESS INTRUSIVENESS AND ADJUSTMENT: THE BUFFERING ROLE OF THE SELF-SYSTEM IN PATIENTS WITH CANCER

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Patients with chronic illness often report their illness disrupts valued social roles and generates negative self-perceptions (e.g., I'm weak, dependent, etc.), both of which may impair psychosocial well-being. The present study examined whether a structural feature of the self-system -- namely differential importance (i.e., the tendency to rate negative self-perceptions as less important and positive self-perceptions as more important to one's identity) -- buffers the adverse aspects of illness intrusiveness. Adults with various cancers that have similar prognoses, symptoms, and treatments (n=73; mean age=55 yrs; mean duration=14 months) completed measures of illness intrusiveness, psychosocial adjustment, and well-being. They also generated self-descriptors in their role as "a person with cancer," and rated each descriptor's valence and importance; differential importance scores (DI) reflected within-subject correlations between valence and importance ratings. Intrusiveness was correlated with both positive self-descriptors (r=.36, p<.01), higher depression and negative affect (rs=.48; p<.01), and lower positive affect, self-esteem, and well-being (rs=.27; p<.05). Conversely, DI was associated with lower depression (r=-.30; p<.05), and with higher positive affect well-being (r=.28; p<.05). Consistent with the buffering hypothesis, illness intrusiveness interacted with DI to predict depression (p<.05) and negative affect (p<.01); these variables did not interact to predict positive adjustment. Thus, illness intrusiveness may contribute to negative self-views that are reflected in patients' negative emotional experiences. Differentially
focusing these negative self-conceptions as unimportant may buffer the adverse effects of illness intrusiveness.

Abstract 1281

STRESS-RELATED BENEFIT FINDING IN CANCER PATIENTS AND COMMUNITY RESIDENTS
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In spite of the stress of illness, many cancer patients report the ability to find benefits. This study explored the uniqueness of benefit finding in cancer patients, as compared to women who experienced other adverse life events. Three years after diagnosis, gynecologic cancer patients (n=52) completed measures of benefit finding (PTGI) and distress (POMS) and wrote an essay on the impact of cancer on their lives. Medical information was obtained from records. Community residing women (n=113) completed the same assessments with reference to a self-selected life event occurring in the past 3 years; their life events were rated for seriousness using the PERI Life Event Scale. Essays were rated for the depth of emotional and cognitive processing of the experience (alpha=.88). Both groups reported substantial benefit finding on the PTGI and did not differ in PTGI or processing (p’s>.15). Among cancer patients, higher cancer stage (p=.02) and more intensive treatment (p=.045) predicted higher PTGI; treatment intensity also predicted greater processing (p=.01). Among community women, more serious events predicted higher PTGI and processing (p’s<.05). Distress was not a significant predictor of PTGI or processing in either group (p’s>.25). However, greater processing predicted higher PTGI scores in both groups (p’s>.01); there was no difference between groups in the relation of processing to PTGI. Extent of benefit finding from stressful events is similar in cancer survivors and community residents. More serious events are associated with greater processing and benefit finding. Greater emotional and cognitive processing of serious events, independent of distress, appears to promote benefit finding.

Abstract 1240

PREDICTORS OF SLEEP QUALITY IN OVARIAN CANCER PATIENTS
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Sleep disturbances are common among cancer patients. However, risk factors for poor sleep and persistence of these disturbances in ovarian cancer are not known. This study examined sleep quality among 134 patients awaiting surgery for a potential ovarian malignancy. Surgical diagnosis confirmed 67 patients with ovarian cancer and 67 with benign masses. At 1 year, 27 ovarian cancer patients not currently on chemotherapy were reassessed. Patients completed scales for sleep quality (Pittsburgh Sleep Quality Index: PSQI), depression (CES-D), avoidance and intrusion (IES total), and the Physical Well Being (PWB) subscale of the FACT. Medical data was obtained from patient records. Pre-surgery, both patient groups reported poor sleep (global PSQI: Ovarian: M=7.60, ±4.13; Benign: M=7.17, ±4.09; PSQI norms: M=2.67, ±1.70), but the 2 patient groups did not differ on global PSQI or on any subscale (all p’s>.25). Pre-surgery, among all patients, greater depression, IES, poorer PWB (all p’s<.001), and presence of ascites (p=.06) independently predicted poorer global sleep quality. A regression model indicated that controlling for PWB (n.s.), a distress composite (CES+IES) predicted poorer sleep (β=.54, p=.001). At 1 year post-surgery, mean PSQI of ovarian cancer patients remained elevated (M=7.58, ±4.34). Poorer PWB (p=.015), greater depression (p=.055), and higher IES (p=.02) but not number of chemotherapy cycles (p=.70) independently predicted poorer sleep. At 1 year, distress and PWB together contributed 24.9% to the variance of global PSQI (p=.037), but neither independently predicted sleep when both were modeled together. Poor sleep quality persists at 1 year even in ovarian cancer patients not currently receiving treatment. These findings may allow for better identification of sleep disturbances during treatment.

Abstract 1614

EVALUATING EXPRESSIVE WRITING AS A PRESURGICAL STRESS MANAGEMENT INTERVENTION FOR BREAST CANCER PATIENTS
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Sixty women with breast cancer were asked to complete measures of distress (Brief Symptom Inventory 18/Perceived Stress Scale), sleep disturbance (Pittsburgh Sleep Quality Index), and pain intensity and interference (Brief Pain Inventory) and measures of psychosocial and demographic characteristics at the end of neoadjuvant chemotherapy and before surgery. Participants were then assigned to one of two writing groups and asked to write for 20 minutes per day for 4 consecutive days. The expressive writing (EW) group wrote about their cancer experience while the neutral writing (NW) group wrote about health behaviors. Participants were reassessed 3 days before and 2 weeks after surgery. Use of analgescics was recorded and recovery time (time from the end of surgery to drain removal) was measured. Forty nine women who contributed at least one writing were included in the analysis. Results from the mixed model analyses indicated that the intervention was not associated with a change in overall distress, perceived stress, sleep disturbance, or pain. Multivariate linear regression analyses suggested that the groups did not differ in their use of analgescics or recovery time. Exploratory mixed model analyses testing for an effect on aspects of distress and sleep disturbance suggested that the EW group reported better sleep quality than the NW group (p=0.04), after controlling for psychosocial and clinical covariates. Descriptive statistics and graphical display of the data suggested that the difference in sleep quality was most pronounced at the presurgical assessment. Overall, these data do not support the use of expressive writing as a presurgical stress management intervention for women with breast cancer. The main effect of the intervention on sleep quality should be interpreted cautiously because of the exploratory nature of the analysis.

Abstract 1159

THE EFFECT OF OPTIMISM ON DISTRESS AND CHANGE IN CA 125 AND PRELIMINARY SUPPORT FOR THE IMPORTANCE OF EDUCATION
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Purpose of the Study: This research examined whether dispositional (DO) or situational optimism (SO) was protective against distress (anxiety, perceived stress, and depression) in ovarian cancer patients on chemotherapy and assessed whether DO or SO predicted change in cancer antigen (CA) 125 levels during treatment. Subject Sample and Statement of Methods: Ninety women with epithelial ovarian cancer were assessed at the beginning of a new round of chemotherapy and then again at the end of chemotherapy. Distress and optimism were assessed by self-report, and CA 125 levels were extracted from medical charts. Prognostic, clinical and sociodemographic factors were also measured and entered as covariates in the multivariate (MV) analyses. Summary of Results: In univariate (UV) and MV analyses, DO and SO were associated with lower distress for ovarian cancer patients. This study also suggests a possible relationship between optimism and change in CA 125; however, education appears to be an important confounder in this relationship.
Abstract 1648

GENETIC COUNSELING IS LESS EFFECTIVE IN INCREASING KNOWLEDGE ABOUT GENETICS OF BREAST CANCER AMONG WOMEN WHO FEEL CONSTRAINED IN EXPRESSING THEIR BREAST CANCER CONCERNS

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The central goal of genetic counseling for women with family histories of breast cancer is to improve their knowledge about the disease and its genetic transmission. However, little is known about patient factors that may be related to increased knowledge following counseling. Accumulating evidence indicates that emotional expression in talking about stressful life events can affect both emotional and cognitive processes. Based on this literature we hypothesized that: 1) women with high levels of social constraints (perceived social barriers to expressing their emotions about breast cancer concerns) will benefit less from genetic counseling, and 2) that this effect will be mediated by their higher levels of intrusive thoughts about cancer (IES). Women (n=169) seeking genetic counseling for breast cancer susceptibility completed an IES and a social constraint measure approximately two weeks before their counseling. They completed a breast cancer knowledge questionnaire at that time and again approximately four weeks after their counseling. Results indicated that: 1) women with higher levels of social constraints had smaller improvements in knowledge and they had higher levels of intrusive thoughts (p <.01); and 2) higher levels of intrusive thoughts were associated with smaller improvements in knowledge (p<.01). Consistent with the mediational hypothesis, social constraints were no longer significantly related to increases in breast cancer knowledge when intrusive thoughts was entered into the equation (p=.08). Findings indicate the importance of psychological factors to the effectiveness of counseling and suggest that interventions facilitating emotional expression may increase retention of complex genetic information.

Abstract 1655

GENDER DIFFERENCES IN PROTECTIVE BUFFERING AMONG CANCER CAREGIVERS

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Female caregivers are at risk for elevated levels of distress and marital dissatisfaction (Langer, 2003). Is such negative affect or felt emotion behaviorally expressed? Spousal caregivers may inhibit the expression of negative emotion for interpersonal reasons. Protective buffering is a coping style whereby spouses hide their concerns from the patient. This study sought to examine gender differences in the facial expression of emotion among caregivers both within the presence of the patient and in the absence of the patient (an experimental test of protective buffering). Cancer survivors and their caregivers (42 couples) were recruited one year following the patients’ diagnosis. ANOVA revealed a significant pattern in work-stress cortisol responses from highest to lowest familial risk (Means: 29.2±3.3, 24.6±3.7, 19.9±1.8; p<.04), and in breast cancer risk perceptions (Means: 58.7±3.8, 45.7±4.3, 32.8±2.1; p<.001). Chi-Square Tests indicated that HFR were more likely to have intrusions about breast cancer (p=0.001; median split). Perceived risk was not related to cortisol responses (p=.5), but intrusions were (p=.01). Including intrusions along with group in the analysis eliminated the previously significant relationship between group and work cortisol responses. Findings suggest that intrusions about breast cancer, but not risk perceptions, provide a mechanism linking familial risk status with heightened responses to acute stressors. The possibility that intrusions may serve as a psychological mediator of heightened reactivity associated with other background stressors deserves further research.

Abstract 1656

ELEVATED WORK-STRESS CORTISOL RESPONSES IN WOMEN AT FAMILIAL RISK FOR BREAST CANCER: PREDICTED BY INTRUSIONS ABOUT BREAST CANCER

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Healthy women with family histories of breast cancer have stronger cortisol responses to acute stressors in the laboratory and in daily life. As these women also report higher levels of perceived risk and intrusions about breast cancer, it was of interest to examine these factors as possible predictors of the heightened acute responses. We recruited 215 healthy working-women with mothers diagnosed before (HFR=41, high familial risk), or after age 50 (LFR=33, low familial risk), and women without cancer in first-degree relatives (NFR=141, no familial risk) by advertisements. Participants completed self-report measures of perceived lifetime breast cancer risk (0-100%) and intrusive thoughts about breast cancer (Impact of Event Scale).

Urine samples were collected for assessment of work-stress cortisol responses. Demographic and health-related variables (e.g., age, smoking) did not identify as confounders. ANOVA revealed a significant pattern in work-stress cortisol responses from highest to lowest familial risk (Means: 29.2±3.3, 24.6±3.7, 19.9±1.8; p<.04), and in breast cancer risk perceptions (Means: 58.7±3.8, 45.7±4.3, 32.8±2.1; p<.001). Chi-Square Tests indicated that HFR were more likely to have intrusions about breast cancer (p=0.001; median split). Perceived risk was not related to cortisol responses (p=.5), but intrusions were (p=.01). Including intrusions along with group in the analysis eliminated the previously significant relationship between group and work cortisol responses. Findings suggest that intrusions about breast cancer, but not risk perceptions, provide a mechanism linking familial risk status with heightened responses to acute stressors. The possibility that intrusions may serve as a psychological mediator of heightened reactivity associated with other background stressors deserves further research.

Abstract 1283

INVESTIGATION ON RELIABILITY OF RECALLED SELF-REPORT ON HEADACHE USING ECOLOGICAL MOMENTARY ASSESSMENT TECHNIQUE

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Evaluation of subjective symptoms such as pain is crucial in both clinical and research settings. Recently, ecological momentary assessment (EMA) has been developed to avoid problems such as recall bias and fake compliance. The aim of this study was to investigate the equivalence of evaluation of headache intensity from weekly recall and from EMA in tension-type headache (TTH) patients. The subjects were 13 male (41.8±9.6 yr) and 31 female (37.7±11.0 yr) patients with TTH. They wore watch-type computers for 1 week. With this device, headache intensity was recorded using a visual analogue scale (VAS). Scheduled recordings were performed approximately every 6 hours. Event- contingent recordings were added at acute exacerbation. At the end of the week, the subjects rated their headache intensity during the previous week with a VAS. First, we calculated four indices from EMA recordings: the average of all the recordings (HI1), the average of the event-contingent recordings only (HI2), the average of the event-contingent recordings only (HI3) and the average of the recordings only when headache existed (HI4). Second, we calculated standard deviation of headache intensity for each subject and divided the subjects into lowSD and highSD groups at the median. Finally, we calculated intra-class correlation coefficients (ICC) of the weekly recall and each index in the whole subjects and also in the two subgroups. ICC of absolute agreement of weekly recall and HI1-4 of the whole subjects were 0.46, 0.40, 0.51 and 0.54 respectively. Those of the lowSD/highSD groups were 0.75/0.21, 0.75/0.16, 0.81/0.21 and 0.77/0.29 respectively. These results indicated that nonequivalence between EMA recordings and recall might exist especially in the highSD group. In conclusion, the equivalence between EMA recordings and weekly recall was very low especially in subjects whose headache intensity varies.
MODERATORS OF THE BENEFITS OF CONSTRUCTIVE ANGER EXPRESSION IN CHRONIC PAIN PATIENTS
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We examined moderators of previously-reported effects of constructive anger expression (CAE) on emotional distress, control over pain, pain severity, and pain interference in chronic pain patients (Graham, Lobel, Glass, & Lokshina, 2004). Treatment group participants (n=57) were assigned to write letters expressing their anger constructively, while those in the control group (n=53) were assigned to write non-emotionally. Outcomes were assessed at approximately 4 and 9 weeks after the intervention by interviewers blind to condition. Possible dispositional and demographic moderators of the intervention were assessed at baseline. Contrary to our expectation, trait anger did not moderate effects of the intervention. However, the receipt of psychological therapy moderated the effect of CAE on pain interference at both 4 weeks, F(1,95) = 8.43, p < .01, and 9 weeks, F(1,99) = 3.75, p < .05, and on pain severity at 4 weeks, F(1,95) = 5.31, p < .05, with those receiving therapy in the treatment group reporting lower levels than those in the control group. Because these individuals were more emotionally distressed than others, one possible interpretation of this result is that CAE is more effective for those who are particularly in need of help. As expected, a trait tendency to express anger constructively also moderated the effect of CAE on emotional distress at 9 weeks, F(1,99) = 6.71, p < .01, with participants in the treatment group who reported this tendency showing lower distress than those in the control group. In addition, the positive effect of CAE on control over pain was marginally stronger for participants in the treatment group who reported being optimistic, F(1,48) = 3.39, p = .07. These results suggest that certain individuals are more readily able to benefit from instructions to express anger in goal-directed, adaptive ways. Overall, results provide a foundation for future research on the utility of CAE as a supplemental intervention against chronic pain.

Abstract 1308
ALEXITHYMIA, PAIN, AND NEGATIVE AFFECT IN THREE CHRONIC PAIN SAMPLES: COMPARING CAUCASIANS AND AFRICAN AMERICANS
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African Americans (AA) with chronic pain disorders often report greater pain severity than do Caucasians (C), but the psychosocial factors responsible for this discrepancy are not known. Alexithymia—difficulty identifying and describing one’s feelings and paying attention externally rather than introspecting—is a risk factor for pain. Alexithymia may contribute to this ethnic group difference in pain, but ethnic differences in negative affect (NA) and alexithymia’s relationship to NA may confound this relationship. We conducted cross-sectional, correlational studies on 3 separate samples of patients with chronic pain disorders: rheumatoid arthritis (n=155), migraine headaches (n=160), or systemic lupus erythematosus (n=123); each sample included only C or AA. The Toronto Alexithymia Scale-20 assessed alexithymia. Pain severity, functional disability, or symptoms were assessed with measures appropriate for each sample, and a measure of NA was available for each sample. Similar findings were found across all three samples. AA had slightly higher levels of alexithymia and NA than did C, although this was partly accounted for by socioeconomic differences between groups. More importantly, alexithymia correlated only weakly with pain or symptom severity for each full sample; however, the two ethnic groups showed different patterns. Alexithymia correlated positively with pain severity among AA, but was uncorrelated with pain among C. Controlling for NA attenuated but did not fully eliminate the ethnic group differences in the alexithymia/pain relationships. We conclude that alexithymia is more correlated with pain severity among AA than among C, in part due to the influence of NA, and that both alexithymia and NA potentially contribute to the elevated pain reports among AA.

MOOD CLARITY PREDICTS DAMPENED HEART RATE REACTIVITY DURING STRESS
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Past research has shown that aspects of ego resiliency, including the experience of positive emotions, speed physiological recovery following stress (Fredrickson et al., 2000; Fredrickson & Levenson, 1998). This study examined the relation between trait positive affectivity and one aspect of mood regulation, mood clarity (MC), and heart rate (HR) reactivity during acute stress in a sample of chronic pain patients. We hypothesized that a propensity to experience positive affect and to experience emotions clearly would be related to dampened HR reactivity during stress. Participants were 46 female Arizona residents between the ages of 40 and 70 years (M = 57, SD = 8.15) recruited from the community, who had a diagnosis of Osteoarthritis (N=23) and/or Fibromyalgia (N=23). The majority of participants were Caucasian (91%) and married (60%), and the average income of the sample was $30K. Participants completed assessments of demographic data and trait mood clarity, 30-day diary questionnaires assessing daily negative and positive affect (NA and PA, respectively), and laboratory measures of HR during rest and a stressful interview about an interpersonal conflict. MC was assessed using the Meta-mood Scale (Solovey et al., 2008) and PA and NA were assessed using the PANAS-X form (Watson & Clark, 1999). Average PA and NA scores were computed by aggregating these scores for each participant across their 30 daily reports. Stress-related change in HR was computed by subtracting scores of average HR at rest from average HR during the stressor. MC was significantly positively correlated with average level of PA (r = .47, p < .01) and negatively correlated with average level of NA (r = -.30, p < .05) over the 30 daily reports. This result indicated that higher levels of MC predicted less HR reactivity (r = -.23, p < .03), over and above average level of PA (r = .57, p = .13) or NA (r = .40, p = .69). These effects were maintained in a model that included resting HR, diagnosis, and age.

DEPRESSIVE SYMPTOMS AND WAYS OF COPING IN PATIENTS WITH RHEUMATOID ARTHRITIS
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We examined how rheumatoid arthritis (RA), one of the common psychosomatic disorders, would be associated with depressive symptoms and if the association differs by stress coping strategies. Forty-four patients with RA (9 men, 35 women; mean age of 48.84±14.53 years) and 61 healthy subjects (23 men, 38 women; mean age of 47.80±7.74 years) completed the Korean version of the Beck Depression Inventory (BDI) and the Korean version of the Ways of Coping Checklist. RA patients showed significantly higher BDI score (12.20±8.33 vs. 7.28±3.67, p=0.000) and higher percentage of depression when using cut off point > 13 in BDI than healthy control subjects (40.91% vs. 18.30%, p=0.012). In terms of coping strategies, the scores of problem-focused coping and active coping in RA patients were significantly lower than those of control subjects (52.50±13.11 vs. 38.40±10.27, p=0.007; 41.93±13.68 vs. 47.31±12.19, p=0.039 respectively). In addition, BDI scores of RA patients were inversely correlated with the scores of problem-focused coping (r=-0.501, p=0.001) and active coping (r=-0.463, p=0.002) to a significant degree. To investigate the relative importance of these pertinent coping strategies, we conducted a hierarchical linear regression analysis using BDI as the dependent variable. When all coping strategies were considered together in a regression model, problem-focused coping significantly accounted for 25.2% of the variance in BDI (p<0.000). Our results suggest that large proportion of RA patients suffer from depressive symptoms and these depressive symptoms are associated with poor coping strategies. RA patients might use less frequently active coping strategy including problem-focused coping. Therefore, facilitating healthier active coping and problem-focused coping strategies might lessen depressive symptoms experienced by RA patients.
PRELIMINARY EVIDENCE FOR DIFFERENCES IN COGNITIVE-AFFECTIVE LANGUAGE USE IN SUBGROUPS OF CHRONIC PAIN PATIENTS

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In order to improve treatment design and outcomes, efforts to characterize subgroups of chronic pain patients have been underway. The cluster taxonomy of the Multidimensional Pain Inventory (MPI) classifies patients into Dysfunctional (DYS), Adaptive (AC), and Interpersonally Distressed (ID) coping profiles. Recent research in expressed emotion and linguistic analysis has provided evidence that emotional and physical health is associated with affective and cognitive processing of traumatic events and may be reflected in language use. Essays of chronic pain patients (n=29 women; mean age=50.7) during an emotional disclosure intervention were examined for differences in cognitive-affective language use based on MPI profile. Computerized text analysis assessed frequency of word usage in categories indicative of somatic symptoms, emotional distress, and social interactions, that is, constructs relevant to differences among the pain clusters. Four one-way analyses of variance were conducted for the selected word categories by MPI profile. Results presented below are the post hoc comparisons. As expected, DYS made significantly more references to somatic symptoms than AC (p=.02) and ID patients (p=.001). The clusters also differed on word use relating to emotional well-being. AC used significantly more positive affect words than ID patients (p=.01), and there was a trend for AC to use less negative affect words than DYS patients (p=.07). Finally, examination of differences on social relations/interactions indicated a trend toward ID using more of these words than DYS patients (p=.08). These results provide preliminary evidence that theoretically-consistent differences in affective and cognitive language use are observed in subgroup clusters of chronic pain patients. Both internal and public language is a core focus of cognitive therapy as a means to alter affective experience. These data provide support for clinically important differences among patients that are relevant to treatment.

Abstract 1353

REGULAR USE OF PRESCRIBED OPIOIDS: ASSOCIATION WITH COMMON PSYCHIATRIC DISORDERS IN A POPULATION-BASED SAMPLE

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In response to campaigns to improve treatment of patients with chronic non-malignant pain through liberalization of access to opioids, prescription opioid use has doubled between 1980 and 2000. Treatment guidelines have suggested that opioid use in patients with current mood, anxiety and substance use disorders may not be appropriate. We analyzed the association of regular use of prescribed opioids with these disorders in a population-based sample using cross-sectional data from the 1998 and 2002 waves of the Health Care for Communities Study (N=14,113). 435 (3%) of these respondents reported that they took an opioid medication "at least several times a week for at least one month or more." These respondents were more likely meet DSM-IV criteria for: Major Depression (OR=4.4), Dysthymia (OR=4.2), Generalized Anxiety Disorder (OR=3.4), and Panic Disorder (OR=4.9). They were also more likely to report problem use of prescription (OR=4.1) for illicit drugs (OR=4.4), but not problem drinking (OR=0.9). Those receiving opioids were more likely to report a need for mental health treatment (OR=2.3), but this became non-significant (OR=1.0) after adjusting for these mental disorders. Other significant univariate predictors of regular opioid use were: age, education, income, work disability, self-rated health, physical-component score from the SF-12, and chronic pain conditions including back pain and headaches. After adjusting for these variables, those on opioids were still more likely to meet criteria for at least one of these common psychiatric disorders (OR=1.8). These data suggest that some opioid prescribing is not meeting current standards of appropriateness. Many patients receiving regular prescribed opioids have unmet needs for mental health and substance abuse care.

HYPOACTIVITY OF VENTROMEDIAL PREFRONTAL CORTEX IN PATIENTS WITH SOMATOFORM PAIN DISORDER – A CONTROLLED FMRI STUDY

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Orbitofrontal cortex and dorsolateral-prefrontal cortex predominantly exert inhibitory influences on pain perception in normal healthy subjects. In addition, the paracingulate region of the medial frontal cortex is necessary for reflective awareness. We hypothesized that during thermal heat stimulation patients with somatoform pain disorder would show reduced prefrontal activation compared to control subjects. 13 right handed women (mean age 47.4 yrs., range28-59) fulfilling DSM-IV criteria (SCID-I) for somatoform pain disorder were recruited from a pain clinic as well as 13 age-matched healthy control subjects (mean age 47.3 yrs., range 28-59). Neuroimaging was performed in a 1.5 Tesla MRI scanner (Siemens Symphony). Thermal noxious stimuli (block design, 10 X 40 sec lasting, 45.8 °C mean pain temperature in both groups) were administered to the volar side of the subjects left forearm. The mean pain ratings between subjects and controls on a numerical rating scale (NRS) were not significant for pain intensity (6.8 vs 7.3; p0.39 n.s.) and pain unpleasantness (7.0 vs 7.6; p=0.40 n.s.). The group analysis (SPM2; RFX model) of fMRI data revealed one region significantly hypoactivated in subjects with somatoform pain disorder compared to healthy controls: the right ventromedial orbitofrontal cortex (MNI 9.5,15,15; BA 10/11). In contrast, thermal noxious heat stimulation resulted in significantly increased rCBF in left parahippocampal gyrus (MNI -36,44,3), secondary somatosensory (MNI -36,36,24) and left anterior insular cortex (MNI -27,21,18). Our findings of a hypoactivation of the right ventromedial prefrontal cortex in somatoform pain disorder may indicate a diminished top-down mode of inhibition of neuronal coupling along the ascending midbrain thalamic-cingulate pain pathway in patients with somatoform pain disorder.

Abstract 1097

HEART DISEASE RISK KNOWLEDGE IN SPANISH SPEAKERS WITH DIABETES: THE ROLE OF MEDICAL INTERPRETERS

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Objective: Investigate heart disease risk knowledge in Spanish speakers with diabetes. Participants: 94 Spanish-speaking adults with diabetes attending a Spanish language diabetes fair in an inner-city community center in CT, USA. Sample: Adults (M=59 yrs) from Puerto Rico (73%), 66% < high school equivalency, financially poor (modal income $10-20k) without a bank account (58%). Most preferred Spanish for speaking (80%), for writing (86%). Most were overweight (BMI M=30), had type 2 diabetes (96%) for M=10 yrs, treated with oral agents (54%). Most had some health care coverage (98%) and a primary care provider (PCP, 77%). Many used ad hoc interpreters (friends/family) during PCP visits (47%); most would prefer professional medical interpreters (64%). Measures: Spanish version of the valid and reliable Heart Disease Fact Questionnaire (HDFQ; scored 0-25, higher scores=more knowledge). Results: Spanish HDFQ showed good internal consistency (KR20=.86). HDFQ scores averaged 3 points lower than published English speaking samples. ANOVAs showed significantly higher HDFQ scores for those with a high school equivalency (M=20) vs. those without (M=17), for those with a banking account (M=20) vs. those without (M=16), for those who did not desire a professional medical translator (M=20) vs. those who did (M=17), and for those who did not use ad hoc interpreters (M=19) vs. those who did(M=16), all p<.05. Regression analyses with these 4 variables as IVs and HDFQ scores as DV showed that not using ad hoc interpreters (beta=.25) predicted higher HDFQ scores, p<.05. R square=.21, adjusted R2=.28. Limitations: Did not measure health literacy. Conclusion: Heart disease risk knowledge may be low in Spanish speakers with diabetes. Providing professional medical interpretation instead of relying on ad hoc interpreters may be recommended for this high-risk group.
Abstract 1096
DIABETES, METFORMIN, & HISTORY OF DEPRESSION: ASSOCIATIONS WITH URINARY ALBUMIN IN WOMEN
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Background: Diabetes, major depressive disorder (MDD), and cardiovascular disease (CVD) covary. Urinary albumin predicts CVD mortality in people with and without diabetes. Metformin is used to treat type 2 diabetes; it may also decrease albumin excretion. We studied the relationship between lifetime MDD and albuminuria, with diabetes and metformin as moderators. Subjects: 73 nonsmoking, postmenopausal women with no CVD, no current MDD, not taking insulin or antidepressants. Sample was mostly White (89%), overweight (BMI M=31), age M=61 yrs, on antihypertensives (47%), with normal BP. Diabetes subsample (n=29) was diagnosed for M=6 years with HBA1c M=6.9, 55% on metformin. Lifetime MDD subsample (n=33) had their first MDD episode at M=37 years, and experienced M=2 MDD episodes. Design: 2X3 factorial design with LIFETIME MDD (previous MDD yes/no) and METFORMIN GROUP (nondiabetic, diabetic on metformin, diabetic no metformin) as IVs, and URINARY ALBUMIN as DV. Measures: History of MDD measured with Structured Clinical Interview for DSM-IV. Albuminuria measured as mg/24 hrs. Analyses: 2X3 ANCOVA consistent with design, and age, BMI, and antihypertensives as covariates. Results: Main effect for LIFETIME MDD; those with lifetime MDD had higher albumin (M=9.3) than those without lifetime MDD (M=7.8) F(2,73)=4.99, *p<.05. Main effect for METFORMIN approached significance, p=.08. Significant interaction between LIFETIME MDD and METFORMIN GROUP F(2,73)=4.26, *p<.05. With BP, smoking history, and HBA1c added as covariates, interaction remained significant. Follow up Tukey tests showed a trend among diabetics for higher albumin in those with lifetime MDD (M=18 mg/day) compared to those with lifetime MDD on metformin (M=8.2 mg/day), p=.07. Discussion: MDD may affect albumin in diabetic women even years after MDD remission. Metformin may protect the kidneys from MDD in diabetes. Limitations: small n, and the need to control for metformin duration and dose.

Abstract 1231
MARITAL QUALITY AND DIABETES OUTCOMES OF IDEATEL, A TELEMEDICINE INTERVENTION FOR THE ELDERLY
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Participants were enrolled in the Informatics for Diabetes Education and Telemedicine Project (IDEATEL), i.e., Medicare beneficiaries with diabetes in medically underserved areas randomized to a telemedicine intervention (home unit to upload blood glucose (BG)/blood pressure(BP)/videoconference with a nurse, and access educational websites) or usual care. N=134 married Ss completed marital stress and satisfaction measures to assess marital quality. Demographics, baseline and 1 year data (BG control, depression, diabetes distress, diabetes self-efficacy, telemedicine use) were provided and 1-year change scores were computed. Baseline correlations: Better marital quality was correlated with better BG control (r=.227, p<.01) and systolic BP (r=.178, p=.043). Less depression (r=.352, p<.001) and diabetes distress (r=.348, p<.001) and better self-efficacy (r=.372, p<.001). Prospective analyses: The relationships among variables controlling for related variables (i.e., gender, duration of diabetes, comorbidity) was examined using tests for the significance of the partial correlation coefficient. Better marital quality predicted improved BG control for intervention (r=.426, p<.048) but not control Ss. Better marital quality predicted improved depression (r=.041) and diabetes distress (r=.026) for control but not intervention Ss (p=.198, r=.783). Marital quality did not predict change in diabetes self-efficacy. Better marital quality predicted fewer online visits (r=.440, p=.002) but not connect time or number of home BG tests. In this group of elderly individuals marital quality was a significant predictor of improved BG control for intervention subjects, and of improved emotional status (depression, diabetes distress) for usual care subjects. Potential reasons for these findings and future research implications are presented.
Abstract 1051

DULOXETINE FOR PATIENTS WITH DIABETIC NEUROPATHIC PAIN: A SIX-MONTH OPEN LABEL SAFETY STUDY
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Introduction: Duloxetine is a balanced and potent reuptake inhibitor of both serotonin (5-HT) and norepinephrine (NE). Since 5-HT and NE inhibit pain via descending spinal cord pathways, duloxetine's dual reuptake inhibition activity may make it an effective agent for the treatment of diabetic neuropathic pain. Study design: In a 28-week, multicenter, open-label study, 449 patients diagnosed with diabetic neuropathic pain (DN) were randomized 3:1 to either duloxetine 60 mg BID or duloxetine 120 mg QD treatment groups. Standard clinical tests, labs and ECGs were performed for all patients. Secondary efficacy measures included the Brief Pain Inventory (BPI) and Clinical Global Impression of Severity (CGI-S) scales. Results: Protocol completion rates were 63.8% and 62.6% for the duloxetine 60 mg BID (n=213) and duloxetine 120 mg QD (n=72) patient groups, respectively. Both treatment groups showed improvement from baseline to endpoint on all subscales of the BPI and the CGI-S (p<0.005). Adverse events were the most frequent cause of discontinuation for both treatment groups. Statistically significant but clinically unremarkable changes occurred in some cardiovascular parameters from baseline to endpoint. In both duloxetine treatment groups, heart rate increased slightly (p<0.05) and systolic blood pressure (BP) was unaffected while diastolic BP decreased slightly in duloxetine 120 mg QD patients (p<0.05). A sustained (3 consecutive visits) BP elevation was reported for 18 (5.5%) and 6 (5.4%) of patients receiving duloxetine 60 mg BID and duloxetine 120 mg QD, respectively. Conclusions: For patients with diabetic neuropathic pain, duloxetine is tolerable as demonstrated by its high percentage of patients completing the study, can be safely administered, and was efficacious in improving the painful symptoms associated with diabetic neuropathy.

Abstract 1158

INCREASING UPPER DIGESTIVE SYMPTOM SEVERITY IN IBS PATIENTS IS ASSOCIATED WITH INCREASED PSYCHIATRIC DISTRESS: THE POLYSYMPTOMATIC PATIENT
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Many pts with IBS report symptoms referable to the upper digestive tract or have abnormalities of upper digestive motility and sensation. To better understand multi-organ symptoms in IBS pts, we evaluated 96 pts with IBS by Rome II criteria, 48 pts with IBD and 67 healthy subjects. Patients used a Likert scale to rate 15 common dyspeptic symptoms restricted to the upper abdomen. Evaluated symptoms included: abdominal pain, discomfort and burning; chest pain, burning and regurgitation; upper abdominal bloating; pressure; early satiety; inability to finish a meal; cramps; nausea; vomiting; belching/burping and bad breath. Pts also completed the SCL-90-R (SCL), the Toronto Alexithymia Scale (TAS) and Somatosensory Amplification Scale(SSAS). Comparisons across groups were made by ANOVA with Bonferroni's postest. Data are expressed as mean±SDEV. Pts with IBS had significantly higher dyspepsia symptom scores (47±36)than IBD pts (29±28)who were significantly more symptomatic than controls (6±9). As symptom scores in IBS pts showed a bimodal distribution, we compared 3 groups: IBS pts with symptom scores >70 (n=29); IBS pts with symptom scores <50 (n=59); and IBD pts with symptom scores <50 (n=39). IBS and IBD pts with symptom scores <50 did not differ with respect to symptom, SCL, TAS or SSAS scores. In contrast, IBS pts with symptom scores >70 had significantly greater scores than IBD and IBS pts with symptom scores <50 for total symptoms (94±25 vs. 20±15 vs. 23±13; p<0.0001), SCL (80±44 vs. 62±37 vs. 49±33; p=0.002) and TAS (48±13 vs. 42±12 vs. 39±10; p=0.004) but not SSAS. We conclude that upper digestive symptoms are common in pts with IBS and IBD and a subset of IBS pts (29%) reports high levels of upper digestive symptom severity. This group demonstrates greater psychiatric distress and alexithymia than IBD and IBS pts reporting fewer upper digestive symptoms.
Abstract 1119

COPING STRATEGIES AND INTERPERSONAL SUPPORT IN IRRITABLE BOWEL SYNDROME AND INFLAMMATORY BOWEL DISEASE
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Coping strategies (CS) are used to manage conflict and illness and have both adaptive or maladaptive effects on health status. Perceived availability and quality of social support (SS) also influences health status. CS and SS are not well studied in IBS. We evaluated CS, SS and psychiatric distress in consec. pts with RomeII IBS and IBD recruited from clinic and ctrls recruited by advertisement. Subjs completed the Ways of Coping Questionnaire, a validated instrument measuring 8 common Cts. Subjs also completed the Interpersonal Support Evaluation (ISEL, a measure of perceived availability and quality of social support), SCL-90-R (SCL; a measure of psychiatric distress), IBS and IBD-QOL, the Somatosenory Amplification Scale (SSAS) and 20-Item Toronto Alexithymia Scale (TAS). Crossings across groups were made by ANOVA with Bonferroni's posttest. We studied 55 ctsrs, 74 IBS and 48 IBD pts. IBS and IBD pts had significantly greater scores on the SCL, TAS and SSAS than ctrls but did not differ from one another. For IBD pts, IBS-QOL and IBS-QOL were highly correlated (p=0.83; p<0.0001). IBS-QOL scores did not differ btwn IBS and IBD groups suggesting similar symptom impact. Patients with IBS and IBD had significantly lower ISEL scores than ctrls but did not differ from one another. Total scores for all CS did not differ btwn ctsrs, IBD and IBS. Compared with controls, IBS and IBD pts were less likely to endorse strategies for planful problem solving or positive reappraisal. They were more likely than ctrls to endorse strategies of escape-avoidance. We conclude that IBS and IBD patients differ significantly from ctsrs with respect to psychiatric distress, CS and SS. IBS and IBD patients do not differ greatly from each other. These data suggest that observed differences in CS strategies reflect general illness behavior rather than a disorder-specific process.

Abstract 1621

RECALL AND MOMENTARY ASSESSMENTS OF TWO SELF-REPORT ITEMS FROM THE CROHN'S DISEASE ACTIVITY INDEX (CDAI)
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The CDAI, used in treatment decisions and as an outcome variable in clinical trials, assesses severity of Inflammatory Bowel Disease (IBD). It includes nightly self-reports of abdominal pain and well-being for 7 days. The pain and mood literature has examined the cognitive processes that are used to recall and report these subjective states. Past research has shown that 1) recall reports are higher than momentary reports, and 2) the best predictors of recall are peak and end momentary reports, while duration of the event is not as predictive. These 2 hypotheses are tested. This study included 16 patients with IBD who were mostly female (75%), white (88%), with a mean age of 46. Electronic diary ratings completed 12x/day for 7 days were compared to recall reports for the same 7 days. Questions differed only in timeframe (Before the prompt vs. Over the last 7 days) and were: Please rate your abdominal pain: 0=None, 1=Mild, 2=Moderate, 3=Severe; Please rate your well-being: 0=Generally Well, 1=Slightly below par, 2=Poor, 3=Very Poor, 4=Terrible. Four variables were computed for each subject from the momentary data: mean (for 7 days), peak value, end (mean for last day), and duration (percent of prompts in pain/low well-being). Paired t-tests were used for Hypothesis 1. Recall abdominal pain was significantly higher than mean momentary (.6 versus .2, p<.01), but there was no significant difference for well-being. For hypothesis 2 hierarchical regression was used to test the model recall=(peak+end)*duration. For abdominal pain peak+end explained 48% of the variance and duration added 7% (p<.05); the overall model explained 55% of variance and was significant (F(3,15)=4.9, p=.02). For well-being peak+end explained 59% of the variance, which increased to 88% with duration (p<.001); the overall model was significant (F(3,15)=29.2, p<.001). Because the CDAI is widely used it is important to understand the potential impact of recall bias on this measure. Momentary reports with an electronic diary may reduce this bias.

Abstract 1109

MEASURING SOMATIZATION IN DIGESTIVE DISORDERS: MEASURES OF SOMATIZATION, SOMATOSENSORY AMPLIFICATION AND VISCERAL ANXIETY
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Somatization (SOM) influences symptom generation, tolerance, and reporting in functional digestive disorders. We compared the Visceral Sensitivity Index (VSI), a new measure of GI symptom-specific anxiety, with a modified SOM scale of the SCL-90-R (SCL-som) and the Somatosensory Amplification Scale (SSAS). We also assessed VSI factor structure and evaluated a shortened version in a separate study. To study these measures. 102 2nd yr medical students (MS) without digestive disorders were studied immediately prior to an examination. MS completed a GI Symptom Questionnaire(GSQ), SCL-som, SSAS and VSI. Relationships between GSQ and SOM measures were determined. Factor analysis of VSI guided construction of a shortened scale (SF-VSI) that was administered with the Hospital Anxiety and Depression Scale (HADS) to 73 randomly chosen new patients in the NU GI Clinic. Our study showed that 90% of MS had at least 1 symptom. VSI, SCL-som, SSAS, and GSQ were all significantly intercorrelated. Stepwise regression identified a 2-step model. VSI explained 23% GSQ variance and VSI + SCL-som explained 33% GSQ variance. VSI factor analysis identified a single factor and a 6-item scale (SF-VSI) was developed that correlated highly (r=0.96) and reliably (alpha=0.87) with the total scale. In GI clinic pts, SF-VSI highly correlated with the full VSI (r=0.95; p<0.0001) and the anxiety scale of HADS (r=0.46; p<0.0001), and the VSI items not included in the SF-VSI (r=0.91; p<0.0001). SF-VSI and VSI correlated with the HADS depression scale (r=0.37; p<0.002 for both). We conclude that the VSI is sensitive to changes in digestive symptoms and is a better predictor of digestive symptoms than SSAS or SCL-som in a MS population. A shortened version may be an equally valid measure.

Abstract 1278

AUTONOMIC AND PAIN RESPONSES IN TRADITIONAL CHINESE MEDICINE BASED IRRITABLE BOWEL SYNDROME SUBGROUPS
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Traditional Chinese Medicine (TCM) may be well suited for functional disorders such as Irritable Bowel Syndrome (IBS). TCM aims to correct digestive symptoms than SSAS or SCL-som in a MS population. A shortened version may be an equally valid measure.

A-75
Children of parents with irritable bowel syndrome (IBS) are more likely to exhibit illness behavior than are children of control parents. School absenteeism is one form of illness behavior in children. Aims: Determine the influence of child demographic and psychosocial factors (age, academic self-esteem and pain catastrophizing) on absenteeism among both children of IBS parents and children of control parents. Methods: 208 mothers with IBS (cases), with 296 children (mean 11.9 years; 48.6% male; 94.9% Caucasian), and 241 non-IBS mothers (controls) with 335 children (mean 11.8 years; 49% male; 99.7% Caucasian) completed measures of child academic self-esteem (Harter), child catastrophizing (Pain Response Inventory - PRI), and school attendance. Results: Univariate regressions indicated that academic self-esteem (Beta=.135, p=.033), age (Beta=.167, p=.006) and catastrophizing (Beta=.168, p=.008) predicted school absences among case, but not control, children. In a stepwise regression (conducted solely on case children), child catastrophizing and age predicted school absences (p<.01); academic self-esteem was not entered into the model. Conclusions: Findings offer implications for children of parents with IBS, with attention to age and maladaptive cognitions (catastrophizing) as risk factors for disability.

Abstract 1404
PLACEBO EFFECTS ON GASTRIC MOTILITY -- EARLIER RESULTS CAN ONLY PARTIALLY BE REPLICATED
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The specific effect of placebo therapies on organs has been rarely studied using experimental approaches. However, as early as 1964, Sternbach had reported that subjects (n = 6) may show an acceleration of stomach activity (compared to control condition) following the administration of a presumed stimulant but a deceleration when the placebo was presumed to be a relaxant. We tried to replicate this study as closely as possible by using cutaneous electrogastrography (EGG). In three randomized conditions 18 volunteers (ages 21-34) received a lactose pill. They were told to receive a drug which either stimulates, or relaxes stomach activity, or has no effect (stimulant, relaxant, or control condition, respectively). Stomach activity was recorded during 30 minutes before and 30 minutes after placebo administration. Raw EGG-signals were bandpass-filtered and half-periods of gastric slow waves determined as mean intervals between successive zero-crossings. The mean of the half-periods (n = 17) increased significantly by 0.22 sec during the stimulant condition and decreased by 0.12 sec during both, the relaxant and control half-periods (n = 17) increased significantly by 0.22 sec during the stimulant condition and decreased by 0.12 sec during both, the relaxant and control conditions, when compared to the corresponding pre-administration values (single-factor ANOVA, p < .05). The pair wise Bonferroni/Dunn post hoc test indicated significant (p < .05) differences between stimulant and relaxant as well as stimulant and control conditions. Thus, compared to the control condition, gastric slow waves decelerated during the stimulant condition but did not change during the relaxant condition. Although our results generally confirm Sternbach's report of placebos affecting gastric slow wave activity we found such changes only in the stimulant condition, and in the opposite direction.

Abstract 1396
THE FEATURES OF JAPANESE HIGH SCHOOL STUDENTS WITH IRRITABLE BOWEL SYNDROME (IBS)
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IBS is often seen in adolescent and the number of such patients has been reported to be increasing. However the prevalence and the features of them are unclear because most of them are non-consulters. The objectives of this research were to know the features of adolescent with IBS in Japan and to compare them with adult IBS. High school students (1,193 boys and 277 girls) fulfilled IBS questionnaires, SF-36 and generalized self-efficacy scale (GSES). One hundred boys (8%) and 47 girls (17%) were diagnosed as IBS based on Rome II criteria. All IBS boys had frequent abdominal pain, but it was 85% in IBS girls. There was no significant difference in frequency of abdominal discomfort between boys and girls. Most of the IBS students complained loose/watery stool (77% boys and 66% girls) when abdominal pain or discomfort. Frequency of bowel movement was significantly higher in boys (p<.001). There were no significant differences in relief of abdominal symptoms with defecation, straining, urgency, feeling of incomplete evacuation, abdominal fullness, but passing mucus (p<.005). Anticipatory anxiety and limitations of daily activity was also observed in both. Girls felt exaggeration of their IBS symptoms under stress more often than boys. The IBS scores, which reflects the severity of IBS symptoms, were higher in girls (p=0.051). All girls with IBS consulted medical services due to IBS symptoms only a few times at most, on the other hand, 7 boys (7%) had experiences of admission (p<.05). We previously reported that IBS students have significantly lower scores in all subscales of SF-36 than healthy controls. In this study, Role Emotional scores (p<.05) were significantly lower in IBS girls than IBS boys. There was no difference in scores of GSES between boys and girls. In conclusion, prevalence of Japanese adolescent IBS was similar to that of adult, but contrary to our hypothesis, adolescent IBS had different features from adults.

Abstract 1082
THE IMPACT OF MAJOR DEPRESSIVE DISORDER ON THE SHORT AND LONG-TERM OUTCOME OF CROHN'S DISEASE AFTER TREATMENT WITH ANTI-TNF-ALFA (INFLIXIMAB): A PROSPECTIVE STUDY
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OBJECTIVE: There is evidence of an association between psychological factors and the course of Crohn's Disease (CD). This prospective study assessed the relationship between major depressive disorder (MDD) and the short- and long-term outcome of CD after treatment with infliximab, taking other psychosocial, demographic and disease-related variables into account. METHODS: A consecutive sample of patients who were treated with infliximab for a flare of CD, were followed up prospectively for 9 months. At baseline, psychosocial, demographical and disease-related variables, as well as biological and clinical parameters were evaluated. Four weeks later, a re-evaluation of relevant psychological variables and disease activity was done. When patients needed retreatment for a relapse of CD, the follow-up ended. MDD was diagnosed with the Patient Health Questionnaire. RESULTS: A total of 100 patients participated in the study. Seventy-eight percent responded to infliximab and in 60% remission was achieved. Psychosocial variables did not predict response, whereas MDD was associated to non-remission (OR=.166, 95%CI=.049-.567, p=.004). Retreatment within 9 months was necessary in 88% of the patients. A univariate Cox regression analyses showed that, among other variables, MDD was significantly associated to the time until retreatment (p=.001). A multivariate Cox regression confirmed MDD as an independent determinant when present at baseline and at re-evaluation (respectively hazard ratio=2.27, 95%CI=1.36-3.79, p=.002 and hazard ratio=3.22, 95%CI=1.71-6.05, p<.001), after adjustment for significant covariates. CONCLUSIONS: MDD is an risk factor for failure of remission and earlier need for retreatment in CD patients after infliximab. Therefore, assessment and management of MDD should be considered in clinical follow up of patients with CD.
Abstract 1085

INFLUENCE OF ANXIOUS EMOTIONAL CONTEXT ON GASTRIC SENSORIMOTOR FUNCTION IN MEN
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AIM: We aimed to investigate whether anxious emotional context alters gastric sensorimotor function in healthy controls. MATERIALS & METHODS: Emotional context was created during the first 10 minutes of each experiment, using both visual projection of validated facial expressions (neutral/fearful) and an audio-tape recalling an autobiographical experience (neutral/anxious) simultaneously. All experiments were performed twice in a randomized cross-over fashion. Anxiety was assessed using a visual analog scale (VAS). 14 subjects underwent a gastric barostat study to assess sensitivity to distension and accommodation to a meal. 18 subjects underwent a 10-min satiety drinking test with registration of epigastric symptom intensity (VAS) every 2 min. RESULTS: 0. Emotion induction--Anxiety scores were significantly higher during anxious context (AUC 95± vs 41±15 mm*min, p<0.05). 1. Barostat study--During anxious compared to neutral context, we found the following significant differences: - lower gastric compliance (55±7 vs 37±8 ml/mm Hg, p<0.03); - discomfort at lower intragastric volume (360 ± 47.4 vs 489.2 ± 40 ml, p<0.01) but not at lower intragastric pressure; - inhibition of gastric accommodation to a meal during the first 10 minutes postprandially (139±25 vs 53±27 ml, ANOVA p=0.03). Perception thresholds were not altered. 2. Satiety drinking test--Anxious context was associated with significantly (all p<0.05) higher scores for satiety (5.5±3.6 vs 6.1±3), fullness (44.8±6 vs 56.6) and bloating (27±6 vs 39±6) but not for pain, discomfort, nausea, belching or heartburn. CONCLUSION: Anxious emotional context decreases gastric compliance, inhibits meal-induced accommodation and increases perception of satiety, fullness and bloating after a meal. These findings demonstrate a potential role for psychological factors in the pathogenesis of FD.

Abstract 1055

CLINICAL COURSE OF INFLAMMATORY BOWEL DISEASES (IBD) PATIENTS WITH DEPENDENT PSYCHOTHERAPY: A 30-MONTH FOLLOW UP STUDY
G Moser, W Miehsler, Internal Medicine IV, Medical University of Vienna, Vienna, Austria

Background: In our recent study, 1/3 of patients with IBD had then any demand for psychotherapy (PT). We followed up (FU) the bio-psycho-social course of this cohort after 30 months. Methods: 199 (66%) of the original 302 patients (Crohn's disease 157, ulcerative colitis 42; m/f: 82/117) answered FU-questionnaires assessing the demand for PT ("ADAPT", score 0-100; demand>50), anxiety and depression (HAD: 0-21), social support (SOZU-K22: 1.0-5.0) and quality of life (QOL: Rating Form of IBD Patient Concerns: 0-100). Additionally the course of IBD including operations, medication and history (PT) was assessed. Results: 67/199 FU patients (34%) had then any demand for PT at baseline, demand remained stable in 43/67 patients (64%). At baseline these patients did not differ clinically from patients without demand for PT, but had higher levels of anxiety (8.3 ± 3.5 vs. 5.6 ± 3.4; p < 0.01), depression (5.5 ± 3.6 vs. 3.6 ± 3.1; p < 0.01), lower QOL (50 ± 18 vs. 53 ± 21; p < 0.01) and less social support (4.2 ± 0.6 vs. 4.4 ± 0.6; p = 0.02). 66 patients (24%) with demand for PT started PT within 30 months, 51 did not. These subgroups were comparable regarding number of flares, operations and medication. Patients having PT improved significantly concerning depression (5.8 ± 3.6 vs. 3.8 ± 2.7; p = 0.049) and QOL (52 ± 15 vs. 39 ± 24; p < 0.01). 36/43 patients with anxiety (84%) at baseline needed immunosuppression compared to 103/156 (66%) without (p = 0.037); 5/20 patients with depression (25%) underwent bowel resection compared to 18/179 (10%) without (p = 0.047). Conclusion: Demand for PT remained stable in 2/3 of IBD patients, being associated with higher levels of anxiety and depression, worse QOL and less social support. IBD patients with need for PT who had PT showed a significant improvement concerning depression and QOL. Anxiety and depression were associated with a higher need for immunosuppression and bowel resections, respectively. Assessing patients' psychosocial status and demand for PT seems mandatory.

Abstract 1254

INFLUENCE OF ANXIOUS EMOTIONAL CONTEXT ON GASTRIC SENSORIMOTOR FUNCTION IN MEN
Brecht Geeraerts, Gastroenterology, UZ Gasthuisberg, Leuven, Belgium, Philippe Persoons, Koen Demyttenaere, Psychiatry, Jan Tacx, Gastroenterology, UZ Gasthuisberg, Leuven, Belgium, Lloyd J. Gregory, Qasim Aziz, GI Sciences, Hope Hospital, University of Manchester, Salford, UK

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Role conflict is considered a source of chronic stress and has been documented to have a significant impact on job satisfaction, psychological distress and physical symptoms. One occupational group where role conflict may be particularly pertinent is medical doctors. Medical doctors, especially those working in an academic hospital setting (who comprise this study’s sample) have multiple work roles: researcher, educator, clinician, and administrator. However, empirical evidence on the deleterious impact of possible conflict arising from the multiple work roles of medical doctors has been sparse. Importantly, research can also unveil factors, both organizational and individual, that can help protect medical doctors from the negative consequences of stressors, such as role conflict. The importance of health promoting behaviors as a moderating variable in the relationship between work stressors and well-being has been emphasized in several studies and is supported by the transactional model on stress and coping.

In the present study, we sought to examine whether engagement in health promoting behaviors can reduce the negative effects of role conflict on psychological distress and somatic complaints in a sample of 226 medical doctors employed at an academic hospital in the Netherlands (161 men, 65 women). High role conflict and engaging less in health promoting behaviors were both significantly associated with higher levels of psychological distress and somatic complaints. We found that health promoting behaviors had a moderating effect on the relationship between role conflict and psychological distress. As perceptions of role conflict increased, individuals engaging less in health promoting behaviors reported increases in emotional exhaustion and depressive symptoms. In addition, health promoting behaviors were found to ameliorate the negative effects of high role conflict. This finding has important theoretical and practical implications.

The Williams LifeSkills Workshop (WLS) has been adapted for adolescents and provides training in stress-related coping skills. These include strategies which enhance awareness and evaluation of thoughts and feelings in stressful situations, determination of whether to change them or the situation, deflection strategies (if decision is to change thoughts and feelings), assertiveness, and problem solving skills (if decision is to change the situation). Stress-prevention skills include speaking clearly, listening, empathy and building supportive relationships. The purpose of this pilot study was to determine the impact of school-based Williams LifeSkills training on blood pressure in adolescents. Thirty-six adolescents (mean age 16±1.5 years, approximately 50% males were randomized to WLS (n=16) or CTL (n=20) groups. The WLS group engaged in twelve 50-min training sessions at school. Resting (seated) systolic BP (SBP) measurements were obtained pre- and posttest in the classroom setting on three consecutive school days using Dinamap 1846SX BP monitor at pre- and 10 weeks post-intervention. Changes in estimated least squared means from pretest to posttest were statistically significant between the WLS (+2.3 mmHg) and CTL (+2.7 mmHg) groups for resting SBP (p<.03). Changes for DBP and HR were not statistically significant. These findings demonstrate the potential beneficial impact of WLS upon SBP in the school environment in healthy normotensive youth. Importantly, these findings were observed over a relatively short intervention period.

Purpose. The literature documenting a relationship between adult attachment style and stress is compromised by the paucity of studies that measure physiological stress responses. We hypothesized that physiological stress response differs from self-reported stress in its relationship to attachment style. Subject Sample and Methods. Sixty-seven healthy adults completed the Experiences in Close Relationships-Revised (ECR-R) measure of attachment avoidance and attachment anxiety and the Perceived Stress Questionnaire (PSQ). High frequency spectral components of heart rate variability (0.15-0.40 Hz, HF HRV) were measured as an indicator of parasympathetic function while subjects recounted a recent severely stressful event (baseline, stress event recall, recovery after 5 min.). Results. There was a significant relationship between ECR-R anxiety and PSQ (F(1, 62) = 9.69, p = .003). There was no significant relationship between ECR-R avoidance and PSQ. Attachment avoidance was associated with diminished recovery of HF HRV following stress (F(1, 61) = 4.926 p = .03). There was no significant relationship between ECR-R anxiety and HF HRV. Conclusions: Attachment anxiety is associated with greater self-reports of chronic stress. Attachment avoidance is associated with incomplete physiological recovery from acute stress but not with complaints of stress. These findings are consistent with prior observations of covert stress responses in avoidantly attached children and with adult studies linking attachment anxiety with help-seeking and symptom-reporting.

Intelligence has long been suspected as an important factor in longevity, but only few studies have examined this in the general population. Our aim was to examine the effect of intelligence in young adulthood on survival in a sample of Danish men. A sample of 1745 obese men and a random population sample of 2663 men who underwent intelligence testing at draft board examinations in 1956-1977 were followed until 2001. A total of 222 obese men and 217 men from the random population sample died during follow-up. After standardizing the intelligence measure to an IQ-type scale (mean=100, standard deviation=15), we assessed the risk conferred by a one standard deviation advantage in IQ using Cox-regression. After control for obesity status, a one-standard deviation advantage in IQ was associated with a Hazard Ratio of 0.75 (95% confidence limits: 0.68; 0.83). Intelligence in young adulthood is a predictor for survival. More research is needed to elucidate the mechanisms.
PLACEBO EFFECTS IN HEALTH CARE INTERACTIONS: A SYSTEMATIC REVIEW

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Throughout history, doctor-patient relationships have been acknowledged as having an important therapeutic effect, irrespective of any prescribed drug or treatment. We conducted a systematic review to determine whether there was any empirical evidence to support this theory. A comprehensive search strategy was developed to include 11 electronic databases. The quality of eligible randomized clinical trials (RCT’s) was objectively assessed by two reviewers, and the type of non-treatment care given in each RCT was categorized as cognitive or emotional care. These studies showed that enhancing patients’ expectations about the illness or the treatment, whereas emotional care refers to the style of the consultation (e.g., warm, empathic), and aims to reduce negative feelings such as anxiety and fear. We identified 25 eligible RCT’s. Nineteen examined the effects of influencing patients’ expectations about treatment, half of which found significant effects. None of the studies examined the effects of emotional care alone, but four trials assessed a combination of both cognitive and emotional care. These studies showed that the placebo effect is most likely to occur when individuals have a strong expectation that the treatment will be effective, and this expectation is influenced by both cognitive and emotional factors. Based on the goal activation model of placebos, we hypothesized that the placebo effect is most likely to occur when individuals have a nonconscious goal that can be fulfilled by confirming a placebo expectation. To test this hypothesis, 57 psychology undergraduates were randomly assigned to receive either a caffeine placebo capsule or no caffeine placebo. Participants were also nonconsciously primed to hold a goal of cooperation or were primed with no cooperation goal using the Scrambled Sentence Test. Participants then took part in a Stroop task in which their blood pressure was recorded as well as their reaction time. In addition, participants nonverbal behavior during the Stroop task was videotaped and subsequently coded for anxiety-related behavior. Finally, after the Stroop task was completed, participants reported on the caffeine-related symptoms they were experiencing. The results on all four dependent measures supported our prediction that the placebo effect is enhanced when individuals hold a cooperation goal. Specifically, participants given the caffeine placebo reported experiencing more caffeine symptoms and displayed more anxiety-related nonverbal behavior when they held the cooperation goal than when they did not hold this goal, ps<.05. Participants given the caffeine placebo also responded faster on the Stroop task and had greater increases in systolic blood pressure when they held the cooperation goal than when they did not hold this goal, p<.05. These data provide the strongest evidence to date that current goals moderate the placebo effect. These findings add to our conceptual understanding of the placebo effect and have important implications for clinical practice as well as medical research employing randomized placebo-controlled clinical trial.

WHICH MEASURES OF OBESITY ARE RELATED TO DEPRESSIVE SYMPTOMS AND IN WHOM?

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This study examined which obesity measurements were associated with depressive symptoms and if these relationships differed by gender and level of fatigue symptoms in healthy subjects. 129 subjects (66 men, 63 women; average age of 37.3 years; <=200 % of ideal body weight) participated in the study. Participants had their height and weight measured to compute Body Mass Index (BMI); % Ideal Body Weight (% IBW) and percentage of body fat (% body fat) were also assessed. Subjects completed the Center for Epidemiologic Studies Depression Scale (CES-D), the short form of the Profile of Mood States (POMS SF), and the Marlowe-Crowne Social Desirability Scale (MCSDS, a measure of response bias). Univariate analysis revealed that in all participants, BMI and % IBW were significantly associated with both the CES-D and POMS SF Depression scores. In contrast, percentage of body fat was related to neither CES-D nor POMS SF Depression scores; however, % body fat was significantly associated with POMS SF Fatigue. In addition, MCSDS and POMS SF Fatigue scores were significantly associated with self report of depressive symptoms: therefore they were included as covariates in subsequent analyses. After controlling for both MCSDS and POMS SF Fatigue subscale scores, and dividing participants by gender, BMI and % IBW remained significantly associated with both the CES-D and POMS SF Depression scores in women only. There was no significant relationship between obesity measures and subjective feelings of depression in men. Results suggest women are more influenced by body size than actual percentage of body fat and that men's depression scores are relatively unrelated to diverse measures of obesity.

COMMUNION AND UNMITIGATED AGENCY MODERATE DIURNAL CORTISOL RESPONSE TO ABRASIVE SOCIAL INTERACTIONS

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Although mounting evidence indicates that conflictual relationships are associated with higher rates of morbidity and mortality, little is known about the biological mechanisms that underlie this phenomenon. Two personality traits, agency and communion, may be important in this regard. Agency (A) involves a focus on the self, whereas communion (C) involves an orientation towards others. The extreme form of A, called unmitigated agency (UA), is characterized by a focus on the self to the exclusion of others. This study used ecological momentary assessment to determine if abrasive social interactions modify cortisol secretion patterns in daily life, and whether C, A, and UA moderate this association. We expected social conflict to be associated with cortisol dysregulation, especially among subjects with a strong need for social harmony - i.e. those high in C or low in UA. Data on social interactions and cortisol secretion were collected from 87 healthy volunteers on 3-4 days over an 11-hour period using electronic diary methods. Individuals who scored in the upper quartiles of the C and the lower quartiles of the UA distributions had flatter cortisol slopes on days when they had more abrasive interactions than usual (p<.05 and p<.01, respectively for C and UA). The slope flattening appeared to be due to higher cortisol output in the afternoon and evening hours. Individuals who scored in the bottom quartile of the C and the top quartile of the UA distributions also responded to abrasive interactions with an initial flattening of cortisol slope, but by the end of the day their cortisol levels had returned to levels observed on days without abusive interactions. This indicates that low-C and high-UA individuals rebound from the impact of negative social exchanges whereas individuals in the other categories do not. Our findings suggest that a strong need for interpersonal harmony may render people vulnerable to cortisol dysregulation in the context of abusive personal interactions.
Video game play has increased dramatically in the last two decades, with growing concern about potential negative health and social effects. The advent of console and computer gaming, and emerging networking capabilities, have changed video games from a solitary activity into large, thriving social networks. One type of social gaming, massively multiplayer online role-playing games [MMORPGs], involves thousands of players in online games that can persist for years. This study is the first randomized longitudinal study on the effects of playing various types of video games (arcade, console, solo play on computer, and MMORPG) on game usage, reported health, well-being, sleep, socializing, and academic performance. Participants were 100 student volunteers (73% male, 68% Caucasian, mean age 19.2). Participants were randomly assigned to play one of the four game types a minimum of one hour each week, and to play more as desired, for a period of one month. Significant group differences existed at follow-up in usage, with the MMORPG group reporting more hours played per week (14.4) than other groups (range 2.1-6.2; p<.01). The MMORPG group also reported worse overall health (p<.05) and worse sleep quality (p<.05) than other groups. No group differences existed for academic performance over the month, overall ratings of social life, or overall ratings of quality of life (p>.10). The MMORPG group reported that video game play interfered more in their real life socializing (p<.05) and academic work (p<.05), yet that they had made new friendships to a greater degree (p<.01). These randomized, prospective data indicate that online, socially-engaging video games produce different responses than conventional video games, including dramatically higher hours and reported sleep. Participation in these online worlds reduces real-life social interactions, yet increased the likelihood of forming new virtual relationships. Online social video games may pose both unique risks (e.g., for problem usage) and opportunities (e.g., social connections).

Abstract 1367

GENDER AND STRESS: DIFFERENTIAL REACTIVITY UPON REEXPOSURE TO A LAB STRESSOR


There is a growing body of literature demonstrating gender differences in reactivity to stress. Women have exhibited greater reactivity to some lab and naturalistic stressors as well as more intrusions and avoidance following exposure to a lab stressor. However, little is known about gender differences regarding habituation vs. sensitization upon reexposure to a stressor. The current experimental study examined gender differences in the impact of repeated exposure to a lab stressor. We hypothesized that women would show greater reactivity at reexposure to the stressor controlling for reactivity at session 1 as a result of more intrusions and avoidance of the stressor between sessions. Participants consisted of 130 medical and graduate students, 47% Caucasian, with a mean age of 24.5. They viewed a Holocaust video at 2 sessions 48 hours apart. NA was measured using the PANAS before and after each video. HR was measured using the Dinamap Pro 100 before and during each video, and intrusions and avoidance were measured using the IES at session 2. The results indicated that women demonstrated greater reactivity at reexposure, controlling for reactivity at session 1, to both NA and HR as evidenced by significant gender by interaction for NA, F(1,117) = 5.67, p = .02 and HR, F(1,122) = 5.39, p = .02. The simple effects revealed a trend towards habitation across sessions for men, whereas women demonstrated a trend towards sensitization for both NA, F(1,61) = 3.55, p = .06 and HR, F(1,62) = 3.67, p = .06, respectively. Finally, women reported more intrusions, F(1,119) = 6.51, p = .01, but not avoidance. These data may have implications for furthering our understanding regarding gender differences in responses to traumatic stressors, including possible differential effects on reexperiencing symptoms as well as the risk of development of PTSD symptoms following a second exposure to a traumatic event.

Abstract 1245

MASSIVELY MULTIPLAYER ONLINE ROLE-PLAYING GAMES [MMORPGs], REPORTED HEALTH, AND SOCIAL BEHAVIOR

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Abstract 1020

EVALUATING CONTRIBUTION OF PSYCHOSOCIAL RESOURCES AND VULNERABILITIES TO SOCIOECONOMIC STRATIFICATION OF SELF-RATED HEALTH

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Negative emotions are hypothesized to explain socioeconomic status (SES) stratification of self-rated health (SRH), but few studies have examined their contribution while controlling for protective psychosocial factors and other established SRH predictors such as smoking, adiposity, physical function, etc. The present study evaluated the ability of positive and negative psychosocial variables to predict SRH, and whether adjustment for these variables reduces the magnitude of the SES - SRH association. Data were collected in a cross-sectional telephone and postal survey of a probability sample of adults aged 25-74 (N=3032) in the National Survey of Midlife Development in the United States (MIDUS). Mood disorders (eg, depressive & generalized anxiety) were diagnosed from a structured clinical interview, while trait negative affect, social support, extraversion, and behavioral (adiposity, smoking) and health status (chronic disease, change in health, physical symptoms, physical function) indices were assessed via questionnaires. SES influence on SRH was appreciably reduced after adjustment for behavioral and health status variables (odds ratio [OR] reduced to 1.32 from 1.61) but subsequent addition of psychosocial variables to the model did not further reduce the association (OR=1.31; p’s < 0.05). In fully adjusted models all psychological variables except generalized anxiety disorder independently predicted SRH. Extraversion was the psychological variable with the largest association with SRH (OR=1.41; p<.001). These psychosocial variables did not explain SES stratification of SRH, but both psychosocial resources and vulnerabilities are important determinants of SRH at the population level, and appear to be independent of health status and other biobehavioral SRH predictors.
Abstract 1376

STRESS ON THE DANCE FLOOR: CORTISOL STRESS RESPONSES IN BALLROOM DANCERS AND THE SOCIAL SELF-PRESERVATION THEORY
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The self-social preservation theory states that humans have a fundamental motivation to preserve the social self, and that threats to the social self perturb psychological markers such as cortisol. Five studies were designed to examine the cortisol response to competitive ballroom dancing as a paradigm for real-life social-evaluative threat. Competitive dancing produced substantial increases in cortisol compared to a control day. These increments were not due to the physical strain of dancing, and were greater than those found during social-evaluative laboratory stressors. Responses did not habituate across competitions, and were most elevated under highly focused conditions of threat (couple versus group competition). These findings support the notion of a social self-preservation system that is physiologically responsive to threats to the social self.

Abstract 1229

AGE-DEPENDENT CHANGES IN NF-KAPPA-B BINDING ACTIVITY IN RESPONSE TO ACUTE PSYCHOSOCIAL STRESS
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We previously showed that the nuclear transcription factor NF-kappaB is rapidly activated by psychosocial stress in healthy subjects and that norepinephrine is able to induce this activation. Additionally, NF-kappaB mediates immune suppressive effects of cortisol. Based on these findings we hypothesized that in response to psychosocial stress norepinephrine leads to a rapid immune activation through induction of NF-kappaB, whereas cortisol leads to delayed suppression of this immune activation. Since NF-kappaB activity also seems to play a role in immune senescence we were additionally interested in the effects of age on this model. In the present study we therefore investigated 44 healthy female and male subjects with ages ranging from 20 to 59 yrs. All subject were exposed to the psychosocial stress paradigm "Trier Social Stress Test" (TSST). Salivary free cortisol levels (CORT), plasma norepinephrine (NE) levels and NF-kappaB-DNA-binding activity were determined before and repeatedly after TSST. To test for effects of age, two groups were formed (young group: 20-30 yrs., older group: 31-59 yrs.). We found significant stress effects on CORT (p<.001) and NE (p<.001) but not on NF-kappaB activity (p=.668). Nevertheless the stress-induced increases in CORT and NF-kappaB correlated significantly (r=.393; p=.047) thereby supporting the hypothesized model. The missing effect of stress on NF-kappaB activity can be explained by taking into account age as an intervening variable: testing for age effects revealed significant group differences for NF-kappaB activity (p=.039). As expected, NF-kappaB activity increased after TSST in the young group. The older subjects, in contrast, showed a decrease in NF-kappaB activity, which is in accordance with findings regarding its role in immune senescence. Interestingly, the older subjects also showed a trend to both elevated CORT (p=.084) and elevated NE (p=.082) levels compared with younger subjects. These results point out that stress can contribute to put older people on a higher risk for infectious disease.

Abstract 1485

THE ROLE OF SELF-SILENCING IN MEDICALLY UNEXPLAINED SYMPTOMS, SYMPTOM ATTRIBUTION, AND ILLNESS BEHAVIOUR FOR WOMEN
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The aim of the study was to explore the role of self-silencing in medically unexplained symptoms, symptom attribution, and illness behaviour in women. The role of depression in these relationships was also examined. Participants were 191 female undergraduate psychology students aged form 17 to 61 years. They were administered the Silencing the Self Scale, the Screening for Somatoform Symptoms-7, the Symptom Interpretation Questionnaire, the Scale for the Assessment of Illness Behaviour, and the Hospital Anxiety and Depression Scale. Univariate analysis of variance revealed that women high in self-silencing reported higher levels (M = 17.71, SD = 8.76) of medically unexplained symptoms than those low in self-silencing (M = 14.56, SD = 7.79). F(1,180) = 6.59, p = .011. However, this relationship was accounted for by group differences in depression, F(1,179) = .75, p = .389. Multivariate analysis of variance (MANOVA) indicated that psychological attribution, but not somatic or normalising attribution, contributed to differences between high (M = 31.56, SE = .71) and low self-silencing (M = 28.30, SE = .71) women above and accounted for by depression, F(1,178) = .94, p = .332. Finally, a MANOVA revealed that the composite illness behaviour measures, although contributing to a significant difference between high and low self-silencing women when depression was included in the analysis F(6,175) = 5.33, p < .001, did not reach significance when depression was controlled for F(5,175) = 1.94, p = .090. The findings support the contention that the gender role schema of self-silencing is an important facet in explanations of biological sex differences found in health. This self-silencing schema, coupled with its relationship to depression, may also have important implications for the co-morbidity found between psychological distress and various health outcomes.

Abstract 1244

CPAP BUT NOT OXYGEN TREATMENT OF SLEEP APNEA IMPROVES CARDIAC CONTRACTILITY TO STRESS
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Sleep apnea impacts cardiac autonomic and hemodynamic functioning. In previous work, treating apneas for one week with continuous positive airway pressure (CPAP) resulted in normalization of cardiac contractility. This study examined the effects of CPAP and nocturnal O2 supplementation (OS) before, after 1 day and after 2 weeks of treatment. Sixty-eight individuals with sleep apnea were enrolled in the study. Reactivity testing was performed before randomization and after the 1st night and after 2 weeks of treatment. Reactivity was determined as the responses to a public speaking stressor. Dependent variables were mean arterial pressure (MAP), heart rate (HR), Heath index (HI), and stroke volume (SV). Subjects were randomly assigned to placebo-CPAP, CPAP, or OS. Data were analyzed by a 3 (treatment) X 3 (study days) X 3 (stress period) mixed model MANOVA. Both CPAP and OS increased mean O2 saturation (p < .01). Apneas were abolished by CPAP alone (p < .01). The MANOVA showed an overall treatment X day X period interaction (p = .008). MAP and HR had a significant stress effect (p < .001); levels increased from baseline to preparation to speaking. HI and SV had a treatment X day X period interactions (p's < .04). At baseline, there was no group difference or in response to the challenge. After 1 day of treatment, the baseline HI and SV were significantly lower in the CPAP (p = .021); there were no significant changes in response to speaking. After 2 weeks of treatment with CPAP, baseline HI and SV were significantly lower at baseline and increased significantly in response to the speech challenge; no changes were observed for the OS or placebo. In this study we replicated our finding that CPAP improves cardiac contractility in people with sleep apnea. This effect might be related to the abolishment of the apnea and not just to the normalization of O2 saturation.
Conclusion: Our preliminary study suggests that tandospirone is a useful drug and sudden onset of subjective symptoms such as pharyngeal pain, myalgia, study, i.e., patients having cervical lymphadenopathy and inflamed pharynx, Cases suggesting chronic fatigue syndrome were excluded from the present psychologically stressful situation and had persisted for more than 4 weeks. Blood pyrogenic cytokines levels such as IL-1 inhibitors, to reduce it. Subjective symptoms also improved dramatically in 3 of 6 patients within 4 weeks. Blood pyrogenic cytokines levels such as IL-1 were normal and they did not change after tandospirone treatment.

Methods: Six patients with psychogenic low-grade fever (18 to 38 years old) were treated with tandospirone (30 - 60 mg, per orally). Psychogenic fever is one of the most common psychosomatic disorders. However, pharmacotherapy for psychogenic fever has not been well established yet. In animals, serotonin (5-HT) 1A receptor agonists have been demonstrated to attenuate psychological stress-induced hyperthermia. The aim of the present study was to investigate the effect of tandospirone, an anxiolytic drug that has a selective affinity for 5-HT 1A receptors, on psychogenic fever. Methods: Six patients with psychogenic low-grade fever (18 to 38 years old) were treated with tandospirone (30 - 60 mg, per orally). Psychogenic fever was diagnosed if the patients met the following criteria: (1) there were no laboratory findings to explain their fever, (2) the fever developed after a psychologically stressful situation and had persisted for more than 4 weeks, and (3) Core temperature increased after exposure to psychological stressors. Cases suggesting chronic fatigue syndrome were excluded from the present study, i.e., patients having cervical lymphadenopathy and inflamed pharynx, and sudden onset of subjective symptoms such as pharyngeal pain, myalgia, and arthralgia. Results: All patients had reduced fever within 4 weeks of taking tandospirone despite the failure of antipyretic drugs, cyclooxygenase inhibitors, to reduce it. Subjective symptoms also improved dramatically in 3 of 6 patients within 4 weeks. Blood pyrogenic cytokines levels such as IL-1 and IL-6 were normal and they did not change after tandospirone treatment.

Conclusion: Our preliminary study suggests that tandospirone is a useful drug for treating psychogenic fever.
DIFFERENCES IN PSYCHOSOCIAL CARE BY GENERAL PRACTITIONERS BETWEEN YOUNGER AND ELDER PEOPLE
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The prevalence of mental disorders of the elderly is about 30%. The general practitioner is often the first contact for psychosocial problems. Little is known about the quality of psychosocial care of the elderly. Since 1987, psychosocial services have been a part of the primary care setting in Germany. We investigated the treatment differences and outcome between younger and older patients in general practice. In the framework of a nation wide project n = 191 practitioners with training in psychosocial primary care participated in a cross-sectional study. They documented 1226 treatment episodes with predominantly psychosocial symptoms. Differences between patients < 60 years and ≥60 years with respect to psychosocial distress, health beliefs, therapeutic procedures and treatment outcome were analyzed. 238 patients (19.3%) of the sample were 60 years of age and older. These older patients were significantly more affected by depression, pain, sleep disorders and physical illnesses. They were more fixated on somatic presentation of psychosocial distress and more frequently without psychological attribution to the illness. Older patients were more frequently treated with psychotropic drugs and referred less often to psychotherapy. But both groups developed a psychological attribution to the illness to the same extent and received psychosocial interventions with the same frequency. The general practitioner estimates mutual understanding significantly worse than with younger patients, although older patients reported feeling understood by the doctor just as frequently as the younger patients. There were no differences regarding verbal psychosocial interventions between younger and older patients who were psychosocially trained GPs. But older patients get more psychopharmacological drugs and less referral to psychotherapy, although the effectiveness of psychotherapy of elderly people has been empirically validated.

A BEHAVIORAL PRACTICE, TAI CHI CHIH, INDUCES ACUTE DECREASES IN SYMPATHETIC NERVOUS SYSTEM ACTIVATION IN OLDER ADULTS
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Older adults show increases of sympathetic nervous system (SNS) activation which may increase their risk of hypertension and cardiovascular events. Novel interventions that decrease SNS output are needed in the elderly. This study hypothesized that a movement-based relaxation practice, Tai Chi Chih (TCC), would induce acute decreases of SNS activity. The sample included two groups: TCC practitioners (9 men, 10 women) and TCC-naïve adults (5 men, 8 women) greater than 60 years of age. The TCC practitioners were recruited from a cohort who had recently completed a 6-week training program in TCC (3x/wk). The TCC-naïve subjects were selected from community dwelling older adults. The groups were similar in age, gender, ethnicity and body mass index. TCC subjects performed TCC for 20 min and TCC-naïve subjects watched a video for 20 min. Pre-ejection period (PEP), an estimate of beta-adrenergic SNS activity, blood pressure and heart rate were measured before and after task (10 min periods). A subsample (n=8) returned for a 2nd evaluation where they performed videotape-guided stretching for 20 min to test the effects of slow-moving physical activity. Results showed that TCC performance induced a significant lengthening of PEP indicative of decreased sympathetic activity whereas passive activity did not (group x time interaction: F(3, 84) = 3.54, p < .05). Furthermore, stretching did not lead to changes in PEP. No changes in blood pressure or heart rate were found for any group. In conclusion, this study is the first to assess the acute effects of TCC practice on PEP in older adults. TCC was associated with phasic decreases in SNS activity, which was not explained by physical activity alone. Further study is needed to determine whether the ongoing practice of TCC leads to decreases of autonomic arousal in older adults.

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SLEEP DURING PREGNANCY IS LINKED TO IMMUNE AND ENDOCRINE ALTERATIONS
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The state of pregnancy is accompanied by changes in immune profiles and sleep patterns. Even though pregnant women experience "an insomnia like sleep condition", there is sparse information describing sleep during gestation, and the immunological consequences for pregnant women who experience "excessive" sleep disruption. The purpose of this study is to elucidate how sleep throughout pregnancy can influence various immune and endocrine parameters associated with both the sleep process and pregnancy. A sample of 79 pregnant and 43 nonpregnant women was recruited through the University of Colorado. Subjects completed sleep questionnaires and provided a blood sample. In addition, each subject kept sleep diaries for 2 weeks following the blood collection. All data were collected at 12-16, 22-26, and/or 36-40 weeks of pregnancy. Serum levels of TNF-α, IL-4, IL-6 and IL-10 were determined via ELISA kits (Biosource Europe); while estriol samples were assessed via EIA (DSL, Webster, TX). The immune and endocrine measures, along with the sleep variables: (# naps taken and average length of nap, sleep onset latency (SOL), wake after sleep onset (WASO), time in bed (TIB), total sleep time (TST), sleep efficiency scores, time spent in REM, and sleep stage 1-4), was assessed during the pregnancy and the nonpregnant groups. No differences among the demographic variables were noted. Independent t-tests revealed differences between the pregnant women and nonpregnant groups for TNF-α for all trimesters, estril for all trimesters, IL-6 and IL-4 for the 3rd trimester; # naps, # of awakenings, and WASO for all trimesters; TIB for 1st and 3rd trimesters and SE for 2nd and 3rd trimesters. Paired samples tests showed significant increases in both IL-4 (anticipated) and IL-6 (not anticipated) from 2nd-3rd trimesters. Sleep is disrupted during pregnancy; however, little data is available regarding sleep patterns and immunological consequences on maternal health. This data revealed alterations in sleep and immune/endocrine parameters for pregnant women, including elevated proinflammatory cytokte levels.

Abstract 1465
THE EFFECT OF CBT, POSITIVE AFFECT AND NEGATIVE AFFECT ON EXACERBATION IN MULTIPLE SCLEROSIS
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Objective: The purpose of this study was to examine the effects of positive affect (PA), negative affect (NA), and telephone-administered cognitive-behavior therapy (T-CBT) on MS exacerbation. We hypothesized 1)T-CBT, compared to telephone supportive-emotion focused therapy (T-SEFT), would produce greater increases in PA and greater reductions in negative affect (NA), 2)higher NA and lower PA would predict exacerbation 8-12 weeks later, and 3)T-CBT would reduce the impact of NA and PA on exacerbation. Methods: 127 patients with MS were randomized to 16 weekly sessions of either T-CBT or T-SEFT. The sample included 87 females and 40 males. The mean age was 45 ± 13.5 years. The mean disease duration was 15 ± 10.2 years. Analysis of covariance was used to test for differences between the groups with and without any exacerbation. Exacerbations were defined as at least a 50% increase in the number of new, enlarging, or sustained enhancing lesions on brain MRI. Results: T-CBT participants had significantly greater increases in PA (p=0.007) and significantly smaller decreases in NA (p=0.048) than T-SEFT participants. Moreover, covarying baseline NA (p=0.01) and PA (p=0.007) with T-CBT versus T-SEFT, the adjusted regression coefficients for NA were significant (p=0.03) and PA were significant (p=0.003) and the interaction term was significant (p=0.002). Conclusions: Our results support the hypotheses that T-CBT would reduce the impact of NA and PA on exacerbation, and that T-CBT participants would have greater increases in PA and smaller decreases in NA. The results of this study have important implications for the future treatment of patients with MS.
Abstract 1160

IS DEPRESSION FOLLOWING MYOCARDIAL INFARCTION AN INDEPENDENT RISK FACTOR FOR MORTALITY AND CARDIAC EVENTS? A META-ANALYSIS OF THE OBSERVATIONAL EVIDENCE
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Objective: To identify relevant prospective observational studies and, using meta-analysis, determine the strength of the evidence implicating depression following myocardial infarction as an independent risk factor for mortality and recurrent cardiac events. Methods: Electronic databases, MEDLINE, EMBASE, PSYCHINFO, & CINAHL (earliest data available to 29 February 2004), and conference and dissertation abstracts were searched. To be included, studies needed to assess depression using diagnostic interview and/or validated questionnaire, include cardiac events and/or mortality as outcomes, and report odds ratios or allow their calculation from data presented or provided. Two authors independently, but with perfect concordance, selected studies for inclusion. Where multiple accounts of the same cohort were available, only the report with the longest follow-up was included in the main analysis. Unadjusted odds ratios, describing the association between depression and outcomes, were calculated and pooled using STATA. Reported adjusted odds ratios were also pooled. The effect of assessment of depression and length of follow-up were examined in subsequent analyses. Results: Unadjusted pooled odds ratios (95% CI) were 2.02 (1.44-2.82), 2.13 (1.22-3.73), and 1.52 (1.26-1.83) for all-cause mortality, cardiac mortality, and recurrent cardiac events, respectively, indicating increased risk among depressed patients. However, the analogous adjusted pooled odds ratios, 1.52 (0.87-2.68), 0.92 (0.13-6.51), and 1.34 (0.98-1.84), respectively, were not statistically significant. Irrespective of how depression was assessed or length of follow-up, adjusted analyses failed to detect significant associations between depression and outcome. Conclusion: Depression following myocardial infarction would not appear to be an independent risk factor for mortality and recurrent cardiac events.

Abstract 1122

BIOPSYCHOSOCIAL PREDICTORS OF MOTIVATIONAL READINESS TO CHANGE LIFESTYLE IN INDIVIDUALS AT RISK FOR HEART DISEASE
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The objective of this research was to examine how biopsychosocial factors interact to predict motivational readiness to change lifestyle practices in persons at risk for coronary heart disease (CHD). Predictors included Framingham absolute risk for CHD, obesity, psychological distress (anxiety, depression), moderators of distress (coping, social support), and socioeconomic status (education, income). Participants were 141 men and 207 women recruited from across Ontario. Participants averaged 4.4 CHD risk factors (i.e., family history, obesity, older age, dyslipidemia, hypertension, diabetes). Physicians provided blood work and risk factor confirmation. Nurses conducted anthropometric and blood pressure assessments. Questionnaires included the BDI-II, the HADS, and a scale measuring stage of readiness to change lifestyle. Interaction models using one-way ANOVA revealed that readiness to change both activity ($F_{1,207} = 5.77, p < .001$) and diet practices ($F_{1,267} = 2.77, p < .01$) were best predicted by a three-way interaction of absolute risk*education level*depression. Participants who were less educated, more depressed, and at high absolute risk for CHD were less ready to engage in physical activity ($M = 6.53, SD = 2.27$) than those who were more educated, less depressed, and at low risk for CHD ($M = 8.68, SD = 1.72$). Conversely, participants who were most ready to change diet were those who were more educated, less depressed, and at higher risk for CHD ($M = 20.67, SD = 3.97$). A structural equation model is presented. Results highlight the importance of addressing biopsychosocial factors when targeting motivational readiness to change.

Abstract 1219

GENDER SPECIFIC PREDICTORS OF FUNCTIONAL IMPAIRMENT ONE YEAR AFTER BYPASS SURGERY
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Bypass surgery has a high overall success rate and improves function but recovery rates vary greatly and some patients continue to be impaired. To better understand recovery, known gender differences in cardiac disease deserve attention. Given that the male/female ratio of bypass patients is about 3:1, few studies to date had sufficiently large samples to draw meaningful conclusions about gender differences. We systematically recruited a sample where 42% were female (total n = 293; n=122 women). Patients were recruited 3-5 days post-surgery and retested after one year. Attrition was 22%. Results are reported only for patients with partners because we were interested in support processes and emotional adjustment. Analyses were stepwise regressions and included demographic, medical, and psychological predictors. In step 1, only demographic and medical predictors were entered (age, sex, NYHA classification, number of vessels diseased), and in step 2, we added the psychological predictors: social support, depression, marital adjustment at time 1. Neither the demographic nor medical variables obtained at time 1 significantly predicted functional impairment after one year for either sex (although step 1 predictors approached significance for women with p=.06). The addition of psychological predictors in analysis step 2, however, amounted to an overall significant predictor model where social support had a clear attenuating effect on impairment in women but not in men (R2 change from .095 to .202, p<.01), and depression explained additional variance in impairment in men (R2 change from .03 to .09, p=.04) but not in women. We conclude that psychological factors are important predictors of functional recovery and that interpersonal variables are particularly important for female patients.

Abstract 1365

PERSONALITY AND ADJUSTMENT TO ATRIAL FIBRILLATION
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Traditional indices of heart disease severity have explained little variance in quality of life (QL) outcomes in atrial fibrillation (AF). The aim of this study was to assess whether personality factors predict QL in AF, after controlling for medical and demographic variables. A cross-sectional AF sample completed the University of Toronto AF Severity Scale, Hospital Anxiety and Depression Scale, Anxiety Sensitivity Index, and the Illness Management Questionnaire. Path analyses evaluated whether symptom preoccupation mediated the associations between anxiety sensitivity and the dependent measures of mental distress and cardiac symptom severity. The sample consisted of 93 patients (participation rate: 79%; 66% male) with a mean age of 61.88±12.04 and mean AF duration of 7.45±6.22 years. Anxiety sensitivity was related to symptom preoccupation (b=.56, p<.001), mental distress (b=.36, p<.001), and symptom severity (b=.56, p<.001), and symptom preoccupation predicted mental distress (b=.52, p<.001) and symptom severity (b=.34, p=.001). Path analyses showed that symptom preoccupation significantly diluted the correlations between (i) anxiety sensitivity and mental distress (b=.10, p<.05) and (ii) anxiety sensitivity and symptom severity (b=.13, p<.05). Symptom preoccupation remained significantly related to mental distress (b=.45, p<.001) and symptom severity (b=.26, p<.05). The results show that anxiety sensitivity is significantly associated with cardiac symptom severity and mental distress in AF patients. Moreover, these relationships are mediated by symptom preoccupation. Albeit correlational, the findings suggest that personality factors are important to consider when assessing the QL impact of AF.

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ACUTE STRESS AND THE PERCEPTION OF HEART SYMPTOMS IN PATIENTS WITH CONGENITAL HEART DISEASE

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In this study we hypothesized that high trait anxious patients with a congenital heart disease show an exaggerated perception of heart symptoms and not of non-heart symptoms during stress as compared to low trait anxious patients. In addition we hypothesized that trait anxiety and disease history and not changes in heart rate predicted increased perception of heart symptoms during stress. Twenty-five patients with congenital heart disease (16 men, 9 women; M = 32.34 years, SD = 12.22) and 24 healthy controls (11 men, 13 women; M = 27.11 years, SD = 10.28) participated in the experiment. The sample was split into a high (14 patients, 10 controls) and low (11 patients, 14 controls) trait anxious group based on a median split of the STAI-trait. All participants received respectively a relaxation period, a mental stress task, and a second relaxation period. After each period 3 heart symptoms and 7 non-heart symptoms were measured. Heart rate was measured continuously. As expected the results showed a significant four-way interaction (p = .007). Follow-up analysis showed that high trait anxious patients showed a higher increase in heart symptoms during stress as compared to non-heart symptoms (p = .03) and as compared to low trait anxious patients (p = .02). High trait anxious patients did not differ from high and low trait anxious healthy controls in increased self-reported heart symptoms during stress (p < .05). Two multiple regression analysis, one with trait anxiety and one with changes in heart rate entered first into the regression, showed that only trait anxiety predicted increased self-reported heart symptoms during stress (R^2 = .15, p = .006). The results suggest that high trait anxiety and not changes in heart rate or a history of heart disease result in an exaggerated increase in perceived heart symptoms during stress.

IMPACT OF ROMANTIC PARTNER REPRESENTATIONS ON STRESS REACTIVITY

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Close intimate relationships have been found to be associated with positive health outcomes (Ryff, et al., 2001). Additionally, longitudinal research supports a link between relationships, emotions and health. The mechanisms through which close relationships, emotions, and health are associated are still unknown. Some have proposed that relationships influence health through their effects on increasing positive emotional experience, which is also associated with better health outcomes (e.g., Repetti, Taylor, & Seeman, 2002; Ryff, et al., 2001). This effect on emotional experience may occur through both conscious and unconscious pathways. For example, one may benefit from a relationship because they ‘feel loved’, without consciously acknowledging the specific acts that make them feel that way (Seeman & Syme, 1987). The beneficial effects of open displays of support from relationship partners seem fairly straightforward. We know less about the beneficial effects of the less conscious processes, however it is likely that activation of the representations we hold of such relationships and the subsequent positive emotional experience are involved. The present study addresses this question by examining whether non-conscious priming of romantic partner representations reduces cardiovascular reactivity to and facilitates recovery from a stressful speaking task. Additionally, this study examined whether that effect was mediated by positive emotional response to the partner prime. 37 Participants (17 m, 20 f) were primed with either the name of their romantic partner, a positive emotion word (joyful), or a neutral word (hat) prior to speaking about their own personal faults. In comparison to the neutral, both the partner and positive priming conditions produced lower lower systolic (part t=-2.79, p<.06; t=-2.66, p=.02) and diastolic (part t=-2.33, p<.05; t=-2.59, p=.02) blood pressure reactivity to the speech task. These results suggest that non-conscious activation of partner representations buffers cardiovascular responses to stressful experiences. Support is also provided for the possibility that positive emotion is the mechanism of such an effect.

EFFECTS OF OMEGA-3 FATTY ACIDS ON BP REACTIVITY TO STRESS, C-REACTIVE PROTEIN, AND LDL-CHOLESTEROL

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Omega-3 (n-3) fatty acids have been shown to substantially reduce cardiac risk. Alpha-linolenic acid (ALA) is the predominant plant-based n-3 fatty acid in the diet, yet few studies have examined the cardiovascular effects of ALA. We tested the effects of replacing saturated fat with polyunsaturated fats from walnuts, walnut oil, and flaxseed oil on lipids, C-reactive protein, and hemodynamic responses to the speech and cold pressor tasks. We used a randomized, three-period, crossover design and enrolled 19 adults (37 to 63 years of age) with hypercholesterolemia. All meals were prepared by a metabolic kitchen. Diets were matched for fat (36 %en), protein (16 %en), carbohydrates (50 %en) and cholesterol (300 mg/d). Participants consumed one meal at the diet center on weekdays; other meals were packaged for off-site consumption. Diets included a control diet with an n-6/n-3 ratio of 10:1; a Linoleic Acid with a 4:1 ratio (LA diet); and an ALA diet with a 2:1 ratio. Calories were provided to maintain body weight. BP, heart rate, cardiac output, and total peripheral resistance were measured at the end of each diet. Relative to the control diet, the two n-3 diets reduced diastolic BP and peripheral vascular resistance by 3-4% (Ps < 0.01); these changes were evident at rest and during stress. Fasting concentrations of LDL cholesterol were reduced by 11-12% on the LA and ALA diets (P < 0.001). Although both the LA and ALA diets reduced C-reactive protein substantially, this effect was only significant during the high ALA diet (P < 0.01). These results suggest that plant-based omega-3 fatty acids have significant beneficial effects on blood pressure, LDL cholesterol, and inflammation in adults at high risk of cardiovascular disease. Furthermore, these data support the use of fat substitution (rather than fat restriction) in adults with hypercholesterolemia.

ARE DEPRESSIVE SYMPTOMS AND SOMATIC FACTORS ASSOCIATED WITH LENGTH OF HOSPITALIZATION IN INDIVIDUALS WITH CONGESTIVE HEART FAILURE?


In 2000, congestive heart failure (CHF), which affects more than 5 million people, was the leading cause of hospitalization in those 65 years or older with costs totaling more than $24 billion in the U.S. The impact of depression on overall morbidity, mortality, and hospitalization has recently been demonstrated in CHF. This project examined the association of depressive symptoms and somatic factors on length of hospitalization in individuals with CHF. Potential psychosocial and somatic correlates of length of hospitalization such as anxiety, depression, dyspnea, rating of overall health, sleep, pain, and physical functioning were obtained from self-rating questionnaires. 39 individuals consented to participate in the project during a hospitalization for CHF exacerbation. Presence of significant depressive symptoms (found in 38% of patients) were defined by HADS-Depression subscale score >7. Correlational analysis was performed to examine relationships among these variables and length of stay. Length of hospitalization significantly correlated with dyspnea (r = 0.45, p=0.04), perception of overall health (r = -0.49, p=0.03), and presence of depressive symptoms (r = 0.39, p=0.04). Dyspnea correlated with depressive symptoms (r=0.43, p=0.04) and perception of overall health (r = -0.42, p=0.03). Further analysis found that factors such as sleep, physical functioning, anxiety, and pain did not correlate with depressive symptoms or length of hospitalization. In summary, somatic factors have variable association with depressive symptoms and length of hospitalization in this admittedly small sample. An individual’s experience of dyspnea and perception of health appear related to depressive symptoms. The role of depressive symptoms is intriguing in the perception of dyspnea. Length of hospitalization reflects symptom control where dyspnea is routinely used to judge efficacy of treatment.
Absence of effect of depression symptom severity on survival in patients with severe, chronic heart failure: Findings from the REMATCH trial

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Purpose: Advanced heart failure has a high mortality rate. Several studies have demonstrated an association between depression and heart failure mortality. The REMATCH trial demonstrated that left ventricular assist device (LVAD) therapy alters course for patients with severe, chronic heart failure, with improved survival and mortality due to device-related complications rather than heart failure. We examined the association of depression symptoms measured prior to randomization with mortality in patients treated with optimal medical management vs. LVAD therapy in the REMATCH trial. Methods: Patients (n = 129) with New York Heart Association Class IV heart failure for over 90 days despite management with digoxin, diuretics, and ACE inhibitors or angiotensin 2 receptor blockers were randomized to therapy with the Thoratec Heartmate I LVAD (n = 68) vs. optimized medical management (n = 61) and followed longitudinally. Patients completed the Beck Depression Inventory (BDI) prior to randomization. Low, intermediate, and high depression symptom scores were defined by BDI <10, 10-16, and >16, respectively. The effect of BDI on survival was measured using Kaplan-Meier product-limit estimates with significance assessed by log-rank tests. Results: The median baseline BDI score was 16 in both treatment groups. In medical management and LVAD groups, BDI <10 occurred in 21% and 10%, BDI 10-16 in 29% and 44%, and BDI >16 in 50 and 56% of patients, respectively. Two-year survival was 11% in medical management- and 31% in LVAD-treated patients. There was no effect of BDI on survival in either medical therapy (p = 0.262) or LVAD-treated (p = 0.149) patients. Conclusion: In patients with severe, chronic heart failure, depression symptoms are not associated with mortality.

Abstract 1633

Physical activity is related to autonomic cardiac function


Diminished heart rate variability (HRV) and physical inactivity are associated with increased coronary heart disease risk. Physical activity may also improve HRV, though most prior studies are limited to Caucasian men. Here, we examine physical activity (PA) in relation to HRV in a healthy, heterogeneous sample of adult men and women (N = 743; ages 30-54; M = 43.5 yrs); 52% women; Caucasian (C): n = 612; African American (AA): n = 132. Self-reported exercise (kcal/week) was measured by the Paffenbarger Physical Activity Questionnaire. Respiratory rate and HRV, indexed by natural log transformed root mean square of successive differences of inter heartbeat intervals (RMSSD) and high-frequency (HF) spectral power [respiratory frequency (Hz) +/- .015], was derived from 5-min, continuous ECG recordings. RMSSD covaried with HRV-HRV (r = 0.71, p < 0.001). Participants were classified into low (<1000 kcal), moderate (1001-2000 kcal), and high (>2001 kcal) PA groups. Men reported more PA than women (p < 0.001). MANCOVA was performed to examine the effect of PA groups, sex and race on HRV measures (covarying for age, body mass index, and smoking status (non/ex-smoker v. smoker)). This analysis showed a significant main effect for PA grouping on RMSSD and HF-HRV (p < 0.001). Among the strongest effects, high PA subjects had significantly greater RMSSD (3.6±.04) than low PA's (3.4±.05) (p < 0.018), with intermediate values among moderate PA's (3.5±.04). RMSSD and HF-HRV were both greater in men than in women (p < 0.001), and in AA's than in C's (p < 0.024). These findings suggest that physical activity greater than 2000 kcal/week may enhance HRV. Supported by NIH grants HL-40962 and HL-65137

Abstract 1491

Psychological status and coping processes following first cardiac events: The role of gender and age

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Depression and anxiety are a common comorbidity in patients with coronary heart disease (CHD). Previous studies have yielded gender differences regarding psychological status and coping in CHD patients, but outcomes are diverse. Our prime interest in the present study was whether age can account for the diversity. A total of 310 patients (104 women and 206 men) following first myocardial infarction and CABG or PCI respectively were taken into the study on a consecutive basis. The patient sample was split into groups of younger (M = 50; range: 29-58) and older subjects (M = 66; range: 59-75), and two-factorial ANOVAs were computed. Relevant results are shown in the table below. Older patients are scoring lower than younger patients, and women are scoring higher than men on all dimensions indicated. Interaction analysis reveals that younger women are scoring highest, and older women are scoring lowest as compared to men. Our findings give little evidence that the disease burden generally is heavier in women. The results rather indicate that differences in psychological status and coping within the female group, particularly between younger and older women, are much greater than across sexes. Thus age seems to play a more important role than gender. The time course psychological adjustment following cardiac events is greatest in younger women. Identifying groups that deserve special attention in cardiac rehabilitation. FQCI = Freiburg Questionaire of Coping with Illness (Muthny, 1989) KKG = Questionaire for Health Locus of Control (Lohaus & Schmitt, 1989)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>age gender</th>
<th>age x gender</th>
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<tbody>
<tr>
<td>depression (SCL-90)</td>
<td>p &lt; 0.05</td>
<td>p = 0.2</td>
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<tr>
<td>vital exhaustion</td>
<td>p &gt; 0.01</td>
<td>p &lt; 0.05</td>
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<tr>
<td>depressive coping (FQCI)</td>
<td>p = 0.04</td>
<td>p = 0.02</td>
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<tr>
<td>fatalistic copin (KKG)</td>
<td>p = 0.01</td>
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<tr>
<td>&quot;playing down&quot; (FQCI)</td>
<td>p &lt; 0.05</td>
<td>p = 0.01</td>
</tr>
<tr>
<td>overall impact of event</td>
<td>p = 0.03</td>
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</tbody>
</table>

Abstract 1490

Gender differences in coping with the threats of medical devices: Results from the extended LIDC (living with an implanted cardioverter defibrillator) study

Karl H. Ladwig, Psychosomatic Medicine Department, Jens J. Baunert, Psychosomatic Medicine Department, Technical University of Munich, Munich, Germany; Claus Schmitt, Electrophysiology, German Heart Center Munich, Munich, Germany

The implantable cardioverter defibrillator (ICD) is highly effective in the management of life threatening ventricular arrhythmias although may cause severe affective comorbidity in subgroups of recipients. Little is known about possible gender differences in coping with the device. A total of 249 patients (168 men and 81 women) who attended the cardiology ICD outpatient clinic of the German Heart Center Munich for routine ICD check-up were included consecutively with subsequent frequency matching for female patients. Written informed consent was obtained from all patients. All patients underwent a standardized interview and psychodiagnostic assessment with instruments covering different features of negative affectivity, personality traits, pain perception. Phobic anxiety was measured with a subscale of the Symptom Check-List (SCL-90). Men were significantly older (p < 0.009) and had a higher educational level than women (p < 0.001). Women were more often resuscitated (p < 0.013). They had experienced significantly more shock applications (p < 0.06). Women were less satisfied with ICD treatment (p < 0.001) and reported significant more cardiac symptoms (p < 0.002). Differences in health perception and perceived severity of disease were marginal as were differences in depression scores and general anxiety. However, women suffered significantly more often from phobic anxiety (PA). After adjustment for age, time since ICD implantation, resuscitation, number of shocks and educational level, the relative risk for PA in women compared to men was 2.48 (95% CI 1.11-5.55, p = 0.027). However, stratification of patients with the experience of < vs. > 5 shocks resulted in a loss of significance between men and women (p = 0.573). Compared to men, women experience a similar level of psychopathological burden associated with the ICD. Chronic PA, however, is a serious problem particular in women which may result from greater barriers towards technology acceptance and from a higher sensitivity of interoceptive cues.
Depression is an independent predictor of mortality in patients with CHF and followed for 2.1±0.9 years. Endpoint was all-cause mortality. Results and NYHA-class (Chi2=4.8, p=0.028), LVEF (Chi2=13.7, p<0.001), 6-minute-MLHFQ), anxiety and depression (HADS) and social support (SSQ-6, and pro-BNP were assessed. Quality of life (SF-36, Minnesota Questionnaire - induced by stress has been suggested as an independent risk factor for CVD. sociodemografic data, NYHA-class, LVEF, peakVO2, a 6-minute-walk-test Subject samples and methods: In 209 patients with CHF, basic clinical and stratification in chronic heart failure (CHF) was to be analyzed. Germany
Markus Haass, Dept. of Cardiology, Theresienkrankenhaus, Mannheim, Psychosomatic Medicine, Medical University Hospital, Heidelberg, Germany, Thomas Müller-Tasch, Dieter Schellberg, Dept. of General Internal and Heart Failure
PSYCHOSOCIAL ASPECTS IN RISK STRATIFICATION OF CHRONIC HEART FAILURE
Thomas Müller-Tasch, Dieter Schellberg, Dept. of General Internal and Psychosomatic Medicine, Christian Zugck, Dept. of Cardiology, Georg Raupp, Wolfgang Herzog, Jana Jünger, Dept. of General Internal and Psychosomatic Medicine, Medical University Hospital, Heidelberg, Germany, Markus Hauss, Dept. of Cardiology, Theresienkrankenhaus, Mannheim, Germany
Purpose: The predictive value of psychosocial variables in models for risk stratification in chronic heart failure (CHF) was to be analyzed. Subject samples and methods: In 209 patients with CHF, basic clinical and sociodemographic data, NYHA-class, LVEF, peakVO2, a 6-minute-walk-test and pro-BNP were assessed. Quality of life (SF-36, Minnesota Questionnaire - MLHFQ), anxiety and depression (HADS) and social support (SSQ-6, anamness) were determined by the respective instruments. Patients were followed for 2.1±0.9 years. Endpoint was all-cause mortality. Results and conclusion: Patient characteristics: see table. Quality of life was only 66.1% of a normative collective. 30% of patients had HADS-scores suspect for depression, 20% suspect for anxiety. In univariate Cox-regression analysis NYHA-class (Chi²=4.8, p=0.028), LVEF (Chi²=13.7, p<0.001), 6-minute-walk-test (Chi²=4.3, p=0.038), peakVO2 (Chi²=10.0, p=0.002), pro-BNP (Chi²=17.9, p<0.001) and depression (Chi²=7.2, p=0.007) predicted mortality. A 3-variable model with pro-BNP, LVEF and depression showed the best predictive value of the multivariate regression models (Chi²=30.32, p<0.001). Depression is an independent predictor of mortality in patients with CHF and improves risk stratification when included in a prognostic index.

<table>
<thead>
<tr>
<th>age (years)</th>
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<tbody>
<tr>
<td>sex (%male)</td>
<td>86.1%</td>
<td>11.5</td>
</tr>
<tr>
<td>cause of CHF (%):</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>dilative</td>
<td>68.9</td>
<td>44.5</td>
</tr>
<tr>
<td>ischaemic</td>
<td>26.3</td>
<td>21.8±9.7</td>
</tr>
<tr>
<td>other</td>
<td>4.8</td>
<td>peakVO2 (ml/kg/min)</td>
</tr>
<tr>
<td>pro-BNP (pmol/l)</td>
<td>415.7±60.8</td>
<td>14.9±5.2</td>
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</tbody>
</table>

INTRO. The Heart Failure Adherence and Retention Trial, a behavioral clinical trial of moderate heart failure, had recruitment goals of up to 30% minority participants with heart failure. The aim of this study was to understand the recruitment process from the patient perspective that might help identify barriers to retention once participants were randomized. METHODS. An experienced African-American interviewer approached each patient after each step of the recruitment process to determine participant’s recall and understanding of randomization, perceptions of the consent process, feelings around the baseline examination, and thoughts after learning their randomization assignment. RESULTS. Fifteen participant interviews were completed. Participants were 56 years +/- 12.9, 60% female, 70% HS graduate or less, 60% were NYHA class 3. Four themes emerged: 1) Participants heard selected and incomplete details of the requirements of trial participation, 2) Participants made the rational choice to enter the trial based on an equal chance of getting into their desired group (active intervention vs. attention control), 3) Participants were attracted to the trial based upon the belief that either the active intervention or attention control would help them CONCLUSIONS. In contrast to the belief that some African-American patients do not understand randomization, our patients chose randomization based on the equal chance of getting their desired group. Streamlining procedures to reduce excessive participant burden and ensuring that there are perceived benefits regardless of randomization may improve recruitment and retention of this important group.

A POPULATION-BASED CARDIOVASCULAR SCREENING MODEL USING RISK ASSESSMENT SURVEYS, FOLLOWED BY BLOOD ASSESSMENT OF AN INFLAMMATORY MEDIATOR, HS-CRP, AMONG HIGH-RISK INDIVIDUALS
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Approximately 25 percent of the U.S. population has elevated high sensitivity C-reactive protein (hs-CRP) levels with normal or low cholesterol. Hs-CRP is an immune inflammatory mediator associated with the development of arterial plaque. Hs-CRP correlates with relative risk for cardiovascular disease, including heart attack and stroke. Recently, the American Heart Association (AHA) and Centers for Disease Control and Prevention (CDC) recommended that individuals at risk for heart disease be screened for hs-CRP. To reach large populations who require risk assessment, an effective outreach strategy with a new algorithm model is needed. Our model employs a self-scored prescreening risk assessment survey that incorporates classic and new integrative medical-health risk information from psychoneuroimmunology. The validity of this survey is based on correlative studies relating hs-CRP levels to specific survey questions. Participants scoring above an identified threshold are considered to have a moderate or higher risk for heart disease and are tested for elevated hs-CRP and cholesterol as recommended by AHA and CDC guidelines. Of the 1,570 prescreened so far, 29% were identified as at-risk for cardiovascular disease. Of the 121 clinically screened, 58% showed elevated cholesterol levels, and 84% had elevated hs-CRP levels. Those who are symptomatic are referred to health/medical care. As a result of our unique approach, our team received a grant from the Unhealth Foundation for $615,000 to evaluate the prescreening questionnaire strategy as an effective algorithm for identifying high-risk individuals in the general population.
DEPRESSIVE COGNITIONS IN PATIENTS WITH CORONARY ARTERY DISEASE
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Cognitive-behavioral therapy (CBT) has been proposed as a mode of treatment in depressed coronary artery disease (CAD) patients. However, for CBT to be successful, depressive cognitions must be present in these patients. The purpose of this study was to document the presence of depressive cognitions among dysphoric (depressive symptoms) and depressed (major depression) CAD patients. A structured clinical interview was administered to 240 CAD patients and 28 depressed psychiatric patients to assess DSM-IV major depression (MD). All patients (n=268) as well as a group of healthy respondents from the general population (n=347) completed the Beck Depression Inventory (BDI) to assess depressive symptoms and the Cognition Checklist assessing depressive cognitions. The level of depressive cognitions among dysphoric (BDI≥10) CAD patients was similar to that observed among dysphoric individuals from the population at large (p=.675). However, among dysphoric (BDI≥10) CAD patients was similar to that observed among dysphoric patients as compared to depressed psychiatric patients. Dysphoric and depressed CAD patients did not differ significantly (p=.612) in mean level of depressive cognitions, indicating that the level of depressive cognitions was not a function of the diagnosis of MD in the context of CAD. Multivariate regression analysis entering demographic variables, depressed CAD status and depressed psychiatric status revealed that only depressed psychiatric status was independently associated with increased depressive cognitions (p<.0001). We found mixed evidence for the involvement of depressive cognitions among dysphoric and/or depressed CAD patients. Hence, it is possible that CBT is the treatment of choice for some depressed CAD patients but not for others.

Abstract 1224
DIFFERENT CONTRIBUTION OF PROINFLAMMATORY AND CORTISOL ACTIVITY TO TOTAL PLASMA FIBRIN CONCENTRATION AND TO ACUTE MENTAL STRESS-INDUCED FIBRIN FORMATION
Roland von Kanel, General Internal Medicine, University Hospital, Bern, Switzerland, Brigitte M. Kudielka, Daniel Preckel, Lilian Zgraggen, Katharina Mischler, Dirk Hanebuth, Joachim E. Fischer, Behavioral Sciences, Federal Institute of Technology, Zurich, Switzerland

Acute mental stress is thought to contribute to atherosclerosis by affecting inflammation and coagulation. The crosstalk between inflammation and coagulation during acute mental stress has not been studied. We investigated the association of plasma fibrinogen, plasma interleukin-6, and free salivary cortisol with the procoagulant marker D-dimer in both a two-hour period and in response to acute mental stress. For this purpose, two different areas under the curve (AUC) were computed. In contrast to the AUC with respect to ground (AUCG) that integrates the total output of a measure over the two-hour period, the AUC with respect to increase (AUCI) ignores the distance from zero for all measurements, thereby emphasizing the changes over time in a particular variable. 21 male volunteers (mean age 47± 8) underwent the Trier Social Stress Test combining a 3-min preparation phase, a 5-min job stimulation. Following platelet stimulation with ADP, depression predicted area under the curve (AUC) with respect to increase for CD62P+ (R2=.17, p=.010) and in response to acute mental stress, we observed a significant increase in fibrinogen (AUCG (R2=.33, p=.007) and cortisol AUCG (R2=.33, p=.007) together explained 50% of the variance in D-dimer AUCG (i.e., total fibrin output). Fibrinogen AUCI (R2=.33, p=.007) and interleukin-6 AUCI (R2=.18, p=.008) together explained 65% of the variance in AUCI D-dimer (i.e. stress-induced fibrin formation). Total procoagulant activity was higher in individuals with attenuated HPA axis activity, and stress-induced changes in acute phase reactants of inflammation and coagulation were associated with each other.

Abstract 1168
ALZHEIMER CAREGIVING DISTRESS AND AGE INTERACT IN PREDICTING PROINFLAMMATORY AND PROCOAGULANT ACTIVITY
Roland von Kanel, General Internal Medicine, University Hospital, Bern, Switzerland, Joel E. Dimsdale, Thomas L. Patterson, Sonia Ancoli-Israel, Igor Grant, Psychiatry, University of California San Diego, La Jolla, CA

Activation of inflammation and coagulation in response to the burden of caregiving could contribute to premature atherosclerosis in Alzheimer caregivers (CG). Moreover, coagulation and inflammation activity both increase with age. We hypothesized that the proinflammatory cytokine interleukin (IL)-6 and the hypercoagulability marker D-dimer would be higher in older CG than in younger CG, and than in older and younger non-caregiving controls. We determined plasma levels of IL-6 and D-dimer in 94 community dwelling CG and 48 gender-matched non-caregiving controls (mean age 71.4±8.5 years) by an enzyme-linked immunosorbent assay. Statistical analyses used multivariate analyses of covariance with IL-6 and D-dimer as the dependent variables and with group (caregiver vs. controls) and age (median split) being fixed factors. Covariates (yes/no) potentially affecting IL-6 and D-dimer were antidepressant drugs, platelet aggregation inhibitors (e.g., aspirin), antihypertensives, statins, hormone replacement therapy, malignancy, coronary artery disease, cerebrovascular disease, diabetes, and cancer. There was an interaction between group and age for IL-6 (p=.026) and for D-dimer (p=.018). Older CG had higher IL-6 (1.59± 1.77 ng/ml) than all other groups: younger CG (0.96± 0.84 ng/ml, p=.008), older controls (0.91±0.98 ng/ml, p=.017), younger controls (0.98±0.86 ng/ml, p=.009). D-dimer was also higher in older CG (889±634 ng/ml) than in all other groups: younger CG (485±214 ng/ml, p<.001), older controls (466±169 ng/ml, p=.003), younger controls (464±230 ng/ml, p=.001). Alzheimer CG are particularly prone to exhibit a proinflammatory and procoagulant state with older age. Higher IL-6 and D-dimer in older caregivers may not merely reflect higher prevalence of organic diseases and frailty but could be a unique consequence of caregiving strain. Acknowledgement: Supported by AG15301

Abstract 1167
PSYCHOSOCIAL FACTORS PREDICT EXAGGERATED PLATELET REACTIVITY TO ACUTE MENTAL STRESS IN ALZHEIMER CAREGIVERS
Roland von Kanel, Paul J. Mills, Karen A. Adler, Joel E. Dimsdale, Thomas L. Patterson, Sonia Ancoli-Israel, Igor Grant, Psychiatry, University of California San Diego, La Jolla, CA

Alzheimer caregivers (CG) have increased negative affects and cardiovascular morbidity. Psychosocial factors may contribute to atherosclerosis by promoting platelet hyperactivity. We investigated whether Brief Symptom Inventory depression, hostility and low socioeconomic status (SES; Hollingshead scale) would affect platelet reactivity in CG. Forty-two spousal Alzheimer CG (mean age 72±9 years) and 30 age- and gender-matched non-caregiving controls underwent a 9-min speech stressor. At rest, immediately post-stress, and 14 min after stress, the percentage of platelets expressing on their surface the two activation markers P-selectin (CD62P+) and GP Ib/IIa (fibrinogen binding site - PAC-1+) or both (CD62P+PAC-1+) was measured. We investigated whether Brief Symptom Inventory depression, hostility and low SES are associated with exaggerated platelet reactivity to acute mental stress. For this purpose, two different areas under the curve (AUC) were computed. In contrast to the AUC with respect to increase for CD62P+PAC-1+ (R2=.17, p=.010) and for CD62P+PAC-1+ (R2=.11, p=.048) both without preceding ADP-stimulation. Following platelet stimulation with ADP, depression predicted area under the curve (AUC) with respect to increase for CD62P+PAC-1+ (R2=.17, p=.010) and D-dimer were higher in older CG than in younger CG, and than in older and younger non-caregiving controls. We determined plasma levels of IL-6 and D-dimer in 94 community dwelling CG and 48 gender-matched non-caregiving controls (mean age 71.4±8.5 years) by an enzyme-linked immunosorbent assay. Statistical analyses used multivariate analyses of covariance with IL-6 and D-dimer as the dependent variables and with group (caregiver vs. controls) and age (median split) being fixed factors. Covariates (yes/no) potentially affecting IL-6 and D-dimer were antidepressant drugs, platelet aggregation inhibitors (e.g., aspirin), antihypertensives, statins, hormone replacement therapy, malignancy, coronary artery disease, cerebrovascular disease, diabetes, and cancer. There was an interaction between group and age for IL-6 (p=.026) and for D-dimer (p=.018). Older CG had higher IL-6 (1.59± 1.77 ng/ml) than all other groups: younger CG (0.96± 0.84 ng/ml, p=.008), older controls (0.91±0.98 ng/ml, p=.017), younger controls (0.98±0.86 ng/ml, p=.009). D-dimer was also higher in older CG (889±634 ng/ml) than in all other groups: younger CG (485±214 ng/ml, p<.001), older controls (466±169 ng/ml, p=.003), younger controls (464±230 ng/ml, p=.001). Alzheimer CG are particularly prone to exhibit a proinflammatory and procoagulant state with older age. Higher IL-6 and D-dimer in older caregivers may not merely reflect higher prevalence of organic diseases and frailty but could be a unique consequence of caregiving strain. Acknowledgement: Supported by AG15301
COMPLIANCE IN HEART FAILURE PATIENTS WITH OBSTRUCTIVE SLEEP APNEA
Laura S. Redwine, Christina Kushney, Nancy Gardetto, Rosemary Cremo, Alan Maisel, Medicine, University of California, San Diego, CA

Congestive heart failure (CHF) affects 5 million Americans each year. Up to 40% of CHF patients have obstructive sleep apnea (OSA), which puts further strain on the failing heart by adding hemodynamic and adrenergic loads and may further reduce survival time. Continuous positive airway pressure (CPAP) is a standard treatment of OSA. However, 50% of patients started on CPAP discontinue use within a year and of those, most exhibit only partial compliance. Auto-adjusting positive airway pressure (APAP) was developed to reduce pressure-associated side effects of CPAP, to avoid treatment failures because of non-compliance. However, few studies have examined APAP compliance on treatment efficacy. Ten CHF patients, class NYHA II-III and OSA were tested before and after 3 months of APAP use. Epworth Sleepiness Scale (ESS), echocardiogram, 6 min walk test (measure of physical fitness), cardiac output, and B-type natriuretic peptide (BNP) levels (a measure of CHF severity) were measured. Hours of APAP use were correlated with post treatment 6 min walk test (r = .851, p = 0.002). There was a trend toward a reduction in BNP levels in the more compliant patients (F = 3.9, p = 0.095). Other measures in the study were not statistically related to compliance, although there were several treatment affects. The apnea/hypopnea index (AHI) was significantly reduced by treatment with APAP from a mean AHI of 37.0 to a mean AHI of 7.6 (t = 5.02, p = 0.002). Cardiac output increased following the intervention (F = 13.1, p = 0.01). Those with diastolic dysfunction had systolic blood pressure reductions (F = 4.9, p = 0.06). Treatment of OSA in CHF patients was associated with improvements in cardiac function and postures that decreased Fatigue level appeared to be related to amount of APAP use. This may result in an increase in quality of life, although this was not measured. A follow-up study with a larger patient pool would be useful to further investigate compliance and OSA treatment in CHF patients.

Abstract 1010
CARDIOVASCULAR (CV) SYMPTOMS IN CAD PATIENTS ARE CORRELATED PRIMARILY WITH EMOTIONAL DISTRESS (ED), & ONLY SECONDARILY WITH TRADITIONAL RISK FACTORS
Mark W. Ketterer, Walter Knyaz, Behavioral Health, Steven J. Keteyian, Sanjay Khanal, John Schairer, Adam Greenbaum, Mohsin Alam, Amjad Farha, Internal Medicine, Henry Ford Hospital/Wayne State University, Detroit, MI

PURPOSE: Symptoms generally attributed to CV disease (e.g., Chest Pain, Dyspnea, Fatigue, Presyncope & Palpitations) are also commonly found in patients with ED. Because of the high prevalence of ED in CV patients, it is reasonable to ask whether these symptoms are most likely due to the CV disease or the ED. METHODS: One hundred and nine patients with documented CV disease (positive catheterization or MI) were evaluated for traditional CV risk factors and ED (Symptom Checklist 90 - Revised, or SCL90R). The CV symptoms were then tested for their covariation with CV risk factors and the SCL90R scales. RESULTS: Female Sex and a History of Hypertension were associated with higher levels of distress for each of the CV symptoms. Chest Pain was associated with Early Onset CV Disease (p < .05), and a History of Diabetes was associated with Fatigue (p < .01). Dyspnea was associated with more Packyears of Smoking (p < .01), Obesity (p < .01) and a History of Diabetes (p < .01). In contrast, with only a few exceptions all the SCL90R scales were strongly associated with the CV symptoms. In the stepwise multiple regression: (a) Anxiety was the strongest unique correlate of Chest Pain (p < .001) and Dyspnea (p < .001), accounting for about 10% of variance in each.; (b) Somatization was the strongest unique correlate of Palpitations (p < .001) and Fatigue (p < .001), accounting for about one-third of the variance in each; and (c) Obsessive-Compulsiveness was the strongest unique correlate of Presyncope (p < .001), accounting for about 10% of this symptom’s variance. CONCLUSIONS: Measures of ED are stronger unique correlates of CV symptoms than the traditional CV risk factors, and therefore must be considered as possible causes of these symptoms. Treatment of ED should be tested as a strategy for diminishing CV symptoms.

Abstract 1319
REDUCED VAGAL-RELATED INDICES OF HEART RATE VARIABILITY DURING NOCTURNAL AWAKE AND SLEEP IN ALCOHOL DEPENDENCE
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Alcohol dependence is associated with an increased incidence of cardiovascular events. Given evidence that sleep has a role in the homeostatic regulation of the autonomic nervous system and that sleep disturbance is highly prevalent in alcohol dependence, this study hypothesized that disturbances of sleep might contribute to alterations in nocturnal sympathovagal balance in alcohol dependence. In 14 abstinent alcohol-dependent men and 14 controls comparable in age-, ethnicity, and body mass index, heart rate variability (HRV) was assessed during a full night of polysomnographic sleep. Alcohol dependent subjects were abstinent for > 30 days prior to assessment. Heart rate was significantly elevated in the alcoholics as compared to the controls across the entire night (t = 3.6, p < 0.01) and during awake (t = 3.0, p < 0.01), stage 2 (t = 3.5, p < 0.01) and REM sleep (t = 2.7, p < 0.05). Examination of high frequency spectral power showed decreases in the alcoholics as compared to the controls during awake (t = 3.6, p < 0.01) and Stage 2 sleep (t = 2.2, p < 0.05). High frequency power is thought to provide an estimate of parasympathetic tone. There were no group differences in the ratio of low- to high frequency power. In abstinent alcohol dependent men, nocturnal elevations in heart rate occur along with evidence of parasympathetic withdrawal during awake and Stage 2 sleep as compared to controls. Increases of sympathetic activity and decreases of parasympathetic tone are implicated, along with disturbances of sleep, as risk factors for hypertension and cardiac arrhythmias.

This work was supported in part by grants AA13239, DA16541, MH55253, AG18367, T32-MH19925, M01-RR00865, M01 RR00827, General Clinical Research Centers Program, and the Cousins Center for Psychoneuroimmunology

Abstract 1304
FACETS OF THE OPENNESS TO EXPERIENCE DOMAIN PREDICT CARDIAC DEATH AND ALL-CAUSE MORTALITY
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Mounting evidence suggests that personality is a major indicator of risk for CHD related mortality. The present study examined Openness to Experience (O) domain and its facets as predictors of cardiac deaths (CD) and all-cause mortality. The NEO PI-R was administered to a sample of 960 coronary catheterization patients. Over the course of follow-up 260 CD and 454 total deaths occurred. The relation of NEO PI-R scores to mortality were examined with Cox proportional hazard models. Each model contained age, left ventricular ejection fraction, severity of congestive heart failure, number of diseased vessels and surgical intervention as covariates. The O domain score was not significantly associated with CD or all-cause mortality. However, higher scores on the Feelings facet, or greater emotional awareness, was associated with a decreased risk of CD (p = .02) and all-cause mortality (p < .001). In addition, high scores on the Actions facet, or high curiosity, was associated with a decreased risk of CD (p = .02) and all-cause mortality (p < .001). Higher scores on the Aesthetics facet were only associated with decreased risk of CD (p = .04) but not all-cause mortality. In contrast to the other O facets, lower scores on the Values facet were associated with decreased risk of CD (p = .03) and marginally for all-cause mortality (p = .07). Similar to previous studies, we found no association between the overall O domain and mortality. However, the facets of O, Feelings, Actions, Aesthetics, and Values did predict mortality. To our knowledge, this is the first study to examine mortality in association with NEO PI-R facet level data on the O domain. Our findings align with similar studies showing an association between mortality and constructs related to the Feelings and Actions facets. This evidence suggests that greater emotional awareness and high curiosity are associated with increased longevity.
Abstract 1288

EFFORT-REWARD-IMBALANCE / OVERCOMMITMENT AND THEIR RELATION TO ALLOSTATIC LOAD
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Background: Imbalances of effort and reward at work have emerged as an independent psychosocial risk factor for cardiovascular disease. The effort-reward imbalance (ERI) model postulates that imbalances are aggravated by the adverse personal coping style overcommitment. We aimed to elucidate this interaction with physiological indicators of the metabolic syndrome and allostatic load. Methods: Participants were 1588 healthy employees (mean age 59.1 ± 11.7 years; 87% male) of the airplane manufacturing industry in Southern Germany. Dependent variables were: body-mass index, waist-hip ratio, systolic and diastolic blood pressure; leukocytes, glycosylated hemoglobin, high density lipoprotein-cholesterol, low density lipoprotein-cholesterol, C-reactive protein, fibrinogen, D-dimer, dehydroepiandrosterone sulfate; albumin, urinary cortisol, norepinephrine, and norepinephrine. Independent predictors were high (upper quartile) versus low overcommitment and reward imbalance (evidence of the ratio ≤ 1) vs. low imbalance. Results: Adjusted analysis controlling for age, gender, alcohol intake, smoking, and physical activity revealed that subjects reporting high ERI imbalance and high overcommitment had significantly higher waist to hip ratio (beta coefficient = 0.02), increased diastolic blood pressure (beta = 1.54 mm Hg), higher levels of low density cholesterol (beta = 6.56 mg/dl), higher WBC (beta = 0.38 cells/ml), elevated C-reactive protein (beta = 0.18 mg/dl), urinary albumine (beta = 0.17 mg/l) and overnight epinephrine excretion (beta = 0.15) as compared to the reference-group with effort-reward balance and low overcommitment. Conclusion: The interaction of ERI imbalance and overcommitment emerges as a risk factor for multiple biological deviations, particularly increased inflammatory activity.

Abstract 1286

MOOD RECOVERY IN PATIENTS WITH DEPRESSION: IMPLICATIONS FOR CARDIOVASCULAR RISK FACTORS
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Mounting evidence indicates that clinical depression increases the risk of metabolic and cardiovascular disease. To identify the mechanisms underlying these relationships, researchers have linked depression to behavioural and biological processes that give rise to disease. However, these associations vary across patients, with some showing evidence of increased risk, and others appearing similar to healthy controls. The current study aimed to identify factors that differentiate depressed patients who do vs. do not show a risk profile for later disease. The focus was the patient’s capacity to recover from sad moods. We expected that more efficient mood recovery would be associated with better health and health practices. Seventy adults who met DSM criteria for depression were enrolled. Measures of adiposity and BP were collected during a lab session, at which time participants also reported on their health behaviours. Participants also completed mood ratings four times daily over four days. Mood recovery was defined as the extent to which individuals who had endorsed sad mood reported decreased sadness during the next diary entry, adjusting for overall sadness. Analyses examined the association of mood recovery with health practices, body composition, and resting BP, controlling for age, race, and gender. To the extent that they showed increased capacity for mood recovery, participants drank less alcohol (r=−.26, p=.02), had smaller waist/hip ratios (r=−.24, p=.04), and lower SBP (r=−.27, p=.02). These associations were not simply an artifact of patients with better mood recovery having less severe depressive symptoms. When Beck Depression Inventory scores were controlled, the associations remained significant (p<.05). Mood recovery was not associated with BMI, DBP, cigarette use, or physical activity. Overall, these findings suggest that the ability to recover from sad moods may determine whether depressed patients develop risk profiles that set the stage for later metabolic and cardiovascular disease.

Abstract 1276

IMPROVING PREVENTION AND REHABILITATION OF CARDIAC DISEASE: IMPLICATIONS FROM TESTING TWO THEORIES PREDICTING NUTRITION AND PHYSICAL ACTIVITY
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In the prevention and treatment of cardiac diseases, nutrition and physical exercise are important. However, many people are not meeting recommendations for the two behaviors. Examining individuals with experiences of cardiac disease (CD) and individuals without (nCD), the question arises whether the mechanisms that promote lifestyle behavior are different for the two populations. The goal of this study was to investigate the question by theory-based analyses in order to guide for effective intervention building: The Protection Motivation Theory (PMT) and the Theory of Planned Behavior (TPB) were chosen. A 1st study employed a cross-sectional design (N=1,216) examining the PMT and dietary behavior. A 2nd study examined the TPB and physical activity longitudinally (N=1,599). Both studies consisted of random community samples and had CD prevalences of approximately 4% and nCD prevalences in Canada’s CD prevalence in the time the studies took place). Individuals with CD perceived greater vulnerability and subjective norms (SN) and had an inferior attitude than people without CD (p<.05). Different interrelations of the variables were found between the two groups for vulnerability-intention (rNCD=−.23; rCD=−.06), response efficacy (RE)-intention (rNCD=−.61; rCD=−.77), control-intention (rNCD=−.22; rCD=−.03), and SN-intention (rNCD=−.08; rCD=−.33). Findings were consistent in both studies. Thus, the theories are applicable to both groups, but the architecture of the variables is partially different. For motivating people without the experience of CD (prevention domain) all individual factors should be improved. For motivating CD-patients (habit settings) RE should be increased by, e.g., teaching and experiencing the benefit of the health behavior, and the social network might also be used to support the health behaviors.

Abstract 1273

WHO SLEEPS WELL?: PSYCHOSOCIAL CHARACTERISTICS OF SLEEPERS AT LOW RISK FOR CARDIOVASCULAR DISEASE
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Purpose: Observational studies show that cardiovascular disease (CVD) morbidity and mortality are associated with self-reported short or long duration of sleep, low sleep efficiency, and daytime sleepiness. The purpose of this study is to identify psychosocial factors associated with self-reported sleep problems in a cohort of postmenopausal women. Methods: 379 women between the ages of 61-69 (mean age 64.7) enrolled in the Healthy Women Study completed questionnaires assessing psychosocial factors and sleep quantity, quality, and daytime sleepiness. Results: Sleep quality categories were derived from information on the Pittsburgh Sleep Quality Index (sleep duration and efficiency) and a question regarding daytime sleepiness. The lowest CVD risk sleep group was defined as having slept 6-8 hrs, sleep efficiency >80% and reporting no serious daytime sleepiness. Higher CVD risk sleepers met 2 of these criteria and highest risk sleepers 0 or 1. The lowest CVD risk sleep group was defined as having slept 6-8 hrs, sleep efficiency >80% and reporting no serious daytime sleepiness. Higher CVD risk sleepers met 2 of these criteria and highest risk sleepers 0 or 1. The lowest CVD risk sleepers reported less depressive symptoms, perceived stress, hostility, aggressive responding, cynicism, negative mood and negative interactions than other sleeper groups, Ps <.02. They also reported being more optimistic, and having more life engagement and satisfaction, emotional stability, and social support, Ps <.02. In analyses controlling for depressive symptoms, low CVD risk sleepers had higher optimism and interpersonal support scores, Ps <.04. A significant interaction between sleeper group and depression was obtained for optimism and was due to women in the highest CVD risk sleeper group who scored above the median on the CESD having the lowest optimism scores. Conclusions: Unique psychosocial factors are associated with sleep characteristics related to CVD risk. Optimism and social support are related to sleep characteristics, independent of depressive symptoms. Sleeping well may protect against CVD.
Abstract 1410

ISCHEMIA, CHEST PAIN AND PSYCHIATRIC MORBIDITY IN PATIENTS REFERRED FOR EXERCISE STRESS TESTING

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Understanding the phenomenas of silent ischemia and syndrome X remain important challenges for clinical cardiology. Both conditions cause increased morbidity and are difficult to treat. Previous studies have linked negative mood states and psychiatric morbidity to these incongruent experiences of chest pain with no ischemia and the absence of pain during ischemia. The present study evaluated the extent to which ischemia and chest pain were related to psychiatric and psychological morbidity. A total of 1367 patients (70% male) underwent standard treadmill exercise stress testing with SPECT imaging. A psychiatric interview (PRIME-MD), the Beck Depression Inventory (BDI), the Anxiety Sensitivity Index (ASI), and the Cook-Medley Hostility Inventory (HO) were also completed. Patients were divided into four groups: no pain-no ischemia (NP-NI, n=631), pain-no ischemia (P-NI, n=106), no pain-ischemia (NP-I, n=427), and pain-ischemia (P-I, n=147). GLM revealed a significant group effect for any psychiatric disorder (F=2.92, p=.033), with the P-NI group (48%) having higher levels of psychological morbidity than the other 3 groups (NP-NI=35%, NP-I=33%, P-I=34%). This pattern was repeated for any mood disorder, any anxiety disorder, major depression, panic disorder, and generalized anxiety disorder. Though there were no group differences for ASI or CMHO, P-NI (10.2 ± 8.8) patient had significantly higher BDI scores (F=7.70, p=.001) than both NP-NI (7.3 ± 6.4) and NP-I (7.0 ± 6.0) groups, but not P-I patients (8.7 ± 8.8). Results suggest that patients who experience pain without evidence of ischemia have the highest psychiatric morbidity. The extent to which this is a cause or a consequence of their condition remains to be established.

Abstract 1637

EFFECTS OF YOHIMBINE CHALLENGE ON SALIVARY ALPHA-AMYLASE SECRETION

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In a prior study, we demonstrated that a standardized psychosocial stress provocation procedure significantly increases salivary alpha-amylase (sAA). From that study we were not able to conclude whether sAA indirectly reflects activation of the autonomic nervous system. The aim of the present challenge study was the assessment of cardiovascular effects, sAA and catecholamine secretion pattern following IV injection of yohimbine hydrochloride (0.4 mg/kg), an alpha-2-adrenergic receptor antagonist. Yohimbine effects were determined in 14 healthy male subjects in a randomized double-blind placebo controlled study design. Besides repeated measurements of blood pressure and heart rate, saliva and blood samples were taken at eight times before, during, and after bolus injection of yohimbine or placebo for the assessment of sAA and plasma catecholamine levels. Compared to placebo administration, yohimbine showed significant increases of sAA activity (F(2,77/33.25) = 3.34; p = .034) and sAA output (F(3.58/43.01) = 4.30, p = .007). Additionally, significant increases of blood pressure, heart rate, salivary flow rate and catecholamines have been observed. No correlations between alpha-amylase parameters and catecholamines have been found. These results indicate that yohimbine administration not only activates autonomic parameters but also sAA. This supports the hypothesis that sAA might be an indirect indicator of the central sympathetic system.

Abstract 1371

HOW STABLE ARE CORTISOL LEVELS IN THE MORNING ACROSS ONE WEEK?

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Background: Morning cortisol levels after awakening have received considerable attention as a possible indicator of HPA-axis functioning. There is a paucity of data from large population based studies investigating the stability of morning cortisol measures over time. Methods: As part of an ongoing study, we sampled free salivary cortisol in a large cohort of industrial workers from an aircraft plant in Southern Germany. Currently, n =658 subjects have collected saliva samples directly after awakening as well as 30 min later across two work days and one leisure day. Applying structural equation modelling (SEM), we compared whether the present data fit better to a model that explains cortisol levels predominantly by a latent factor that is stable across one week. Alternatively, we tested a second model that explains cortisol levels by a stabil latent factor across one week and additional day specific factors. Results: The analysis revealed that the first model had to be rejected (C=139.2, df=15, p<.001) while the second model could be accepted (C=17.4, df=13, p=.2). About 10-40% of the variance was due to the latent factor stability, 6-40% of the variance was due to the latent factors day. At the work days, 30% of the variance was due to change (increase) in cortisol from the first to second sample, but only 4% during the leisure day. Conclusion: In addition to a stable cortisol factor across days, there is a substantial influence of situative factors on cortisol levels after awakening.

Abstract 1298

REDUCED HABITUATION OF FREE CORTISOL RESPONSES TO REPEATED ACUTE MENTAL STRESS IN VITAL EXHAUSTION

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Chronic stress has been prospectively linked to adverse health outcomes. The allostatic-load-model posits that one possible biological pathway mediating this association is the loss of habituation to everyday challenges in chronically distressed individuals. There is a paucity of data elucidating the relationship between chronic distress and the reactivity of the hypothalamus-pituitary-adrenal axis to acute stress. We investigated the impact of exhaustion, a common sequela of chronic stress, on the habituation of the HPA-axis response to repeated acute stress. The sample comprised 25 healthy male subjects (38-59yrs) who were confronted three times with the Trier-Social-Stress-Test. Exhaustion was assessed by the Maastricht-Vital-Exhaustion-Questionnaire by Appels and coworkers. ANOVA results showed the well-known habituation effect in cortisol responses across sessions. At the second and third stress exposure, higher cortisol stress responses emerged with increasing exhaustion. Furthermore, we identified 21 individuals showing a response habituation (negative slope for area-under-the-cortisol-secretion-curve) and 4 individuals showing a response sensitization over the three sessions (positive slope). The latter participants reported significantly higher exhaustion scores. Linear regression models revealed a relevant dose-response relationship between exhaustion and the degree for habituation (standardized beta=4.46, R²=2.1). The observed loss of a normal habituation to repeated exposure to the same stressor in exhausted individuals suggests a state of increased vulnerability for allostatic load. Such impaired habituation might be one potential mechanism how exhaustion relates to increased disease vulnerability.
Abstract 1336

A META-ANALYSIS OF THE AWAKENING CORTISOL RESPONSE AND ITS RELATIONSHIP TO TIME OF WAKING
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The ‘stress-hormone’ cortisol has a distinct diurnal cycle. In particular, a pronounced elevation occurs immediately after awakening. This awakening cortisol response (ACR) peaks c. 30 minutes after awakening. The ACR has of late attracted considerable interest as a well-defined entity with links to psychological and physical health status. However there are several on-going methodological concerns, including the influence of awakening time in determining the magnitude and shape of the ACR. There is a need for better understanding of this influence. Therefore we performed new analyses of a combined data-base (N=103) of three published studies which, despite different primary focuses, all had in common (i) sampling of cortisol in the key period following awakening, (ii) repetition of the protocol on a second day, and (iii) recording of awakening time. Waking time was inversely related to the magnitude of the ACR (r = -0.28; p<.004). Descriptively, the quartile who woke earliest (<7am) had ACRs approximately 60% higher than the quartile who woke latest (>9am). These results are in line with the few recent studies which have explicitly investigated the influence of awakening time. Furthermore, analysis suggests that effects depend on degree of rise seen between the first and subsequent sample points over 45 minutes, rather than reflecting awakening starting-values in cortisol. Most interestingly, analysis across two sampling days suggests a causal link: changes in cortisol from one day to another were significantly related to changes in wake-up time. Those with increased cortisol on Day 2 reported no real change in awakening time (Day 1 time + 1.5 minutes on average); those with reduced cortisol on Day 2 reported waking on average 36 minutes later than on Day 1 (p<.006). We shall discuss possible interpretations of these methodologically important findings.

Abstract 1125

REPRESSIVE COPING STYLE AND HPA AXIS HABITUATION
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Repeated exposure to homotypical stressors results in habituation of the hypothalamic pituitary adrenal (HPA) axis. In previous studies, pronounced individual differences in habituation patterns were observed. Although there is a widely accepted notion that the ability to habituate to frequently re-occurring stressors might be a crucial factor in stress-related pathologies, it is still rather unclear which factors influence HPA axis habituation. Purpose of this study was to investigate the impact of coping styles on HPA axis habituation. 87 male participants (mean age 22.23 ± 4.3 years) underwent two psychosocial stress exposures (Trier Social Stress Test, TSST) with an interval of one week in between stress sessions. Salivary cortisol samples were collected on Day 2 and after the TSST. Extreme repressors (n=10) and truly high anxious (n=7) participants were selected with the Marlowe-Crowne Social Desirability Scale and the Taylor Manifest Anxiety Scale. Both groups showed significant cortisol increases for both TSSTs (main effect time TSST1 F = 27.44, p <.001 and TSST2 F = 9.74, p <.001). The groups did not differ in their cortisol results for the first TSST (time x group F = 0.76, p > .05; main effect group F = 1.04, p > .05). At the second TSST, repressors showed significantly higher cortisol stress responses than truly high anxious participants (time x group interaction F = 5.51, p = .006; main effect group F = 5.83, p = .029). These data indicate the possible influence of coping style on HPA axis habituation. It could be shown that an extremely repressive but not a truly high anxious coping style is related to the inability to habituate to a repeated stress exposure. A repressive coping style has been previously associated with chronic diseases and worse survival rates after chronic illness. It could be argued that a diminished habituation pattern associated with repressive coping serves as a possible link between coping style and negative health outcomes.

Abstract 1358

SECURE ATTACHMENT STYLE MAY PROTECT AGAINST DEVELOPMENT OF PTSD SYMPTOMS IN WOMEN WITH PRIOR CHILDHOOD MALTREATMENT
Paul S. Ciechanowski, Joan E. Russo, Edward A. Walker, Wayne J. Katon, Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA

Purpose of Study. Adults with prior childhood maltreatment are at risk for developing significant post-traumatic stress disorder (PTSD) symptoms. The capacity of an individual to gain general support or support specifically related to prior childhood maltreatment may mitigate against development of PTSD symptoms. We hypothesized that among female patients reporting prior childhood maltreatment, those with insecure attachment styles would be more likely to report significant PTSD symptoms as compared to those with secure attachment style. Subject Sample and Statement of Methods. In a large sample of adult female primary care HMO patients (N=701), we used ANCOVA to determine whether there was effect modification of the association of maltreatment type and PTSD symptoms (PTSD Symptom Checklist score) by attachment style. Fearful, preoccupied and dismissing attachment styles were compared to secure attachment style. Childhood maltreatment was assessed using the Childhood Trauma Questionnaire and indicated that 12% of patients reported subthreshold maltreatment, 29% reported experiencing non-sexual maltreatment and 18% experienced sexual maltreatment. Demographic variables and depression severity (MHI-5 from the SF-36) were included as covariates. In the event of a significant interaction, stratified analyses by maltreatment style and PTSD symptoms. Summary of Results. There was a significant interaction between maltreatment type and attachment styles in predicting PTSD symptoms (p<.05). In patients experiencing subthreshold levels of maltreatment, fearful (p<.05) and dismissing (p<.01) attachment styles were associated with increased PTSD symptoms as compared to secure attachment style. In patients with sexual maltreatment, fearful (p<.05) and preoccupied (p<.01) attachment styles were associated with increased PTSD symptoms compared secure attachment style. Attachment style was not associated with increased PTSD symptoms in patients with non-sexual maltreatment. Conclusion. Assessing attachment styles in adult patients with prior childhood maltreatment may help guide clinicians to determine risk of having PTSD symptoms.

Abstract 1463

THE CAPACITY TO RELY ON OTHERS: ATTACHMENT STYLES AND PERCEIVED SOCIAL SUPPORTS IN PATIENTS WITH DIABETES
Paul S. Ciechanowski, Joan E. Russo, Wayne J. Katon, Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA

Purpose of Study. Patients with chronic illness can optimize their self-care and disease outcomes by actively collaborating with providers, family members and peers. However, individuals vary in their capacity to rely on others and the number of individuals in one's social network may depend on one's attachment style, i.e. perceptions and expectations of relationships based in large part on prior caregiving experiences. We hypothesized that diabetic patients with an insecure attachment style would report having fewer social supports and be less satisfied with these supports as compared to those with secure attachment style. Subject Sample and Statement of Methods. In a large sample of adult patients to work with important others in carrying out self-care for chronic illness.

Abstract 1462

PERCEIVED SOCIAL SUPPORTS IN PATIENTS WITH DIABETES: THE CAPACITY TO RELY ON OTHERS: ATTACHMENT STYLES AND SECURE ATTACHMENT STYLE MAY PROTECT AGAINST DEVELOPMENT OF PTSD SYMPTOMS IN WOMEN WITH PRIOR CHILDHOOD MALTREATMENT

Paul S. Ciechanowski, Joan E. Russo, Wayne J. Katon, Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA

Purpose of Study. Patients with prior childhood maltreatment are at risk for developing significant post-traumatic stress disorder (PTSD) symptoms. The capacity of an individual to gain general support or support specifically related to prior childhood maltreatment may mitigate against development of PTSD symptoms. We hypothesized that among female patients reporting prior childhood maltreatment, those with insecure attachment styles would be more likely to report significant PTSD symptoms as compared to those with secure attachment style. Subject Sample and Statement of Methods. In a large sample of adult female primary care HMO patients (N=701), we used ANCOVA to determine whether there was effect modification of the association of maltreatment type and PTSD symptoms (PTSD Symptom Checklist score) by attachment style. Fearful, preoccupied and dismissing attachment styles were compared to secure attachment style. Childhood maltreatment was assessed using the Childhood Trauma Questionnaire and indicated that 12% of patients reported subthreshold maltreatment, 29% reported experiencing non-sexual maltreatment and 18% experienced sexual maltreatment. Demographic variables and depression severity (MHI-5 from the SF-36) were included as covariates. In the event of a significant interaction, stratified analyses by maltreatment style and PTSD symptoms. Summary of Results. There was a significant interaction between maltreatment type and attachment styles in predicting PTSD symptoms (p<.05). In patients experiencing subthreshold levels of maltreatment, fearful (p<.05) and dismissing (p<.01) attachment styles were associated with increased PTSD symptoms as compared to secure attachment style. In patients with sexual maltreatment, fearful (p<.05) and preoccupied (p<.01) attachment styles were associated with increased PTSD symptoms compared secure attachment style. Attachment style was not associated with increased PTSD symptoms in patients with non-sexual maltreatment. Conclusion. Assessing attachment styles in adult patients with prior childhood maltreatment may help guide clinicians to determine risk of having PTSD symptoms.

Abstract 1463

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Paul S. Ciechanowski, Joan E. Russo, Wayne J. Katon, Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA

Purpose of Study. Patients with chronic illness can optimize their self-care and disease outcomes by actively collaborating with providers, family members and peers. However, individuals vary in their capacity to rely on others and the number of individuals in one's social network may depend on one's attachment style, i.e. perceptions and expectations of relationships based in large part on prior caregiving experiences. We hypothesized that diabetic patients with an insecure attachment style would report having fewer social supports and be less satisfied with these supports as compared to those with secure attachment style. Subject Sample and Statement of Methods. In a large sample of adult patients to work with important others in carrying out self-care for chronic illness.
DEVELOPMENT OF THE RUMINATION QUESTIONNAIRE FROM THE MMPI
Joshua R. Dyer, Jiaping Zhang, Psychology, Indiana University Purdue University Indianapolis, Indianapolis, IN

This study aims to develop a rumination scale from the Minnesota Multiphasic Personality Inventory (MMPI). Rumination is characterized by repetitive, aversive, uncontrollable thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands. Research suggests rumination may exacerbate depressed mood and increase anger expression and aggression. It has also been linked with increased cortisol levels and delayed cardiovascular recovery after stressful events. Although rumination has been associated with negative health consequences, no longitudinal studies have yet been reported. Developing a scale from the MMPI will allow researchers to utilize longitudinal data to study the long term health impact of rumination. In the present study 150 undergraduates (75% women, 75% Caucasian, 71% ages 18-28) at a large urban university in the Midwest completed the Response Styles Questionnaire (RSQ; Nolen-Hoeksema et al, 1993), Anger Rumination Scale (ARS; Sukhodolsky et al, 2001), rumination subscale of the Behavioral Anger Response Questionnaire (BARQ; Linden et al, 2003), and 111 items selected from the MMPI for their face validity with regard to rumination. Individual MMPI items were correlated to the rumination measures and 24 items with a correlation coefficient of absolute value > 0.4 were retained and subjected to principal component analysis (PCA). Following PCA, 19 items remained with all factor loadings above 0.52. Cronbach's alpha coefficient for the scale was 0.91. These 19 items appear to be unidimensional as one factor explained 37.87% of the total variance. The scale correlated with the rumination subscale at r = 0.53. These results provide preliminary evidence for the construct validity of the MMPI Rumination Scale. Physiological correlates of rumination are currently being investigated. Longitudinal association of rumination with health consequences will be studied using archival datasets.

THE EFFECTS OF COMPETITION ON CARDIOVASCULAR REACTIVITY AND PERFORMANCE
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We live in a highly competitive world, yet it is unclear what the effects of competition are on behavior and health. This study investigated how relative standing in competition, whether ahead or behind, affects both cardiovascular reactivity and performance. Additionally, we examined whether males and females are affected differently by competition. A total of 53 male and 68 female participants competed against a male confederate in a race to solve 12 lists that contained 8 anagrams each. Upon finishing a list, participants rang a bell and called out the number of the list they just completed. The confederate was given a signal when he was to ring his bell based on whether the participants were supposed to be behind or ahead. During the task, participants’ blood pressure and heart rate were measured as well as the time it took them to complete each list. Both males and females performed the task faster when behind and slower when ahead in the competition. Males and females differed however, in regards to cardiovascular reactivity. Males had higher systolic and diastolic blood pressure reactivity when behind rather than ahead in the competition and females displayed the opposite pattern.

CLASSROOM SOCIAL STATUS INFLUENCES THE CORTISOL A WAKENING RESPONSE IN 10-12 YEAR-OLD CHILDREN
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In primates, social status is related to HPA-axis activity and associated health characteristics. We questioned whether these associations could also be found in humans, using the classroom as the social environment. We collected data on social status in 10-12 year-old Dutch preadolescents as part of the TRacking Adolescents Individual Lives Survey (TRAILS). Children received a list of all classmates and were asked to nominate them in three dimensions: popularity/acceptance-rejection (who do you like? and who do you dislike?), helping (by whom are you helped? and who do you help?), and bullying-victimization (by whom are you bullied? and who do you bully?). As indicators for these dimensions we used the proportion of dyadic nominations children received from their classmates, the so-called indegree. Salivary cortisol was collected at home on a school day at awakening and 30 minutes later. The awakening response was calculated as the Area Under the Curve with respect to the Ground (AUCG). In girls, significant positive correlations were found between AUCG and being helped (Pearson r=0.137, p=0.004) and helping (Pearson r=0.122, p=0.011). In contrast, in boys, negative correlations were found between AUCG and being disliked (Pearson r=-0.122, p=0.021) and bullying (Pearson r=-0.110, p=0.038). We conclude that classroom social status is associated with differences in the cortisol awakening response; these associations are gender-specific.

VALIDATION OF A SCALE ASSESSING SOCIAL SUPPORT LEADERSHIP BEHAVIOR IN THE INDUSTRIAL CONTEXT
Thorsten Scherf, Institute of Behavioral Sciences, Jan C. Schuller, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland, Dirk Hanebuth, Institute of Behavioral Science, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

Background: Longitudinal studies have revealed an inverse relation between social support at work and health outcomes. An important determinant of social support at work is the social aspect of leadership style. Current questionnaires assessing leadership styles inadequately capture this aspect. We aimed to develop a scale describing social support aspects of leadership style in an industrial context. Population: N = 982 white and blue collar employees of an airplane manufacturing industrial site in Southern Germany. Methods: Twelve candidate items for the questionnaire were derived from two subscales of the Salutogenic Subjective Work Analysis questionnaire and one subscale from the Questionnaire for Supervisor Behavior Assessment. Structural equation modeling was employed to compare a single factor model and a solution reflecting the original scales. Construct validity was assessed by examining the association with the reward component of the effort-reward imbalance model. Results: The one factor model provided inadequate fit indices. In contrast, the model replicating the original subscales (supportive supervisor behavior, adverse supervisor behavior, control versus laissez-faire leadership style) yielded excellent fit indices (GFI = 0.96, AGFI = 0.94, CFI 0.97, RMSEA = 0.56 (90% CI 0.44-0.67)). The absolute value of the standardized factor loadings amounted to 0.85 to 0.90. The construct validity of the latent factor for leadership-style was confirmed by a significant correlation (r = 0.68) with reward component of the effort-reward imbalance scale. Conclusion: The resulting 12-item scale may be used to capture the social aspects of leadership behavior which relate to health outcomes in the industrial context.
POSTER SESSION III

STRESS REACTIVITY AND SALT-SENSITIVITY IN FEMALE – RISK FACTORS FOR ESSENTIAL HYPERTENSION?
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Objective: Salt-sensitivity (SS) is believed to be an important factor for the aetiopathogenesis of essential hypertension. Salt-sensitive (ss) healthy males showed higher cardiovascular reactivity to mental stress than salt-resistant (sr) subjects. In this study we investigated if this effect would also occur in healthy females. Methods: We included 19 healthy females in the study. They did not take any contraceptives and had a regular menstrual cycle (26-34 days). Subjects were examined in the follicular phase. SS was determined by a 2-week-dietary protocol (BP change of 2.8 mmHg MAP after 7 days of high salt (hs) and 7 days of low salt (ls) intake (Sharma 1994)). All subjects underwent a mental stress test with continuous BP and HR recordings.

Results: 8 subjects were salt-sensitive (ss) and 11 salt-resistant (sr), with comparable age (25.3±3.7 vs 24.3±2.0) and BMI (21.8±1.6 vs 21.9±1.4).

There were no significant differences between groups regarding baseline SBP and HR (assessed by a 90-minute session before the day of experiment). SS compared to sr females showed higher stress-related increases in SBP (13.7±11.5 vs 11.4±7.8) and DBP (11.3±7.8 vs 7.3±5.3). Repeated measures ANOVA confirmed the higher SBP and DBP levels in ss subjects by significant group effects of SS (F[1,17]=5.431; p=0.032) and F[1,17]=7.533; p=0.014, resp.). Conclusion: In this study we could demonstrate higher BP levels during stress exposure in ss compared to sr females. A stricter definition of SS (BP increase between hs and ls of 2.8 mmHg) could be responsible for this finding. SS and cardiovascular stress reactivity seem to play a role in the aetiopathogenesis of EH not only in men but also in women.

Abstract 1517
THE WHITE COAT EFFECT: INFLUENCES AND IMPLICATIONS FOR DIAGNOSIS
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PURPOSE: To provide a valid means of assessment of the white coat effect. Blood pressure is the most common clinical measurement, yet the predictive utility of clinic blood pressure measurements has been questioned. One problem with taking blood pressure in the clinic or physician’s office is the white coat effect (WCE), a transient blood pressure elevation commonly seen in hypertensive patients that inflates the clinic blood pressure, but that does not appear to be linked to target organ damage. There is little agreement as to how the WCE should be estimated. All methods compute differences between measurements taken by the physician and resting measures; the question, however, concerns which resting measure is most appropriate. The awake ambulatory blood pressure is the most usual. However, while arguably the most useful measure for prediction of target organ damage, it is probably not appropriate for use as a resting measure, because the level depends on many factors, including physical activity. A method has been described in which measurements taken in the clinic, prior to the measurements taken by the physician, serves as the resting measure. Like the ambulatory awake average, however, this method also may be problematic because it is possible that the clinic ‘resting’ level is already elevated, and will therefore lead to an underestimation of the WCE. METHOD: We addressed this question by taking resting measures on outpatient hypertensive patients on the day before the patient was seen at the Hypertension Clinic (in a non-medical setting), and comparing these with resting measures taken on the following day, in the clinic, before the patient sees the physician. RESULTS: As predicted, the prior day (Day 1) resting levels were lower than those taken in the clinic prior to seeing the physician: (F[1,151]=4.87, p<0.05 (systolic pressure), and 49.9, p<0.001 (diastolic pressure)). Using the Day 1 resting levels, our data indicate that the estimated WCE, for hypertensives, was 5.3 mm Hg (systolic) and 6.9 mm Hg (diastolic); compared to estimates, using the clinic resting levels, of 0.3 mm Hg (systolic) and 0.5 mm Hg (diastolic). The data have implications for the estimation of the WCE, and for how clinic blood pressure should be assessed.

Abstract 1239
RELATIONSHIP BETWEEN DEPRESSION AND PRESSOR SENSITIVITY
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It has been well established that depression is associated with increased cardiovascular morbidity. However, few studies have examined the physiological mechanisms underlying this association. This study examines the relationship between depressive symptoms and mean arterial pressure (MAP) responses to phenylephrine (PE) in 50 Caucasian Americans and 49 African Americans. Responses to PE were examined at an inpatient clinical research center. After a 3-minute baseline period, a 100-mg intravenous PE bolus was administered to participants. Depression was assessed using the Center for Epidemiological Studies Depression Scale (CESD). After controlling for baseline MAP, body mass index, cigarette smoking, gender, and ethnicity, depression accounted for 6.2% of the change in MAP following the PE dosage (b = -2.7, p = .02). There was no interaction between ethnicity and CESD scores on MAP responses to PE. Further, there was no interaction between gender and CESD scores on MAP responses to PE. Thus, the effect was not moderated by gender or ethnicity. To understand the nature of the relationship between depression and MAP responses to PE, we dichotomized CESD scores, comparing those who scored > 16 on the CESD (standard cut point for classifying depressed individuals) with those who scored below 16. Individuals who were identified as depressed had greater MAP responses than those who were not depressed (F = 6.9, p = .01). These findings suggest that depression alters a-adrenergic receptor functioning, and may provide a putative mechanism underlying the association between depression and increased cardiovascular morbidity.

Abstract 1242
EFFECTS OF SOCIAL SUPPORT AND EVALUATION ON CARDIOVASCULAR REACTIVITY TO ACUTE STRESS
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There are significant inconsistencies in studies of the effects of social support on cardiovascular reactivity (CVR) to acute stress. The current study tested the hypothesis that social support attenuates CVR when potential for evaluation from a support person is low, but augments CVR when potential for evaluation is high. Eighty-two women gave a speech in 1 of 4 conditions: in the presence of an evaluative companion, in the presence on a non-evaluative companion, alone while being evaluated via video-camera by a companion, or alone while a companion waited in a waiting area. Manipulations of support and evaluation significantly impacted reactivity of total peripheral resistance (TPR) and cardiac output (CO), component processes underlying blood pressure change. Specifically, companion presence significantly attenuated TPR responding (p=0.01). In fact, all 7 of those classified as TPR responders were in an alone condition. In contrast, evaluation by a companion resulted in greater CO reactivity to the stressor (p=0.03), which is associated with active coping processes. Regardless of the potential for evaluation, the presence of another did not augment or attenuate heart rate, systolic blood pressure, or diastolic blood pressure reactivity. These results highlight the importance of utilizing impedance measures which may reveal meaningful differences in underlying hemodynamic reactivity even in the absence of differences in absolute blood pressure change. Impedance measures also allow for greater insight into the mechanisms by which cardiovascular reactivity may be linked to cardiovascular disease. In addition, results indicate that inconsistencies across studies of the effects of social support on blood pressure reactivity are not adequately explained by differences in potential evaluation from the support person. Future research should focus on alternative explanations for these discrepancies. These include exploration of the differential impact of social support depending on the intensity of the stressor, as delineated by the stress-buffering model of social support, and the degree to which TPR and CO reactivity are affected differently by given stressors and support manipulations. Supported by NIH grant HL068956 to the second author.
Those with blunted decline in BP while asleep (non-dippers) are at increased risk for cardiovascular disease. This study describes ethnic/racial group differences in BP dipping of adolescents and tests whether physical factors (BMI, waist circumference, physical activity), and psychosocial factors (anger, hostility, education of mother) account for ethnic/racial group differences in BP dipping among adolescents. In public schools, a stratified quota sample (n=370 11 to 16 years old) was recruited based on gender, ethnic/racial group (African American(AA), Hispanic American(HA), European American(EA)) and age. Ambulatory SBP and DBP were monitored (Spacelabs 90207) for 24 hours on a school day. Activity (Motionlogger actigraph) and diary recordings determined physical activity and sleep/wake intervals. Sexual maturation (Tanner stage), height, weight, and waist circumference were measured during a physical exam. Cook-Medley and STAXI instruments were completed on another school day. Dipping was defined as a mean asleep SBP/DBP divided by the 24-hour mean SBP, 89.0; mean SBP dipping was 88.0 (SD 4.6); mean SBP dipping was 79.3 (SD 7.1). AA adolescents had, on average, less decline in SBP (89.0) while sleeping compared with EA (87.3, p<.005) and HA adolescents (87.5, p<.006), but these groups were not significantly different in BP dipping. Physical activity, BMI and maturation were significantly associated with SBP dipping, but waist circumference was not. Adding education of mother improved the regression model; anger and hostility did not. In the final model, AA adolescents were different from EA in SBP dipping (p<.006), but not different from HA (p>.09). The variance explained by all variables was small (R²=.09, F=4.9, p<.0001). Further study is recommended to understand ethnic/racial group differences in BP dipping and to identify markers of cardiovascular risk early in life.

Abstract 1438

AGE, STRESS AND AMBULATORY BLOOD PRESSURE
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Prior research on age, emotions, and physiological function suggests that older adults may show lower physiological responses to general emotional stimuli (Levenson, Carstensen, & Gottman, 1994). However, the stress and reactivity literature suggests that age is associated with higher cardiovascular reactivity to laboratory stress (Jennings et al., 1997; Uchino et al., 1999). The primary aim of this study was to further examine the influence of age on stress responses as indexed by ambulatory blood pressure (ABP). Participants in the study were 384 men and women between the ages of 40 to 70 from a larger study on aging, hostility, and health in married couples. Participating individuals were free from most major heart and blood pressure medications. All participants wore a SunTech Medical Accutraker II ABP monitor that was set to take a random reading every 45 minutes during the course of a day. Participants completed a corresponding diary assessment that included questions related to their affective states and whether or not they were dealing with an everyday hassle. They also completed a standard set of control questions that need consideration in ABP studies (e.g., posture). We identified outliers (Kamarck et al., 1998; Marler et al., 1988) and statistically controlled for significant standard control factors in the analysis of ABP. Proc Mixed (SAS Institute; Littell, Milliken, Stroup, & Wolfinger, 1996) was used to examine the association between age, diary responses, and ABP. Results revealed that older individuals felt lower levels of negative emotions (e.g., sadness - p < .05; stress - p < .001). Importantly, we also found a significant age X daily hassles interaction in predicting DBP (p < .01). Plotting predicted values revealed that relatively young individuals showed no difference in DBP when dealing with problems. However, older adults showed relatively high levels of DBP when dealing with a problem compared to instances when they were not. The results of this study suggest that although older adults experience less negative emotions in daily life, when hassles are experienced they tend to have a stronger influence on cardiovascular function.
NOVEL PREDICTORS OF MORNING PLASMA ENDOTHELIN-1
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Endothelin-1 (ET-1) is a potent vasoconstricting peptide. The literature links elevated ET-1 levels with higher blood pressure (BP) & disrupted sleep, particularly in sleep apnea. We wondered if ET-1 levels would be associated with measures of insomnia & other personal characteristics in an otherwise healthy population of hypertensives & normotensives. 89 African- & Caucasian-American individuals were studied with inpatient polysomnography. Blood was drawn upon awakening the next morning to assay plasma ET-1 levels (ELISA). Participants were excluded if they were taking medication other than antihypertensives. Insomnia variables included sleep onset latency, time awake after sleep onset (WASO) & sleep efficiency (total sleep time/time in bed). Social class was based on education & occupation (per Hollingshead). In bivariate correlation analyses, higher ET-1 levels were associated with higher systolic BP (r=0.20, p=.02), older age (r=0.18, p=.03) & lower social class (r=.26, p=.001). T-tests revealed differences in ET-1 levels between men (3.12 +/- .87 pg/ml) & women (2.68 +/- .87 pg/ml) (p=.002), but not between African- & Caucasian-Americans. Therefore, SBP, age, social class & gender were controlled for in subsequent analyses. Results of hierarchical linear regression analysis were significant (R^2=.28, p=.001): control variables explained 13% of variance in ET-1 (p=.015); insomnia variables explained an additional 15% (p<.001) of variance in ET-1. Higher levels of ET-1 were associated with longer sleep onset latency (Beta=.041, Beta=.464, p=.001) but not sleep efficiency or WASO. Links between ET-1 & BP, and between ET-1 & disrupted sleep in apnea patients, are widely appreciated. This study suggests that individual characteristics such as insomnia & low social class–both of which are associated with hypertension–are also associated with this potent vasoconstrictor in normotensives/hypertensives from a general population.

Abstract 1688
ENDOTHELIAL DYSFUNCTION IS ASSOCIATED WITH ELEVATED SYSTOLIC BP AT REST AND DURING A SPEECH TASK
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Flow mediated dilation (FMD) of the brachial artery is a widely used test for measuring vascular endothelial dysfunction, and impaired FMD is a predictor of increased risk of coronary events. There is inconsistent evidence about whether acute stress impairs FMD, and only one previous study tested whether subjects with low FMD scores exhibited exaggerated hemodynamic responses to stress. We examined the effects of an impromptu speech task (5 min) on FMD and hemodynamics in 29 healthy adults. FMD was measured at baseline and at 10, 45, and 90 min post-stress. A subset (n = 9) had an additional testing session (counterbalanced order) during which they underwent the same measurement protocol in the absence of the stressor task. FMD was measured as the percent change in brachial artery diameter following an increase in flow, using an Acuson Aspen ultrasound, and arterial diameters were measured using customized software. In the group as a whole, there was no significant change in FMD in the 90 min post-stress. However, for subjects who underwent both testing sessions, mean FMD on the stress day was lower than the mean value during the resting test session (4.5% vs. 5.5%, respectively). Subjects with FMD above the median score (> 4.0%) exhibited significantly lower systolic BP (mean group difference = 12 mmHg, p = 0.006) and this pattern was apparent at rest and during stress. In conclusion, although we did not observe acute changes in FMD following a stressor, average FMD was significantly lower during the session that included the speech stressor. This study is the first to report that individuals with low FMD scores exhibit exaggerated SBP levels during a speech task. These results suggest that careful study design is required to detect effects of acute stress on endothelial function.

Abstract 1457
MENSTRUAL CYCLE PHASE AND CARdiovascular Reactivity TO A PAINFUL STRESSOR
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Previous research has shown that women have higher cardiovascular reactivity to stress in some phases of the menstrual cycle. In addition, pain sensitivity may vary across the menstrual cycle. Endogenous opioids have been implicated in both cardiovascular reactivity and pain sensitivity. This study was designed to test for differences in reactivity and pain sensitivity across the menstrual cycle and to test for possible influences of endogenous opioids in these effects. Forty-three healthy female participants were asked to attend two laboratory sessions approximately one month apart. They were randomly assigned to attend laboratory sessions during either the follicular or luteal phase of their menstrual cycle. During one session they were administered orally 0.7 mg/kg of the opioid antagonist naltrexone, and during the other they were administered placebo. Blood pressure measurements were taken during rest and during a 2-minute cold pressor task. After the cold pressor, participants filled out the McGill Pain Questionnaire. Participants who were in the follicular phase had higher reactivity to the cold pressor than those in the luteal phase (all p < .05). Participants in the two phases did not differ in their pain reports, and opioid blockade did not interact with either cardiovascular reactivity or pain reports. It seems that increased reactivity to the cold pressor during the follicular phase of the menstrual cycle is not necessarily related to increased pain reports. In addition, there is no evidence at this time that increased reactivity during the follicular phase is influenced by endogenous opioids. Supported by HL10227 to Dr. Helfer and HL32738 to Dr. McCubbin.

Abstract 1622
AN INTERACTION BETWEEN NEUROTICISM AND AGREABLENESS PREDICTS VASCULAR RESPONSES TO AFFECTIVE STIMULI AMONG OLDER AFRICAN-AMERICAN ADULTS
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Heightened cardiovascular reactivity (CVR) to mental and emotional stress is a possible causal mechanism leading to hypertension in African-Americans, and poor CVR during emotion recognition is linked with risk personality profiles. The present study assessed the role of Neuroticism (N) and Agreeableness (A) in emotion recognition and CVR. Participants were 106 African-Americans (51 males, 55 females; aged 21-92) who are part of the Healthy Aging in Nationally Diverse Longitudinal Samples (HANDLS) Study. Participants completed the NEO FFI scale and then evaluated affective stimuli among older African-American adults. Emotions were presented using a PORTscan heat-to-beat BP monitor. Measures of log-transformed high frequency heart rate variability (HF-HRV) were computed to assess vagal response. Diastolic BP (DBP) and total peripheral resistance (TPR) scores increased and HF-HRV scores decreased significantly from PAT tasks to recovery (p < .04). Using dichotomized groups (based on median split) on N and A, the period by N by A effect was significant for TPR (p < .05) and DBP (p < .009). At high A, high N was associated with a larger increase in TPR from faces to recovery and higher DBP during recovery (p < .06) than low N. It is posited that persons high on N and A are quick to anger and experience emotion, but reluctant to express it. The evidence from this study suggests that the high N/high A profile is associated with reduced cardiovascular recovery in the context of emotion processing, a potentially health damaging process that may contribute to hypertension among African Americans.
Abstract 1192

INCREASED AORTIC INTIMA-MEDIA THICKNESS AND QUANTITATIVE EVALUATION OF WHITE MATTER CHANGES ON MRI BY MULTIFRACTAL ANALYSIS
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Multifractal analysis based on generalized concepts of fractals can provide a precise quantitative description of a broad range of heterogenous phenomena. Recently, multifractal analysis has been applied to evaluate in many kinds of biological tissues. Considerable evidence suggests that pathophysiological process occurring in the human deep white matter may in part account for geriatric depression or cognitive deterioration in elderly subjects, and its clinical significance is receiving attention. We carried out multifractal analyses in a group of healthy 31 elderly subjects (14 females; mean age 60±5.2 years), without any evidence of atherosclerotic risk factors, to examine white matter microstructural changes on T2MR images. Then we correlated such changes with ultrasonographic measures of intima-media thickness (IMT) of carotid arteries, which is a reliable indicator of early atherosclerosis. We examined the effects of being a caregiver of an AD patient on fibrinolysis. Sixty-seven spousal AD caregivers (mean age 71.8 years) and 36 non-caregiving controls comparable in age and gender (mean age 70±7.8) were classified as low demand caregivers (N=38) if the AD spouse's Clinical Dementia Rating (CDR) score was 1 or 2 [questionable-mild dementia], while for high demand caregivers (N=29) spousal CDR was 3 or 4 [moderate-severe dementia]. Plasma levels of type-1 plasminogen activator inhibitor (PAI-1) antigen were measured at rest, post speech, and at 14 min recovery (ELISA). PAI-1 is the most important antifibrinolytic enzyme by virtue of inhibiting the profibrinolytic enzyme tissue-plasminogen activator (t-PA) in a t-PA/PAI-1 complex. Plasma PAI-1 antigen responses as compared to low racial groups in the current study were lower in AD caregivers (p=0.04), while it remained unchanged in low demand caregivers (p=0.40) and increased in controls (p=0.04). Providing care to an elderly spouse suffering from Alzheimer's disease (AD) is burdensome, stressful and may contribute to increased risk for atherosclerosis. We examined the effects of being a caregiver of an AD patient on fibrinolysis. Sixty-seven spousal AD caregivers (mean age 71.8 years) and 36 non-caregiving controls comparable in age and gender (mean age 70±7.8) were classified as low demand caregivers (N=38) if the AD spouse's Clinical Dementia Rating (CDR) score was 1 or 2 [questionable-mild dementia], while for high demand caregivers (N=29) spousal CDR was 3 or 4 [moderate-severe dementia]. Plasma levels of type-1 plasminogen activator inhibitor (PAI-1) antigen were measured at rest, post speech, and at 14 min recovery (ELISA). PAI-1 is the most important antifibrinolytic enzyme by virtue of inhibiting the profibrinolytic enzyme tissue-plasminogen activator (t-PA) in a t-PA/PAI-1 complex. Plasma PAI-1 antigen responses as compared to low racial groups in the current study were lower in AD caregivers (p=0.04), while it remained unchanged in low demand caregivers (p=0.40) and increased in controls (p=0.04).
RACE DIFFERENCES FOR RISK OF ARTERIOSCLEROSIS ARE ALREADY PRESENT IN YOUTH
Jacquelyn Creamer, Gaston K. Kapuku, Greggory Harshfield, Neil Shah, Harry Davis, David Ludwig, Frank Treiber, Pediatrics, Medical College of GA, Augusta, GA

Increased carotid artery intima-media thickness (IMT) is considered an early marker of arteriosclerosis and increases the risk of cardiovascular disease (CVD). Previous studies in adults demonstrated race differences in arteriosclerosis as measured by IMT. The purpose of this study was to examine whether IMT differs by race in normotensive adolescents and young adults. A biracial sample of 127 subjects (mean age: 17.9 years) underwent bilateral ultrasound scanning of the common carotid artery (CCA). IMT was calculated via an automated border detection system (Vascular Tool), which enabled continuous reading of CCA frames. Anthropometrics, indices of fat distribution (skinfolds, waist circumference), hemodynamics (resting and reactive BP), endothelin 1, flow mediated dilatation of femoral artery and indices of cardiac structure and function (LVM, MFS) were also measured. Means and standard errors for IMT were .515 ± .007 mm for Whites and .535 ± .004 mm for Blacks [F (1,127) = 6.18, P = .01, R² = .05]. BMI was positively correlated (.20) with IMT [F (1,127) = 5.42, P = .02, R² = .04]. When race and BMI were entered into the statistical model simultaneously, the full model explained approximately 8% of the variance in IMT with Race and BMI accounting for 4 and 3% of the variance, respectively. No statistically significant relationships were found between IMT and any of the other measured variables (r range from -0.05 to .15). This suggests that Race and BMI account for mostly unique (i.e., non-redundant) variance in IMT. Our data provide evidence of racial differences in IMT in young individuals. Whether this finding has direct implications for increased future risk of CVD or accelerated development of arteriosclerosis in black youth remains to be determined.

GENDER DIFFERENCES IN LOW BACK PAIN: ANALYSIS OF THE NATIONAL HEALTH INTERVIEW SURVEY
Stephen J. Morewitz, Research, Stephen J. Morewitz, Ph.D., & Associates, IL & CA, Chicago, IL

Low back pain can be a disabling and costly health problem. Work-related physical factors, such as lifting more than 25 kg, and work-related psychosocial factors, such as dissatisfaction with work, high job demands and low control over work, are some of the conditions that are associated with an increased prevalence of low back pain among workers. However, little is still known about the risk factors for low back pain, especially in the general population. Several occupational studies have found that female workers are more at risk of suffering low back pain than male workers. More research needs to be done to determine the extent to which there are gender differences in low back pain in the general population as well as the risk factors for low back pain in the general population. The following study tests the null hypothesis that there are no gender differences in low back pain, after adjusting for other income and other possible predictor variables. The findings from the population-based 1998 National Health Interview Survey (N=30,534 adults) were used. Descriptive and correlational procedures evaluated possible gender differences in low back pain in the past 3 months after adjusting for income and other predictors. The null hypothesis was rejected. Women had a higher prevalence of low back pain in the past 3 months (.30%) than men (.26%) (Chi-Square=75.79, df=2, p < .000). These gender differences in low back pain remained significant after controlling for occupation, age, race, income, and other predictor variables. These findings highlight the need to screen women for low back pain.

PSYCHOSOCIAL IMPAIRMENT AS A RISK FACTOR FOR RADIATING LOWER EXTREMITY PAIN
Stephen J. Morewitz, Research, Stephen J. Morewitz, Ph.D., & Associates, IL & CA, Chicago, IL

Radiating lower extremity pain, including sciatica pain, is a prevalent health problem. Work-related physical factors, such as lifting more than 25 kg, and psychosocial distress are some of the conditions that are associated with sciatica pain symptoms. However, more research is needed to determine the extent to which different types of psychosocial distress are risk factors for radiating lower extremity pain, including sciatica pain, especially in the general population. More information is needed to determine the degree to which feelings of anxiety and depression predict radiating lower extremity pain. The present investigation tests the null hypothesis that emotional impairment is not associated with radiating lower extremity pain, after adjusting for other income and other possible predictor variables. Data from the population-based 1998 National Health Interview Survey (N=30,534 adults) were used. Descriptive and correlational procedures evaluated the possible association between emotional impairment, e.g., emotional feelings impaired daily functioning, and having pain that spreads down the leg and below the knee in the last 3 months, after adjusting for income, occupation, and other predictors. The null hypothesis was rejected. Individuals who reported that emotional feelings interfered with their life in the past 30 days were more likely to report radiating lower extremity pain (r=+.172, p < .000, N=4,247). This association remained significant after controlling for occupation, age, race, income, and other predictor variables. These findings highlight the need to screen and treat emotional impairment among individuals with radiating lower extremity pain.

CHILDHOOD TRAUMA AND DIURNAL CORTISOL DISRUPTION IN FIBROMYALGIA SYNDROME
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Adults with fibromyalgia syndrome report high rates of childhood trauma. Neuroendocrine abnormalities have also been noted in this population. We explored relationships between retrospective reports of childhood trauma and diurnal salivary cortisol patterns among 85 women with fibromyalgia. Subjects with a documented diagnosis of fibromyalgia completed questionnaires assessing trauma including physical and sexual abuse during their childhood and teenage years. Self-reports of recent major life events, current perceptions of stress, and depressive symptoms were collected. Cortisol levels were measured in saliva samples taken six times a day for two consecutive days. The diurnal cortisol rhythm, awakening cortisol response, and mean cortisol levels were assessed. Hierarchical regression analysis controlled for age, relevant medications, life events, perceived stress, and depressive symptoms. Childhood physical abuse predicted flattened diurnal cortisol rhythms as well as greater cortisol responses to awakening. Sexual abuse was a second predictor of increased awakening cortisol responses. Patients with a history of trauma had markedly low levels of cortisol at the time of first awakening, which partly explained these results. These findings suggest that severe traumatic experiences in childhood may be a factor of adult neuroendocrine dysregulation among fibromyalgia sufferers. Trauma history should be evaluated in patients with fibromyalgia and supportive interventions should be offered.
This naturalistic longitudinal study is one of the first investigations aimed to improve the identification and subsequent treatment of emotional disorders in patients with non-cardiac chest pain (NCCP). For the majority of patients seen in primary care settings who present with a chief complaint of chest pain, commonly no known medical etiology can be found (80-90%; Katon, 1990). Multiple medical rule-outs are part of a typical work-up for individuals with NCCP, but psychological evaluations are not. Chest pain is associated with panic attacks, which occur in a range of emotional disorders. Panic attacks represent only one of a number of psychological processes involved in the development and maintenance of NCCP (Mayou, 1998), and very few studies have aimed to improve the recognition and subsequent treatment of emotional disorders in patients with NCCP. A total of 125 patients with a chief complaint of chest pain in the absence of known cardiac or other organic etiology were recruited from the cardiology department of a university-affiliated medical center. Patients were recruited subsequent to negative cardiac examination and negative results on exercise tolerance testing. Structured clinical interviews were conducted on all diagnoses. Only 10% met clinical criteria for current panic disorder, however, 16% met criteria for social anxiety and 12% met clinical criteria for generalized anxiety disorder. A high prevalence of psychiatric morbidity was detected in this sample of chest pain patients, and data suggest that psychiatric morbidity is associated with more impairment and service utilization (p < .05). Efforts aimed to improve the recognition and subsequent treatment of anxiety and mood disorders in patients with unexplained physical symptoms are discussed.

**SEX AND PUBERTY DIFFERENCES IN PAIN TOLERANCE AND HEART RATE RESPONSES IN CHILDREN**
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Converging evidence from multiple lines of research points to the existence of important sex-related differences in pain, with females generally demonstrating less pain tolerance. However, the mechanisms underpinning such differences are not well understood. The aim of this study is to examine the relationship between sex and pubertal differences in pain tolerance and autonomic arousal to laboratory pain stimuli in healthy children. We tested the following specific hypotheses. 1) Females would have greater autonomic arousal and less pain tolerance than males, and 2) This sex difference in pain tolerance would be mediated by autonomic arousal. Participants were 244 healthy children (51% female, mean age 12.73 ±3 years, range 8–18 yrs). Separate 4 trial blocks of cutaneous pressure and thermal pain stimuli were presented in counterbalanced order. Heart rate (HR) was recorded during 2 to 3 min rest periods preceding and following each block and a 1-minute period between trials. Results indicated decreased tolerance in females for cutaneous pressure (p < .05; females =32.98 ±3.96 sec; males =45.26 ±3.97 sec) but not thermal pain. In addition, HR was greater for females both before and during the pain tasks (p<.01, overall mean HR females =79.76 ±0.98; for males =75.76 ±0.95). Mediation analysis showed that sex differences in pressure pain tolerance could be accounted for by sex differences in HR. There were also significant effects for puberty but these did not vary by sex. Overall early puberty children had less pain tolerance than late puberty children, in both cutaneous pressure (p<.001) and thermal pain trials (p<.0001). Early puberty children also had greater HR than late puberty children (p<.001). These results support the notion of autonomic arousal as a potential mediator of sex-related differences in pain responses in children.

**TREATMENT PROGNOSIS IN PATIENTS WITH BACK PAIN, PAIN DISORDER AND SOMATIZATION DISORDER: A SCID-BASED STUDY**
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The purpose of the study was to evaluate the significance of somatoform diagnoses in a population of patients undergoing standardized multidisciplinary treatment for chronic back or other musculoskeletal pain in an orthopaedic in-patient setting. The study was conducted as a prospective examination of n = 74 consecutively treated patients who completed assessments at admission (T1), at discharge after three weeks (T2) and after six months (T3). Patients took part, at admission, in a structured clinical interview for DSM-IV (Axis 1, SCID-1, modified to include criteria for multisomatiform disorder) and filled out questionnaires assessing pain severity, pain related disability ( Oswestry), somatoform, anxiety and depressive symptoms (SOMS, HADS), treatment satisfaction and health related quality of life (SF-36). Twenty six patients (35%) fulfilled criteria for no somatoform disorder (BackPain); 35 patients (47%) fulfilled criteria for pain disorder (PainDis); 13 patients (18%) fulfilled criteria for somatization disorder or multisomatiform disorder (SomDis). At intake, there was no difference in age, pain intensity or pain related disability between the three groups. All groups showed reductions in symptoms and pain related disability after treatment (T= 2.73 and 8.25, p<0.01 each). However, SomDis patients rated their treatment as significantly less successful at discharge (T=2.14; p=0.05) and the degree of recovery for pain related disability and intensity of somatoform symptoms other than back pain was lower (T=-1.93 and 1.77; p=0.03, p=0.04 respectively). In contrast, PainDis patients saw their treatment as being successful at the same rate as BackPain patients. Assessing somatoform disorders in a population of patients seeking treatment for chronic back pain helps to identify patients at risk of lower treatment response. The nosologically problematic category of Pain Disorder does not identify high risk patients as well as the categories based on systematic assessment of somatoform symptoms other than back pain.
LONG-TERM OUTCOME OF BACK PAIN TREATED BY A PSYCHOLOGICALLY-BASED PROGRAM
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The purpose of this study was to determine if there was sufficient evidence that the mind-body treatment mode called Tension Myositis Syndrome (TMS) could effectively treat persistent back pain to justify further serious study of its effectiveness. Methods–85 patients treated for TMS between 1995 and 2000 in Dr. Schechter's office were interviewed on the telephone by trained medical students at least a year after treatment was initiated. It was not a randomized, placebo controlled trial. Results: Of those 85 patients, over 60% fell into the “A” and “B” outcome groups that showed clinically significant improvement. Eighteen percent improved some (“C”), and 21% failed to improve (“F”). Evaluation criteria included presence of pain, activity restrictions, and medication use, both before and after treatment. Nearly all the patients had tried a variety and often a combination of typical treatments including medication, physical therapy, chiropractic, acupuncture, etc. without long-term relief. Patient were also classified by pain duration before diagnosis, with those reporting pain over a year (72 patients or 85%) defined as “chronic,” and less than a year (13 patients or 15%), “acute.” Eleven (85%) of the “acute” patients and 41 (57%) of the “chronic” ones fell into Groups A or B. Conclusions–Our most significant finding is the 57% success rate among the chronic patients. Moreover, the treatment is relatively inexpensive, non-invasive, and non-pharmacological. At the very least, the effectiveness of TMS treatment for back pain merits further study as a way to address the chronic pain problem. This symposium will discuss the conceptual model of Tension Myositis Syndrome (TMS) and the specifics of the treatment program described above including the use of journaling, home educational program, office-based seminar, psychotherapy, etc. The results of the outcome study will be analyzed and a description of additional studies that have been done or are planned will be presented. Opportunities for input from the attendees on the neuroscientific correlations, brain imaging implications, research methodology, and clinical methods will be emphasized.

ETHNICITY, STRESS, AND MENSTRUAL CYCLE: MODIFIERS OF PAIN SENSITIVITY IN MEN AND WOMEN
Beth Mechlin, Psychiatry, William Matzner, School of Dentistry, Kathleen Light, Rebecca Klatkin, Susan Girlder, Psychiatry, University of North Carolina, Chapel Hill, NC

The primary aims of this study were to examine endogenous pain regulatory factors, including menstrual cycle, stress, and blood pressure (BP), which may contribute to ethnic differences in pain perception. A total of 107 medically and psychologically healthy men and women (18-47 yrs) were tested for sensitivity to ischemic, thermal heat, and cold pressor pain following mental stressors and also following a rest control period, while counterbalancing order of stress/rest and pain tests. Half of each gender was composed of African Americans (AA; n=52) and the other half mostly Caucasian (Cauc; n=55). Women were tested 3 times: early follicular (EF), late follicular (LF), and luteal (Lut) phases of ovulatory cycles, randomizing order. Men were also tested 3 times. As expected, for both ethnic groups men had greater threshold and tolerance levels to all pain tests than women (Fs>8.02, ps<.01). Also, for all tests, AA men and women had lower tolerance levels (Fs>5.72, ps<.02) than Cauc, but no ethnic difference in thresholds existed. Evidence for stress-induced analgesia (SIA) was limited to the ischemic pain test in all women reported lower unpleasantness ratings following stress vs. rest (F=3.89, p=.05) while no SIA was seen in men. A trend for a cycle effect was observed during cold pain in Cauc women (F=2.50, p=.09) since their LF phase was associated with lower cold pain intensity ratings than EF and Lut phases (ps>.05). No cycle effect was observed in AA women. Expected positive correlations between systolic BP and pain tolerance for all 3 pain tests were seen in Cauc males and females (rs=.25, ps=.01-.06), while there were no relationships between SBP and tolerance in AAs. Thus, cycle phase and stress appear to modify pain perception in women, while the absence of BP related hypoalgesia in AA men and women may contribute to their greater pain sensitivity.

LABOR MARKET, FINANCIAL, INSURANCE AND DISABILITY OUTCOMES AMONG NEAR ELDERLY AMERICANS WITH DEPRESSION AND PAIN: A NATIONAL STUDY
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Symptoms of depression and pain commonly co-exist and contribute to worsening health status and higher healthcare costs. We analyzed the relationship between depression and pain on labor market, financial, insurance, and disability outcomes among Americans aged 55-65. Cross-sectional data from Wave 3 of the Health and Retirement Survey, a nationally representative sample of individuals aged 55-65 surveyed in 1996 were used. Multivariate regression analyses, controlling for socio-demographics and chronic health conditions, estimated the association between depression and pain on economic outcomes. Outcomes included: work and retirement status, household income and wealth, healthcare costs, government health insurance, social security, health limitations and activities of daily living (ADLs) affecting work. Primary explanatory variables included the presence or absence of depression with or without self-reported pain. Individuals with depression and pain versus those with conditions singly were less likely to work, had higher medical expenditures, and were more likely to report limitations in ADLs and health limitations on work (all ps<.01). Depression with pain strongly predicted work status, retirement, household income, total wealth, total medical expenditures, government insurance, social security earnings, limitations in ADLs, and health limitations affecting work (both ps<.01). Depression with pain was associated with poor labor market, financial, insurance and disability outcomes in a nationally representative sample of near elderly adults. These cross-sectional analyses cannot identify causal effects of depression with pain. Depressed individuals with pain may benefit from treatment that addresses the duality of these conditions. Further understanding is needed of the medical professional’s ability to diagnosis and treat these patients and the perceived barriers individuals face for treatment.

IMPACT OF PAST PSYCHOLOGICAL TRAUMAS ON THE TRANSITION FROM ACUTE TO CHRONIC PAIN
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Although past traumas are associated with chronic pain, the cognitive-affective processes in this relationship have not been explored in newly injured back pain patients. In this prospective study of acute back pain patients, we examined cumulative DSM-IV (Criterion A) traumas and trauma-related schemas as predictors of pain and disability 3 months later, the IASP criterion period for chronicity. Eighty-four patients referred to an acute back pain clinic completed measures of lifetime traumas (TLEQ), maladaptive schemas (TCS), pain (DDS), and disability (PDI) at baseline and follow-up. Multiple regression analyses, controlling for baseline pain and disability and demographic and medical factors, indicated that more traumas directly predicted greater subsequent pain severity (B = .23, sr2 = .05, p < .05) and indirectly predicted more subsequent disability, via pain (B = .32, sr2 = .08, p < .001). Cumulative traumas, however, were not related to trauma schemas. Negative trauma-related schemas did not predict baseline pain or disability but positively predicted 3 month pain (B = .25, sr2 = .06, p < .05) and disability (B = .34, sr2 = .11, p < .01), controlling for initial levels. Cumulative past trauma experience is directly, positively related to chronic pain, independent of initial pain and cognitive-affective reactions. Separately, trauma-related schemas are associated with both more severe pain and greater functional impairment at 3 months. Both high past trauma exposure and maladaptive schemas are possible red flags for chronicity and should be evaluated early to guide treatment. A biopsychosocial approach to treating newly injured back pain patients is indicated to prevent development of chronic pain syndrome.
RESILIENCE RESOURCES CONTRIBUTE TO BETTER HEALTH OUTCOMES AMONG RHEUMATOID ARTHRITIS PATIENTS
Kate E. Murray, Brendt P. Parrish, Mary C. Davis, John W. Reich, Alex J. Zautra, Psychology, Arizona State University, Tempe, AZ

Symptoms of physical debilitation, pain, joint swelling and depression are well documented to be influenced by psychosocial factors in addition to physiological factors in predicting disease worsening among patients with Rheumatoid Arthritis (RA) (Evers, 2003). Psychology and the biopsychosocial model have traditionally focused on identifying the negative environmental and behavioral conditions that contribute to stress and illness across various populations. However, a growing body of literature suggests resilience resources play an equally important role, aiding in adaptation and well-being (Fredrickson, 1998; Ryff, 1989; Zautra, Johnson & Davis, 2004). A number of such resources, including positive emotions, (Affleck & Tennen, 1996; Zautra, Johnson & Davis, 2004), self-efficacy (Bandura, 1986; Geissner, Robinson, Miller & Bade, 2003), and an individual’s sense of purpose in life (Ryff, 1989) have been linked to health and well-being. This study investigates the role of these individual resilience resources above and beyond the traditional risk factors in predicting mental and physical health outcomes among 124 RA patients. Our investigation shows that negative environmental factors such as income level and negative behavioral conditions such as interpersonal stressors, and negative affect correlated with self reports of physical and mental functioning, depression and fatigue. The Resilience factors of purpose in life, positive affect and self-efficacy also correlated with these health outcomes. Using stepwise regression analyses for each of these outcomes, placing negative environmental and behavioral conditions on the first steps, resilience factors still explain 29.4% of the variance in physical functioning, 13.8% in mental health, 8.8% in depression, and 23.4% in fatigue. These findings suggest resilience resources are a critical component in understanding individual health outcomes and should be targeted in cognitive behavioral treatment for RA pain patients.

Abstract 1701
DIFFERENTIAL Efficacy OF WRITTEN EMOTIONAL DISCLOSURE AMONG SUBGROUPS OF FIBROMYALGIA PATIENTS
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Written emotional disclosure (ED) of personal trauma has been shown to yield psychological and health benefits in several medical populations. In a RCT of ED across three writing sessions with female fibromyalgia patients (n=92; mean age= 49.7), a moderate treatment effect (d=.54) was observed for psychological well-being relative to the control group. A moderator analysis was conducted to determine if clinical and demographic patient characteristics could be identified that influence treatment efficacy. Baseline levels of depression, anxiety, and defensiveness were not significant moderators. Likewise, race, employment, disability status, and marital status were not significant moderators. However, there was evidence that in the treatment group more highly educated patients benefited significantly, whereas less educated patients worsened similar to the controls (t(23)=-2.35, p=.02). Second, there was evidence that among the treated patients one taxonomic cluster (based upon the Multidimensional Pain Inventory) - the Interpersonally Distressed patients - experienced significant improvement in psychological well-being relative to the other two clusters (Adaptive and Dysfunctional) (t(224)=-2.15, p=.03). These data suggest that psychological distress - be it depression or anxiety - and defensiveness are not contraindications for successfully applying the emotional disclosure paradigm. Further, it provides insight into other patient characteristics - educational level and pain coping style - that are predictive of successful response to the treatment.

LINKS BETWEEN CHILDHOOD ABUSE AND NEGLECT, ALEXITHYMIA AND CURRENT HEALTH PROBLEMS IN COLLEGE STUDENTS
Tanya Anagnostopoulou, Ioannis Velikis, Anna Mastorakou, Hellenic Institute of Psychology & Health, Thessaloniki, Greece, Sofia Triliva, Psychology, University of Crete, Rethymno, Greece

The aim of the study was to investigate the association between physical /emotional /sexual abuse and neglect in the family of origin with the presence of alexithymia, suicidal ideation and health problems in adult life. The sample consisted of 365 college students (mean age 21.9; 71% female) who completed a self-administered battery of questionnaires examining current health problems, suicidal ideation, and alexithymia (TAS-20). The Greek Family Dysfunction scale was specifically developed to elicit information about emotional rejection (a=.77), emotional neglect (a=.66) and physical abuse/punishment (a=.79). Results indicate that 12% of the sample reported sexual abuse, 37% suicidal ideation and 31% more than two health problems. The first factor of TAS-20, inability to identify feelings, was positively related to emotional rejection (p<.001), emotional neglect (p<.01), sexual abuse (p<.05), suicidal ideation (p<.001) and the presence of more than 2 health problems (p<.001). The second factor of alexithymia, the inability to express feelings, was positively related to emotional rejection (p<.01), emotional neglect (p<.05) and suicidal ideation (p<.001). Cluster analysis was used to classify the sample in two groups: a) subjects who reported family dysfunction (N=158) and b) subjects who did not report family dysfunction (N=157). As expected, the first group reported more health problems (p<.01), suicidal ideation (p<.001) and higher scores in the first factor of TAS-20 (p<.05). Results support the hypothesis that students who have experienced one or more types of family abuse and neglect, tend to have problems identifying and expressing their feelings, and present higher frequency of suicidal ideation and health problems. Finally, physical abuse and external orientation did not relate to poor health outcomes or suicidal ideation in adult life.

EFFECTS OF INTEGRATED THERAPY SYSTEM ON THE STRESS REDUCTION: SINGLE SESSION TRIAL
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Stress is one of the common, important issues related to health, disease, and the quality of life. There are variable strategies in the stress reduction and prevention. But, few integrated therapy systems are practiced. Therefore, we performed this study to investigate the effects of Integrated Therapy System on the stress reduction. In 50 healthy medical school students (male 25, female 25), psychophysiological measures (percent alpha, electromyogram, skin conductance, finger temperature, blood volume pulse, heart rate, respiratory rate, etc.), psychosocial measures and hormonal measures were evaluated. We used the Integrated Therapy System (EMOSytech, Korea); therapy system consisted of video, music, aroma, and color therapies; ITT) as the stress reduction method. After non-recording adaptation period(15minutes), psychophysiological measures were recorded during pre-ITT period(5 minutes), ITT period(16 minutes), and post-ITT period(5minutes). During ITT, percent alpha power(p<.05), finger temperature(p=0.05) were significantly more increased, and EMG(p<.001), skin conductance(p<.05) significantly more decreased comparing pre-ITT, but blood volume pulse, heart rate, and respiratory rate were no significance. This results suggest that our subjects showed significantly more relaxed state during ITT period than pre-ITT period. ITT is a comprehensive, non-invasive, near-natural, easy-to-use, wide spectrum, and effective strategy for stress reduction and prevention. This therapy has the potential for the other many indications as well as stress(for example, insomnia, mood disorders, etc.).
WRITTEN EMOTIONAL DISCLOSURE: TESTING THE NEED FOR SOCIAL SHARING AND THE EFFECTS OF PLACEBO WRITING
Alison M. Radcliffe, Mark A. Lumley, Jessica Kendall, Jennifer Stevenson, Joyce Beltran, Psychology, Wayne State University, Detroit, MI

Written emotional disclosure can have positive health effects. Yet almost all disclosure studies have participants submit their writings to the researchers, whereas in actual practice, writing is likely to remain private and unshared. Also, disclosure studies typically use placebo writing controls, but the effect of placebo writing against no writing, which is the practical alternative, has not been tested. We hypothesized that the health benefits of writing follow this pattern: submitted disclosure > private disclosure > placebo writing > no writing. Undergraduates (n = 139; 80% women; 55% white, 28% African American, 8% Asian) who were screened to have an unresolved stressful experience were randomized to one of two Disclosure conditions (4 days of writing about stress either submitted or kept private) or one of two Control conditions (placebo writing for 4 days or no-writing). The Impact of Events Scale (IES), Posttraumatic Growth Inventory (PTGI) and Brief Symptom Inventory (BSI) were completed at baseline and 3-month follow-up. ANCOVA first compared combined disclosure groups with combined controls. Disclosure led to significantly improved IES intrusion (p = .001) and avoidance (p = .004), PTGI relating to others (p = .012) and spiritual change (p = .020), and BSI depression (p = .001) and global severity (p = .001). When the four separate groups were compared, only submitted disclosure, but not private disclosure, led to significant improvements on intrusion, avoidance, and depression, compared with either placebo writing or no-writing; effects were somewhat larger when compared with no writing. Public or social disclosure rather than private, unshared writing appears to augment the benefits of expressive writing. It is not known whether a recipient of a person's writing who is a recipient in mind changes one's writing, or whether simply knowing that one's secrets are shared is important. Benefits of shared disclosure occur compared with placebo writing, but are stronger compared with no writing.

SICKNESS ABSENTEEISM, SUBJECTIVE HEALTH AND ADVERSE PSYCHOSOCIAL WORKING CONDITIONS
Dirk Hanebuth, Michael Meinert, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland, Dirk Hagemann, FBI Psychology, University of Trier, Trier, Germany, Joachim E. Fischer, Institute of Behavioral Sciences, Swiss Federal Institute of Technology, Zurich, Switzerland

Sickness absenteeism is an important health-related outcome in industrial working populations. Previous studies have suggested that short term and long term absence spells are differentially associated with psychosocial work characteristics and personal health. To test this hypothesis we obtained daily-to-day absence data for a twelve-month period for the workforce of an airplane manufacturing plant in Southern Germany. N = 521 individuals provided full data regarding personal health and assessment of psychosocial work characteristics. Structural equation models were first fitted to number of absence spells in four categories: 1- day, 2-3 days, 4-5 days and more than 5 days. In Germany, sickness absence periods of less than 3 days do not require a medical certificate. In a second step we introduced personal health (physical health summary scale of the SF12, age, body-mass-index and alcohol intake) and psychosocial work characteristics (i. e. social support at work, effort-reward-imbalance) into the model. In contrast to a model comprising short term (up to 3 days) and long term absence indicators, the single absence factor provided poor fit and had to be rejected. The full model including personal health and work setting characteristics provided good fit indices (GFI = 0.945, AGFI = 0.920, CFI = 0.919, RMSEA = 0.057). The fit was confirmed by bootstrapping. The model revealed substantial correlations between personal health and long term absence (r = .77) and a lesser association with short term absence (r = .35). Work characteristics showed independent moderate associations with personal health (r = .23), short term absence (r = .20) and long term absence (r = .27). The study supports the concept of a differential association of work characteristics and personal health with short and long term absence spells.

CHANGES IN RISKY BEHAVIORS OVER TIME IN COLLEGE STUDENTS
Melissa T. Buelow, Margret A. Appel, Elizabeth A. Doherty, Psychology, Ohio University, Athens, OH

College students' involvement in various risky behaviors including sexual behavior, alcohol consumption, and drug use is a current area of concern. The present study examined whether participation in eight categories of risky behavior changed over the course of two years. Participants were 46 female and 50 male college students who completed a demographic survey, the Center for Disease Control's National College Health Risk Behavior Survey (NCHHRS), and the Cognitive Appraisal of Risky Events (CARE) frequency of involvement scale. Participants completed these surveys first in 2002 (ages 18-26) and again in 2004 (ages 20-29). An ANOVA with administration times as the within-subjects variable and sex and GPA as the between-subjects variables was conducted for each category of risky behaviors and yielded the following results. There were no significant changes in driving behaviors, involvement in high-risk sports, tobacco use, drug use, aggressive and illegal behaviors, and academic and work behaviors. There was a significant gender-time interaction for alcohol consumption. Specifically, men increased their alcohol consumption (Time 1 Mean = 40.97, Time 2 Mean = 78.63), whereas women decreased their alcohol consumption (Time 1 Mean = 57.50, Time 2 Mean = 41.43), F(1,86) = 4.268, p < .05. For both men and women, there was a significant increase in sexual behaviors (Time 1 Mean = 18.85, Time 2 Mean = 23.28, F(1,45) = 11.540, p = .001), coupled with a significant decrease in condom use over time (Time 1 Mean = 4.72, Time 2 Mean = 3.35, F(1,47) = 9.778, p < .01). The results indicate that, across time, college students are not decreasing their involvement in risky behaviors and may actually be increasing certain risky behaviors that may have serious implications for their health and well-being.

DISTRESS MEDIATES THE RELATIONSHIP BETWEEN ANXIOUS ATTACHMENT AND SLEEP DISTURBANCE
Hani Shabana, Patrick Steffen, Psychology, Brigham Young University, Provo, UT

Introduction: Research has suggested that both anxious attachment style and sleep disturbance are predictive of health problems, however, few studies have examined the impact of anxious attachment on sleep disturbance, and if measures of distress mediate this relationship. It was hypothesized that anxious attachment would predict increased distress and higher levels of sleep disturbance, and that increased distress would mediate the relationship between anxious attachment and sleep disturbance. Methods: 129 participants (48% female; mean age 30; 92% European American, 3% Hispanic, 5% other) were administered the Experiences in Close Relationships scale, the Perceived Stress Scale, the Weinberg Adjustment Inventory (depressive symptoms), and the Pittsburgh Sleep Quality Index. Results: Controlling for age and gender, anxious attachment was positively correlated with sleep disturbance (r = .24, p < .01). Perceived stress (r = .41, p < .0001) and depressive symptoms (r = .32, p < .001) were also positively correlated with sleep disturbance controlling for age and gender. When controlling for perceived stress and depressive symptoms, the relationship between anxious attachment and sleep disturbance was no longer significant (r = .03, ns). Conclusion: Anxious attachment is related to increased distress and sleep disturbance, and distress mediated the relationship between attachment and sleep. Distress and sleep disturbance may pathways through which attachment is related to health outcomes.
HYDRATION AND COGNITION IN HEALTHY YOUNG ADULTS

Jessica A. Hall, Julie A. Suhr, Psychology, Ohio University, Athens, OH

Being that water is necessary for so many aspects of physiological and psychological functioning, the impact of dehydration on cognitive performance is surprisingly poorly understood, particularly when dehydration is mild or moderate. The current study sought to elaborate how naturally occurring levels of hydration impact the cognitive functioning of healthy young adults. Participants were 52 university students (25 females, 18-22 years). Participants completed measures of psychomotor speed, memory, verbal fluency, motor speed, and attention. Hydration was measured using both Bioelectrical Impedance Analysis (BIA), from which the participant’s total body water was determined (M=53.8 L/kg), and Urine Color Analysis (scored 1-7 where 1=lower hydration; M=3.30). Participants completed a questionnaire addressing typical fluid consumption, health status, alcohol use, academic status, and other demographic data. Results indicated that higher levels of hydration measured by BIA were correlated with better performance on measures of attention (r = .308, p<.001). Higher levels of hydration measured by Urine Color Analysis were related to improved performance on measures of immediate (r = -.265, p<.03) and delayed memory (r = -.290, p<.02), and psychomotor speed (r = -.303, p<.02). This indicates that poor hydration can impact some aspects of cognitive functioning, even in healthy adults. Further, the cognitive impact varies depending on whether chronic (BIA) or acute (Urine Color Analysis) hydration levels are measured.

Abstract 1692

EFFECTS OF HYDRATION ON CARDIOVASCULAR PSYCHOPHYSIOLOGY

Lynne M. Rochette, Stephen M. Patterson, Psychology, Ohio University, Athens, OH

The purpose of this study was to assess the effects of hydration status on cardiac function at rest and during psychological laboratory stressors. Volunteers (23 male, 22 female) participated in an initial physiological assessment (Session 1), a pre fluid-load stress manipulation assessment (Session 2), and a post fluid-load/stress manipulation assessment (Session 3). At each session, blood pressure (SBP, DBP), heart rate (HR), total body water (TBW), intracellular water (ICW), extracellular water (ECW), and percentage of TBW by weight (%TBW) were obtained. During Session 2, participants were assigned to either a Hydration Enhanced (HE) condition or a Non-Enhanced (NE) condition. The HE Group (n=23) drank 2 liters of water a day for 3 days prior to Session 3. At Session 3, cardiac measurements were recorded during a lab protocol: 10-min seated baseline, 6-min intermediate baseline, and a 3-min cold pressor task. Change scores (task-baseline) were computed for Session 3 cardiac measurements. Session 1 t-test analyses revealed that males exhibited significantly greater TBW, ICW, ECW, and %TBW than females (p's<.01). Session 2 correlational analyses revealed significant inverse relationships for males between DBP and TBW, r = -.579, ICW, r = -.575, and ECW, r = -.537 (p's<.05). At Session 2 and 3, t-test analyses again revealed males displaying greater TBW, ICW, ECW, and %TBW relative to females (p's<.01). Session 3 correlational analyses revealed significant inverse relationships for HE males between SBP and ECW, r = -.698, and %TBW, r = -.625, (p's<.05). Resting cardiac assessments at Session 3 revealed participants in the HE Group showed greater HR at rest (M=68.6) compared to the NE Group (M=63.2), t(43) = -2.14, p<.05. Stress-reactivity analyses for Session 3 math task revealed the NE Group displayed greater DBP reactivity (M=17.4) compared to the HE Group (M=13.3), F(1, 43) = 5.18, p<.05. These results indicate differential effects of hydration status on cardiac function both at rest and during psychological stress.

STRESS MARKERS IN MARINES BEFORE, DURING & AFTER HI-ALTITUDE WINTER OPERATIONS & LINKS TO MOOD


Several studies have shown that military personnel experience stress from military operations, but most have focused on short-term changes. We previously observed mood changes in a cohort of Marines conducting high-altitude winter field training exercises (FTX) that persisted 90-days post-FTX. We extend these findings by evaluating serum stress markers & their relation to mood in the same cohort during the same FTX. Blood samples & Profile of Mood States (POMS) were collected from 60 male Marines (mean age=19yrs, range=18-28) at baseline (23 days prior to deployment), upon arrival at the FTX site, 1-day post-FTX, 30- & 90-days post-FTX. Stress markers were elevated at the conclusion of the FTX with some related to hypothalamic-adrenal & gonadal function remaining elevated up to 30-days post-FTX. Significant positive associations were noted for changes in cortisol vs. POMS tension, depression, anger & vigor at the end of the FTX (p<.05). Testosterone levels & cortisol:testosterone ratio were positively associated with vigor (p<.05). At 30-days post-FTX a significant association was observed between vigor & sex hormone binding globulin (SHBG) (p<.05). Results imply that certain mood states may reflect stress hormonal & biochemical changes in response to military operations. (See Table: *p<.05)

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<td>Free Testosterone</td>
<td>79.5</td>
<td>81.8</td>
<td>65.4*</td>
<td>56.9*</td>
<td>70.6</td>
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WELL-BEING OF EXERCISE ADHERERS: RESULTS FOR MEN AND WOMEN
Margret A. Appel, Melanie M. Michaud, Melissa T. Buelow, Jessica Tag, Psychology, Ohio University, Athens, OH

The relationship of exercise adherence to individuals' feelings of well-being was assessed in a sample of 473 college students (260 women and 213 men), aged 18 to 24, who participated in a prospective study of exercise adherence over a seven-week period. Data on exercise adherence and exercise intensity were assessed at both Time 1 and Time 2 using the Stage of Exercise Scale and the Godin Leisure Time Exercise Questionnaire. Participants also completed the Reasons for Exercise Inventory to assess the importance of various motives for exercising. Well-being was assessed with the General Well-Being Scale which yields a total score as well as six subscale scores. Data were analyzed to assess the relationship between exercise adherence scores and Time 2 well-being scores, with the data for men and women analyzed separately. Adherence correlated positively (p < .05) with the Total Well-Being Scale and with the scores on the four subscales of Energy Level, Satisfying and Interesting Life, Cheerful versus Depressed Mood, and Emotional-Behavioral Control for both men and women. In addition, adherence correlated positively with the Relaxed versus Tense-Anxious subscale score for men, but not for women. Adherence did not correlate with the Freedom from Health Worry score for either men or women. Change in Stage of Exercise from Time 1 to Time 2 produced the same pattern of correlations as was found with exercise adherence. When exercise intensity was examined, positive correlations with the well-being scores tended to be more frequent with moderate and strenuous levels of exercise compared to mild levels of exercise for both men and women, although the number of correlations that were significant (11 versus 5) was lower for women, suggesting that intensity of exercise is a less important variable for women's well-being than for men's well-being. Motives for exercising produced similar correlation patterns for men and women for mood and tone, but some differences for attractiveness, enjoyment, fitness, health, and weight control motives.

GENDER MODERATES THE EFFECTS OF NEUROTICISM ON STRESS AND WELL-BEING
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Neuroticism (N) is related to both physical and mental well-being and is a risk factor for anxiety disorders, clinical depression, and hypochondriasis. However, little research has examined the role of gender in these links. The purpose of the current study was to examine the moderating role of gender on relations between N and both subjective well-being and objective health indices. Of particular interest was whether gender affects the relationship between N and interpersonal stress. 37 male and 40 female college students (mean age=19.5 years) completed measures of N, and physical and depressive (BDI-II) symptoms at the beginning of the academic year. Measures of stress (Inventory of College Students Recent Life Experiences; ICSRLE), physical and depressive symptoms, sick days, health center visits, and immune cell counts (CD4, CD8) were obtained 2 months later. N was related to physical and depressive symptoms, total daily hassles, interpersonal hassles, sick days, and health center visits, ps <.05, but was unrelated to immune cell counts. Women had more health center visits and higher depression compared to men, whereas men had lower CD4 and higher CD8 counts. Gender moderated the relationship between N and daily hassles: N was related to interpersonal stress for women, p <.0001, but not for men, ns. Additionally, daily hassles were related to increases in depression from baseline for women, p <.0001, but not for men, ns. Daily hassles were related to lower CD4 cells for men, p <.05, but not for women, ns. N was more strongly related to 2-month depression for women, p <.0001, than for men, p <.05. Findings suggest that gender affects the types of stressors to which high-N individuals are most vulnerable. Although the strength of the N-depression relationship was stronger for women, N effects on other measures of well-being were similar for males and females. Findings also provide preliminary evidence that gender may moderate the effects of daily stress on emotional vs. physical health outcomes.

SELF-AFFIRMATION REDUCES STRESS RESPONSES
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An emerging body of research suggests that dispositional self-resources, such as self-esteem and self-enhancement, can reduce stress. Building on this work, the present study tested if self-affirmations could recruit these self-resources (i.e., trait self-esteem and self-enhancement) to reduce psychological and physiological stress responses. Forty-five participants were randomly assigned to complete a self-affirmation or control activity prior to participating in the Trier Social Stress Task. Results showed that dispositional self-resources (e.g., trait self-esteem and self-enhancement) moderated the relationship between self-affirmation and psychological stress responses (p <.03), with high self-resource participants reporting the lowest stress responses after completing a self-affirmation. Self-affirmation participants had significantly reduced cortisol responses to stress (p <.03), regardless of the amount of dispositional self-resources. These findings suggest that reflecting on the positive self, as through self-affirmation, can reduce psychological and physiological stress responses.

THALAMIC SIZE AS A NEUROFUNCTIONAL CORRELATE OF DYSFUNCTIONAL SENSORY PROCESSING IN CHRONIC FATIGUE SYNDROME
Jan Borch, Roland von Kanel, General Internal Medicine, Johannes Slotboom, Luca Remonda, Claus Kiefer, Gerhard Schroth, Neuroradiology, Stefan Begre, General Internal Medicine, University Hospital, Berne, Switzerland

Patients with chronic fatigue syndrome (CFS) regularly present with difficulty in processing sensory inputs reporting e.g. hypersensitivity to visual and auditory perceptions. The thalamus is an important relay station in processing sensory inputs. We investigated whether thalamic size would differ between CFS patients and controls. We included 5 out-patients with CFS (mean age 46±7 years) and 5 gender- and age-matched controls and performed a high-resolution 3-dimensional MRI data set covering the whole brain for each subject (MP-RAGE). Thalamic volume was approximated computing 6-7 matched slices. CFS was diagnosed in a semi-structured interview following the 1994 criteria of the International CFS Study Group. CFS severity was assessed rating each of the 9 CFS symptoms on a 5-point scale (0=not at all, 4=constantly; maximum score 36). Mood was rated by the Hospital Anxiety and Depression Scale (HADS). Statistical analyses used non-parametric testing. Patients had been suffering from CFS for a mean period of 15 years (first symptoms) and 4 years (impairment in daily functioning), respectively. CFS severity score was 25.4±5.2 and mood disturbance was mild (HADS depression: 8.6±4.3; HADS anxiety: 7.6±3.1). The right thalamus was significantly greater in CFS patients than in controls (+15.3%, p<.052), and a similar trend towards statistical significance was observed for left thalamic volume (+13.3%, p<.01). The CFS severity score showed an inverse relationship with left thalamic volume (r=-.90; p=.037). CFS duration and mood were not significantly correlated with thalamic volume on either side. This preliminary study is the first to show that altered size of the thalamus could represent a neurofunctional correlate of dysfunctional sensory processing in CFS. Data from a larger sample size will be presented at the meeting.
FORGIVENESS AND SOCIAL SUPPORT MEDIATE THE RELATIONSHIP BETWEEN RELIGIOSITY AND DISTRESS

Kevin Jordan, Patrick Steffen, Psychology, Brigham Young University, Provo, UT

Purpose: Religiosity has been related to decreased distress; however, the pathways through which this occurs are unclear. Potential psychosocial pathways studied in behavioral medicine that are related to positive health outcomes, such as social relationships, may play a role in the relationship between religion and distress. Given that most religious orientations emphasize positive social relationships and forgiveness of others, it was hypothesized that social support and forgiveness would at least partially mediate the relationship between religiosity and distress.

Method: Questionnaires were administered to 315 undergraduate students at a large religious university. Religiosity was assessed using a measure that assessed the quality of perceived relationship with God. Forgiveness, social support, depressive symptoms, and perceived stress were also assessed.

Results: A positive perceived relationship with God was related to less depressive symptoms (r = -25, p < .0001), less perceived stress (r = -16, p < .01), and increased forgiveness (r = .25, p < .0001), social support satisfaction (r = .40, p < .0001), and more support persons (r = .31, p < .0001). Controlling for the 5 facets of forgiveness and social support resulted in the relationship between religiosity and distress becoming nonsignificant.

Conclusions: Forgiveness and social support appear to be pathways through which religiosity is related to lower distress. Given that positive social relationships are not exclusive to religious settings, these findings may indicate that the health aspects of religiosity may be available to all people regardless of religious orientation.

Abstract 1565

SELF-ENAGEMENT AND SELF-ASSESSED HEALTH: EXAMINING THE UNIQUE EFFECTS OF NEUROTICISM AND ANXIOUS ATTACHMENT

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Self-assessed health (SAH) is crucial in effective regulation of health, but is heavily influenced by psychological processes, such as self-enhancement. An example of an illness self-enhancement (ISE) process is self-handicapping, or using illness as an excuse for failure. Two personality variables, neuroticism (N) and anxious attachment (AA), have been extensively examined in symptom-perception research; N is typically studied in the context of fairly straightforward attention to and interpretation of symptoms, and AA is frequently considered in the context of secondary gain mechanisms. This study seeks to determine the degree to which N and AA uniquely predict SAH, and whether these relationships are mediated by ISE. We previously have found that ISE mediates the relationship between AA and SAH (Fortenberry & Hamilton, 2002). While both variables influence SAH, albeit with different motivations attributed to each process, it is not clear to what extent and by what mechanisms the two factors exert overlapping or separate influence. 88 college students completed measures of N, AA, SAH, and ISE in small groups. Zero-order correlations revealed, as expected, that N and AA are related to each other (r = .49, p < .01) and to SAH (r = .25, p < .05). Next, we determined that ISE mediates the association between AA and SAH, as well as the association between N and SAH. Specifically, when controlling for ISE, the relationship between AA and SAH was significantly reduced (B = .19, p = .06, Sobel test = 1.7, p < .01), and the relationship between N and SAH was reduced to insignificant (B = .23, p = .40). We repeated the above regressions including N and AA simultaneously, and found that N continues to predict SAH when AA is controlled (B = .58, p < .01), and AA marginally continues to predict SAH when N is controlled (B = -.19, p < .10). These findings provide initial evidence that N and AA influence SAH independently of each other, and that self-enhancing processes influence both pathways.

Abstract 1447

PERSONALITY AND EXECUTIVE FUNCTIONING PERFORMANCE: RISK FACTORS FOR SUBSTANCE USE DISORDERS IN THE OKLAHOMA FAMILY HEALTH PATTERNS PROJECT

Andrea S. Vincent, Psychiatry and Behavioral Sciences, Kristen H. Sorocco, Geriatric Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK, William R. Lavallo, Psychiatry and Behavioral Sciences, VA Medical Center, Behavioral Sciences Labs, Oklahoma City, OK

Models specifying the neural basis of substance use disorders focus on frontal-limbic system connections as factors underlying poor behavioral regulation. Personality variables also have been associated with risk for substance abuse. We examined the relationship between measures of personality (California Personality Inventory (CPI), Tridimensional Personality Questionnaire (TPQ), Psychopathic Personality Inventory, and Eysenck Personality Inventory) and executive cognitive functioning (Stroop task) in young adults with and without a family history of alcoholism (FH+ FH-). Participants (N=146) were enrolled in the Oklahoma Family Health Patterns Project, a long-term study on risk for substance abuse. Results suggest Stroop interference was less among FH- as compared to FH+ individuals (p<.03). Stepwise regression analysis was performed to examine the relationship between FH and personality in predicting Stroop interference. Two subscales were retained in the model accounting for 8.5% of the variability in Stroop interference scores (F = 6.39, p = 002): 1) CPI subscale 3, Good Memories of Home and Parents (b = -.23, p = .065) and 2) TPQ subscale Shyness with Strangers (b = -.22, p = .009). Individuals who report good memories of home and shyness with strangers exhibit lower levels of Stroop interference regardless of FH. Further analyses suggested the lack of predictive value of FH was due to its significant biserial correlation with CPI subscale 3 (r = .17, p = .03). These findings suggest that certain personality variables may provide insight into the hypothesized relationship between behavioral dysregulation and the development of problem drinking, and that these relations precede problem drinking among healthy young adults.
PAST AND PRESENT MAJOR DEPRESSION PREDICTS IN-HOSPITAL MORTALITY IN MEDICAL INPATIENTS
Estefania De Aguas, Psychiatry, Santa Clara University Hospital, Bogota, Columbia, Ruby Castilla-Puentes, Psychiatry and Epidemiology, UNC School of Medicine and GSK, WWEmployeeiology

OBJECTIVE: to determine whether a history of depression and current depression predicts mortality independent of severity of medical condition. A clinical interview that included the Schedule for Affective Disorders and Schizophrenia was used to determine demographic variables and psychiatric diagnoses. Diagnoses included major depressive disorder and dysthymia diagnosed according to DSM-IV criteria that included all symptoms regardless of etiology and according to criteria modified for the medical condition (depressive symptoms were eliminated if easily explained by medical illness, treatments, or hospitalization; anhedonia, hopelessness or depression were used as the qualifying affective symptoms). A chart review was used to identify past psychiatric history and diseases measures. The Charlson combined age-comorbidity index was used to measure severity of medical disease. RESULTS: A diagnosis of major depressive disorder for patients with medical disease predicted mortality. A past history of depression and the Charlson combined age-comorbidity index predicted in-hospital patients with medical disease predicted mortality. A past history of depression and the Charlson combined age-comorbidity index predicted in-hospital patients with medical disease predicted mortality.

Abstract 1355

CORTISOL STRESS RESPONSE AND RISK FACTORS FOR SUBSTANCE USE IN THE OKLAHOMA FAMILY HEALTH PATTERNS PROJECT
Kristen H. Sorocco, Geriatric Medicine, Andrea S. Vincent, Psychiatry and Behavioral Sciences, University of Oklahoma Health Sciences Center, Oklahoma City, OK, William R. Lottalvo, Psychiatry and Behavioral Sciences, VA Medical Center, Behavioral Sciences Labs, Oklahoma City, OK

Males with a history of alcoholism have a diminished salivary cortisol response to acute psychological stressors. Diminished responses have also been found in healthy males with a family history of alcoholism. These reductions in reactivity may involve neurophysiological pathways for emotional processing and personality variables. We examined the relationship between cortisol response to a psychological stressor and personality measures (California Personality Inventory (CPI), Tridimensional Personality Questionnaire (TPQ), Beck Depression Inventory (BDI), Eysenck Personality Inventory, and Psychopathic Personality Inventory) in 65 males with and without a family history of alcoholism (FH+; FH-). Participants were enrolled in the Oklahoma Family Health Patterns Project, a long-term study on risk for substance abuse. Salivary cortisol levels were measured in response to public speaking and mental arithmetic and compared to levels obtained on a separate rest day. Stress reactivity was defined as the difference between cortisol stress responses on stress versus rest days. A stepwise regression revealed four variables that accounted for 37% of the variance in cortisol stress responses (F = 8.51, p < .0001: 1) Optimism, Self-confidence, and Positive Affect subscale from the CPI (b = .48, p = .0002), 2) Tension about Uncertainty or Physical Danger subscale from the TPQ (b = .45, p < .0001), Depression scores from the BDI (b = -.27, p = .03), and 4) family history (b = -.27, p = .01). FH+ exhibited lower stress reactivity. These findings suggest that personality factors in combination with FH influence stress reactivity and may serve as risk markers for the development of substance use disorders among healthy males.

Abstract 1503

CHANGE OF BARORECEPTOR SENSITIVITY (BRS) DURING MENTAL STRESS TESTING PREDICTS PSYCHOTHERAPY OUTCOME
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Background: Growing interest in the relationship between autonomic regulation and mental disorder has stimulated a large body of research. One area of interest concerns psychophysiological predictors of psychotherapy outcome. Methods: In a pilot study, cardiac reactions to mental stress-testing (heart rate, blood pressure, stroke index, baroreceptor sensitivity) were measured in response to a psychological stressor and personality measures (California Personality Inventory (CPI), Tridimensional Personality Questionnaire) in 65 males with and without a family history of alcoholism (FH+; FH-). Participants were enrolled in the initial phase of inpatient psychotherapy in 20 subjects (14 women and 6 men, mean age 29.6, SD 8.26) with depression and without heart disease. Aggregated data of cardiac parameters were assessed during induced stress (mental arithmetic and anger recall) and relaxation. A reactivity measure was defined as the difference between stress and relaxation. This measure was correlated with psychotherapy outcome, as measured by baseline-adjusted residual scores on the Global Severity Index (GSI) of the Symptom Check List 90 revised. Results: During the three months of psychotherapy, mean GSI decreased from 1.42 (SD .47) to .58 (SD .26). BRS reactivity significantly predicted GSI-residuals (r = -.57, p < .01, two-tailed) and remained the only significant predictor after controlling for age, sex, initial negative affect, social inhibition and cardiac parameters in a multiple regression model. Conclusion: Higher initial BRS-reactivity is associated with better psychotherapy outcome. Despite the small sample size our data indicate that better autonomic functioning may be connected to psychotherapy outcome in a linear way. BRS reactivity as a marker for the vagal component of autonomic regulation may also be a promising candidate for predicting long term effects of psychotherapy.

Abstract 1407

DOES PANIC DISORDER INCREASE THE RISK OF CORONARY HEART DISEASE? A RETROSPECTIVE COHORT STUDY OF THE INTEGRATED HEALTH CARE INFORMATION SERVICES DATABASE
Andres Gomez-Caminero, Global Epidemiology and Outcomes Research, BMS, William Blumentals, Epidemiology, Procter & Gamble, Regina Brown, WWEmployeeiology, R&D, GlaxoSmithKline, Ruby Castilla-Puentes, Psychiatry and Epidemiology, UNC School of Medicine and GSK, WWEmployeeiology, Leo Russo, Benefit-Risk Management (BRM), Johnson & Johnson R&D LLC

The association between panic disorder (PD) and acute myocardial infarction (AMI) among men was examined in the Integrated Healthcare Information Services National Managed Care Benchmark Database (IHCIS). The IHCIS is a fully de-identified, HIPAA-compliant database and includes complete medical history for more than 17 million managed care lives; data from more than 30 US health plans, covering seven census regions; and patient demographics, including morbidity, age and gender. A total of 39,920 PD patients and an equal number of patients without PD were included in the retrospective cohort study. Logistic regression analyses were performed to assess the adjusted risk of AMI that accounted for age at PD diagnosis, smoking, obesity, depression and medications including ACE inhibitors, beta blockers and statins. The cohort of patients with PD were observed to have a two-fold increase in the risk for AMI (HR=1.87, 95% CI=1.80, 1.91) after adjusting for age at PD diagnosis, smoking, obesity, and use of ACE inhibitors, beta blockers and statins. Some evidence of a possible trend toward increased risk was detected by depression diagnosis group. After controlling for the aforementioned covariates and compared to patients without a diagnosis of depression, it was noted that patients with a comorbid diagnosis of depression were almost three times more likely to develop an AMI (OR=2.6, 95% CI=2.30, 3.0). The risk of AMI associated with a diagnosis of PD suggests close monitoring by cardiologists and internists of these patients in order to ensure a reduction in the risk of AMI.
GIRLS SHOW GREATER RESPONSES TO CRH CHALLENGE OVER PUBERTY: THE PITTSBURGH PSYCHOBIOLOGIC STUDIES
Laura Stroud, Psychiatry and Human Behavior, George Papandonatos, Center for Statistical Sciences, Brown Medical School, Providence, RI, Douglas Williamson, Ronald Dahl, Child and Adolescent Psychiatry, University of Pittsburgh Medical School, Pittsburgh, PA

Given links between depression and alterations along the HPA axis, we propose that sex differences in HPA regulation over puberty may be one mechanism underlying the emergence of sex differences in depression over puberty. We examined sex differences in cortisol responses to CRH challenge across pubertal stages in carefully screened controls pooled from three phases of the Pittsburgh Psychobiologic Studies. Participants ranged in age from 7-16, were physically healthy with no current, personal, or family history of psychiatric disorder. 211 afternoon CRH challenge sessions were completed, including 30-40 minutes pre-infusion baseline, 1 µg/kg CRH infusion, 90-180 minutes of post-infusion measures, and 9-10 plasma cortisol samples. Physician-rated Tanner staging was also conducted. We developed a nonlinear mixed model to fit the data then examined the influence of gender and Tanner stage on model parameters. Although no significant gender by Tanner interactions emerged for baseline slope, we found significant gender by Tanner interactions for time to peak response and total cortisol response to CRH (p<.05). Girls showed slower time to peak cortisol response over Tanner stages 1/2, 3, and 4/5 (30, 35, and 41 min), while boys showed little change over puberty (33, 32, 31 min). Overall, however, girls showed increasing total cortisol responses to CRH across Tanner stages (709, 819, and 945 µg/dl/min), explained by slower recovery from peak cortisol levels. Boys showed similar total responses across Tanner stages (898, 881, 865 µg/dl/min). Results show subtle sex differences in the influence of puberty on HPA regulation at the pituitary level. Given sex differences in carefully screened adolescents, future research should examine whether more or less pronounced sex differences emerge in depressed or high-risk adolescents.

HEART RATE AND BLOOD PRESSURE VARIABILITY, AND BAROREFLEX SENSITIVITY IN PATIENTS WITH EATING DISORDERS
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Anorexia nervosa (AN) has a significant risk for sudden death because of cardiac complications. Previous studies show AN has abnormalities of the autonomic nervous system and these abnormalities may be one of the reason of cardiac dysfunction. Bulimia nervosa (BN) is also reported abnormalities of the autonomic nervous system. However, few studies investigated heart rate variability (HRV), blood pressure variability (BPV) and baroreflex sensitivity (BRS). Therefore, the aim of this study was to investigate autonomic nervous function in AN and BN patients by analyzing HRV, BPV and BRS. Cross-spectrum between R-R interval and systolic blood pressure was measured for 10 minutes in the supine position. HRV and BPV were analyzed with the fast Fourier Transform. Power of each spectrum was calculated for the low (LF, 0.04-0.15 Hz) and the high (HF, 0.15-0.40 Hz) regions. Cross-spectrum between R-R interval and systolic blood pressure in the LF region was used to calculate the magnitude of the transfer function between systolic blood pressure and R-R interval as an index of BRS when coherence exceeded 0.5. Each variable was compared among the three groups. Using one-way analysis of variance (ANOVA), and Tukey's multiple comparison test, BMI in AN patients was compared among the three groups. Participants ranged in age from 7-16, were physically healthy with no current, personal, or family history of psychiatric disorder. 211 afternoon CRH challenge sessions were completed, including 30-40 minutes pre-infusion baseline, 1 µg/kg CRH infusion, 90-180 minutes of post-infusion measures, and 9-10 plasma cortisol samples. Physician-rated Tanner staging was also conducted. We developed a nonlinear mixed model to fit the data then examined the influence of gender and Tanner stage on model parameters. Although no significant gender by Tanner interactions emerged for baseline slope, we found significant gender by Tanner interactions for time to peak response and total cortisol response to CRH (p<.05). Girls showed slower time to peak cortisol response over Tanner stages 1/2, 3, and 4/5 (30, 35, and 41 min), while boys showed little change over puberty (33, 32, 31 min). Overall, however, girls showed increasing total cortisol responses to CRH across Tanner stages (709, 819, and 945 µg/dl/min), explained by slower recovery from peak cortisol levels. Boys showed similar total responses across Tanner stages (898, 881, 865 µg/dl/min). Results show subtle sex differences in the influence of puberty on HPA regulation at the pituitary level. Given sex differences in carefully screened adolescents, future research should examine whether more or less pronounced sex differences emerge in depressed or high-risk adolescents.

NEUROTIISM AND AUTONOMIC FUNCTION IN FEMALE TWINS
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Neuroticism is a popular personality measure in psychopathological research because of its highly predictive value for onset, duration and severity of psychopathology. In spite of this, the neuroticism concept largely remains a 'simple score on a questionnaire'. This severely limits the use of neuroticism as an explanatory concept in etiological theory and research of psychopathology. Unraveling the psychological and physiological stress mechanisms that underlie individual differences in neuroticism might indicate why neuroticism reflects vulnerability to mental disorders. In the current study, in 124 female twin pairs (18-30 years), the association between neuroticism and cardiovascular measures is investigated. Neuroticism was evaluated by the NEO-FFI inventory. The median value on neuroticism scores was divided to divide the women into a high and low neuroticism group. Autonomic function was assessed by inter-beat interval (IBI), heart-rate-variability (HRV) and baroreflex sensitivity (BRS), during standardized laboratory rests and mental stress tasks. As expected, lower IBI (F=14.4, p<0.001) and HRV (F=5.9, p=0.001) values were found during the stress tasks compared to the rest measures. Preliminary analyses showed that highly neurotic women had lower HRV than those with low scores (F=4.6, p<0.004). These findings suggest that high neuroticism is associated with a dysregulated stress system. The presentation will concern associations between neuroticism and cardiovascular measures, and their genetic and environmental basis.
Objective: The treatment of major depressive disorder (MDD) remains a difficult issue for clinicians because 20% of all patients diagnosed with this illness remain refractory to treatment. In recent years, interest has grown in the medical and lay literature in dietary use and supplementation with Omega 3 Fatty Acids (O3FA), as a treatment for MDD. The authors performed a meta-analysis of the literature on treatment of MDD with O3FA to determine if there is evidence to support the clinical efficacy of this treatment. Method: Articles were obtained using the Medical Subject Heading (MeSH) database of Medline, searching the reference section of relevant articles and contacting authors of selected papers. Results: Five articles were included in the analysis. The primary outcome measure was change in the depression rating scale included as the primary measure in each paper. Three of the five studies found supplementation with O3FA to be significantly effective in improving MDD. The overall effect, using a random effects model, showed a reduction in MDD scale scores greater than that in the placebo group (t= -0.85, 95% CI=(-1.60, -0.09)). Conclusion: This meta-analysis shows that O3FA may be effective in the treatment of MDD. However, there are a number of limitations, which limit broad application of this evidence at this time.

Abstract 1651
SELECT DIMENSIONS OF PERSONALITY, PERFORMANCE STRESSORS, AND PHYSIOLOGICAL SYMPTOMS IN ELITE CLASSICAL MUSICIANS
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We sought to explore the nature, causes and impact of stress in classical musicians and to explore associations with personality traits related to attentional and emotional styles. Participants were 34 classical music students (Performance majors) from The Juilliard School in New York City (Aged 18-31; 50% female; 61% Caucasian). Assessments were self-report inventories of attentional style, anxiety, performance stressors, and stress-related symptoms including: Tellegen Absorption Scale (TAS), Dissociative Experiences Scale (DES), Differential Attentional Processes Inventory (DAPI) subscales, Spielberger State-Trait Anxiety Inventory (STAI), and Performance Symptoms and Concerns Questionnaire (PSCQ). Participants exhibited higher than normative scores on the DES (Mean = 20.0; SD = 12.8) and DAPI (e.g., Extremely Focused Attention subscale Mean = 58.32; SD = 20.0). Most participants reported moderate to severe concern with "making a mistake" (88%) or "having a memory slip" (68%). Most participants reported being bothered by one or more symptoms before and during performances, including cold hands, racing heartbeat, shaking fingers, and sweaty hands. Participants reported high stress during competitions (Mode = 8.0/10.0), auditions (Mode = 9.0/10.0), and before performances (Mode = 8.0/10.0). Physiological symptoms were associated with performance concerns (r = .62; p < .001) and perceived stress (r = .52; p < .01). Performance stress was moderately associated with Trait Anxiety (r = .42; p < .05); DES scores were moderately associated with post-performance symptoms (r = .46; p < .01). These exploratory findings suggest performance stress and stress-related symptoms are serious problems for classical musicians that appear to be associated with trait anxiety and dissociative tendencies. Further research and clinical interventions are needed to address the specific mechanisms, causes and consequences of stress in classical musicians.

Abstract 1479
REGIONAL CEREBRAL BLOOD FLOW CHANGES IN PATIENTS WITH POST-TRAUMATIC STRESS DISORDER
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Purpose of the current study is to explore regional cerebral blood flow changes in patients with post-traumatic stress disorder (PTSD). We investigated the regional cerebral blood flow of 13 subjects with PTSD among survivors of Taegu subway fire and 20 healthy comparison subjects. One hundred ninety two people were killed in the intense fire during a 15-minute period in February 2003 and there were several hundred survivors. All subjects were without current medical problems and without comorbid psychiatric disorders prior to the fire. Technetium-99m-hexamethyl-propyleneamine oxide single photon emission computed tomography (Tc99m-HMPAO-SPECT) was conducted for the assessment of the regional cerebral blood flow. Brain regions with significant difference of the regional cerebral blood flow between the subjects with PTSD and the healthy comparison subjects were defined by the Statistical Parametric Map 99 (SPM 99). Subjects with PTSD had decreased regional cerebral blood flow in right thalamus, compared to the healthy comparison subjects (p<0.05 corrected for multiple comparison). In addition, to a lesser degree, subjects with PTSD had increased regional cerebral blood flow in right superior parietal gyrus, right middle temporal gyrus, right precentral gyrus, compared to the healthy comparison subjects (all uncorrected p<0.001). The pattern of decreased blood flow in thalamus and increased blood flow in cortex in PTSD is consistent with the suggestion that PTSD patients are less sensitive to external sensory stimulus, as most sensory input pass through thalamus. Changes of blood flow in right thalamo-cortical areas may also underlie the common clinical manifestation in PTSD, such as dissociation, numbing, re-experience, impairments in sensory processing, and affective dysregulation.

Abstract 1677
THE MINI-COG IS ASSOCIATED WITH FUNCTIONAL IMPAIRMENT IN ELDERLY ITALIANS
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We examined relationships between the Mini-Cog and functional health indices. We hypothesized an inverse relationship between disability and Mini-Cog scores and that the Mini-Cog would be free from educational biases. The Mini-Cog, a brief cognitive impairment screen, was included in a survey of 2369 older Italians (age 65+). Mini-Cog scores range from 0 (most impaired) to 5 (most normal). Previous data suggested that dementia reached 95% when Mini-Cog=0. Lacking formal dementia diagnoses, Mini-Cog scores were used as proxies for more extensive cognitive assessment. A standardized survey was administered to a randomly selected population sample from 12 Italian provinces. To examine education effects, we compared subjects with 4 years or less of schooling vs. those with 5+ years (education mean + SD=5.73+3.8). Mini-Cog scores declined with age. When subjects with high Mini-Cog scores (Mini-Cog=5) were compared with subjects with low Mini-Cog scores (0), significant differences were found for all functionality measures (activities of daily living, social activities, physical exercise, phone conversation, self-rated health, and the ability to control urination, understand conversation, and read newspapers, all chi squares>7.7, all p<.01). High and low education subjects differed in mean Mini-Cog score. However, when subjects with the same Mini-Cog scores, but different educational levels were compared, functionality measures were similar. These results suggested that high/low education difference in mean Mini-Cog scores reflected differences in functional abilities, rather than test biases. Results in this large Italian sample suggests that low Mini-Cog scores are associated with many functional disabilities. The Mini-Cog shows educational differences, but these differences do not appear to underestimate functional abilities of poorly educated subjects.
THE EFFECT OF EXERCISE DOSE ON QUALITY OF LIFE IN DEPRESSED ADULTS
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We wanted to determine the effect of energy expenditure on quality of life (QOL) among participants in The Depression Outcomes Study of Exercise, a 12-week trial to determine the efficacy of exercise to treat mild to moderate depressive disorder (MDD). Eighty men and women were randomized to 1 of 5 exercise doses (5 treatment cells): 7.0 kcal/kg/week in 5 days/week (LD), 17.5 kcal/kg/week in 3 days/week (PDH), 17.5 kcal/kg in 5 days/week (PHD), or 15-20 minutes of stretching for 3 days/week (Control). Thirty-five participants with complete baseline and 12-week data were included in this analysis. Depressive symptoms were measured with the Hamilton Rating Scale for Depression (HRSD). QOL subscales of mental health, vitality, and physical functioning were measured with the Short Form Health Survey (SF-36). Mean change scores for SF-36 subscales in the PHD and LD groups respectively were: mental health = 6.7 (SD=3.9) 5.0 (SD=3.5); vitality = 6.1 (SD=3.6) 4.8 (SD=3.8); physical functioning = 0.7 (SD=2.0) -0.3 (SD=3.5). Analysis of variance (ANOVA) found no significant association between exercise dose and QOL. A second ANOVA including HRSD change scores further reduced the variability in QOL explained by exercise dose. In this model HRSD change was associated with changes in the mental health subscale (F=5.46; p=0.03). There were no significant findings for vitality or physical functioning. Results suggest that change in depressive symptoms accounted for changes in the mental health component of QOL and that energy expenditure does not influence QOL. Results should be interpreted with caution because of sample size and a potential lack of sensitivity of the SF-36. Supported by NIMH Grant MH57031/MH067692.

EFFECT/REWARD IMBALANCE, OVERCOMMITMENT AND SELF-REPORTED HEALTH: IT'S THE INTERACTION THAT MATTERS MOST
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In recent years, the effort-reward-imbalance (ERI) model has become a widely used framework to examine job characteristics and health. There is a paucity of data investigating the relative contribution of the components of the ERI model (effort-reward imbalance/overcommitment) to the explanation of impaired health-related quality of life, sleep problems, increased risks of vital exhaustion, and depressed mood. We conducted a cross-sectional study amongst 1,894 employees (mean age 39.7, SD 11.86 years; 86.8% male) from two separate production plants in the airplane manufacturing industry in Southern Germany. Participants were subdivided into two by two groups according to effort-reward-imbalance status and overcommitment scores. Multivariable and Univariate regression analyses were used with either of the four subgroups coded as dummy variables. Subjects reporting high effort-reward imbalance or high overcommitment had a decreased health-related quality of life and higher risks of sleep problems, vital exhaustion, and depressive mood. The observed effects (standardized beta coefficients) were generally larger in those employees reporting both high imbalance between effort and reward and overcommitment as compared to individuals reporting effort-reward imbalance or overcommitment only. Interaction between perceived imbalance and high overcommitment particularly predicted vital exhaustion (1.11 SD), depressed mood (0.04 SD), and SF12 mental health (0.90 SD). This study underscores the predictive validity of the ERI model on employee's health. The data suggests that the interaction of effort-reward imbalance and overcommitment is the strongest risk factor of poorer self-reported health in terms of SF12 subscales, sleep problems, vital exhaustion and depressed mood.
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Health risk in old age arises in part from dysregulation of the neuroendocrine system, which can be exacerbated by psychosocial stress. Environmental disruptions are commonly studied as sources of stress, but few have investigated the effects of cognitive styles. Higher levels of negative repetitive thought (RT), an uncontrollable and repetitive focus on negative topics, have the potential to create or enhance subjective stress and contribute to neuroendocrine dysregulation. Married older adults (n = 26; mean age = 76; 62% female) completed questionnaires at baseline and collected saliva samples at 6-month intervals (1 wave = 4 samples/day over 5 days; median = 3 waves). Eleven had spouses diagnosed with dementia (median months since diagnosis = 17). Multi-level models tested the effects of spousal illness and negative RT on cortisol dynamics across waves. Both spousal illness (p < .05) and negative RT (p < .02) significantly predicted lower diurnal intercept, but not diurnal slope or area under the curve. Examination of sampling times showed that spousal illness and negative RT were specifically and significantly associated with lower waking cortisol. Those with ill spouses and high levels of negative RT had predicted waking cortisol of 0.245 ug/dl, less than half that for those with well spouses and low levels of negative RT, 0.542 ug/dl. This effect was independent of age, sex, passage of time, and depression. Spousal illness and negative RT predisposed older adults to morning hypocortisolemia. Furthermore, the effect of RT (22% of waking function) significantly associated with cortisol across waves. Those with a high score in negative RT were characterized by a lower cortisol response to awakening and stressors. In a longitudinal study, cortisol levels can be used to assess the potential to create or enhance subjective stress and contribute to neuroendocrine dysregulation. Therefore, the aim of this study was to compare autonomic function at moments when symptoms occurred with at randomly scheduled moments without symptoms in MCS patients in their natural settings by analyzing HRV using an ecological momentary assessment. The subjects were 14 MCS patients (36.7 ± 7.3 yr). Beat-to-beat RR intervals were measured continuously for 7 days using a portable, long-term ambulatory monitor. They also underwent one-week measurement of physical and psychological symptoms with watch-type electronic diaries at randomly scheduled moments at event-driven moments when symptoms occurred. We used the smoothed-pseudo-Wigner-Ville distribution (SPWVD) to analyze HRV, which is a time-frequency analysis and has the advantage of providing instantaneous information about autonomic function under non-stable physiological conditions. Linear mixed models were used to compare HRV variables from SPWVD between moments when symptoms occurred and randomly scheduled moments without symptoms. There were significant main effects of symptom occurrence in RRI (p < 0.01) and in the ratio of low frequency power to high frequency power (LF/HF) (p < 0.01), and in instantaneous center frequency (p = 0.02). There were also significant interactions of symptom occurrence x time in HF (p = 0.04) and maximal LF power (p = 0.03). In conclusion, changes in autonomic nervous function may be accompanied in MCS patients when symptoms occur.

Abstract 1280

SPOUSAL ILLNESS AND NEGATIVE REPETITIVE THOUGHT PREDICT MORNING HYPOCORTISOLEMIA IN OLDER ADULTS

Abstract 1282

REAL-TIME ASSESSMENT OF HEART RATE VARIABILITY IN NATURAL SETTINGS IN MULTIPLE CHEMICAL SENSITIVITY USING AN ECOLOGICAL MOMENTARY ASSESSMENT

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Multiple chemical sensitivity (MCS) has been reported to be associated with autonomic nervous system dysfunction. However, previous studies examined autonomic nervous function not in natural settings, but in laboratory settings. Moreover, they used simple heart rate or blood pressure changes and did not study heart rate variability (HRV), which is recently used as autonomic nervous function. Therefore, the aim of this study was to compare autonomic function at moments when symptoms occurred with at randomly scheduled moments without symptoms in MCS patients in their natural settings by analyzing HRV using an ecological momentary assessment. The subjects were 14 MCS patients (36.7 ± 7.3 yr). Beat-to-beat RR intervals were measured continuously for 7 days using a portable, long-term ambulatory monitor. They also underwent one-week measurement of physical and psychological symptoms with watch-type electronic diaries at randomly scheduled moments at event-driven moments when symptoms occurred. We used the smoothed-pseudo-Wigner-Ville distribution (SPWVD) to analyze HRV, which is a time-frequency analysis and has the advantage of providing instantaneous information about autonomic function under non-stable physiological conditions. Linear mixed models were used to compare HRV variables from SPWVD between moments when symptoms occurred and randomly scheduled moments without symptoms. There were significant main effects of symptom occurrence in RRI (p < 0.01), in the ratio of low frequency power to high frequency power (LF/HF) (p < 0.01), and in instantaneous center frequency (p = 0.02). There were also significant interactions of symptom occurrence x time in HF (p = 0.04) and maximal LF power (p = 0.03). In conclusion, changes in autonomic nervous function may be accompanied in MCS patients when symptoms occur.

Abstract 1144

GENDER IDENTITY AS A PREDICTOR OF CARDIOVASCULAR REACTIVITY

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Earlier research suggests that cardiovascular reactivity (CVR) is, in part, a function of the interaction between one's gender identity and the gender relevance of a stressor. According to this model, individuals who adhere to the masculine gender role should show greater CVR to masculine relevant stressors, than individuals who identify with feminine gender role values. The purpose of the present study was first to examine the relationship between gender identity and CVR, and second to evaluate different measures of gender identity. Participants included 38 healthy students (19 men, 19 women) aged between 17 and 36 years (M = 21.0). Participants were exposed to a variant of the Trier Social Stress Test in which they had to deliver a speech for a job application (5 min) and perform a N-back task (5 min) in front of a jury. As work and performance are two important aspects of the masculine gender role, this stressor was defined as masculine relevant. Systolic blood pressure, diastolic blood pressure, and heart rate were continuously measured, whereas stroke volume, cardiac output, and total peripheral resistance were computed from these parameters. Gender identity was assessed with three explicit and two implicit measures. Multiple regression analyses indicate that gender identity as measured by the Implicit Association Test predicted higher reactivity (Beta = .57, p < .003), and slower recovery (Beta = .48, p = .015) on systolic blood pressure. That is, masculine participants showed higher responses during the performance of and the recovery from the stressor, than feminine participants. None of the other gender identity measures were significant predictors of CVR during the anticipation, stressor, or recovery period. Results suggest that CVR, at least on systolic blood pressure, is a function of the interaction between gender identity and the gender relevance of a stressor.

Abstract 1446

REAL-TIME ASSESSMENT OF PSYCHOSOCIAL FACTORS PREDICTING ADVERSE MEDICATION EVENTS: PRELIMINARY DATA FROM A MULTISITE STUDY OF PHYSICIANS AND NURSES

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Purpose: Adverse medication events are a common and significant problem in health care settings, yet we know little about the behavioral, cognitive, and emotional factors that may contribute to their occurrence. This study adapts ecological momentary assessment methods through the use of palm-held computers to sample information about work and psychological characteristics of hospital providers at random intervals across their workdays. Medication events are recorded through several institutional and self-report channels. Method & Sample: Participating providers carry palm-held units installed with study-designed software for the collection of random surveys, self-reported medication events, and demographic information. Physicians and nurses complete similar but customized surveys assessing factors such as case volume, perceived workload, stress and other emotional variables, and work setting characteristics. The software randomly assesses providers approximately 6 times a day over 90-minute intervals. Assessments of sleep quality, memory function, and demographic factors are collected on a daily or one-time basis. The assessments are each based on validated tools customized for use with the palm computers. Daily surveys take approximately 90 seconds to complete. Results: A total of 138 physician and nursing providers across four San Diego hospitals carried palm-held computers over the course of week-long shifts. To date, we’ve completed 1485 days of data collection, with more than 5300 completed random daily surveys. Our analysis of response burden indicates providers completed roughly 60% of survey prompts, with another 20-25% of partial completions, and 15-20% non-responses. This report describes psychosocial provider characteristics in relation to work setting variables, details the palm data collection software, and discusses the ways in which this information will aid in the understanding and prevention of adverse medication events.
Dieting, one of the most common treatments for obesity, is effective for weight losses of up to 10% in the short-term. However, dieting (defined as the restriction of caloric intake) has not proved effective in maintaining these losses over the long-term. The purpose of this study was to determine whether or not dieting, instead of being an effective treatment for obesity, might actually be a chronic stressor. Chronic stress leads to prolonged activation of the hypothalamic-pituitary-adrenocortical axis, which then leads to hypercortisolism, which in turn leads to increased insulin resistance, which finally leads to increased visceral obesity. Thus, if dieting is indeed a chronic stressor, dieting may lead not only to negative health outcomes associated with chronic stress, but also ironically back to weight gain. To investigate the relationship between dieting and chronic stress, a longitudinal study was conducted. We hypothesized that dieting at baseline would predict future stress. In exchange for course credit or payment, 114 female undergraduate participants visited the lab at baseline and nine weeks later. At both time points, dieting was measured using the Dietary Restraint Scale, the most commonly used measure of dieting (Polivy, Herman, & Howard, 1988). The outcome measure used was the Perceived Stress Scale (PSS), the most commonly used measure of chronic stress (Cohen, Kamarck, & Mermelstein, 1983). The Social Readjustment Ratings Scale (SRRS; Holmes & Rahe, 1967) was also used to assess the number and severity of all stressors of participants. Participants' weight was also measured. Dieting and perceived stress were correlated at baseline ($r = .28, p = .001$). In addition, dieting at baseline predicted perceived stress nine weeks later, controlling for baseline stress and the total number of stressors ($r = .20, p = .002$). The mean weight change was not significant at an increase of .83 pounds. This study offers evidence that supports the hypothesis that dieting is a chronic stressor. As chronic stress leads to a host of negative health outcomes including visceral obesity, further research testing a causal relationship between dieting and chronic stress is warranted.

**Abstract 1568**

**ASSOCIATION OF CLINICAL SEVERITY AND PSYCHIATRIC MORBIDITY IN PATIENTS WITH PSORIASIS: A FOLLOW-UP STUDY**

**Francesca Sampogna, Angelo Picardi, Paolo Pasquini, Eva Mazzotti, Cornella De Pità, Damiano Abeni, and the IMPROVE Investigators, Istituto Dermopatico dell'Immacolata IDI-IRCCS, Rome, Italy**

Purpose of the study. To analyze changes in presence of psychiatric morbidity and their association with clinical improvement or worsening of psoriasis. Subject sample and methods. Adults hospitalized at IDI-IRCCS from Feb. 2000 to Feb. 2002 with psoriasis were given the self-administered Psoriasis Area and Severity Index (SAPASI) and the 12-item General Health Questionnaire (GHQ-12). The SAPASI allows a clinical assessment of psoriasis by the patient, and the GHQ-12 is a self-administered instrument designed to detect minor, non-psycho logical psychiatric disorders. GHQ-12 scores were computed collapsing adjacent responses to obtain a dichotomous scoring (0-0-1-1). The cut-off threshold ($c = 4$) we used for case identification has been shown to maximize sensitivity and specificity of GHQ-12 in a dermatological setting. After hospital discharge, patients were given the same selfadministered questionnaires and were asked to complete and return them after a month. Summary of results. A total of 414 patients completed both the SAPASI and the GHQ-12 at baseline and follow-up. At baseline there were 201 GHQ-positive patients (48.5%) and one month later the prevalence of cases was 34.7%. SAPASI was improved in 352 patients (85%), and worsened or unchanged in the others. Among patients with improved SAPASI, 49.7% of GHQ-cases became non-cases, while among people with worsened or unchanged SAPASI only 17.6% became non-cases ($p = 0.0006$). On the other side, non-cases that became cases were 25.0% among patients with worsened or unchanged psoriasis and 14.9% among clinically improved patients ($p = 0.093$). Results were very similar in men and women. Conclusion. Minor psychiatric disorders are very frequent in patients with psoriasis. We observed that improvement in clinical severity was associated with a decreased frequency of psychiatric disturbance. However, in a substantial proportion of patients psychiatric morbidity persisted. Even in presence of effective dermatological treatment, psychiatric support seems to be needed.

**Abstract 1451**

**STRESS, CORTISOL REACTIVITY, AND SKIN BARRIER RECOVERY**

**Theodore F. Robles, Psychology, The Ohio State University, Columbus, OH**

In this study, we report preliminary findings from an ongoing study of brief laboratory stress, cortisol reactivity, and a clinically relevant health outcome: the skin’s ability to heal. Brief laboratory stressors, such as a public speaking, and naturalistic stressors such as academic exams delay skin barrier recovery within 3 hr after skin disruption. Our study provides new data on the theory that stress-related increases in cortisol inhibit immune and epithelial processes involved in skin repair. The skin barrier was disrupted in 32 participants through tape stripping, involving repeated applications of cellophane tape on an area of the dominant forearm. After random assignment to a non-stressful reading task (N=10) or the Trier Social Stress Test (TSST; N=22), skin barrier recovery was measured by assessing transpidermal water loss from the stripped site. Analyses to date showed no differences in skin barrier recovery between the two groups. Salivary cortisol was collected at regular intervals until 90 min after the tasks, and reactivity was determined by computing area under the curve. The TSST group showed larger cortisol reactivity compared to the non-stress group ($p < .001$). In addition, for non-stressed participants, cortisol reactivity was negatively correlated with skin barrier recovery at 2 hr post-distruption ($r = -.68, p = .03$). For TSST participants, cortisol reactivity was also negatively correlated with skin barrier recovery ($r = -.18, ns$), suggesting that cortisol levels are related to skin barrier recovery, but only under non-stressful conditions. Taken together, this study integrates physiological measurements with measures of a clinically relevant health outcome - skin barrier recovery. Indeed, prolonged barrier recovery exacerbates skin disease symptoms and indicates slower wound healing. As such, data from this ongoing study will provide more insight into the relationship between stress, physiological changes, and health.

**Abstract 1636**

**HOW LONG DO YOU SLEEP? A COMPARISON OF SUBJECTIVE AND OBJECTIVE MEASURES OF SLEEP DURATION**

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Sleep duration is an important variable to assess in research and clinical settings. Often, people inaccurately report health behaviors such as diet, and it may be true of sleep as well. We compared subjective assessments of total sleep time (TST) with objective measures of TST as part of a larger study. 21 healthy right-handed people, with normal sleep patterns participated. This study included a telephone interview that asked "On average, what time do you go to bed" and "wake up". Participants then completed the Horne-Ostberg Morningness-Eveningness Scale (HOMES) that asked about preferred bed and wake times; and underwent 2 weeks of actigraphy, when they: continuously wore a watch-sized accelerometer that recorded activity and quiescence; and noted bed and wake times in a diary. Daily TST was recorded directly from the actigraph and was averaged over the 2 weeks. TST from the subjective methods was correlated with actigraphy and journal entries by Pearson's R. TST recorded by actigraphy (445 +/- 117 Min) was highly correlated with TST from the interview (449 +/- 151 Min), and was modestly correlated with TST assessed by HOMES (500 +/- 121 Min). A similar pattern held when comparing TST from the interview and HOMES. These results suggest that: 1) People are accurate in describing their sleep duration; and 2) People are fairly good at obtaining what they see as their preferred sleep durations.

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PHLEBOTOMIST INTERPERSONAL SKILL PREDICTS THE EXPERIENCE OF VASOVAGAL REACTIONS IN VOLUNTEER BLOOD DONORS
Kendra R. Stewart, Christopher R. France, Psychology, Ohio University, Athens, OH, Aaron W. Rader, Central Ohio Region Blood Services, American Red Cross, Columbus, OH, Jesse C. Stewart, Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA

The experience of vasovagal reactions to blood donation (e.g., faintness, dizziness, weakness) may deter donors from returning for future donations. In the present study, the interpersonal skill of phlebotomists was investigated as a potential predictor of vasovagal reactions. Participants were 70 phlebotomists (76% female, 27% non-Caucasian, mean age = 40.1 years) employed by the Central Ohio Blood Services Region of the American Red Cross. Phlebotomists completed the Social Skills Inventory, a self-report measure of interpersonal skills. For each phlebotomist, data concerning vasovagal reactions were retrieved for the donations that they conducted during a 30-day period 6 months before they completed the Social Skills Inventory. The final data set included 8,669 donors (49% female, 9% non-Caucasian, mean age = 40.8 years). Multilevel logistic regression analyses were performed with donor characteristics (age, sex, race, and first-time donor status) at level 1 and phlebotomist characteristics (age, sex, race, training experience, and interpersonal skills) at level 2. Overall, 3.3% of the total variance in donor vasovagal reactions was at the phlebotomist level. After controlling for other donor and phlebotomist characteristics, total score on the Social Skills Inventory was negatively related to donor reactions (B = −0.16, SEB = 0.06, p < 0.01). Specifically, a one standard deviation increase in Social Skills Inventory score was associated with a 14% reduction in the likelihood of vasovagal reactions among volunteer blood donors, and therefore, training aimed at enhancing phlebotomist interactions with donors may enhance the overall blood donation experience.

Abstract 1169
OPPOSITE EFFECT OF NEGATIVE AND POSITIVE AFFECTS ON COAGULATION RESPONSES TO ACUTE MENTAL STRESS AND RECOVERY IN MEN
Roland von Kanel, General Internal Medicine, University Hospital, Berne, Switzerland, Daniel Preckel, Brigitte M. Kudielka, Joachim E. Fischer, Behavioral Sciences, Federal Institute of Technology, Zurich, Switzerland

Acute mental stress evokes a hypercoagulable state. We investigated whether positive or negative affects or both would affect the procoagulant stress response. 27 healthy men (mean age 47±8 years) completed six psychological scales to assess negative affects: SF-12 mental subscale, 9-item vital exhaustion (VE) questionnaire, negative affectivity (NA) scale of the Type D personality inventory, Hospital Anxiety and Depression Scale, Penn State Worry Questionnaire. Positive affects were Profile of Mood States (POMS) vigor and perceived social support (SFSU). All subjects underwent the 13-min Trier Social Stress Test (combines preparation, job interview, and mental arithmetic). Von Willebrand Factor (vWF) antigen, fibrinogen, clotting activity of factor VII (FVII:C), FVIII:C, FXII:C, and D-dimer were determined in plasma immediately before and after stress. Of the 48 comparisons (8 psychological scales with change scores (d) in 6 coagulation measures from rest to post-stress) 17 turned out to be significant (p<.05 to p<.001): dWF correlated with SF-12 mental subscale (r = .42), VE (r = .62), type D NA (r = -.60), depression (r = -.47), worrying (r = -.45), social support (r = .42), and vigor (r = .46); dFibrinogen correlated with type D NA (r = .48) and depression (r = -.55); dFVII:C correlated with SF-12 mental subscale (r = .49) and vigor (r = .43); dFVIII:C correlated with SF-12 mental subscale (r = -.43), VE (r = -.40), worrying (r = -.40), and vigor (r = .51); dFXII:C correlated with anxiety (r = -.43); D-dimer correlated with SF-12 mental subscale (r = -.39). Perceived negative effects were consistently associated with an attenuated coagulation activation to stress, and the opposite was observed for positive affects. From an evolutionary perspective, we propose that positive affects increased survival of the human species by promoting rapid clotting and, therefore, less blood loss in fight or flight.

Abstract 1431
EXPERIENCE OF VASOVAGAL REACTIONS IN VOLUNTEER BLOOD PHLEBOTOMIST INTERPERSONAL SKILL PREDICTS THE
Roland von Kanel, General Internal Medicine, University Hospital, Berne, Switzerland, Brigitte M. Kudielka, Daniel Preckel, Katharina Mischler, Lilian Zgraggen, Joachim E. Fischer, Behavioral Sciences, Federal Institute of Technology, Zurich, Switzerland

Acute mental stress elicits hemocoagulation and increases blood cell counts. Habituation and sustenance of stress-hemoconcentration and stress leukocytosis, lymphocytosis, erythrocytosis, and thrombocytosis have not been investigated. Whether this stress-induced polycytosis is affected by concomitant plasma volume shift is elusive. We subjected 24 reasonably healthy men (47±7 years) to a 13-min mental stressor three times, one week apart. At weeks one and three, hematocrit, hemoglobin, and counts of leukocytes, lymphocytes, erythrocytes, and platelets were measured immediately before and after stress, and after 45 min and 105 min of recovery. All variables of interest significantly increased from rest to immediately post-stress (p's<.001). After 105 min of recovery, leukocytes and platelets both were higher, and hematocrit, hemoglobin, lymphocytes, and erythrocytes were all lower than at rest (p's between <.001 and <.05). At all four time points, hematocrit (p=.005) and erythrocytes (p=.006) were lower at week three than at week one. The magnitude of change in hemoconcentration and cell counts to stress and recovery did not habituate. Adjustment for stress-induced plasma volume shift altered findings: Elevated leukocytes post-stress persisted at 105 min (p=.001); any changes in lymphocytes became insignificant; erythrocytes decreased from rest to post-stress (p=.001) to increase again during recovery (p's<.05); platelets increased linearly between rest and 105 min of recovery (p=.005). Changes in hemoconcentration and blood cells during acute mental stress and recovery failed to habituate to stress repeats. Perturbation of hematological changes sustained for at least 105 min. Plasma volume shift accompanying stress affects the time course of stress polycytosis.

Abstract 1223
POLYSOMNOGRAPHIC MEASURES OF POOR SLEEP QUALITY CORRELATE WITH PROCOAGULANT ACTIVITY IN ALZHEIMER CAREGIVERS
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Alzheimer caregivers have elevated plasma levels of the hypercoagulability marker D-dimer providing one explanation for their increased cardiovascular morbidity. Sleep apnea is also associated with a hypercoagulable state. We hypothesized that adverse sleep physiology would relate to increased D-dimer in caregivers. 61 community dwelling Alzheimer caregivers and 37 gender-matched non-caretaking controls (mean age 73±9 vs. 68±7 years; p=0.006) underwent one full overnight polysomnography at their homes. D-dimer was measured in plasma by an enzyme-linked immunosorbent assay. Caregivers and controls had equal rates of sedating medications, cardiovascular disorders and risk factors. None of the sleep variables was associated with D-dimer in controls (p’s>.20). In caregivers, however, D-dimer correlated with total sleep time (TST) (r=.37, p<.004), wake after sleep onset (WASO) (r=.34, p=.008), sleep efficiency (SE) (r=.38, p=.003), rapid eye movement (REM) sleep (r=.27, p=.034), stage 2 sleep (r=.26, p=.040), slow wave sleep (r=.24, p=.061), and the apnea hypopnea index (AHI) (r=.34, p>.007). In stepwise linear regression, SE (R2=.14, p<.003), AHI (dR2=.11, p=.005), and stage 2 sleep (dR2=.065, p=.023) together explained 32% of the variance in D-dimer (p<.001). After controlling for age (R2=.39, p<.001), WASO still explained 5% of the unique variance in D-dimer (dR2=.047, p=.031). Compared to non-caretaking controls, objective measures of poor sleep are associated with a hypercoagulable state in Alzheimer caregivers. Much of this association was accounted for by age. However, even when controlling for age, sleep physiology may independently predict procoagulant activity in caregivers. Acknowledgement: Supported by AG15301.
TAKING CHARGE OF YOUR HEALTH: PATIENT INVOLVEMENT IN HEALTH CARE AND FUTURE SUBCLINICAL CAROTID DISEASE

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Research suggests that cardiac patients who assume a more active role in their health care have better post-surgical outcomes and show better compliance to medical regimens. Less is known about how these factors influence cardiovascular risk in initially healthy samples. The purpose of the present study was to examine the association between preferences for information and behavioral involvement in medical care (assessed via the Krantz Health Opinion Survey; KHOS) and subclinical carotid disease. Participants were 370 middle-aged women from the Healthy Women Study, a prospective investigation of health during and following the menopausal transition. The KHOS was administered 3 years following study entry, B-Mode ultrasound measures of intima-media thickness (IMT) and plaque in the carotid arteries were performed approximately 8-yr later when all women were post-menopausal. Women who reported greater behavioral involvement in health care had lower IMT (b = -.14, p < .01) and marginally less plaque (OR = 94, CI: .88, 1.01) compared to women who reported lesser behavioral involvement. The results for IMT persisted after statistically controlling for education, age, duration of follow-up, pulse pressure, smoking history, and triglycerides. Moreover, these results were independent of a general personality measure of instrumentality. Mediation analyses revealed that lifestyle factors including physical activity level and weight gain over the follow-up period partially attenuated the effect of behavioral involvement on IMT, but the effects were still significant. These results highlight the importance of the present trend in health care to encourage patients to be active participants in their health and well-being.

PERSISTENT POST-SURGICAL DEPRESSIVE SYMPTOMS AND LONG-TERM SURVIVAL FOLLOWING CORONARY ARTERY BYPASS SURGERY


In addition to physical benefits, successful coronary artery bypass grafting (CABG) surgery is associated with improved quality of life. However, many patients continue to experience depressive symptoms following successful intervention. Post-CABG depression is increasingly recognized as an important risk factor for mortality. The aim of the current study was to examine the effect of persistent depressive symptoms up to 18 months after surgery on long-term post-CABG mortality. A sample of 307 patients (214 men, 93 women) completed a modified Center for Epidemiological Studies Depression scale prior to elective CABG surgery and at 6 and 18-months post-CABG. Patients were followed for up to 12.4 years. There were 98 deaths (31.9%) over a mean follow-up of 11.02 years. Mean survival time for the sample was 8.2 years. Higher depressive symptoms at each time point were correlated with mortality. Survival analyses (Cox regression) controlling for age, sex, left ventricular ejection fraction, and diabetes showed no relationship between presurgical depressive symptoms and mortality. Presurgical depressive symptoms were controlled for in analyses of 6 and 18-month depressive symptoms on mortality. At 6 months post-CABG, a sex X depressive symptoms interaction was found, HR 1.13 (CI 1.0 to 1.3, p<.05). Follow-up analyses showed that males reporting higher depressive symptoms 6 months after CABG were at greater risk of mortality than those reporting fewer symptoms, HR 1.07 (CI 1.0 to 1.14). At 18 months, higher post-CABG depressive symptoms predicted mortality, HR 1.07 (CI 1.01 to 1.13, p<.02) suggesting long-term influence. The results of this study support persistent post-surgical depressive symptoms as an important risk factor for mortality following CABG.

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EFFECTS OF PRE-SURGICAL OPTIMISM ON 6 AND 18-MONTH DEPRESSIVE SYMPTOMS FOLLOWING CORONARY ARTERY BYPASS SURGERY


Depression is an important risk factor for cardiac morbidity and mortality following coronary artery bypass grafting (CABG) surgery. Less is known about specific predictors of post-surgical depressive symptoms amongst CABG patients. The aim of the current study was to examine pre-surgical optimism as a predictor of post-surgical depressive symptoms in a sample of CABG patients. Patients were 309 (215 men, 94 women) patients scheduled for CABG. Patients completed the LOT and CES-D measures prior to surgery and at 6 and 18-month follow-ups. The LOT pessimism items and optimism items were summed separately and a total LOT Optimism score was also calculated. We expected that higher pre-surgical total optimism and higher optimism subscale scores would predict less depressive symptoms and higher pre-surgical pessimism subscale would predict more depressive symptoms over time. Data were analyzed using stepwise multiple regression. Pre-surgical depressive symptoms were entered in the first block, pre-surgical optimism in the second block, and the gender X optimism interaction in the third. Total optimism, optimism and pessimism subscales were analyzed separately. Higher pre-surgical total optimism predicted fewer depressive symptoms at the 6 month, but not at the 18 month, follow-up. Higher pre-surgical optimism subscale predicted fewer depressive symptoms at the 6 month follow-up. An interaction between gender and pre-surgical optimism subscale was found for 18 month depressive symptoms such that males reporting more optimism prior to surgery reported fewer post-surgical depressive symptoms. Finally, higher pre-surgical pessimism predicted more depressive symptoms at the 6 month follow-up. These findings suggest that pre-surgical optimism and its components are important to short-term emotional adaptation following CABG and may have lasting effects for males.

TYPE D PERSONALITY IS INDEPENDENTLY ASSOCIATED WITH IMPAIRED HEALTH STATUS AND DEPRESSIVE SYMPTOMS IN CHRONIC HEART FAILURE (CHF)

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Background: Type D personality, defined by negative affectivity and social inhibition, is a determinant of quality of life in coronary patients. Little is known about this determinant in CHF. We examined whether Type D is associated with impaired health status, depressive symptoms and poor well being in CHF.

Methods: 84 outpatients (63 men and 21 women; mean 65±12.1 years) with systolic heart failure completed the DS14 (Type D), Minnesota Living with Heart Failure Questionnaire (MLWHFQ; health status), CES-D (depressive symptoms), and Global Mood Scale (GMS; mood status). Gender, age, New York Heart Association (NYHA) functional class and aetiology of CHF were included in multivariate analyses.

Results: Type Ds more often experienced impairment in health status (18/38 vs 47%) as compared to non-Type Ds (11/46=24%, p=0.02) and reported more depressive symptoms, i.e. 18/38=47% versus 6/46=13%, p=0.001. In multivariate analyses, Type D was a significant associate of health status and depressive symptoms (table 1). Conclusions: Type D is associated with impaired health and depressive symptoms, independent of gender, age, and the severity/aetiology of CHF.
DEPRESSION AND ADHERENCE TO MEDICAL RECOMMENDATIONS IN PATIENTS WITH CORONARY HEART DISEASE
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Depression is hypothesized to be associated with poorer treatment adherence among cardiac patients. This study examined the relationship between depression and adherence to medical recommendations among Phase 2, 3, and 4 cardiac rehabilitation (CR) patients at a regional medical center. Phase 3 and 4 CR patients were included because of their under-representation in the psychosocial literature. Thirty-two CR patients (23 male, mean age=64) were dichotomized into low-depression (LD; n = 22) or high-depression (HD; n = 9) groups based on their scores on the Beck Depression Inventory (BDI) using a standard cutoff score of 10. We expected that, relative to the LD group, the HD group would have: 1) a higher proportion of current smokers, 2) lower adherence to prescribed cardiac medications, 3) higher mean LDL cholesterol level, and 4) higher mean blood pressure. None of the primary hypotheses were supported (p's > .05). However, the HD group was significantly more likely to report a history of physical inactivity (p = 0.01) and to have a higher self-reported BMI upon entry to CR (p = 0.04). Depression was not generally associated with poorer medication compliance or elevated CHD risk at baseline, but may be a marker for a sedentary lifestyle among those with established coronary heart disease.

Abstract 1106

IMPARED HEALTH STATUS AND DEPRESSION FOLLOWING SUCCESSFUL PERCUTANEOUS CORONARY INTERVENTION WITH SIROLIMUS-ELUTING OR BARE STENT IMPLANTATION: PERSISTING EFFECT OF TYPE D PERSONALITY
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Purpose of study: Drug-eluting stenting reduces restenosis post-percutaneous coronary intervention (PCI) but subgroups of patients may not benefit optimally from PCI. We examined the effect of Type D personality on health status and emotional distress at 6 and 12 months post-PCI and the clinical relevance of Type D as a predictor of impaired health status and distress at 12 months post-PCI. Subject sample and state of methods: Consecutive patients (n=671) participating in the Rapamycin-Eluting Stent Evaluated At Rotterdam Cardiology Hospital (RESEARCH) registry treated successfully with PCI using drug-eluting or bare stents filled in the Type D Personality Scale at 6 months and the Hospital Anxiety and Depression Scale at 6 and 12 months post-PCI. Summary of results: Type D patients reported a substantially lower score on all health status domains and increased emotional distress at 6 and 12 months compared with non-Type D patients. Type D was an independent predictor of impaired health status at 12 months for all domains with the risk ranging from OR: 2.02 (95% CI: 1.37-2.99) for physical functioning to OR: 7.50 (95% CI: 5.07-11.11) for vitality adjusting for stent type, demographic and clinical risk factors. Type D also was associated with increased depression (OR: 5.90; 95% CI: 3.92-8.86) and anxiety (OR: 5.83; 95% CI: 3.86-8.81) adjusting for all other factors. These results show that Type D personality modulates the effect of PCI on health status and emotional distress in patients treated with drug-eluting or bare stents. The effect of Type D on outcome was persisting over time. The role of personality factors as determinants of outcome in cardiac patients should not be overlooked.

Abstract 1161

IMPAIRED HEALTH STATUS IN WOMEN FOLLOWING PERCUTANEOUS CORONARY INTERVENTION WITH SIROLIMUS-ELUTING OR BARE STENTS
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Despite advances in the diagnosis and treatment of cardiovascular disease, gender differences continue to exist in the pathophysiology, treatment, and outcome. Drug-eluting stents have lead to a dramatic decrease in restenosis and the need for repeat revascularization following percutaneous coronary intervention (PCI), but subgroups of patients may not benefit optimally from PCI in terms of health status. We compared women's health status with that of men 6 and 12 months post-PCI and investigated whether predictors of poor health status 12 months post-PCI are similar for women and men. Consecutive (n=673; 28% women) patients treated successfully with PCI with sirolimus-eluting stents or bare stents completed the Short-Form Health Survey 36 and 12 months post-PCI. Although we found a significant improvement in health status over time (p < 0.001), women experienced a significantly poorer health status than men (p < 0.001) also when adjusting for differences in baseline characteristics. The effect of sex was persistent over time as indicated by the non-significant interaction effect for time x sex (p = 0.038). Predictors of impaired health status were different for women and men: in women the predominant predictors were older age, CABG, and renal impairment, whereas in men older age was associated with improved functioning and previous PCI with impaired health status. Of note, in women CABG was associated with a 200% to 700% increased risk of impaired health status depending on the health status domain in question. Our findings suggest that women do not benefit from PCI with drug-eluting or bare stents on a par with men in terms of health status. These findings underscore the importance of examining risk factors for adverse outcome for women and men separately, which undoubtedly will lead to better risk stratification in research and clinical practice.

Abstract 1519

DETERRIMENTAL EFFECT OF DEPRESSION AND TYPE D PERSONALITY ON CARDIAC PROGNOSIS IN THE DRUG-ELUTING STENT ERA
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Little is known about the impact of psychological risk factors on cardiac prognosis in the drug-eluting stent era. We examined the relative impact of anxiety, depressive symptoms, and Type D personality on the occurrence of adverse clinical outcome 2 years post percutaneous coronary intervention (PCI). Consecutive patients (n = 875) with ischemic heart disease undergoing PCI with sirolimus-eluting or bare metal stents, who participated in the Rapamycin-Eluting Stent Evaluated At Rotterdam Cardiology Hospital (RESEARCH) registry, completed the Hospital Anxiety and Depression Scale and the Type D Personality Scale post-PCI. The endpoint was a composite of death and non-fatal myocardial infarction (MI) 2 years post-PCI. At follow-up, there were 49 events. In a stepwise multivariate cox regression analysis entering anxiety, depression, Type D personality and their interaction terms with sex, and any demographic and clinical variables, we found that depressive symptoms (p = 0.008), Type D x male sex (p = 0.006), older age (p = 0.02), and previous cardiac history (p = 0.02) were associated with adverse outcome. A stepwise procedure was adopted in order to avoid overlap between psychological constructs. In a subsequent analysis, we entered all psychological constructs and their interaction effects significant at p < 0.05 together with all demographic and clinical variables. Depressive symptoms [HR: 2.24; 95% CI: 1.20 to 4.16], the interaction term Type D x male gender [HR: 2.47; 95% CI: 1.29 to 4.71], and previous cardiac history [HR: 2.26; 95% CI: 1.21 to 4.23] were independent predictors of adverse outcome adjusting for all other factors including stent type. Depressed patients and male patients with a Type D personality were at increased risk of death or MI 2 years post-PCI despite recent advances in interventional cardiology. The role of psychological risk factors as determinants of hard clinical outcome, and that some risk factors may be sex-specific, should not be overlooked in clinical practice.
SUPPORT GROUP ATTENDANCE FACILITATES HEALTH BEHAVIOR CHANGE ASSOCIATED WITH IMPROVED CORONARY RISK FACTORS AND QUALITY OF LIFE: THE MULTICENTER LIFESTYLE DEMONSTRATION PROJECT

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Social support is considered a key factor in adherence to lifestyle changes, which in turn influence physical health and quality of life. This study analyzed data from the Multicenter Lifestyle Demonstration Project, which aimed at improving diet (low fat, plant-based), stress management, and exercise among 440 (21% female) patients with coronary artery disease (CAD). We investigated (a) the role of group support in lifestyle change, and (b) the influence of health behaviors (diet, stress management, exercise) on health outcomes after 1-year program participation. Group support was measured as percentage attendance of all weekly meetings over 1 year. There were significant (p<.001) improvements in diet, stress management, exercise, coronary risk factors (e.g., body weight, plasma lipids), and quality of life (physical and mental health) from baseline to year 1. Multiple regression analysis was used to first examine the influence of group attendance on changes in health behaviors. Results showed that group attendance was associated with increases in stress management (beta=.29; p<.001) and exercise (beta=.14; p<.01). Changes in health behaviors and group attendance were then entered into a regression model to test their effects on changes in health outcomes. Diet (beta=.11; p<.05) and exercise (beta=.11; p<.05) contributed to reductions in weight; exercise to improved physical health (beta=.12; p<.01); stress management to enhanced mental health (beta=.17; p<.01) and decreased LDL/HDL ratio (beta=-.13, p<.05). In sum, support group attendance may indirectly influence program success by fostering adherence to health behavior change. Our results also underline the importance of multicomponent programs in secondary prevention of CAD.

Abstract 1157

DEPRESSION AND WHOLE BLOOD SEROTONIN IN PATIENTS WITH CORONARY DISEASE: DATA FROM THE HEART AND SOUL STUDY

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Disregulation of serotonin physiology is a plausible mechanism by which depression may lead to adverse cardiovascular outcomes. Disregulation of central serotonin neurotransmission may be associated with perturbations in whole blood concentrations of serotonin (WBS). The Kuopio Ischemic Heart Disease Study showed that hopelessness was related to serotonin levels in the periphery, but no large study has examined the relationship between depression and WBS in patients with CHD. To examine the association of depression with WBS, we performed a cross-sectional analysis of baseline data from 1024 participants (18% female) with CHD in the Heart and Soul Study, a prospective cohort study of depression and CHD outcomes. At baseline (9/00-12/02), major depression was ascertained using the computerized Diagnostic Interview Schedule (DIS), with severity of depressive symptoms quantified using the Patient Health Questionnaire (PHQ-9). Serotonin concentrations of whole blood were measured in 216 participants with current (past month) major depression, compared to 504 participants who had no history of depression and no evidence of depressive symptoms (PHQ score <4). In comparison to the nondepressed participants, mean WBS was lower in participants with current major depression (104 +/- 83 vs. 116 +/- 72 ng/ml; p=0.05). Half (108/216) of the depressed participants had low serotonin (<90 ng/ml), compared with 40% (201/504) of the nondepressed participants (Odds Ratio 1.5, 95% Confidence Interval 1.1-2.1; p=0.01). However, the association between depression and low WBS was eliminated after adjustment for use of selective serotonin reuptake inhibitors (OR 0.9, 95% CI, 0.6-1.3; p=0.64). In this sample of patients with CHD, current major depression was associated with lower WBS levels, but this association was explained by use of SSRI s.

Abstract 1349

ATTACHMENT STYLE AND ANGINA IN PATIENTS UNDERGOING MYOCARDIAL PERFUSION IMAGING

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The relationship between myocardial ischemia and angina is highly variable and poorly understood. In accord with an interpersonal model of symptom perception, we hypothesized that daily angina frequency would be related to attachment style. A total of 245 patients, age 60.5+11.5, 58% male underwent radionuclide myocardial perfusion imaging (64% with exercise; 36% with pharmacological stress) to assess for coronary heart disease at the University of Washington Medical Center or the Seattle VA Medical Center. Patients were asked to complete a set of questionnaires prior to their imaging test. Angina over the past 4 weeks was assessed using the angina frequency scale of the Seattle Angina Questionnaire. Attachment style was assessed by combining scores on the Relationship Scales Questionnaire and the Relationship Questionnaire as: secure (34%), preoccupied (27%), fearful (24%) or dismissing (15%). Rest perfusion image scores were subtracted from stress image scores to calculate a perfusion difference score as the measure of myocardial ischemia. In a linear regression model including age, gender, perfusion difference score, and continuous measures of the four attachment styles, secure attachment style was associated with significantly less angina (β=2.1, p=0.04). If attachment styles were entered individually (due to collinearity), secure (β=3.1, p=0.002) was associated with less and fearful (β=-2.6, p=0.01) with more angina. If analyzed in terms of main effects, both positive view of self (β=2.1, p=0.03) and positive view of others (β=2.0, p=0.05) are associated with less angina. Attachment effects remain significant if depression (SCL-20) is added to the regression model. These results suggest that interpersonal factors such as attachment style may help determine angina frequency.
Abstract 1602
ASSOCIATION OF SPOUSE RATINGS OF ANXIETY, ANGER, AND DEPRESSION WITH CORONARY ARTERY CALCIFICATION IN HEALTHY OLDER ADULTS
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Trait anger, anxiety, and depressive symptoms predict coronary heart disease (CHD), perhaps through associations with coronary artery disease (CAD). These negative affects are correlated components of neuroticism or negative affectivity, but few studies test their combined and independent effects. Further, few studies have examined their association with asymptomatic CAD. We examined associations of NEO Personality Inventory spoue ratings of anger, anxiety, and depression with the severity of CAD as measured by CT scans of coronary artery calcification (CAC) in 125 couples (age 60–70) without serious health problems. For women’s CAC, husbands’ ratings of their wives’ anger, anxiety, and depression considered together accounted for 7% of the variance in log transformed calcification scores, F(3, 120) = 3.2, p<.03, controlling for age. Considered separately, both anxiety (p<.01) and anger (p<.05), but not depression were related to CAC severity. Considered simultaneously, only husbands’ rating of their wives’ anxiety were independently related to wives’ CAC, p<.02. For husbands’ CAC, wives’ ratings of their husbands’ anger, anxiety, and depressive symptoms considered together accounted for 8% of the variance in transformed calcification scores, F(3,120) = 3.5, p<.02, controlling for age. Considered separately, both anxiety (p<.05) and anger (p<.005), but not depression were related to CAD severity. Considered simultaneously, only wives’ ratings of their husbands’ anger were independently related to husbands’ CAC, p<.02. Hence, collectively, trait negative affects are associated with CAD severity in otherwise healthy older adults. For women, anxiety was the best predictor, whereas for men it was anger. Therefore, anxiety and anger could contribute to incident CHD through effects on CAD, though perhaps differently for men and women. Null findings for depression might indicate that the well-established association between depressive symptoms and CHD incidence does not involve an association with CAD.

Abstract 1711
DOES PHARMACOTHERAPY, EXERCISE, OR PSYCHOPHYSIOLOGIC INTERVENTION ENHANCE VAGAL-HEART RATE CONTROL AMONG PATIENTS WITH CORONARY HEART DISEASE? A META-ANALYSIS
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Markers of vagal-heart rate (HR) control from spectral analysis of HRV variability (HRV) independently predict cardiac mortality following myocardial infarction. Vagal-HR control is also decreased among cardiac patients with depression. We hypothesized that psychophysiological interventions and physical exercise would enhance vagal-HR modulation. The efficacy of cardiac medications (beta- or calcium channel blockade or ACE inhibition) and antidepressants was assessed as the conventional standard of care. Medline, Pubmed, PsychINFO, Embase, and the Cochrane databases were searched for randomized controlled trials between Jan. 1990 and June 2004. From 73 trials, 40 RCT’s were retained. pooled N=1837, M Age=57.9 yrs, 17.43% female with gender unspecified in 7 trials, M treatment duration=10.43 wks. Treatment efficacy using composite HRV domains indicated a small-to-moderate pooled effect size across cardiac and psychotropic medication, exercise, and psychophysiological treatment: Hedges’s G = .37 (95%CI, 0.19, 0.55), p<.0006. The heterogeneity index was not significant (Q=44.63, p=.18), indicating that the effect sizes of these interventions did not differ significantly. Significant heterogeneity was observed within exercise trials (Q=37.4, p=.007). Behavioral interventions demonstrated an effect size of 28 (95%CI=−.34, 0.00), p = .37. This finding may be influenced by the small pooled sample (N=174). It was also noteworthy that psychophysiological trials utilized control groups in which patients received active treatment with cardiac medication or exercise. Vagal-HR control is enhanced with current interventions, particularly with pharmacotherapy and exercise. Psychophysiological interventions merit further study as a complementary approach to secondary prevention.

Abstract 1460
COGNITIVE MECHANISMS IN THE RELATIONSHIP BETWEEN HOSTILITY AND SOCIAL SUPPORT
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Although past research has consistently demonstrated that hostile individuals report fewer satisfactory sources of social support, it remains unclear whether their evaluation is based on an objective assessment of their social environment or is colored by hostile cognitions. To evaluate this question, 120 young adults, falling in the upper or lower tercile groups on a hostility measure, participated in a social cognition experiment. Participants were randomly assigned to one of three priming conditions (Hostile, Supportive, or Control) designed to activate cognitive schemata. They then read through vignettes depicting stressful situations typically encountered by students and evaluated how supportive various offers of help would be in response to these problems. A 2 Hostility (High, Low) x 3 Condition (Hostile, Supportive, or Control) MANOVA was run to examine the impact of personality and primed schemata on judgments of social support. Analyses yielded a significant Hostility x Condition interaction (Roy’s GCR = .084, p < .05). Simple main effect analyses indicated that individuals low in hostility made the most negative judgments of perceived helpfulness in the Hostile condition [q (3,57) = 3.57, p < .01], supporting the prediction that an active hostile schema biases people to view offers of help in a more pejorative way. However, hostile participants made their most negative judgments in the Supportive condition [q (3,57) = 3.51, p < .05]. This could indicate that an active social support schema is associated with increased mistrust and guardedness about offers of help in hostile individuals. These data suggest that hostile and non-hostile individuals process support-related information differently, which has important implications for interventions designed to augment social resources in at risk individuals.

Abstract 1551
DYNAMICS OF LOW FREQUENCY BLOOD PRESSURE VARIABILITY RESPONSES TO PSYCHOLOGICAL AND ORTHOSTATIC CHALLENGE
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Atherosclerotic coronary heart disease is believed to result from a series of dynamic processes affecting the coronary artery endothelium. One candidate process is low frequency blood pressure variability (LF-BPV, 0.04-0.15 Hz), which is thought to reflect vascular sympathetic drive. Therefore, this index should rise in proportion to the sympathetic arousing characteristics of challenges. We tested this hypothesis in 34 healthy subjects, age 18-45 yrs, who participated in a larger protocol designed to study the impact of exercise training on cardiovascular autonomic regulation. Subjects were measured for RR interval variability (RRV) and BPV while resting quietly and then in response to psychological (mental arithmetic and Stroop) challenges and passive orthostatic tilt. Data from the two psychological challenges were aggregated to enhance response stability and RRV and BPV data were log transformed prior to analysis. As expected, psychological challenge led to an increase in HR (6.1 bpm) and SBP (10.0 mmHg) and a decrease HF HRV (-.86 msec2). Contrary to expectation, LF-SBPV fell during psychological challenge (-0.98 mmlg2). In contrast, orthostatic tilt led to an increase in HR (14.8 bpm) and LF-SBPV (0.63 mmlg2) and a decrease in HF-HRV (-1.35 msec2). Thus, the direction of LF-SBPV change is challenge-dependent. Because both psychological and orthostatic challenge are characterized by sympathetic arousal and parasympathetic withdrawal, although in possibly different proportions, these findings raise questions about the relationship of LF-SBPV to vascular sympathetic drive. They also complicate attempts to link LF-SBPV to the pathophysiology of coronary artery disease.

A-117
A BRIEF SCREENING TOOL FOR IDENTIFYING PSYCHOLOGICAL DISTRESS IN CARDIAC PATIENTS
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PURPOSE: It has been well established that psychosocial factors contribute significantly to the morbidity and mortality associated with coronary artery disease (Rozanski, Blumenthal & Kaplan, 1999). In addition, there is evidence that psychological distress is often missed in medical settings. However, due to limited resources it is often seen as overly burdensome to implement full-scale psychological assessments on every patient attending clinic. Therefore there is a need for a very brief and cost-effective psychological screening tool. A brief psychological screening tool (BST) was developed to identify patients experiencing some of the most common symptoms of psychological distress in this population: depression, anxiety, stress, anger, and poor social support.

SAMPLE AND METHODS: 157 cardiac patients (mean age = 49; Male = 102 (65%); Female = 52 (33%)) were consecutively recruited during their routine clinic visit. Subjects were given a short questionnaire to fill out that included: 1) basic demographics, 2) the BST, 3) the Beck Depression Inventory-11 (BDI), 4) the Beck Anxiety Inventory (BAI), 5) the State-Trait Anger Expression Inventory-2 (STAXI-2), and 6) the MOS Social Support Survey Streeter version. RESULTS: Both Pearson correlations and ROC curve analyses were performed for each BST item and the corresponding validated measure. Analyses reveal that the single-items in the BST are reasonably predictive: 1) Between the BDI and the BST depression item, $r = .81$ ($p < .001$), and the area under the ROC curve = .892; 2) Between the BAI and BST anxiety item, $r = .62$ ($p < .001$), and the area under the ROC curve = .793; 3) Between the SSS and BST social support item is $r = -.47$ ($p < .001$), and the area under the ROC curve = .52. The BST will be presented along with cut-off scores established by these analyses.

INCREASE IN C-REACTIVE PROTEIN IN RESPONSE TO ACUTE STRESS IN PATIENTS WITH RHEUMATOID ARTHRITIS
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Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease, affecting 1% of the population, that is associated with increased risk for myocardial infarction (MI), compared to the general population. Osteoarthritis (OA), a joint disease not characterized by systemic inflammation. The causes of this remain unknown. MI may be triggered by psychological and/or postural stress, and, moreover, stress-induced changes in blood flow and blood constituents have been implicated. This study examined the effects of acute stress on inflammatory, hemostatic, rheological, and hemodynamic activity in patients with RA (N=21) compared to OA (N=10).

METHODS: Both Pearson correlations and ROC curve analyses were performed for each BST item and the corresponding validated measure. Analyses reveal that the single-items in the BST are reasonably predictive: 1) Between the BDI and the BST depression item, $r = .81$ ($p < .001$), and the area under the ROC curve = .892; 2) Between the BAI and BST anxiety item, $r = .62$ ($p < .001$), and the area under the ROC curve = .793; 3) Between the SSS and BST social support item is $r = -.47$ ($p < .001$), and the area under the ROC curve = .52. The BST will be presented along with cut-off scores established by these analyses.

STRESS-INDUCED HEMOCONCENTRATION AND BLOOD PRESSURE REACTIVITY DURING THE MENSTRUAL CYCLE
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Variations in the incidence of MI and ischemic episodes have been reported with phase of the menstrual cycle; women seem to be more susceptible in the follicular phase. Anecdotal and epidemiological evidence suggest that stressful events may trigger myocardial infarction (MI). Disturbances in blood rheology and blood flow, such as a decrease in plasma volume (i.e. hemoconcentration) and an increase in blood pressure, have been reported in response to mental stress and may represent a possible pathway by which stress may trigger MI. The present study examined the effect of the menstrual cycle phase on stress-induced hemoconcentration and blood pressure reactivity. 12 healthy women, not using oral contraception and with regular periods, were tested during the follicular phase (between days 4-9 of the menstrual cycle) and the luteal phase (between days 19-25 of the menstrual cycle), with the order of testing counterbalanced. Plasma volume and systolic blood pressure (SBP) and diastolic blood pressure (DBP) measurements were taken during a 20-min rest period and every 8 mins of a 32-min mental stress task. The stress task elicited a decrease in plasma volume ($p<.001$), with no significant difference between blood pressure reactivity during the follicular phase ($M = 12$ mmHg for SBP, $M = 8$ mmHg for DBP) and the luteal phase ($M = 10$ mmHg for SBP, $M = 7$ mmHg for DBP). In sum, there is no effect of menstrual cycle phase on rheological and blood pressure reactions to mental stress. In conclusion: the findings of this study suggest that differences in stress-induced disturbances in rheological and vascular measures cannot be explained the reported variation in incidence of MI during the menstrual cycle.

DEPRESSION AND ANXIETY AS PREDICTORS OF VENTRICULAR TACHYCARDIA AMONG POST-MI PATIENTS
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Purpose: The aim of this study is to investigate the association between clinical depression, anxiety, and ventricular tachycardia (VT) among post-myocardial infarction (MI) patients. Method: The study population consisted of 72 patients assessed in in-hospital within 72 hours following MI. Patients ranged in age from 32 to 86 (mean age 55.7±11.3 years) and consisted of 68% males and 32% females (64% Caucasian, 29% African-American, 7% Native-American). Patients were required to have a left ventricular ejection fraction (LVEF) >=30% at the time of enrollment. All patients underwent a diagnostic interview to assess for the presence of major and minor depression and also completed the Beck Depression Inventory (BDI) and the Spielberger State-Trait Anxiety Inventory (STAI) before undergoing 24 hour in-hospital holter monitoring. Results: Of the 72 patients, 13 (18%) met criteria for clinical depression. There were no significant differences between clinically depressed and non-depressed patients in age (depressed: 53.8±11.1 years vs. non-depressed: 55.4±11.2 years; $p=64$) or LVEF (depressed: 54.9±14.3 % vs. non-depressed: 52.3±6 %; $p=42$). Of the patients classified as clinically depressed, 38% had at least one run of VT compared to 10% of the non-depressed group (chi-square (1df)= 6.4; $p=0.01$). Also, a logistic regression model for VT risk revealed that a one standard deviation (8 pts) increase in BDI score was associated with an 81% increase in the odds of having VT. Although anxiety scores did not predict the occurrence of VT, an exploratory analysis among patients with VT showed that the frequency of VT was predicted by trait anxiety scores ($r = .59$, $p < .05$) as well as BDI scores ($r = .742$; $p < .001$). Conclusion: Results from the present study showed that depression during hospitalization following MI was a significant predictor of VT. Also, BDI scores and trait anxiety scores were associated with the frequency of VT, suggesting a relationship between depression, anxiety, and life threatening dysrhythmias.
The purpose of this study was to examine: 1) prevalence of depression using Beck Depression Inventory (BDI) in patients suffering from coronary artery disease (CAD), stroke, or peripheral vascular disease (PVD); 2) prevalence of hostility using Cook and Medley Hostility Inventory in patients suffering from CAD, stroke, or PVD; 3) risk factors associated with the development and progression of atherosclerotic diseases. 508 patients were recruited from the Lowering of Vascular Atherosclerotic Risk Study at Lehigh Valley Hospital. They were between 39-79 years of age and suffered a cerebral, cardiac, or peripheral vascular event within six months. Characteristics of CAD, stroke, and PVD patients with depressive/hostility symptoms were compared to non-depressed/non-hostility patients using chi-square tests for categorical variables and t-tests for continuous variables. Of 508 patients, 355(70%) had CAD, 87(17%) had stroke, and 66(13%) had PVD. 60 (17%) of CAD patients, 24(38%) of stroke patients, and 22(33%) of PVD patients were more likely than CAD patients to have depression(p=0.001). Stroke patients were more likely than CAD patients to have depression(p=0.001). Female stroke patients were more likely to have depression(p=0.008). Depressed CAD patients were more likely to be on an antidepressant than their non-depressed counterparts (p<0.001). There was no significant difference in hostility prevalence among CAD, stroke, or PVD patients. Male CAD patients were more likely to have hostility traits than females (p=0.002). CAD patients with hostility were also more likely to have anxiety (p=0.008) and depression (p=0.042), and be on medications (p=0.048). Future studies are needed to examine the effects, including mortality, of depression and hostility on CAD, stroke, and PVD.

DEPRESSION, ANXIETY, AND HOSTILITY ARE ASSOCIATED WITH 3-YEAR INCREASES IN SERUM INTERLEUKIN-6
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Cross-sectional studies have shown that depression, anxiety, and hostility are associated with elevated concentrations of proinflammatory cytokines (e.g., interleukin-6; IL-6). Because these findings have yet to be replicated using a prospective design, we examined the relationships between depression, anxiety, and hostility and 3-year changes in serum IL-6. Participants were 331 healthy, older adults (49% male, 85% white, mean age=60.5 years) involved in the Pittsburgh Health Heart Project, an ongoing prospective study. At baseline, participants completed the Beck Depression Inventory-II (BDI-II), Beck Anxiety Inventory (BAI), and Cook-Medley Hostility Scale (CMHS). Blood draws were performed at baseline and 3-year follow-up. Serum IL-6 was measured by enzyme-linked immunosorbent assay (ELISA). Regression analyses revealed that higher scores on the BDI-II (p<.04), BAI (p<.06), and CMHS (p<.02) at baseline were each associated with greater 3-year increases in serum IL-6, even after adjustment for significant covariates (baseline IL-6, body-mass index, hormone replacement therapy, and tobacco use). A single principal component combining the BDI-II, BAI, and CMHS was positively related to 3-year changes in serum IL-6 (p<.01). After including this factor score in the model, BDI-II, BAI, and CMHS scores were no longer predictors (all p's>.35). Because this study was prospective, our results cannot be accounted for by the effects of proinflammatory cytokines on the central nervous system (e.g., mood changes). Instead, our findings suggest that depression, anxiety, and hostility may bring about increased production of proinflammatory cytokines. Shared variance between these psychological factors may explain the observed associations. This research was supported by NIH HL56346 and HL07560.
Abstract 1661

PREVALENCE OF ANXIETY DISORDERS IN MEN AND WOMEN WITH CORONARY HEART DISEASE
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Negative emotions, such as depression and anxiety, have been associated with the development and recurrence of coronary heart disease (CHD). Although the prevalence of depressive disorders is well documented in patients with CHD, considerably less attention has been focused on the prevalence of anxiety disorders in cardiac populations. One hundred and fifty men and women with established CHD and enrolled in a phase II cardiac rehabilitation program were evaluated via a psychiatric, structured interview to assess lifetime and current history of anxiety disorders. A total of 68 (45.3%) patients met the DSM-IV diagnostic criteria for at least one anxiety disorder in their lifetime, and 54 (36.0%) presented with at least one current anxiety disorder at the time of the interview. Specifically, social phobia and generalized anxiety disorder had the highest prevalence among patients, both demonstrating a lifetime prevalence rate of 26.0% and a current prevalence rate of 21.3% and 18.7%, respectively. In addition, the lifetime prevalence of specific phobia was approximately 15.3%, while 14.7% met criteria for a current diagnosis during the interview. There were no significant differences across prevalence rates for panic disorder (lifetime = 5.3%, current = current = 4.7%), agoraphobia (lifetime = 4.7%, current = 3.3%), PTSD (lifetime = 1.5%, current = 0%), and OCD (lifetime = 0.7%, current = 0%) were observed. With respect to sex differences across prevalence rates, women evidenced significantly higher lifetime and current prevalence rates of anxiety disorders. Specifically, 70.8% of female patients met criteria for at least one anxiety disorder in their lifetime, while 58.3% were diagnosed with at least one anxiety disorder upon entry into the program. In contrast, a significantly lower percentage of male patients met criteria for an anxiety disorder (lifetime = 33.3%, current = 25.5%) (p < .001). The results of this study suggest that a substantial number of CHD patients reported a significant history of anxiety. Efforts to assess and treat anxiety are needed in the cardiac rehabilitation setting and may be associated with better medical and quality of life outcomes for men and women with CHD.

Abstract 1285

IMPACT OF ALCOHOL INTAKE AND SMOKING ON HEART RATE VARIABILITY IN MIDDLE AGED INDUSTRIAL EMPLOYEES
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Decreased heart rate variability has been implicated as an independent risk factor for cardiovascular disease. Little data exists on the effects of adverse health behavior on heart rate variability from large population samples. We aimed to investigate the independent contribution of smoking and alcohol intake to heart rate variability. The study population comprised N = 521 middle aged employees of an airplane manufacturing plant in Southern Germany. Twenty seven percent were smokers, the median self reported daily alcohol intake was 11 g (interquartile range 4 to 22 g). We employed structural equation modeling to elucidate a possible independent contribution of health behavior to work-time and night-time heart rate variability. We calculated the RMSSD as a measure of heart rate variability during working hours (7.30 am to 3.30 p.m) and during sleep (the interval from 30 min after falling asleep to 30 min prior to awakening). The null model implicated no association between health behavior and either RMSSD index. In either model, we controlled for the effect of age on RMSSD. Results: As compared to the null model implying no association of health behavior an heart rate variability (chi-square = 27.8, df = 5), a model relating smoking to working-hours RMSSD and alcohol intake to sleep RMSSD yielded a superior fit (chi-square = 1.1, df = 3, p = 0.78, CFI = 1.0, RMSEA 0, 95% CI 0.049). The absolute value of the standardized factor loadings amounted to -.18 for smoking and to -.10 for alcohol intake. The data suggest that smoking and alcohol intake differentially affect heart rate variability.

Abstract 1535

THE EFFECTS OF LIFE COURSE SES AND RACE ON CARDIOVASCULAR REACTIVITY DURING AN ANGER RECALL TASK
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Long standing physical health disparities exist between social classes and racial groups. To evaluate the effects of life course SES and race on physiological reactivity to anger arousal, measures of SBP, DBP, and HR were taken at one-minute intervals in 165 healthy black and white participants during a 5-min rest period and followed by a 5-min anger recall task. Subjects whose father had less than a high school diploma had a larger increase in SBP (p = .03) and DBP (p = .05) than subjects whose father completed high school or more education. Ss current SES was only marginally associated with HR (p = .07) reactivity and mother’s education was only marginally associated with SBP (p = .075) and DBP (p = .059) reactivity. High SES Ss whose father had a high education level exhibited smaller changes in SBP (8.6 +/- .95) and DBP (6.0 +/- .56) than the other three SES X father's education groups (all p < .01; means > 10.3 for SBP and >7.3 for DBP). Low SES Ss whose mother had a low education level exhibited greater DBP reactivity to stress than all other SES X mother + education groups who did not differ from each other (all p > .05). After controlling for life course SES, blacks had significantly higher SBP (p = .01), DBP (p = .005), and HR (p = .046) reactivity. There was a race by life course SES interaction for DBP when childhood SES was measured by mother’s education (p = .053) such that being high SES throughout the life course was associated with lower reactivity for whites but not for blacks. These findings suggest that the combination of low SES in both adulthood and childhood is associated with a heightened CV reactivity during anger related stress. Furthermore, blacks experience greater reactivity to stress than whites, an effect that appears not to be mediated by differences in life course SES.

Abstract 1713

SOMATOFORM AND FACTITIOUS DISORDERS IN OLDER HOSPITALIZED PATIENTS: PREVALENCE, DEMOGRAPHIC CHARACTERISTICS, HEALTH CARE USE, AND CO-OCCURRENCE
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Patients with chronic unexplained medical complaints may qualify for one of six psychiatric diagnoses (somatization disorder, hypochondriasis, pain disorder, conversion disorder, undifferentiated somatoform disorder, and factitious disorder with physical symptoms). Despite the assumption that these diagnostic groups are supported by empirical evidence of their reliability and validity, little proof exists. Low rates of these diagnoses are one reason that few studies have been able to make comparisons between them. The present study examined persons aged 65 or older in the United States' Medicare health insurance system between 1984 and 1997. The objective was to evaluate the rates of somatiform, factitious and other target diagnoses, and to secure sufficient numbers of patients with each specific target diagnosis to allow for meaningful comparisons between them. A related objective was to evaluate the co-occurrence of the target diagnoses. The incidence of any target diagnosis was 129 per 100,000. The incidence of somatiform and factitious disorders was 58 per 100,000. Thus the majority of persons with a target diagnosis was 129 per 100,000. The incidence of somatoform and factitious diagnoses was 58 per 100,000. Thus the majority of persons with a target diagnosis (55%, 71 per 100,000) received a non-psychiatric diagnosis (e.g., 306.x Physical Condition with Psychological Cause). The rates of all target disorders were higher among females than males (RR=1.98). Contrary to previous reports there was no evidence of higher levels of target diagnoses among African American beneficiaries. Patients with target diagnoses had more admissions during the study period than patients without a target diagnosis, however, average length of stay was the same, and patients with target diagnoses underwent fewer procedures. On all study variables the individual diagnoses were similar, and co-occurrence rates ranged from 4.6% to 11%. Our results suggest low rates of official recognition of DSM somatiform and factitious disorders. Patients diagnosed with these different disorders do not differ on demographics or health care use, and co-occurrence is high given that the disorders are, by definition, mutually exclusive.
Abstract 1710

RATES AND CHARACTERISTICS OF HOSPITAL ADMISSIONS RELATED TO DIAGNOSES OF SOMATOFORM DISORDERS, FACTITIOUS DISORDERS, AND RELATED CONDITIONS

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Chronic unexplained medical complaints are categorized by the DSM-IV-TR into six psychiatric disorders: somatization, hypochondriasis, pain disorder, conversion disorder, undifferentiated somatoform disorder, and factitious disorder. The purpose of this study was to examine the way these official diagnoses, along with related diagnoses, are used in coding hospital admissions. The aims of the study were (a) to determine the rates at which the target disorders are diagnosed, and (b) to determine whether they could be distinguished from one another. Data from Utah's Hospital Discharge Data Base (HDDB) were examined. The HDDB contains data on 2.5 million hospitalizations in the state of Utah from 1993-2001, including primary discharge diagnosis, LOS, and hospitalization costs. It can be queried by specific ICD-9 diagnoses, and results can be reported by patient age and gender. The incidence of any official target diagnosis was 38 per 100,000, with conversion disorder occurring most frequently (18 per 100,000) and hypochondriasis least frequently (44 per 100,000). Residual target disorder categories accounted for (e.g., Physical Condition with Psychological Cause) accounted for an addition 10 admissions per 100,000. The rates of target disorders were greater among women than men (overall RR= 2.05). The peak incidence for all target diagnoses occurred for patients 35-44 yrs of age. Both males and females with target diagnosis had longer average stays than patients without a target diagnosis. However, average costs per day and average total costs were less for patients with a target diagnosis. Even from a population of 2,500,000 patients, there were too few patients with each target diagnosis to make comparisons between them. The results suggest low rates of recognition of target disorders than would be expected from previous epidemiological studies. However, costs appear to be contained for patients who receive one of these diagnoses.

Abstract 1202

VOLUNTEERING IS ASSOCIATED WITH DELAYED MORTALITY IN OLDER PEOPLE: ANALYSIS OF THE LONGITUDINAL STUDY OF AGING

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We tested the hypothesis that frequent volunteering is associated with less mortality risk when the effects of socio-demographics, medical status, physical activity, and social integration and support are controlled. The Longitudinal Study of Aging (LSOA) assessed the health and social functioning of a representative sample of 7527 American community-dwelling older people (age 70 years or older). We used Cox proportional hazards analyses to assess the unadjusted and adjusted associations between frequency of volunteering and time-to-death (96 month follow-up). Death occurred in 38.3% of the sample. Only 15.7 percent of the LSOA sample reported volunteering during the previous year, roughly half the rate found in other studies of older US citizens (e.g., Musick et al., 1999; Oman et al., 1999). In the unadjusted model, frequent volunteers had significantly reduced mortality compared to people who ever volunteered (hazard ratio (HR) = 0.47). After adjusting for covariates, frequent volunteers still had significantly reduced mortality (HR = 0.81, 95% confidence interval = 0.68 - 0.96) compared to non-volunteers. This association was greatest for those who scored higher on markers of social integration, especially those who frequently attended religious services. Having attended religious services in the past two weeks significantly interacted with level of volunteering. Constructing the adjusted model separately for religious service attenders and non-attenders we found dramatically different effects. For attenders (n = 3804), frequent volunteering reduced mortality risk by 30% (HR = 0.70, 95% CI: .56, .86, p < .001) compared to non-volunteers. In non-attenders, there were no significant associations between volunteering frequency levels and mortality. These results a link between volunteering and mortality, although mechanisms of action remain unclear.
ISSUES UNDERLYING DEVELOPMENT OF PALLIATIVE CARE CURRICULA: THE DIFFERENCE BETWEEN ACCURATE INFORMATION AND THE CERTAINTY OF KNOWING
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We conducted a pilot study assessing Miami Veterans Administration Medical Center staff knowledge of palliative care to inform development of palliative care training curricula. Participants were personnel (N = 86) from Medical (n = 21), Nursing (n = 29), Psychology (n = 8), Administration (n = 16), and other (n = 12) departments. An 11-item measure was developed incorporating qualitative responses and self-report response certainty ratings. Three raters evaluated qualitative responses. Inter-rater reliability was high (r = .83, alpha = .93). Ratings ranged from .34 (sd = .59) to .85 (sd = .71) on a scale of 0 (demonstrated no understanding of concept) to 2 (full understanding). Certainty scores ranged from 3.37 (sd = 1.33) to 4.17 (sd = 1.09) on a scale of 1 (not at all certain of response) to 5 (absolutely certain). Multiple regression analysis revealed that certainty of one’s information inversely predicted actual knowledge of basic palliative care concepts (R^2 = .31, F change(1,87) = 39.02, p < .001). ANOVA results revealed variability in knowledge of: which medical staff deliver palliative care (F(4,81) = 3.85, p < .007), who discusses prognosis and treatment planning with patients (F(4,78) = 3.37, p < .02), as having a treatment options (F(4,82) = 2.75, p < .04), palliative care team composition (F(4,81) = 3.52, p < .01), certainty of treatment options (F(4,82) = 2.75, p < .02) and certainty of palliative care team composition (F(4,76) = 3.43, p < .02). Post-hoc analyses revealed physicians (p < .03) and nurses (p < .04) were more knowledgeable of team composition than administrators. Variance of qualitative response ratings and certainty ratings was predominantly within groups. We concluded that some personnel may be overconfident in their information. Additionally, knowledge of palliative care was inconsistent within departments. These issues must be addressed as curricula are developed.

FACTORS ASSOCIATED WITH MEDICAL SPECIALTY CHOICE: FURTHER EVIDENCE FOR THE IMPORTANCE OF PERSONALITY FACTORS AND ATTACHMENT STYLES
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Purpose of Study. Patient-provider relationships in primary care are characterized by greater continuity and depth than in non-primary care specialties. We hypothesized that attachment styles of medical students are associated with specialty choice factors and that such factors will mediate the association between attachment style and matching in a primary care specialty. Subject Sample and Statement of Methods. In 146 primary care diabetic patients we performed a randomized controlled trial of depression treatment in patients with diabetes, we determined attachment model of other, demographic characteristics, clinical characteristics (PHQ-9 depression score, BMI, medical comorbidity and diabetes complications, duration, and type) and self-care and glucose control (HbA1c) variables. We determined magnitude of difficulty in the relationship perceived to be posed by the patient as assessed by the intervention provider using the Difficult Doctor-Patient Relationship Questionnaire (Hahn et al., 1995). We used linear regression with provider-perceived patient difficulty as the dependent variable and included in the model: clinical, demographic and psychosocial variables including attachment model of other. Summary of Results. Attachment model of other was associated with difficulty in the patient-provider relationship (p = .01) in the multivariate model where all other clinical, psychosocial and demographic variables were not significantly associated with difficulty in the relationship. Attachment model of other was most highly associated with: 1) perceived patient self-destructiveness (p < .001) and 2) the patient appearing to be time consuming to care for (p < .002). Conclusion. Understanding developmental aspects of challenging patient-provider relationships may facilitate development of novel approaches for working within such challenging relationships.