

# Abstracts

Participation in Medical Student Research Day continues to grow. This year we had 82 participants. The scope and depth of the projects done by MSSM students are impressive. New mentors are participating every year, offering our students the chance to do research in a wide variety of areas. Student efforts translate into a very special educational experience. According to official surveys, MSSM has far more students than the national mean who do research and more students than the national mean who co-author manuscripts. I would like to thank Dean Kenneth Davis and Dean of Medical Education Larry Smith for their continued support of medical student research, and acknowledge Grace Oluoch, Annabelle Rinaldo, Michelle Sainte, and the MSSM Alumni Association.

Karen Zeir, Ph.D.  
Associate Dean for Medical Student Research

## Tenth Annual Medical Student Research Day November 12, 2004

**The Role of Pre-synaptic Active Zone Proteins in the Development of Opiate Addiction.** N.S. Abul-Husn, J.A. Morón, and L. Devi. Department of Pharmacology and Biological Chemistry, Mount Sinai School of Medicine, New York, NY.

An important characteristic of opiates is their capacity to induce compulsive drug-seeking behavior, a major component of drug addiction. Despite extensive research in this field, the molecular mechanisms underlying the development of opiate addiction remain poorly understood. Opiates, such as morphine, are known to act on both pre-synaptic and post-synaptic receptors to produce their neuronal effects. They regulate a spectrum of signaling molecules, including serine/threonine kinases such as mitogen-activated protein kinase (MAPK), protein kinase C $\gamma$  (PKC $\gamma$ ), and calcium/calmodulin-dependent kinase (CAMK) II. To date, very little attention has been given to the influence of pre-synaptic signaling molecules in the development of opiate addiction. This is partly due to a prior inability to effectively isolate and characterize the pre-synaptic active zone (PAZ). In this study, we have used a novel approach to isolate the PAZ from mouse brains in high yield and purity. We have determined that several signaling molecules known to be involved in opiate signaling are associated with the PAZ. We are currently exploring the changes in expression and activation of these PAZ proteins during morphine addiction, using a proteomics approach. These studies will lay the foundation for a better understanding of the pathways involved in opiate addiction and are a prerequisite to the development of novel therapies for the treatment of narcotic addiction.

**Complementary Alternative Medicine Use in Older Adults in East Harlem.** K.A. Artis, S. Hu, C.X. Pan, and J.L. Howe. Departments of Geriatrics and Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY.

Complementary alternative medicine (CAM), defined as a group of medical practices that do not conform with the standards of the medical community, includes modalities such as acupuncture, chiropractic and herbal supplements. CAM use is increasingly prevalent in older adults in the United States. While some research on geriatric CAM use exists, little is known about its use in ethnically diverse, low income and community-dwelling populations. Understanding geriatric CAM use in older adults is important because it may help prevent potentially harmful drug-herb interactions for which geriatric patients on complex medicine regimens are particularly at risk, as well as help provide patient-centered care. This study explored CAM use prevalence and characteristics among commu-

nity-dwelling older adults in East Harlem, NY. On-site social service coordinators assisted in the recruitment of 100 participants who were interviewed in English, Spanish or Mandarin. The survey asked a series of questions about types of CAM used, reasons for use, referral sources, perceived efficacy and monthly expenditures. After adjusting the results to exclude prayer and commonly prescribed vitamins, analysis revealed that two-thirds of participants were CAM users and that participants living in Linkage House, and those not born in the United States, were more likely to use CAM. The primary information source about CAM came from the community, including family and friends. Only 1% of CAM users reported adverse events, while 81% reported high satisfaction with CAM. Health providers working with older populations should be aware of the high rate of CAM use among their patients and the implications of this phenomenon.

**Assessment of the Gap between HIV/AIDS Treatment and Prevention in the Setting of a Traditional Siddha Organization in Tamil Nadu, India.** K. Baban, S. Ikeda, N. Hennig, MD/PhD, D. Pooran, and H. Sacks, MD/PhD. Thomas C. Chalmers Clinical Trials Unit, Mount Sinai School of Medicine, New York, NY.

Gandeeepam is a non-governmental organization in the poor south Indian state of Tamil Nadu. In a country with one of the most rapidly increasing rates of HIV infection, the small state of Tamil Nadu contains close to 50% of India's cases. Gandeeepam practices Siddha medicine, an affordable traditional healing method, and focuses on the curative treatment of HIV/AIDS. As part of a network of 60 Tamil Nadu NGOs (the Gandeeepam Global Foundation, GGF), Gandeeepam's presence in the community also extends far beyond the medical, providing after-school tutoring, organizing financial empowerment groups, and more. The purpose of this assessment is to determine whether Gandeeepam and its partners make maximum use of the tremendous opportunities thus provided to promote HIV awareness, prevention, and treatment. The gap that keeps treatment discrete from education and prevention is a global phenomenon, acknowledged as a major challenge to controlling the spread of HIV/AIDS. Three weeks with Gandeeepam, and survey responses from 39 GGF NGOs, yielded widely varied approaches to HIV/AIDS education and prevention, and no discernible coordination with treatment. Among other findings: Most GGF NGOs, including Gandeeepam, neither provide, promote, nor believe in condoms to prevent HIV transmission. Reluctant to discuss such issues with men or single women, those that do promote condoms usually target married women. A minority of GGF organizations provides condoms to sex workers. Compounding these issues, Gan-

deepam considers treated patients cured and thus does not advise on how to prevent transmission. This preliminary assessment shows great potential but also tremendous social obstacles to the dissemination of effective education and prevention messages, and perhaps offers insight into challenges faced globally.

**Increased Body Mass Index (BMI) and Psychosocial Dysfunction in Children: Is There an Association?** T.M. Balija and D. Steinbaum. Department of Pediatrics, Mount Sinai School of Medicine, New York, NY.

Obesity and mental health disorders have been shown to have a co-morbid relationship in adult populations. Currently, there is a paucity of literature examining this association in inner-city school-age populations. Among adults living in New York City, East Harlem is the epicenter of both obesity and mental illness. This community has several socioeconomic factors that contribute to both the high prevalence of mental health diagnoses and obesity experienced by its residents. As part of an ongoing research study at the Pediatric Associates Practice of the Mount Sinai School of Medicine, this study will examine the relationship between body mass index (BMI) and psychosocial dysfunction in the 8- to 10-year-old patients of an East Harlem pediatric clinic. Psychosocial dysfunction will be determined using the Pediatric Symptom Checklist (PSC), an accepted screening tool, and BMI will be determined via chart review. This study hypothesizes that BMI and PSC scores will be directly correlated; i.e. as PSC scores increase, BMI increases. It is intended that findings from this study will inform physician management of concurrent obesity and mental health problems.

**Immunohistochemical Analysis of Caspase-3 in G86R Superoxide Dismutase-1 Transgenic Mice.** M.A. Barnes<sup>1</sup>, W.G.M. Janssen<sup>2</sup>, J.H. Morrison<sup>2</sup>, and D.J. Lange<sup>1</sup>. <sup>1</sup>Department of Neurology, and <sup>2</sup>Fishberg Department of Neuroscience, Mount Sinai School of Medicine, New York, NY.

**Purpose:** To establish the localization of caspase-3 in both its inactive and active forms in the G86R SOD-1 transgenic mouse, a valuable model of ALS.

**Methods:** Fluorescent immunohistochemistry established localization of inactive caspase-3 (CPP32), SOD-1, ChAT and active caspase-3.

**Results:** Non-transgenic and transgenic mice expressed SOD-1 cytoplasmically. The transgenic mouse motor neurons showed intense cytoplasmic localization, apoptotic morphology and nuclear membrane breakdown. SOD-1 cytoplasmic expression in non-transgenic mice was low and the motor neuron morphology was normal. In both groups CPP32 showed nuclear localization. The non-transgenic mice showed a bright nuclear signal, whereas the transgenic mice had a weaker nuclear signal. Activated caspase-3 was intensely cytoplasmic in the transgenic mice, while only a couple of cells, in the non-transgenic mice showed weak cytoplasmic localization. Staining with ChAT of motor neuron populations identified a relative decrease in transgenic mice.

**Conclusions:** The role of SOD-1 in ALS pathogenesis is still unclear; however, there is a different pattern of expression in transgenic and non-transgenic mice. The low levels of CPP32 coupled with the high levels of active caspase-3 in transgenic mice may represent the transformation and translocation of inactive caspase-3 into overexpressed active caspase-3. The loss of motor neurons, identified by the localization of ChAT validates the notion that symptomatic transgenic mice lose motor neurons. Our data supports the hypothesis that caspase-3 activation is an integral part of the process responsible for motor neuron loss in ALS.

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**Internodal Conduction Pathways in the Adult Mouse Atria.** E.L. Baron, K.J. Casey, and G.E. Morley. Department of Medicine, Division of Cardiology, New York University School of Medicine, New York, NY.

Atrial fibrillation, the major cardiac cause of stroke, is the most common sustained cardiac arrhythmia. Three atrial structures, crista terminalis, Bachmann's bundle, and the Eustachian valve, have been identified as morphologically crucial in understanding the internodal pathways of the human heart. It is widely accepted that these structures contribute to the

complex patterns of propagation during atrial arrhythmias. We hypothesize that the heterogeneous anatomical and electrophysiological properties of the murine atria interact to coordinate electrical activation. High-resolution optical mapping of voltage dye fluorescence was used to study patterns of atrial excitation in isolated Langendorff-perfused murine hearts. Activation maps were generated showing the spread of electrical excitation. Following imaging studies, hearts were paraffin-embedded and sectioned at 10 $\mu$ m. Images of sections will be used for 3D reconstruction of hearts onto which activation maps will be superimposed. Initial mapping studies have identified the location of the SA node on the posterior upper right atrium, at the junction of the superior vena cava and crista terminalis. The signal spreads rapidly and anisotropically from the SA node through the right atria, presumably via the posterior internodal pathway. Slower conduction was observed as the wavefront moved toward Bachmann's bundle presumably via the anterior pathway. Thus, we have demonstrated electrical heterogeneity within the mouse atria. Our conduction patterns correspond well with previously described morphological internodal pathways. Ongoing studies in the laboratory involve 3D visualization of internodal pathways, and determining the role of intercellular coupling in establishing and maintaining atrial conduction between the SA and AV nodes.

**Effect of Cardiac Catheterization on Left Ventricular Compliance.** A. Belanger, M. Chiu, L. Croft, MD, and M.E. Goldman, MD. Department of Cardiology, Mount Sinai Hospital, New York, NY.

Cardiac catheterization (cc) is an invasive therapeutic and diagnostic exam of the coronary vessels. While focused on coronary patency and improving systolic function, the impact of the >800,000 annual cath on LV diastolic function has not been well studied. Therefore, we recruited twenty-three consecutive consenting patients undergoing a cc procedure. We performed limited 2-D Doppler echoes prior to and 2–24 hours following cc, using the transmitral E/A ratio as a measure of LV compliance (E/A >1 suggests a compliant LV, while E/A <1 suggests a stiff LV). Of the 23 patients studied, 16 underwent stenting and had a significant decrease in E/A (-0.16) compared to those without stenting (n=7, 0.01) (p=0.021). Interestingly, first time catheterization patients' E/A ratios decreased (improved) an average of 0.051 while patients with at least 1 prior cath increased (worsened) an average of 0.191 (p=0.013). While this preliminary study was too small to assess all variables, it is the first to suggest that intervention such as stenting during cc may impact LV diastolic compliance, which may indicate damage to small vessels.

**The Effect on Lifespan of Ablating Isocitrate Dehydrogenase 2 in Eat 2 Mutants of *C. elegans*.** R.E. Berger, K. Yen, and C.V. Mobbs. Fishberg Research Center for Neurobiology, Mount Sinai School of Medicine, New York, NY.

Caloric restriction increases lifespan and is thought to retard the aging process. Eat 2 mutants of *C. elegans* have a pharyngeal defect that approximates caloric restriction. Our group has shown that caloric restriction induces isocitrate dehydrogenase 2, an enzyme that is thought to play a major role in anti-oxidant defenses by producing NADPH in the mitochondria. Jo et al. state, "Decreased expression of isocitrate dehydrogenase 2 markedly elevates the ROS generation, DNA fragmentation, lipid peroxidation, and concurrent mitochondrial damage with a significant reduction in ATP level." We hypothesized that caloric restriction increases lifespan in part by inducing isocitrate dehydrogenase 2. We therefore assessed whether inhibiting the synthesis of isocitrate dehydrogenase 2 would block the effects of caloric restriction to increase lifespan. Using RNAi, we ablated isocitrate dehydrogenase 2. At day ten of our study, ablation of isocitrate dehydrogenase 2 had no effect on survival in non-calorically restricted control worms. In contrast, ablation of the isocitrate dehydrogenase 2 gene significantly reduced the effect of the Eat 2 mutation to increase lifespan. This result suggests that isocitrate dehydrogenase 2 expression may play a key role in the life-extending effect of Eat 2 induced caloric restriction.

**Premenstrual Dysphoric Disorder: Physicians' Perspectives.** E.J. Bernstein, and D.R. Korenstein, MD. Division of General Internal Medicine, Department of Medicine, Mount Sinai School of Medicine, New York, NY.

Premenstrual Dysphoric Disorder (PMDD) recently entered the DSM-IV without an official category or axis. This project investigates physicians' diagnostic and prescription behaviors surrounding PMDD: how they distinguish it from PMS and prescribe SSRI's for its treatment; and the level of information they provide when prescribing Sarafem (fluoxetine). Whether physicians accept this diagnosis will ultimately affect its utility. I hypothesize that physicians' employment of this diagnosis correlates with their prescription behaviors. At stake is the role of the pharmaceutical industry in influencing physician diagnostic behavior. Seventy-seven Mount Sinai physicians in the departments of OB/GYN, Medicine, Psychiatry, and Adolescent Medicine completed an on-line survey. Fifty-seven see women of reproductive age; their responses were included in the analysis. Structured interviews were conducted with twenty respondents. The results indicate little consensus surrounding the diagnosis and treatment of PMDD. Thirty-nine percent of participants define PMDD as more severe than PMS; 19% make no distinction. Eighteen percent characterize PMS by physical symptoms and PMDD by mood/psychological symptoms. Forty-seven percent of respondents instruct patients to take SSRI's during the luteal phase only; 34% instruct patients to take SSRI's daily. The pharmaceutical industry's influence is apparent: 49% of respondents prescribe Sarafem for PMDD, 96% of whom inform women that Sarafem is identical to Prozac. Moreover, 32% of respondents had patients request Sarafem. Given the disagreement surrounding the diagnosis and treatment of PMDD, research is needed about the physiological basis of PMDD, the differences (if any) between PMDD and PMS, and the mechanism of action of SSRI's for the treatment of PMDD when only taken during the luteal phase.

**East Harlem Pediatric Asthma: Parent/Child Diad Disparities in Awareness of Psychological Toll.** P.W. Burke, T.I. Evtimova, and E.J. Garland. Department of Community and Preventive Medicine, Healthy Families Healthy Community Program, Mount Sinai School of Medicine, New York, NY.

**Background:** East Harlem continues as the neighborhood most afflicted by pediatric asthma in all of New York City's boroughs, with 17.55 hospitalizations per 1000 children, ages 0-14 years. This starkly contrasts to the 6.91 hospitalizations per 1000 children for Manhattan as a whole in the same age group. Furthermore, an April 2003 study by the New York City Department of Health and Mental Hygiene revealed approximately 30% of East Harlem children will suffer from asthma at some time during their lives. Little is known, however, regarding how pediatric asthma affects East Harlem children psychologically. Therefore, this project evaluates (a) pediatric asthma's psychological toll on patient quality of life and (b) parental awareness of this psychological toll.

**Methods:** Psychological impact and parental cognizance of the degree and extent of pediatric asthma's psychological effect were assessed by an original, standard 22-question verbal interview administered to East Harlem children and their respective parents.

**Results:** Statistical analysis of data, rendered on a Likert scale of four, includes individual examination of school performance effects, psychological outlooks, activity limitations/quality of life, social ramifications, and medical care efficacy while also performing paired T-tests to evaluate significant disparities between each parent/child diad's replies.

**Conclusion:** Disparities and differences shall be further explored, with an eye towards possible future education and fostering better parent-child communication and adult empathy regarding pediatric asthma.

**Effects of Time Since First Depressive Episode on Cognition in Patients with Recurrent Major Depressive Disorder.** C.M. Celano, M.A. Rapp, A. Reichenberg, K. Dahlman, and J.M. Gorman. Department of Psychiatry, Mount Sinai School of Medicine, New York, NY.

**Background:** Recently, decreased hippocampal neurogenesis has been proposed in major depressive disorder (MDD). At the same time, hippocampal volume loss has been associated with longstanding MDD, and patients with recurrent geriatric MDD have been shown to have distinct deficits in delayed recall. However, few studies have examined the effects of depression duration on neuropsychological performance, and they have yielded inconsistent results. The aim of our study was to de-

termine the effects of the amount of time since first depressive episode in patients with recurrent MDD on 5 cognitive domains: short- and long-term memory, fluency, attention, and visuospatial learning.

**Methods:** The neuropsychological evaluations of 59 adults with recurrent MDD were examined. For each participant, the year of first episode of MDD was recorded. Pearson correlations, partial correlations, and regression analyses assessing the association between years since first episode of depression and neuropsychological variables were performed.

**Results:** A moderate ( $r=-0.377$ ) negative correlation was found between years since first episode of depression and the delayed recall cognitive domain, controlling for the effects of age. Regression analyses indicated that, beyond age, gender and education, years since first episode of depression had a significant effect on delayed recall in our sample.

**Conclusions:** These results suggest that suffering from recurrent MDD for a long period of time may result in the specific impairment of long-term memory, possibly related to hippocampal dysfunction. These results may explain distinct deficits in recall observed in recurrent geriatric MDD.

**The Role of B4 Integrin in Squamous Cell Carcinomas.** P.R. Chaudhari, B.A. Horst, and M.P. Marinkovich. Department of Dermatology, Stanford University, Stanford, CA.

Squamous cell carcinoma (SCC) is one of the most common tumors with an incidence of 80 in 100,000 people per year. In a recently described tumor model, normal keratinocytes can be transformed into SCC-like cells via overexpression of Ras and IkbA. Formation of tumors in this model has been shown to be dependent on expression of a6b4 integrin and laminin 5. Integrins are transmembrane receptors essential for attachment and interaction of keratinocytes with the ECM. In order to further define the role of the a6b4 integrin, mutant forms of b4 integrin which cannot bind to extra and intracellular ligands, are re-expressed in keratinocytes. These studies are critical in defining the mechanism of the formation of SCC. Overexpression of Ras and IkbA is achieved by retroviral transfer of these genes into keratinocytes with stable integration into the genome. Using a fibroblast packaging cell line, viral supernatant for infection with Ras and IkbA was produced and tested on normal keratinocytes. Overexpression of both Ras and IkbA protein was confirmed by Western blot. The viral titer will be further used to transform keratinocytes expressing mutant forms of b4 integrin into SCC-like cells to test their tumor forming potential. Preliminary results suggest that the interaction of a6b4 integrin with laminin 5 is essential for this process. A mutant form of a6b4 integrin has been found to significantly inhibit tumor formation in this model. Further insight into the interactions may ultimately lead to development of new drugs for targeting early stage squamous cell carcinoma.

**The Perception and Evolution of Medical Error in the Health Care Profession and Consequential Impact on Education of Physicians.** P.W. Chen, D. Muller, and K. Ornstein. Department of Medicine, Mount Sinai School of Medicine, New York, NY.

The lay press and the medical literature have extensively covered many aspects of medical errors: from data on their frequency and outcomes, to suggestions for reducing error, to attempts at understanding how errors should be handled. As medical trainees develop a tolerance over time to pain, suffering, tragedy, we believe that they develop a tolerance to errors. Our hypothesis is that the perception and definition of a medical error undergoes a transformation or evolution in the minds of most trainees over the course of their transition from students to residents. Through pilot studies (phase 1) and previously collected surveys (phase 2) distributed to all first year entering students, third year medical students after they have completed their clinical clerkships, medical interns at the end of internship, and graduating third year medical residents, we hope to continue the project this summer by showing a dramatic difference between the perceptions of incoming first year students and graduating house staff through extensive data compilation and analysis (phase 3). We also expect that, with some variation, there will be a graded change in perception over time. Students who have not had clinical experiences will define errors more broadly and will be harder on themselves for errors they make. Residents will define error more narrowly and will be more adept at minimizing their personal and professional fallout. We hope to gain a better understanding of how the perception of medical error evolves during critical phases of medical training, and more specifically what factors influence this evolution.

**Does FAK Control Fibroblast Migration by Regulating the Localization of ZO-1 to Lamellipodia?** A.S. Chheda, M. Benezra, and S.K. Masur. Ophthalmology, Mount Sinai School of Medicine, New York, NY.

ZO-1 is an intracellular protein component of tight junctions, and has been shown by our lab to localize to the leading edge of lamellipodia of migrating corneal fibroblasts in a cell culture model of wounding. The possibility that lamellipodial ZO-1 plays a role in migration was suggested by preliminary studies of mouse embryonic fibroblasts lacking FAK (focal adhesion kinase): FAK<sup>-/-</sup> cells have inhibited migration and they also lack lamellipodial ZO-1. To test whether the absence of FAK is responsible for the decrease in lamellipodial ZO-1, we decreased FAK in two other ways: (a) transfecting FAK siRNA to prevent the transcription of FAK mRNA and (b) transfecting GFP tagged-FRNK, a dominant negative for FAK kinase activity. si RNA, or GRP-FRNK or appropriate controls were introduced into mouse embryonic fibroblast. After 3 days, we fixed and immunodetected FAK and ZO-1. Both FRNK cells and siRNA cells had decreased expression of FAK in their focal adhesions. Furthermore, less ZO-1 was detected in their lamellipodia and cell-cell contacts. We plan to do migration studies to test the hypothesis that decreased lamellipodial ZO-1, decreases migration. The results of this study support a role for FAK kinase cascade in regulation of ZO-1 in cell junction formation and possibly for fibroblast motility in the wound healing process. This information would afford us a more complete understanding of the factors that mediate corneal wound healing, which can help us to avoid the complications of slowed and impaired wound healing as in infections and blindness.

**Acute Impact of Cardiac Catheterization on Ischemic Mitral Regurgitation and Left Ventricular Wall Motion.** M. Chiu, A. Belanger, L. Croft, MD, and M.E. Goldman MD. Department of Medicine/Cardiology, Mount Sinai Hospital, New York, NY.

Though ischemic mitral regurgitation (MR) is often indirectly addressed with percutaneous revascularization, with the expectation that treating the underlying coronary artery disease (CAD) will lead to its eventual resolution, there have been no "acute" studies. To determine the immediate impact of catheterization on ischemic MR on left ventricular wall motion, we recruited 35 consecutive consenting patients and performed a pre-catheterization echocardiogram focusing on the left ventricular wall motion and the presence and severity of MR (graded on a scale of 0–4). A second echocardiogram was performed 2–24 hours following the catheterization procedure on 28 patients. Fifteen of the 35 patients (43%) had at least mild MR with 9 of 35 (25%) classified as ischemic MR. Three of 7 (43%) interventional ischemic MR patients displayed marked MR improvement (defined as a decrease of > one grade) while neither of the two non-intervention ischemic MR patients displayed marked improvement. In addition, 8 of 17 intervention patients (47%) displayed an improvement in wall motion in at least one left ventricular segment, while there were no changes in wall motion in any non-intervention patients. Two intervention patients displayed deterioration in at least one segment. While our study is too small to draw any broad conclusions, our preliminary findings suggest that revascularization of the left ventricle results in acutely improved wall motion and ischemic MR.

**Is the TIMI Risk Score Predictive of Positive Stress Tests in Emergency Department Chest Pain Patients?** E. Cho and L. Hermann, MD. Department of Emergency Medicine, Mount Sinai School of Medicine, New York, NY.

Cardiac ischemia, a disease process associated with significant patient morbidity and mortality, is often difficult to diagnose at the time of initial presentation. Published data suggests 2–4% of patients with cardiac ischemia are inadvertently discharged from emergency departments each year. Recently, clinical risk scores have been developed to help guide therapeutic decisions regarding patients treated for possible cardiac ischemia. The TIMI risk score has been validated as a tool for establishing risk of death, myocardial infarct, or recurrent ischemia in high-risk chest pain patients but has not been applied to low-risk groups. The present study investigates whether the TIMI risk score can be applied to low-risk chest pain patients to help predict the presence of cardiac ischemia as demonstrated by a positive stress test. Patients presenting to the emergency department (ED) with symptoms of cardiac ischemia during the study period were screened for risk of complications via a validated pro-

ocol. Patients at low risk for complications were admitted to the ED chest pain unit (CPU) where they underwent serial EKG and cardiac enzyme testing to screen for myocardial injury. If negative, the patient then underwent a stress test to determine the presence of reversible myocardial ischemia. Patient records were accessed retrospectively using the electronic data system in the Mount Sinai ED. During the study period, 161 patients were evaluated in the CPU. A TIMI score was calculated for each patient. The scores ranged from 0–5, the lowest and highest possible score being 0 and 7, respectively. A score of 3 or higher indicates a moderate to high risk of cardiac complications. Data was analyzed using the Spearman Rank-Order Correlation Coefficient. Results showed no correlation between the TIMI score and the likelihood of a positive stress test in patients (.064 correlation coefficient). Of the 142 patients classified as low risk (TIMI risk score 0–2), 15% had a positive stress test. This study shows that the TIMI risk score is not helpful in predicting the presence of cardiac ischemia in low to moderate risk patients.

**Development of a Questionnaire to Measure Quality of Life in Families with a Food-Allergic Child: The Food Allergy Quality of Life—Parental Burden (FAQL-PB) Questionnaire.** B.L. Cohen, S. Noone, A. Muñoz-Furlong, and S.H. Sicherer. The Elliot and Roslyn Jaffe Food Allergy Institute, Division of Allergy and Immunology, Department of Pediatrics, Mount Sinai School of Medicine, New York, NY.

**Background:** Food allergy is potentially severe, affects approximately 5% of children, and requires numerous measures for food avoidance to maintain health. The impact of this disease on health-related quality of life (HRQL) has been documented using generic instruments, but no disease-specific instrument is available.

**Objective:** To create a validated, food allergy-specific HRQL instrument to measure parental burden associated with having a food-allergic child.

**Methods:** After identification of 74 items affecting families with food allergic children, 88 families were approached for impact scoring. Final items were generated by score results, elimination of redundancies, and content review. Resulting high impact areas were queried for validation with a 7-point Likert scale. A final instrument including 17 items and 2 "Expectation of Outcome" questions was distributed to 352 families for validation.

**Results:** Areas of impact included: Family/social activities, restaurant meals, social activities, childcare, vacation, school, time for meal preparation, health concerns and emotional issues. Validation steps showed strong internal validity Cronbach  $\alpha$ , 0.95 and good correlation with "Expectation of Outcome" questions  $r=0.412$ ,  $p<0.01$  and scores on a generic HRQL instrument, the CHQ-PF50  $r=-0.36$  to  $-0.4$ ,  $p<0.01$ . The instrument showed the ability to discriminate by disease burden: parents whose children had multiple >2 food allergies were more impacted than those whose children had fewer allergies scores 3.1 vs. 2.6,  $p<0.001$ .

**Conclusions:** The FAQL-PB demonstrates strong internal and cross-sectional validity. Its discriminative ability suggests it will be a useful tool to measure outcomes in treatment studies of food allergy for children.

**Histological Analysis of Age and Gender-Related Changes in Endosteal, Intracortical, and Periosteal Porosity of the Distal Radius.** M.A. Cordova, J.W. Williams, D.C. Casagrande, J.E. Bird, D.M. Laudier, C.J. Terranova, and K.J. Jepsen. Leni and Peter W. May Department of Orthopaedics, Mount Sinai School of Medicine, New York, NY.

Although bone density scans (DXA) are recommended to measure bone health at the hip, a peripheral site measurement would offer the advantage of minimizing central radiation exposure. However, the relationship between hip and wrist bone loss is not fully understood. This study's goal was to assess the bone loss progression of the distal radius as a function of age and gender. Bone loss was assessed from 44 cadavers (48–100 years; 24 females, 22 males). Total area (TA), cortical area (CA), medullary area (MA), and intracortical porosity (ICP) were quantified from digital images. The slopes of endosteal bone loss (MA/TA) and total bone loss (MA+ICP)/TA versus age were two times greater in females compared to males. However, intracortical porosity (ICP/TA) increased with age for males but decreased for females. A high resolution analysis of the progressive increase in Haversian canal size from the periosteum to the endosteum revealed that individual pores increased in size and eventually coalesced subendosteally with neighboring expanding pores. The

ICP continued to increase until the size of the resulting pore ultimately coalesced with the marrow, leading to an age-related increase in MA and a decrease in ICP. Ongoing research will incorporate specimens of a younger population to view comparable trends over a broader age range. The results of this study provide new insight into age-related bone loss. Men and women show a similar pattern of bone loss; however, women tend to lose bone faster than men, perhaps contributing to the higher fracture incidence of fragility fractures in women.

**Immune Assessment of Peripheral Blood Leukocytes.** J. Corona, C.M. Divino<sup>1</sup>, and S-H Chen<sup>2</sup>. <sup>1</sup>Department of Surgery and <sup>2</sup>Carl C. Icahn Center for Gene Therapy and Molecular Medicine, Mount Sinai School of Medicine, New York, NY.

Previous research has demonstrated that tumors often evade attack from the immune system due to defective immune cell function. Tumor-bearing cells secrete cytokines that affect cell proliferation causing atypical differentiation of the myeloid cell lineage causing an accumulation of immature myeloid cells (ImC). This population has been found to involve immune T tolerance and T regulatory cell development in murine tumor models. This study aimed to identify and quantify the abnormal cell populations present in the peripheral blood mononuclear cells (PBMC) of patients with cancer. Peripheral blood samples from both normal volunteers and cancer patients were obtained and assayed for the presence of ImC composed of immature monocytes, early stage myeloid and dendritic cells. PBMCs were separated from blood samples on Ficoll-Hypaque and percoll density gradients. Percoll density gradients were used to separate the cells into four fractions. Each fraction was collected and stained using immunofluorescent antibody markers to isolate and quantify ImC as well as mature cell populations. ImCs (Lin<sup>-</sup>) were stained using Lin<sup>-</sup>, CD115, and CD15; Mature myeloid cells (Lin<sup>+</sup>) via CD3, CD16, CD19, CD20, and CD56. Flow-cytometry and total cell numbers aided in the quantification of the cell types present. Blood fraction II from patients with cancers should be found to contain higher quantities of ImCs. This experiment is the first step in identification and isolation of this ImC population from cancer patients. Such characterization will be crucial for the identification and the treatment strategies on ImCs, which may induce immune tolerance in human cancer patients.

**Risk of Myocardial Infarction or Vascular Death after First Ischemic Stroke: The Northern Manhattan Stroke Study.** M.S. Dhamoon, BA<sup>1</sup>, R.R. Sciacca, EngScD<sup>2</sup>, B. Boden-Albala, DrPH<sup>3,4</sup>, T. Rundek, MD, PhD<sup>4</sup>, R.L. Sacco, MD, MS<sup>4,5,6</sup>, and M.S.V. Elkind, MD, MS<sup>4,5</sup>. <sup>1</sup>Joseph P. Mailman School of Public Health, <sup>2</sup>Department of Medicine, College of Physicians and Surgeons, <sup>3</sup>Department of Sociomedical Sciences, Joseph P. Mailman School of Public Health, <sup>4</sup>Department of Neurology, College of Physicians and Surgeons, <sup>5</sup>Sergievsky Center, College of Physicians and Surgeons, and <sup>6</sup>Division of Epidemiology, Joseph P. Mailman School of Public Health, Columbia University, New York, NY.

In national guidelines, absolute long-term risk of myocardial infarction (MI) or vascular death determines target low-density lipoprotein (LDL) levels, but stroke patients are not explicitly addressed. We sought to determine 5-year rates and predictors of cardiovascular outcomes after first ischemic stroke in a multiethnic cohort.

**Methods:** In the population-based Northern Manhattan Stroke Study, first ischemic stroke patients >40 years were prospectively followed annually for recurrent stroke, MI and cause-specific mortality. Kaplan-Meier 5-year rates for cardiovascular events were calculated. Multivariate Cox proportional hazards models were used to calculate hazard ratios and 95% confidence intervals (HR, 95% CI) for predictors of individual and combined cardiovascular outcomes.

**Results:** Mean age (n=655) was 69.7 ± 12.7 years; 55.4% were women, 51.3% Hispanic. Median follow-up for survivors was 4.0 years. The 5-year rate of MI or vascular death was 16.5% (95% CI 13.4–19.6%). Predictors of MI or vascular death were age >70 years (HR 1.86, 1.16–2.98), history of MI (HR 1.90, 1.19–3.05), and history of atrial fibrillation (HR 2.11, 1.24–3.59). Even for the lowest risk group, those <70 years without coronary artery disease (CAD), 5-year rates of MI or vascular death were 9.5% (95% CI 5.5–13.4%). Including non-fatal stroke as an outcome measure, the 5-year risk of cardiovascular events was 25.2%.

**Conclusion:** The absolute rate of MI or vascular death after ischemic stroke is high enough, even without concurrent CAD, to warrant inclusion of ischemic stroke patients in the category of coronary risk equivalents, implying target LDL levels <100 mg/dL for ischemic stroke patients.

**The Impact of the Attitudes and Stigmas of Children Regarding HIV/AIDS on Preventing the Spread of Infection in the Bronx, New York.** N.E. Edmondson, and M. McKay Ph.D. Department of Psychiatry, Mount Sinai School of Medicine, New York, NY.

In the light of the high rates of HIV infection in the Bronx, New York, this study examines the attitudes, stigmas, and knowledge of children regarding HIV/AIDS before they reach high risk age groups. The study aims to determine the origins of these views as well as how this information can be used by physicians to better educate their young patients. Despite recent research advances, HIV/AIDS remains a highly stigmatized disease in the United States. There are many published theories about HIV prevention, but there is a lack of information about children, who are already developing ideas and beliefs that will influence future health decisions. By focusing on understanding these attitudes and stigmas of children regarding the disease, this study aims to discover more effective HIV/AIDS prevention techniques specifically for children. Data for this study will be collected by interviewing and surveying children ages nine to thirteen in the Bronx to examine their beliefs and knowledge of several aspects of the disease. The study began by interviewing children whose parents help organize HIV prevention programs in their community. Next, these children of knowledgeable and motivated parents will be compared to children whose parents are not involved with AIDS prevention programs. The conclusions of these studies could shed light on how the attitudes of children impact the spread of HIV/AIDS, the role of the family in AIDS prevention, and new education and prevention techniques for physicians.

**The Stark Study: A Cross-Sectional Study of Adherence to Short-Term Drug Regimens in Urban Kenya.** A.E. Ellis, R.P. Gogel, B.R. Roman, J.B. Watson, D. Indyk, PhD, and G. Rosenberg, PhD. Department of Community and Preventative Medicine, Mount Sinai School of Medicine, New York, NY.

The purpose of the STARK study (Short-Term Adherence Research in Kenya) was to identify factors that predict adherence to short-term drug regimens in Nairobi, Kenya. Despite the deleterious effects of nonadherence on patients, limited literature exists on adherence to short-term regimens. The 357 participants enrolled in the study were predominantly mothers under the age of 30 living in nuclear families with an average of three children. Sixty percent of the participants had attended upper primary school. The average weekly income was \$2.50, while average weekly expenses were triple that amount. The participants were recruited from the RAFIKI Foundation Clinic, a free primary healthcare clinic in Kibera, Nairobi's largest slum. Quantitative surveys were administered in Swahili to 357 participants regarding their adherence patterns; surveys were also given to a subgroup of 233 mothers regarding their adherence in giving medicine to their children. Forty participated in four focus groups. The study population strongly believed that Western medicine was instrumental in making them well. Fifty-two percent of participants reported taking all of their prescribed medication and 47% took it until they felt better. The most frequently cited barriers to adherence included lack of food and clean water, stress, financial problems, and cost of medication. For the mother-child subgroup, over 65% of mothers reported giving all prescribed medication to their children and cited lack of food as the key barrier to adherence. The amount of control that participants felt they had over their health was positively correlated with how they described their overall health status, and participants reported that greater financial stability would help them to feel greater control over their health. The free nutritional feeding program and caring doctors and nurses made it easier for them to take their medications on schedule. By identifying obstacles to adherence and strategies to overcome them, this study showed that a community-based clinic with committed healthcare workers in Kenya can empower an economically disadvantaged population to be adherent.

**Inducible Sirna Targeting of Tumor Suppressor KLF6 Splice Variants and the Effects on *in vivo* Tumorigenicity.** F. Feller, O. Camacho-Vanegas, and J.A. Martignetti. Department of Human Genetics, The Mount Sinai School of Medicine, New York, NY.

The Kruppel-like factor six (KLF6) gene is a tumor suppressor and its functional inactivation is increasingly becoming implicated in a variety of cancers, including prostate, ovarian, and head and neck squamous cell carcinoma. Most recently, we have demonstrated in a multi-institutional study of 3,411 men, that a germline KLF6 single nucleotide polymorphism (SNP) is significantly associated with increased prostate cancer risk. This SNP results in the increased transcription of two alternatively spliced KLF6 isoforms. These splice variant proteins are mislocalized to the cytoplasm and antagonize wtKLF6 function, leading to decreased p21 expression and increased cell growth. To directly examine the *in vivo* biology of these KLF6 variants we have generated inducible cell lines which specifically silence each of the KLF6 family members. Using this system, the biological effects of KLF6 and its variants can be demonstrated in a temporally restricted manner on a variety of levels from cell culture to *in vivo* tumorigenesis. With these cell lines, we will explore the effects of independent and targeted siRNA mediated reduction of both KLF6 splice variants on cell proliferation, colony formation, invasion, and *in vivo* tumorigenicity. Ultimately, these results may provide insight into the molecular mechanisms which underlie the development and/or progression of cancer.

**In-vitro Generation of Pancreatic Beta Cells from Embryonic Stem Cells Using Transcription Factors.** E. Galeano and T. Ku. Department of Gene and Cell Medicine, Mount Sinai School of Medicine, New York, NY.

Insulin Dependent Diabetes Mellitus (IDDM), also known as Type 1 diabetes, is a chronic disease in America. The disease is caused by the loss of beta cells in the pancreas, which are responsible for the production of insulin. The disease is treated with daily insulin intake. Injected insulin, however, cannot accurately mimic the natural insulin response, and there are still serious long-term health risks associated with this treatment. Replacing the lost beta cells would perhaps be an effective cure; one possible source of beta cells would be embryonic stem cells (ES cells). Past research has been able to differentiate ES cells into early pancreatic insulin and glucagon expressing cells (Ku et al., Stem Cells, in press). Pax 4 is a transcriptional repressor that functions by repressing the alpha cell differentiation program and thus allows the cells to develop into beta and delta cells. This research project will focus on overexpressing Pax 4 using a doxycycline inducible system and monitoring the effects of upregulating the genes in ES derived cells. Doxycycline treated cells will be assayed for insulin and glucagon expression after one to four weeks. This will be the first step toward differentiating cells that secrete insulin. Mature pancreatic cells can be used as a treatment for Type 1 diabetes.

**The Relationship between Palliative Care and Hospital Costs.** M. Gomez-Trochez, E. Granieri, R.S. Morrison, and J.D. Penrod. Department of Geriatrics, Mount Sinai of Medicine, New York, NY.

Palliative care has been developed to improve care at end of life and for advanced illness. Other studies have examined the effectiveness of palliative care, the most pronounced effect being an improvement of patient and family satisfaction. Despite the prevalence of palliative care in our hospitals, there are few empirical studies comparing the costs of palliative care and usual care. We conducted a retrospective analysis of all the patients who died in the Brooklyn VA hospital, of non-traumatic causes, during fiscal year 2003. We identified patients who did and did not receive a Palliative Care Consultation Team (PCCT) consult during their terminal stay, and matched patients in the two groups based on principal diagnosis, age and co-morbidity. Forty-three PCCT patients were matched to 43 usual care patients. We looked at differences in direct, pharmacy and ancillary cost (average cost per day). There was no significant difference between groups in terms of age, co-morbidity score, number of hospital stays in the previous year or length of stay. PCCT patients had an average 15% fewer days spent in the ICU over the total hospital stay, to a significant degree. We also found significantly lower PCCT costs in average direct and average ancillary costs, and no significant difference in pharmacy costs. We conclude that palliative care incurs lower hospitalization costs at end of life than does usual care, while providing an array of services that may improve care.

**The Association between History of Depression and Angiographic Extent of Coronary Artery Disease.** J.S. Goodman, N. Rieckmann, D. Haas, D. Shimbo, and K.W. Davidson. Integrative and Behavioral Cardiology, Mount Sinai School of Medicine, New York, NY.

**Background:** Coronary artery disease (CAD) patients with a history of depression are at increased risk for mortality. It is unclear what mediates this relationship. We examined the relationship between self-reported history of depression and the extent of cardiac disease as indicated by angiography. We hypothesized that patients with a positive history of depression would exhibit greater extent of CAD when compared to patients with no history.

**Methods:** Participants included 93 post-Acute Coronary Syndrome (ACS) patients. History of depression was assessed using the Depression Interview Scale (DIS). Measures of disease extent were obtained from angiography.

**Results:** There was no association between depression history and presence of left main or 3 vessel disease and maximum percent stenosis ( $p > 0.20$ ). However, number of diseased coronary vessels was significantly lower in patients with a depression history ( $p = 0.05$ ).

**Conclusions:** Contrary to our expectations, patients with depression history did not exhibit greater angiographic extent of CAD and even had fewer significantly diseased vessels. Several previous studies have shown that various severity markers of CAD are not associated with current depression. We review those studies that have examined the relationship between depression and CAD severity markers. Furthermore, we discuss the implication these results have on the pathophysiologic theories underlying higher rates of mortality in depressed CAD patients.

**Restorative Proctocolectomy and Ileal Pouch Anal Anastomosis in a Patient with Ulcerative Colitis and Primary Sclerosing Cholangitis following Liver Transplant.** A. Grucela and R. Steinhagen, M.D. Division of Colorectal Surgery, Mount Sinai Medical Center, New York, NY.

Primary sclerosing cholangitis (PSC) is present in 5% of patients with ulcerative colitis (UC). Conversely, as many as 90% of patients with PSC have been found to have UC. The accepted treatment for advanced PSC is orthotopic liver transplant, and the treatment of ulcerative colitis with concomitant PSC is restorative proctocolectomy with ileal pouch anal anastomosis (IPAA). A small number of studies have shown that there is an increased risk of pouchitis in UC patients with PSC following ileal pouch anal-anastomosis. We reviewed the literature of restorative proctocolectomy with IPAA in patients with previous liver transplant for PSC and, additionally, reported a case of a 45-year-old male who underwent a two-stage restorative proctocolectomy with IPAA after previous orthotopic liver transplant for PSC. The goal of this investigation was to see if additional factors such as orthotopic liver transplant for PSC, and immunosuppression prior to IPAA, effect the outcome of the surgery. Our primary area of concern was pouchitis, and whether these results require a change of patient management. We concluded that no change in management is warranted for intractable UC in patients who have had previous orthotopic liver transplants for PSC. However, it is important to be aware of the possibility of increased pouchitis risk postoperatively, and to follow these patients closely to avoid complications. The data is speculative, as patient populations are small, and there is a need for further study in this area.

**Local Anesthetics and Labor Epidural Analgesia: Bupivacaine vs. Ropivacaine vs. Levobupivacaine.** N.R. Guinn, BS, and Y. Beilin, MD. Department of Anesthesiology and OB/GYN, Mount Sinai School of Medicine, New York, NY.

For many years, the local anesthetic bupivacaine has been the standard anesthetic for labor epidurals because of its analgesic effectiveness, differential sensory-to-motor blockade, and its relative long-lasting effects. The FDA has approved two new drugs, ropivacaine and levobupivacaine, which may be safer, having less cardiotoxicity as well as less lower extremity motor blockade. This in turn may correlate with a lower rate of cesarean and forceps assisted delivery. Vaginal deliveries are safer and more cost effective than instrumental deliveries. Thus an anesthetic that decreases the rate of instrumental deliveries while still providing sufficient analgesia would be preferable. This study is looking at the difference in the rate of instrumental deliveries between the three local anes-

thetics. In a randomized, double blind study, women in labor were assigned to receive one of these three drugs in their epidural catheter. They were assessed for pain, blood pressure, nausea, pruritus, and motor blockade of lower extremities throughout labor, and mode of delivery. Preliminary results show that bupivacaine has the highest cesarean (35%) and total instrumental delivery rate (40%). Levobupivacaine shows lower rates of instrumental (32.4%) and cesarean (26.5%) delivery but with a higher average dose of local anesthetic than the other anesthetics. Ropivacaine has a similar cesarean (25.6%) delivery rate to levobupivacaine but larger instrumental delivery rate (38.4%). Thus far, levobupivacaine appears to be the best local anesthetic for labor epidurals, given the significantly lower rate of cesarean and instrumental delivery rate. We plan on enrolling a total of 360 patients.

**Healthy Food Availability in Guadalajara, Mexico, Compared to New York City.** M.M. Haglund and C.R. Horowitz, MD, MPH. Department of Health Policy, Mount Sinai School of Medicine, and the East Harlem Diabetes Center of Excellence, New York, NY.

Eating a healthy diet is essential for preventing and controlling diabetes and obesity, which disproportionately affect Mexicans and Mexican Americans. In minority communities in the US, there is a relative shortage of stores that carry nutritious foods. Stores in East Harlem, New York City, an urban, predominantly poor and minority community, are significantly less likely than stores in the predominantly wealthy and white Upper East Side to carry healthy foods. It is not known whether this disparity in healthy food availability exists in developing countries, where many urban US immigrants originate. Therefore, I studied food availability in Mexico, and compared it to food availability in NYC. I surveyed the grocery stores in wealthy and poor neighborhoods of Guadalajara, Mexico, to determine whether they carry healthy versions of five staple foods: fresh fruits, fresh vegetables, high fiber or low carbohydrate breads, low fat milk, and diet sodas. Overall, 11% of stores in the poor, versus 72% in the wealthy area, carry all 5 healthy items, as compared with 18% in East Harlem and 58% on the Upper East Side. In conclusion, there is an even greater disparity between healthy food availability in affluent and low income communities in Guadalajara than there is in NYC. Given that obesity and diabetes are epidemic in both nations, efforts should be made to determine the effect of this disparity on diet and on health, and to improve availability of healthy foods. Efforts to educate US immigrants on healthy eating should recognize that individuals may be from environments where they had limited exposure to healthy foods.

**Prevalence and Characteristics of Physician-Older Adult Communication about Complementary Alternative Medicine Use in East Harlem, New York.** S.Y. Hu, C.X. Pan, and J.L. Howe. Departments of Geriatrics and Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY.

Previous research shows that CAM is widely used among older adults, often without knowledge by their physicians (Cohen RJ, Pan CX, 2002). This pilot study is a follow-up to find the possible causes of the physician-older adult communication barrier regarding the use of CAM in an urban low-income community. We compared the demographics and the types of CAM used by the communicators and the non-communicators to assess predictors of lack of discussion about CAM use between physicians and patients. Of the communicators, we also assessed physician characteristics that facilitate discussion as well as the elders' perceived usefulness of these discussions. One hundred surveys administered in Mandarin, Spanish and English were acquired from interviewing elders living in government subsidized housing facilities, i.e., Linkage House, and participants of the East Harlem senior centers Gaylord White, James Weldon Johnson, Corsi and Washington/Lexington. Preliminary results agree with our hypothesis that older adults in East Harlem tend not to talk to their doctors about CAM use, as supported by a communication rate of about 33% among CAM users. Hispanics and Asians are more likely not to talk to their physicians, with Asians being the most unlikely. Analysis on other predictors of communication barriers about CAM, such as doctor-patient language concordance and type of CAM usage, is ongoing. With the results of this study, we hope to assess the predictors of poor physician-older adult communication on CAM use, which may serve as a basis for future public health initiatives and physician education.

**Trauma Exposure and PTSD in an Inner-City Outpatient Clinic.** A. Hurtado, J. Newcorn, E. Greenblatt, T. Brennan, D. Charatan, I. Ivanov, E. Shemesh, C. Chemtob, R. Yehuda, A. Garnacho, and C. Hamilton. Department of Adolescent Child Psychiatry, Mount Sinai School of Medicine, New York, NY.

Childhood exposure to traumatic stress has been widely recognized as a prominent risk factor in the development of psychopathology in childhood and later life. This is of particular importance in urban areas, where children have been found to be repeatedly exposed to traumatic events. Nevertheless, much of the literature disproportionately discusses youth exposed to single event traumas, such as natural disasters. Therefore, the relationship between traumatic experiences encountered by children living in high-risk environments and childhood psychiatric disorders remains poorly understood. In order to examine the prevalence of traumatic exposure and PTSD symptoms, 203 children visiting Mount Sinai Hospital's outpatient child psychiatric clinic for the first time were recruited. Participating children were between the ages of 4 and 17. Parent and child were asked to complete a series of psychiatric measures that include the UCLA Post-traumatic Stress Reaction Index. We found that 68% of these children reported some type of trauma. The most common trauma reported was related to domestic violence. Based on child reports, 44% of the children meet either full or partial PTSD criteria. The parent reports, however, demonstrate that 31% meet full or partial criteria for PTSD. Furthermore, 68% of children reported any trauma, while only 59% of parents reported any trauma. Of the 31 children who met full PTSD diagnosis, based on parent report on PTSRI, only 7 were diagnosed with PTSD by clinicians. Similarly, 7 of the 30 children meeting full criteria based on child PTSRI reporting were diagnosed with PTSD. This data suggests that traumatic stress may be under-appreciated by parents and underdiagnosed by clinicians.

**Induction of Apoptosis by HIV-Infected Monocytic Cells.** F.S. Hwang and K. Sperber. Department of Medicine, Center for Immunobiology, Mount Sinai School of Medicine, New York, NY.

We have cloned an apoptotic protein, the human hypothetical protein FLJ21908 isolated from the CD14<sup>low</sup>CD16<sup>high</sup> 43 HIV human macrophage hybridoma cell line that we have renamed the SHIVA (soluble HIV apoptotic) protein. SHIVA may play a role in the neurological complications of AIDS, especially HIV-associated dementia (HAD), since it induces apoptosis in neuronal cells, can be co-localized in brain macrophages of patients with HAD by immunohistochemistry, and is detected (ELISA and PCR) in the cerebrospinal fluid of patients with HAD but not in HIV-infected patients without dementia, or normal controls. We have identified 2 candidate receptor(s) (MW 100 kDa) for SHIVA and demonstrated that SHIVA-induced apoptosis can be blocked by memantine (an NMDAR antagonist), anti-oxidants and transfected Bcl-2 in neuronal cell lines. SHIVA causes apoptosis by activating Bad and Bax, suppressing Bcl and Bcl-xL, and releasing cytochrome c from the mitochondria that activates caspase 9 and caspase 3. We analyzed brain tissues of patients with HIV-1 Associated Dementia (HAD) obtained from the Manhattan AIDS Brain Bank, located here at The Mount Sinai Medical Center. We have determined the presence of SHIVA and other apoptotic factors, including TNF-alpha, gp120 and Tat in the frontal lobes, basal ganglia and the sub-cortical white matter in HIV patients with HAD, compared to HIV patients without HAD and normal controls with immunohistochemistry. We will analyze those stains showing apoptosis via morphometric analysis to further characterize the role of SHIVA.

**Assessment and Review of HIV-Positive Patient Medical Records from a Traditional Siddha Medicine Hospital in Tamil Nadu, India.** S. Ikeda, K. Baban, N. Hennig, MD, PhD, and H. Sacks MD, PhD, Thomas C. Chalmers Clinical Trials Unit, Mount Sinai School of Medicine, New York, NY.

Only a small percentage of people worldwide have access to HIV antiretroviral therapy and many rely on indigenous medicine systems. For this reason, WHO through the World Health Assembly in 2002 identified the study of these methods as a priority. Siddha medicine, one such traditional system, originated in Tamil Nadu, an impoverished state in south India bearing a disproportionate percentage of the country's HIV/AIDS cases. As part of a long-term goal to evaluate the efficacy of Siddha medicine as

a therapy for HIV, we assessed the medical record-keeping system of Gandeepam, a Siddha hospital in rural Tamil Nadu. Because traditional medicine systems do not necessarily keep records of their patients, it cannot be assumed that such records exist nor that they resemble Western patient charts. However, Gandeepam had begun keeping records two years prior. The records of 36 HIV positive patients were randomly selected from a total of 87 cases. Diagnoses, adherence to treatment, changes in patient health status, adverse events, and a system of unique patient identifiers employed by Gandeepam for a previous study were documented and evaluated. Preliminary findings indicate the records included patient symptoms, treatments prescribed, and changes in patient status. However, little insight into Siddha diagnoses or adverse reactions were provided. Additionally, patients' identifying information was linked to their unique study number within the chart. Recommendations for improvement to Gandeepam's medical record system based on these findings will pave the way for continued collaboration with Gandeepam, and future clinical studies of Siddha medicine.

**Regulation of CA2+-Regulating Enzymes, CD38 and CD157, by TNF- $\alpha$  during Osteoclastogenesis.** J. Iqbal and M. Zaidi. Department of Medicine, Mount Sinai School of Medicine, New York, NY.

CD38 and CD157 are evolutionary conserved ecto-enzymes that catalyze the conversion of NAD<sup>+</sup> to Ca<sup>2+</sup>-releasing molecules. The expression of both CD38 and CD157 is enhanced in severe rheumatoid arthritis, the osteolysis associated with which is TNF-mediated. We therefore examined whether CD38 and CD157 were positively regulated by TNF as a means to control excessive osteoclastogenesis. TNF- $\alpha$  stimulated, by >30- and >8-fold respectively, the expression of CD38 and CD157 mRNA in ficoll-purified bone marrow cells for up to 48 hrs. This was expectedly not seen with CD38<sup>-/-</sup> cells, confirming specificity. Double-labeling experiments showed that both CD38 and CD157 were up-regulated in the same cells. To understand the mechanism of the TNF- $\alpha$  effect, we carried out half-life experiments, CHIP and DNA binding assays. Both CD38 and CD157 mRNAs in TNF- $\alpha$  treated cells displayed half-lives of about 3 hrs, excluding effects on mRNA stabilization. Consistent with this, we detected binding of an NF- $\kappa$ B responsive element in the murine CD38 promoter to the NF- $\kappa$ B subunit, p50. This binding was abrogated when a G $\rightarrow$ C point mutation was introduced within promoter, confirming specificity. CHIP analysis showed increases in p65/p50/c-fos binding to the CD38 promoter 3 hours after TNF addition. In contrast, RANK-L treatment failed to increase NF- $\kappa$ B binding to the promoter. Re-CHIP analysis at 3 hours after TNF addition showed that p65/p50/AP-1/STAT1 all bound to the CD38 promoter and were able to immunoprecipitate each other. As CD38 negatively regulates osteoclast formation, its up-modulation may provide a primary mechanism for controlling the TNF- $\alpha$ -driven osteoclastogenesis in rheumatoid arthritis.

**The Epidemiology of Molecular Markers and Breast Cancer Prognosis.** W.R. Jimenez and J. Bernstein. Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY.

Many studies have examined the relationship between survival and molecular markers. However, there are only a few studies on the association between epidemiologic risk factors for breast cancer, molecular markers (p53, Her-2/neu, estrogen receptors and progesterone receptors) and prognosis. The Cancer and Steroid Hormone Study (CASH) provides a unique opportunity to study the association between epidemiologic risk factors, molecular markers, and prognosis because of: (a) the large number of women enrolled; and (b) the availability of extensive interview information, and annual follow-up data. All 4,660 CASH patients were between 20–54 years of age with a diagnosis of a first primary breast cancer between 1980–1982 ascertained through 5 population-based SEER tumor registries, and interviewed within 6 months of their initial diagnosis. For the current analyses, tumor tissue is available for 1200 cases. Using the combined CASH interview data and SEER follow-up data, we are conducting an association study of the epidemiologic risk factors and molecular markers. In addition, we will also study whether there are variations in survival in subgroups in which epidemiologic risk factors for breast cancer are associated molecular markers. Our work focused on identifying important risk factors associated with the molecular markers by reviewing the literature. The identified risk factors will be used to guide variable selection in the analysis and interpretation of the results. The re-

sults of this study may help identify more homogenous subgroups of women with breast cancer, and consequently better-tailored treatment options.

**Evaluation of Dynamic Contrast Enhanced Perfusion MRI in Kidney Disease.** P.E.M. Johnson and J.P. Goldman. Department of Radiology, Mount Sinai School of Medicine, New York, NY.

Chronic Renal Insufficiency (CRI) is a largely asymptomatic epidemic thought to affect more than 10 million Americans. If left unchecked, CRI progresses to End Stage Renal Disease (ESRD), the incidence of which is rapidly increasing, and represents a significant, growing and largely preventable health care burden. The key to prevention lies in arresting CRI before it progresses to ESRD, an intervention that rests heavily on diagnosis. We have developed a new dynamic contrast enhanced perfusion MRI (DCE-MRI) for the quantitative measurement of kidney perfusion. The procedure is both rapid and minimally invasive. It is our hypothesis that quantitative MRI measurements of kidney perfusion will provide useful information in assessment of kidney pathology. We applied this technique in scans of 12 normal controls and of 4 patients with a diagnosis of CRI. Additionally, 8 of the 12 controls had a second scan several weeks after the initial scan. Scans were analyzed to produce descriptive data related to the blood flow into and out of the region of interest. We found no significant difference in measures between the two sessions for those control subjects that had repeat scans. Significant differences were found between control and patient groups in measures of both cortical and medullary diffusion ( $p < 0.01$ ), and in cortical perfusion rates ( $p < 0.001$ ). While we must be conservative with a small sample size, initial findings suggest that DCE-MRI may provide a new technique for the diagnosis and assessment of CRI and related kidney pathology.

**Evaluation of the Individual Herbs of FAHF-2 in a Murine Model of Peanut Allergy.** J.D. Kattan and X-M Li. Division of Pediatric Allergy and Immunology, Mount Sinai School of Medicine, New York, NY.

Peanut allergy is a major cause of fatal and near-fatal anaphylactic reactions. It has no curative therapy. Our lab has shown that a Chinese herbal formula, Food Allergy Herbal Formula 2 (FAHF-2), blocks peanut-induced anaphylaxis in a murine model. This study was designed to investigate the effects of the nine herbs in FAHF-2, to see their individual effects on peanut-induced anaphylactic reactions in a mouse model of peanut allergy. Mice were sensitized with freshly ground whole peanut in the presence of cholera toxin. After herbal treatment for 7 weeks, mice were challenged with peanut, and anaphylactic symptoms, body temperatures, and plasma histamine and IgE levels were measured. T-cell proliferative responses and cytokine production were also determined. In our trials, some single herbs lessened peanut-induced anaphylactic symptoms, though no herb offered full protection from anaphylactic symptoms. The herbs had highly variable effects on mast cell degranulation and histamine release, as well as peanut-specific serum IgE levels. The herbs also had different effects on cytokine production. In conclusion, individual herbs offered varying amounts of protection from anaphylactic reactions, while no single herb supplied complete protection. This suggests that the herbs of FAHF-2 work synergistically to produce the curative therapeutic effects seen in the overall formula, and that each of these herbs may be necessary in future trials of FAHF-2. Further studies must be done to see if all nine herbs are necessary to prevent an anaphylactic reaction in a mouse model of peanut allergy and, ultimately, in a human model.

**Ribavirin Suppresses eIF4E-Mediated Oncogenic Transformation by Physical Mimicry of 7-Methyl Guanosine mRNA Cap.** A. Kentsis, I. Topisirovic, B. Culjkovic, L. Shao, and K. Borden. Structural Biology Program, Department of Physiology and Biophysics, Mount Sinai School of Medicine, New York, NY.

The eukaryotic translation initiation factor eIF4E is deregulated in many human cancers, and its overexpression in cells consistently leads to malignant transformation. Oncogenic properties of eIF4E are directly linked to its ability to bind 7-methyl guanosine of 5' mRNA. Here, we observe that antiviral guanosine analogue ribavirin physically mimics 7-methyl guanosine under physiological conditions. As a result, ribavirin binds to eIF4E with  $\mu$ M affinity at the functional site used by 7-methyl guanosine mRNA cap, competes with eIF4E:mRNA binding, and at low  $\mu$ M con-

centrations selectively disrupts eIF4E subcellular organization and transport and translation of mRNAs post-transcriptionally regulated by eIF4E, thereby reducing levels of oncogenes such as cyclin D1. Ribavirin potently suppresses eIF4E mediated oncogenic transformation of murine cells in vitro, tumor growth of a mouse model of eIF4E dependent human squamous cell carcinoma in vivo, and colony formation of eIF4E dependent acute myelogenous leukemia cells derived from human patients. These findings describe a specific, potent, and unforeseen mechanism of action of ribavirin. Quantum mechanical and NMR structural studies offer directions for the development of derivatives with improved cytostatic and antiviral properties. In all, physical mimicry of 7-methyl guanosine by ribavirin may provide a pharmacologic means for the interruption of post-transcriptional networks of oncogenes that maintain and enhance neoplasia and malignancy in human cancer.

**From Frizzled to Dishevelled: Molecular Mechanisms of Signal Specificity.** T.J. Klein and M. Mlodzik. Brookdale Department of Molecular, Cellular and Developmental Biology, Mount Sinai School of Medicine, New York, NY.

Canonical Wnt/Fz signaling is important for the regulation of a vast array of developmental processes and, when mutated, is associated with a number of human diseases, including lung, breast, colon, and prostate cancer. Two members of the canonical Wnt/Fz pathway, the transmembrane receptor Frizzled (Fz) and the cytoplasmic factor Dishevelled (Dsh), are not only important for canonical Wnt/Fz signaling, but also regulate a distinct non-canonical pathway that controls planar cell polarity (PCP). PCP signaling regulates processes in which cells are polarized relative to one another within the plane of a tissue. We are interested in understanding how Fz and Dsh specifically transduce signals to one pathway versus the other. To do this, we generated a series of canonical/non-canonical chimeric Fz receptors designed to answer this question. We expressed these receptors in both the *Drosophila* eye and wing, and scored for canonical and non-canonical phenotypes. Using this method, we identified key regions of Fz required for signaling specificity. We also established assays in cell culture and the *Drosophila* wing to study the recruitment of Dsh by both canonical and non-canonical Fzs. Experimental results using these assays demonstrate a requirement for heterotrimeric G-protein signaling specifically for the recruitment of Dsh by non-canonical Fzs. To confirm these results, we analyzed genetic interactions between Fz, Dsh, and G-protein signaling effectors and found a requirement for PLC $\beta$  in transducing non-canonical signals.

**Availability of Physical Activity Resources for Children in the Urban Environment of East Harlem.** J.H. Kobil and M. Galvez. Departments of Community and Preventive Medicine and Pediatrics, Mount Sinai School of Medicine, New York, NY.

Childhood overweight and obesity have become epidemic in the United States, especially among African-American and Latino children. East Harlem, a predominantly minority community, has the highest prevalence of obesity of any neighborhood in New York City. Physical inactivity is a major risk factor for obesity. The community-based participatory research project, "Growing Up Healthy in East Harlem," is exploring the relationship between children's growth and development and the physical or "built" environment. A comprehensive survey of East Harlem zip codes 10029 and 10035 was performed through (a) direct observation via walking tours of the neighborhoods and (b) compiling information from various local and state internet sources and city/state agencies. A series of maps of physical activity resources available to East Harlem children has been developed using the geographic information systems software package, ArcGIS. These maps provide location information on resources such as public parks, playgrounds, pools, recreation centers, after-school activities, dance lessons, and sports instruction and teams. Preliminary analysis of the maps will provide information on distribution of resources throughout the community. The maps will be used to examine the effect of access and utilization of physical activity resources on levels of overweight and obesity in East Harlem children. Additionally, the maps will be distributed to East Harlem residents by pediatricians, community health organizations, and the New York City Department of Health's district public health office in East Harlem. The maps will thus serve as a community resource for physical activity opportunities available to children in East Harlem.

**Ex vivo Magnetic Resonance Microimaging of the Tg2576 Transgenic Mouse Model of Alzheimer's Disease: Determining Volumetric Changes in the Brain.** M.H. Kujawski<sup>1</sup>, C.Y. Tang<sup>2,3</sup>, and Patrick R. Hof<sup>1,3</sup>. Departments of <sup>1</sup>Neuroscience, <sup>2</sup>Radiology, and <sup>3</sup>The Advanced Imaging Program, Mount Sinai School of Medicine, New York, NY.

The pathogenesis of Alzheimer's disease (AD) is characterized by the deposition of neurofibrillary tangles and amyloid plaques in brain regions associated with memory and cognition. Abnormal amyloid metabolism and its subsequent deposition as plaques in the brain can lead to neuronal damage and synapse dysfunction. This project addresses the relationship between plaque deposition and cerebral attrition in the Tg2576 mouse model of AD. It is hypothesized that there is an age-dependent volume loss in regions of the Tg2576 mouse brains that are specifically vulnerable in Alzheimer's disease, such as the hippocampus and entorhinal cortex. The Tg2576 model expresses the "Swedish" double mutation of the amyloid precursor protein, exhibiting diffuse deposition of beta-amyloid plaques in areas of the brain vulnerable in AD. Ex vivo magnetic resonance microimaging (MRM) is performed at 9.4 Tesla to generate a high-resolution, three-dimensional image. The image is imported into Amira software for segmentation of brain regions in three orthogonal planes to obtain volumetric measures of the specified regions. Regions of interest include areas afflicted by plaque deposition in AD, such as the hippocampus, the entorhinal cortex and the neocortex. This project therefore examines the temporal and spatial progression of neuronal pathology in a quantitative manner. Preliminary data yield regional volumes that are consistent with values obtained from histological specimens. We plan to expand this project to in vivo MRM, which will allow us to follow pathologic changes prospectively within the same animal during aging, as well as assess the effect of preventive measures on disease progression.

**The Role of Atherosclerotic Risk Factors in Aortic Remodeling: a Comparison of New York Latinos to Native Mexicans.** A.A. Lambert and M.E. Goldman. Cardiovascular Institute and The Center for Cardiovascular Health, Mount Sinai School of Medicine, New York, NY.

Aortic dilatation is a progressive disease which can lead to aneurysm and rupture. Atherosclerotic risk factors (smoking, diabetes, age, and hypertension) are associated with thoracic and abdominal aortic dilatation. Medically underserved populations have more risk factors leading to progressive aortic dilatation as compared to better served populations. To test whether thoracic aortic abnormalities correlate with quality of medical care, two populations were evaluated—the general population served by Mount Sinai Hospital, which includes an underserved population, and the native Mexican population of Guadalajara, Mexico. This study had three aims: (a) to correlate aortic dilatation with classic atherosclerotic risk factors; (b) to examine the rate of progression of dilation in successive echocardiograms; and (c) to compare aortic size and risk factors for the Latinos living in East Harlem to those living in Guadalajara, Mexico, as well as to the non-Latino population. Thus, once patients consented to participate in an IRB-approved study, a detailed interview was conducted to assess their risk factors prior to their 2D echocardiogram, which specifically measured thoracic aortic diameter. Presently, the patient population consists of 127 patients recruited from New York City and 32 from Guadalajara, Mexico. Analysis is currently being conducted. Results of this study may provide insight into whether genetic or environmental variables play an important role in aortic remodeling.

**Violence Intervention and Prevention Education Program.** D. Laochamroonvorapongse, M. Foley, EdD, E. Garland, MD. Department of Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY.

Domestic violence is a major public health problem, affecting as many as one in five families in this country. Despite this staggering figure, primary care providers often fail to screen for domestic abuse or recognize the warning signs that may suggest the potential for escalation of violence. To date, violence screening practices that do occur have focused almost exclusively on women. A brief screening tool for men, useful in primary care practice, is currently not available. For this study, 18 primary care physicians were interviewed to determine what they currently do to screen for, identify, and refer men who might present in the clinical care setting with intimate partner violence (IPV) tendencies. The collected

data shows that all physicians interviewed screen less than 5% of their male patients for IPV, and that they decide to screen only when the patient exhibits aggressive behavior or signs of physical injury. If patients have risk factors for IPV or have committed IPV, most physicians will counsel them on anger management skills and refer them to a social worker or psychiatrist. Drawing from the survey results, we plan to design and pilot test a screening tool in the clinical setting. Then, we will develop a teaching, patient screening, and evaluation module on IPV and family violence and present it as an elective course in the master of public health (MPH) program. This will allow physicians to enhance their ability to conduct early detection and develop preventive response strategies for IPV.

**Development of an Animal Model to Assess the in vivo Response of Tendons to Fatigue Loading.** H. Lee, V.M. Wang, and E.L. Flatow. The Leni and Peter W. May Department of Orthopaedics, Mount Sinai School of Medicine, New York, NY.

Tendon injuries are among the most common orthopedic pathologies and occur especially frequently in athletes and the elderly. Despite this prevalence, the etiology of tendon rupture is poorly understood, both clinically and scientifically. Based on clinical observations, tendon failure is widely attributed to the process of wear. However, existing studies of tendon healing have incorporated tendon laceration (i.e., wounds) as opposed to direct mechanical loading as the injury model and thus do not model injury progression. In tendons that sustain matrix damage, the extent to which these tissues are capable of matrix-level repair and the biological repair mechanisms are not known. Therefore, we have developed a novel in vivo rodent model to determine how well patellar tendons recover their biomechanical function following experimentally induced fatigue and to elucidate the biologic mechanisms by which tendons respond to matrix-level injury. This approach enables us to determine the relationship between the magnitude (dosage) of tissue mechanical loading and the time course of intrinsic repair. Having developed the techniques and implemented our loading protocols in preliminary fatigue experiments for the patellar tendon, we will initiate our in vivo studies shortly. Our quantitative histological and biomechanical results will provide much needed insight into the nature of damage accumulation in tendons and their biologic repair response. These will constitute the first reported data on intrinsic tendon repair following mechanical loading. Future studies using this model may result in the earlier diagnosis and treatment of tendon injury.

**Depression and White Matter Changes in Acute Coronary Syndrome Patients.** D.A. Lessman, M. Rapp, C.Y. Tang, R. Paulino, S. Williams, and K. Davidson. Coronary Patients Evaluation Study (COPES). Mount Sinai School of Medicine, New York, NY.

Depression is a common complication in post-acute-coronary syndrome (ACS) patients and has been linked with increased morbidity and mortality when compared to non-depressed ACS patients. However, the neurophysiological correlates of this type of depression are unknown. Studies have demonstrated that frontal white matter changes correlate with depression severity as well as prognosis. It has been proposed that these white matter changes are related to vascular changes and perfusion deficiencies. Furthermore, such relationships have been demonstrated in depressed patients with comorbid diabetes mellitus and hypertension. Because of the implications of depression on the cardiovascular prognosis in ACS patients, it becomes important to ask whether mechanisms that affect vascular integrity and express themselves acutely as unstable angina or myocardial infarction may also be associated with deep frontal white matter changes. To this end, we will be using magnetic resonance imaging (MRI) to measure changes in white matter integrity and cerebral perfusion in ACS patients. We will use a case-control design, comparing depressed and non-depressed ACS patients as classified by the Beck Depression Index (BDI) from the Coronary Patients Evaluation Study (COPES). Previous investigations of this relationship have largely relied on conventional MR methods. Our investigation is primarily using diffusion tensor imaging (DTI), which has been shown to be more sensitive to changes in white matter than other MR methods, and which can also be used to quantify microstructural organization of white matter fibers through fractional anisotropy. We expect to find more extensive white matter changes in depressed patients.

**Understanding Influences on Care for HIV/AIDS: the Overlap of Health, Mental Health, and Substance Abuse.** E. Levi and M. McKay, PhD, LCSW. Department of Community and Preventive Medicine. Mount Sinai School of Medicine, New York, NY.

Although there are currently medications and health care options that have been shown to greatly increase the quality of life and life expectancy for people living with HIV/AIDS, there are patients who are not accessing or adhering to these health care services and protocols. This study seeks to explore how issues such as mental health difficulties, substance abuse problems, stigma associated with care and disclosure, and competing life priorities may be associated with patients dropping out of or underutilizing outpatient care. Participants in this study will be recruited at an inpatient AIDS unit at Mount Sinai. The participants will be interviewed using standardized instruments, both qualitative and quantitative, regarding a range of topics including: mental health needs, past and present alcohol and substance use and abuse, and barriers to care. The goal of the project is to identify specific barriers to care, so as to inform programs on how to reduce the rate of patient drop-out, make their services more accessible, and ultimately decrease patient mortality.

**The Brodmann Areas: Histology and Magnetic Resonance Imaging at 9.4 Tesla.** R.J. Lien<sup>1</sup>, T.P. Naidich<sup>2</sup>, W.G.M. Janssen<sup>3</sup>, M.M. Lim<sup>4</sup>, and P.R. Hof<sup>3</sup>. <sup>1</sup>Mount Sinai School of Medicine, <sup>2</sup>Departments of Radiology, and <sup>3</sup>Neuroscience Mount Sinai School of Medicine, New York, NY; and <sup>4</sup>University of Scranton, Scranton, PA.

**Background:** The cytoarchitectonic divisions of the human cortex are traditionally characterized by the histological criteria of Brodmann (1). High-field MRI now displays the intrinsic laminar organization of the human cortex (2). Hypothesis: Correlation of MR images with histological stains of the identical specimens will establish and validate MR criteria for characterizing and identifying the Brodmann areas.

**Materials and Methods:** Specimens of all numbered Brodmann areas were imaged at 9.4 T to achieve a slice thickness of 500  $\mu$ m and an in-plane resolution of 80  $\times$  80  $\mu$ m, as given in (2). The specimens were cryoprotected with graded concentrations of sucrose and then cryosectioned at serial 50  $\mu$ m intervals. Every 500  $\mu$ m, two adjacent sections were prepared with Nissl (neuron) and Black Gold (myelin) stains, and the stained sections correlated with the corresponding MR images to discern MR criteria for characterizing the Brodmann areas.

**Results:** MR images displayed the varying thicknesses of the cortex and individual cortical layers, and demonstrated well the presence and relative thicknesses of the bands of Baillarger. Low signal intensity on MR images corresponded to either high cellularity and/or dense myelination.

**Conclusion:** Changes in MR signal intensities faithfully reflect the cortical histology. MR criteria successfully identify major Brodmann areas, but do not yet distinguish regional subdivisions and boundaries among areas.

1. Brodmann K. Vergleichende Lokalisationlehre der Grosshirnrinde in ihren Prinzipien dargestellt auf Grund des Zellenbaues. Leipzig: Barth; 1909.
2. Fatterpekar GM, Naidich TP, Delman DN, et al. Cytoarchitecture of the human cerebral cortex: MR microscopy of excised specimens at 9.4 Tesla. *AJNR* 2002; 23:1313–1321.

**Drinking Water Guidelines for Operation in Remote Locations.** A.L. Ligouri, S.E. Lerman, MD, MPH, and M.D. Hochberg. Mount Sinai School of Medicine, New York, NY; and Exxon Mobil Biomedical Sciences Inc., Annandale, NJ.

Drinking water contamination has been linked to large-scale epidemics, and is still a major cause of mortality due to dysentery around the world. Exxon Mobil, a corporation that operates in a variety of remote locations, must ensure that the employees, contractors and others whom they supply water to are protected from health hazards such as Legionella, coliform bacteria and cholera. Exxon Mobil stands behind its maxim of "Nobody Gets Hurt," and is assisted with ensuring this through their Exxon Mobil Biomedical Sciences Inc. (EMBSI), and Medical and Occupational Health Department (MOH). To this end, they have developed a common process to address expectations for the construction, operation, maintenance and monitoring of potable/drinking water systems, to ensure that

potential health risks are identified and controlled commensurate with the risk. To develop this process, a review of the literature including references from the World Health Organization, United States Environmental Protection Agency, American Water Works Association, European Union Drinking Water Directives and Australian Drinking Water Guidelines was conducted. It was concluded that drinking water quality should adhere to World Health Organization Drinking Water Guidelines. The key to making sure that "nobody gets hurt" is that each operating site is to have a Drinking Water Contaminant Control Program in place. Highlights of this contaminant control program are drinking water system configuration, operational/ maintenance expectations, disinfection where chlorine residual is measured, record keeping, operator qualification and training, and emergency situation plan. Exxon Mobil's emphasis on drinking water is a prime example of its commitment to being a responsible global citizen, and should be considered for use as a model for other global corporations.

**The Effect of Cataract Extraction and Intraocular Implant on Optic Disc Topographic Measurements.** A.A. Macedo, R. Madhok, V.C. Edwards, L.A. Polikoff, and J.B. Serle. Department of Ophthalmology, Mount Sinai School of Medicine, New York, NY.

**Background:** Glaucomatous optic neuropathy is characterized by progressive loss of ganglion cells. Reliable detection of optic disc changes over time is the mainstay of glaucoma diagnosis, follow-up and treatment. The Heidelberg Retina Tomograph (HRT) was developed as an adjunct to visual field and clinical evaluation of patients.

**Purpose:** To determine the effects of cataract extraction with intraocular lens placement on HRT parameters in the glaucomatous optic disc.

**Methods:** Retrospective analysis of 32 patients using HRT and Humphrey Visual Field (HVF) studies from before and after cataract extraction. Pre- and post-op HRTs were compared for changes in the Moorfields Regression Analysis classification globally and in six sectors of the optic disc, as were differences in the 14 variables of the Multivariate Discriminant Analysis. Pre- and post-op HVFs were compared for differences in mean deviation and pattern standard deviation.

**Results:** Significant increases in the HRT parameter rim volume were detected post-operatively, globally ( $p < 0.04$ ), and in the temporal-superior ( $p < 0.04$ ) and nasal-inferior sectors ( $p = 0.023$ ). Both mean and maximum cup depth were significantly increased in the temporal sector ( $p = 0.03$ ,  $p = 0.036$  respectively). Analysis of the HVFs showed a decrease in mean deviation ( $1.61$ ,  $p = 0.002$ ), but no significant changes in PSD or CPSD.

**Conclusion:** This study has shown that rim volume and cup depth measurements, which are important in the early detection of optic disc change, are altered by the presence of lens opacity. Based on these findings, a new baseline image should be obtained after cataract surgery in order to properly monitor glaucomatous progression.

**Attitudes towards Academic Dishonesty and Professionalism among Medical Students.** L.C. Manace, MPH, S. Berns, L.G. Smith, MD, B.D. Stimmel, MD, and S. Rose, MD. Department of Medical Education, Mount Sinai School of Medicine, New York, NY.

Medical education has become increasingly concerned with the ethical integrity and professionalism of physicians in training. Studies examining cheating in medical school have found that a high percentage of students admit to cheating, but more investigation regarding the motivation for dishonest behavior is warranted. This study was designed to evaluate students' self-reported academic dishonesty and their opinions about ethical issues, by an anonymous questionnaire. Across all four years, 13.8% and 15.5% reported that they were academically dishonest once or more often during their pre-clinical and clinical clerkship years, respectively. And 42.9% and 50.5% of students observed academic dishonesty once or more times during their pre-clinical and clinical clerkship years, respectively. Levels of stress were not correlated with cheating. Students who reported they had cheated were more likely to respond that people who are academically dishonest "are not always morally upright." Though 76.6% answered that honor codes would definitely or somewhat reduce academic dishonesty, 54.7% and 86.6% of students replied that a system for documenting professional and unprofessional behavior will not reduce the academic dishonesty of others or themselves, respectively. The results of this study direct the etiology of cheating and unprofessional behavior away from the competitive environment of medical training and towards the in-

dividual nature of students. Past reports have shown a comparable or higher rate of self-reported cheating in medical school, but this study is unique in finding that the motivation of students who cheat lies outside the academic pressures of medical school.

**Calorie-Restricted Low Carbohydrate Diet Reduces Amyloid Load in Mouse Model of Alzheimer's Disease.** K.P. Maniar<sup>1</sup>, A. Rocher<sup>1</sup>, L. Ho<sup>2</sup>, J. Wang<sup>2</sup>, G.M. Pasinetti<sup>2</sup>, and P.R. Hof<sup>1</sup>. Departments of <sup>1</sup>Neuroscience and <sup>2</sup>Psychiatry, Mount Sinai School of Medicine, New York, NY.

Numerous studies have suggested an association between diet and the aging process. It has been demonstrated that diets with high fat, carbohydrates, or calories may increase the risk of developing Alzheimer's Disease (AD). In this study, the effect of a low-carbohydrate, calorie-restricted diet on a mouse model of AD was investigated. Eleven APP mice, transgenic animals which accumulate amyloid plaques characteristic of AD as they age, were separated into two groups. One was subjected to standard dietary conditions and the other to a 70% calorie restriction, low-carbohydrate diet. The mice were sacrificed and perfused, and brain sections were labeled for the presence of amyloid using thioflavin-S staining. Amyloid load in the prefrontal cortex and hippocampus was estimated by the fractional amyloid load using the Cavalieri principle. The calorie-restricted mice were found to have a significantly lower amyloid load in the prefrontal cortex (52% for standard, 11% for calorie-restricted) as well as in CA1 (50% for standard, 5% for calorie-restricted) and dentate gyrus (33% for standard, 3% for calorie-restricted) of the hippocampus. These results suggest that a low-calorie, low-carbohydrate diet may prevent or slow the progression of AD. By demonstrating a potentially significant environmental contribution to the disease, the results not only have implications for its prevention and treatment, but also provide insight into its causes and etiology. Further studies into other forms of calorie, macromolecule, or nutrient restriction should provide useful results and have promising implications for clinical application to human subjects. Supported by NIH grants AG02219 and AG05138.

**Evaluation of the Maternal Immunological Response to the Influenza Virus Vaccine during Pregnancy.** N.C. Marcell, A. Fernandez-Sesma<sup>1</sup>, C. Gyamfi<sup>2</sup>, R.S. Sperling<sup>2</sup>, T. Moran<sup>1</sup>. Departments of <sup>1</sup>Microbiology and <sup>2</sup>Obstetrics, Gynecology and Reproductive Science, Mount Sinai School of Medicine, New York, NY.

Traditionally, the lack of rejection of the fetal-allograft led scientists to believe that pregnancy was an immunosuppressed state. Recent evidence shows, however, that the immunological difference between pregnant and non-pregnant women is not merely quantitative, but qualitative. Immune responses can be categorized as either T helper 1 (Th1), typically aimed at viral and bacterial pathogens, or T helper 2 (Th2), seen in parasitic invasion or allergic responses. Th1 responses are proinflammatory and can be so potent that developing fetuses may be attacked, as suggested by high levels of Th1 cytokines in women with recurrent spontaneous abortions. Our goal is to compare immunity in response to the 2003/2004 trivalent, inactivated influenza virus vaccine in pregnant and non-pregnant women. We hypothesized: (a) that pregnant women would have a lower antibody titer than non-pregnant women in response to vaccination and (b) that pregnant women would produce IgG4 antibodies, characteristic of a Th2 response, as opposed to IgG1 antibodies, typical of Th1 responses expected in non-pregnant women. Using hemagglutination inhibition assays to analyze the sera of 33 pregnant and 41 non-pregnant women, before and after vaccination, we found that women in both groups responded with equivalent increases in antibody titer. A/Panama and A/New Caledonia virus strains induced the highest levels of antibody titers; surprisingly, the B/Hong Kong strain elicited very weak antibody responses. We are currently developing an immunofluorescence assay to distinguish between IgG1 and IgG4 antibodies against the influenza HA protein expressed on the surface of transfected cells. This will provide a qualitative assessment of the immune response to vaccination.

**The Effect of 6-Mercaptopurine on Progression to Colorectal Neoplasia in Ulcerative Colitis.** S. Matula<sup>1</sup>, V. Croog<sup>1</sup>, S. Itzkowitz<sup>1</sup>, N. Harpaz<sup>2</sup>, C. Bodian<sup>3</sup>, S. Hossain<sup>3</sup>, and T. Ullman<sup>1</sup>. <sup>1</sup>The Dr. Henry D. Janowitz Division of Gastroenterology, Department of Medicine; <sup>2</sup>Division of Gastrointestinal Pathology, Department of Pathology; and <sup>3</sup>Department of Biomathematical Sciences, Mount Sinai School of Medicine, New York, NY.

**Background:** Patients with longstanding, extensive ulcerative colitis (UC) are at increased risk for developing colorectal cancer (CRC). Evidence suggests that mesalamine-based anti-inflammatory medicines may prevent progression to CRC in UC. If mesalamine exerts its chemopreventive effect by reducing mucosal inflammation, then other medications that reduce colitis activity should also possess chemopreventive properties.

**Aim:** To determine the effect of 6-mercaptopurine (6MP) and azathioprine (AZA) in preventing the development of dysplasia or CRC in UC.

**Methods:** UC patients who underwent surveillance colonoscopy in 1996-7 were identified from a gastrointestinal pathology database and included if they had UC  $\geq 7$  years,  $\geq 2$  surveillance exams, and no histologic dysplasia at entry. Data were abstracted from subjects' medical histories, colonoscopy and pathology reports. Proportional hazards analysis was performed to evaluate the effect of 6MP use over time on the endpoints: (a) progression to any neoplasia and (b) progression to advanced neoplasia. Life table analysis tested for the influence of covariates, including mesalamine use.

**Results:** 315 subjects met inclusion criteria. There were no significant differences in rates of progression to advanced neoplasia or any neoplasia between 6MP-users and never-users by log-rank testing. Proportional hazards analysis resulted in hazards ratios of 1.06 (95% CI: 0.59–1.93) and 1.3 (95% CI: 0.45–3.75) when considering the effect of 6MP-use on progression to any or advanced neoplasia respectively. Results were unaffected by known potential confounders.

**Conclusion:** In UC patients without history of dysplasia, 6MP/AZA use appears to have little to no effect on rate of colonic neoplastic transformation. Importantly, the use of 6MP/AZA did not increase malignant transformation in UC.

**Characterization of alpha-Galactosidase A Signal Peptide Mutations.** M. McCarthy, G. Thiagarajan, M. Yasuda, J. Shabbeer, and R.J. Desnick. Department of Human Genetics, Mount Sinai School of Medicine, New York, NY.

Fabry disease is an X-linked recessive inborn error of glycosphingolipid catabolism results from deficient activity of the lysosomal exoglycosidase, alpha-galactosidase A (alpha-Gal A). The signal peptide of the alpha-Gal A gene consists of 31 amino acids that direct the protein to the endoplasmic reticulum for subsequent trafficking to the lysosome. Generally, the signal peptide motifs consist of: one of the first five residues of the N-terminal region contains a basic amino acid followed by a central hydrophobic core, an a-helix breaker –4 to –8 residues from the cleavage site, and a C-terminal signal cleavage site with a sequence of Ala-X-Ala. Five alpha-Gal A signal sequence mutations (M1R, M1T, M1I, A20P, and still in progress A31V) were characterized by over expressing their respective mutant enzymes in COS-7 cells. Mutations were introduced by site-directed mutagenesis. The sequence-confirmed mutant alpha-Gal A constructs in the expression vector pcDNA3 were then transiently transfected into COS-7 cells, and the intracellular and secreted enzymatic activity was analyzed using a specific fluorogenic substrate. Mutations of the first Met residue in the protein resulted in negligible enzymatic activity, while A20P had ~4% of wild-type activity. Immunofluorescence microscopy using specific anti-alpha-Gal A antibodies demonstrated that M1R, M1T, and M1I proteins were not detectable in the endoplasmic reticulum, Golgi apparatus, or endosome/lysosome system, indicating that these polypeptides were rapidly degraded in the cytosol. In contrast, the A20P mutant demonstrated lysosomal staining, although markedly reduced as compared to wild-type. Apparently, the proline 11 residues upstream of the cleavage site had a less deleterious effect on inevitable delivery of the enzyme to the lysosome as compared to mutations at the first methionine residue. These studies demonstrated that signal peptide mutations in alpha-Gal A, with the notable exception of A20P, were unable to enter the endoplasmic reticulum and rapidly degraded in the cytosol, thereby causing classical Fabry disease.

**Construction and Expression of an NUP98-NSD1 Fusion Gene, a Novel Gene Product Implicated in Childhood Acute Myeloid Leukemia (AML), and Investigation into Deregulation of Set-Domain Histone Lysine Methyltransferase Activity.** I.J. Neeland and J.D. Licht. Gerald H. Rutenberg Cancer Center, Mount Sinai School of Medicine, New York, NY.

The novel gene products of NUP98-NSD1 and MMSET have been implicated in human malignancy. Recent research has demonstrated that NSD1 and possibly MMSET contain a SET-domain sequence of amino acids that possesses histone lysine methyltransferase (HMTase) activity, an important regulatory mechanism of DNA transcription and gene expression. Deregulation of this process may be a contributing factor in oncogenesis. Investigation into the action and regulation of these proteins is required in order to understand their role in deregulation of transcriptional control leading to malignancy. Our specific aims were to: (a) Create an expression construct of NUP98-NSD1 using PCR amplification techniques. (b) Express the construct in cells with the purpose of studying its expression and gene activity using Western blotting and immunofluorescence. We hoped to compare the fusion construct with a non-fused NSD1 protein. and (c) Overexpress the MMSET protein in a human cell line and compare its effects on cellular proliferation with wild type cells. At present, cloning protocols to engineer the fusion gene have been successful (Aim 1) and we expect to have a finished clone with which to use in expression assays soon (Aim 2). MMSET was successfully transfected into NIH/3T3 cells and protein expression levels were quantified using Western blotting. A colony-suppression assay is being performed to determine the effects of MMSET overexpression on cell growth (Aim 3). Understanding the HMTase activity of the SET-domain in NSD1 and MMSET will allow us to use it as a therapeutic target in the treatment of acute myeloid leukemia and multiple myeloma.

**Motor and Sensory Neuropathy in Lead Poisoning: a Revision of the Classical Clinical Presentation of Workers Exposed to Lead.** P.J. Neuburger and D. Milek. Mount Sinai-Irving J. Selikoff Clinical Center for Occupational and Environmental Medicine, Mount Sinai School of Medicine, New York, NY.

Despite substantial decreases in the number of instances of adult occupational lead poisoning, New York City currently experiences about 100 new cases per year. The decline in reported lead toxicity from occupational exposures has resulted in fewer studies of lead-related pathology and less discussion about the clinical presentation of lead toxicity. The classical description of lead poisoning taught for years in internal medicine, occupational medicine and neurology textbooks and on the wards describes an almost exclusively motor neuropathy. Five recent cases involving bridge painters with elevated blood lead levels and signs and symptoms expanding on the textbook description of lead toxicity have prompted us to reconsider the clinical presentation commonly associated with lead poisoning. We found substantial support for our clinical findings confirmed by a review of 33 studies describing sub-clinical changes in nerve conduction velocities (NCV) of both motor and sensory divisions of the peripheral nervous system after exposure to high levels of lead. Based on the results of our clinical assessment, laboratory testing and evidence in the literature, we believe that sensory deficits in the extremities should be evaluated during clinical examination of patients with lead exposure in addition to the motor deficits currently considered. This would serve to modify the practice of primary care, occupational medicine and the education of occupational physicians, internists, physician's assistants and nurses. It would also improve the quality of care given to patients with elevated blood lead levels.

**Designing a Cumulative Exposure Matrix for NYC Firefighters Exposed to World Trade Center (WTC) Dust.** A.L. Nowak<sup>1</sup>, G.L. Banauch, MD<sup>2</sup>, K.J. Kelly, MD<sup>2</sup>, and D.J. Prezant, MD<sup>2</sup>. <sup>1</sup>Mount Sinai School of Medicine, New York, NY and <sup>2</sup>the New York City Fire Department's Bureau of Health Services, Albert Einstein College of Medicine, Pulmonary Division.

A comprehensive analysis of health outcomes for the nearly 11,000 NYC firefighters at World Trade Center Ground Zero requires a cumulative exposure matrix encompassing the entire rescue/recovery/cleanup effort from 9/11/2001 to 6/30/2002. Two sources were used to identify fire-

fighters present and their hours worked at Ground Zero—computerized fiscal records and handwritten supervisor records for each shift. After entering supervisor records into a computerized database, we compared supervisor and fiscal databases for matches in identity (firefighter name) and monthly work hour totals. Preliminary analysis for 2 months is reported. Our initial bias had been that fiscal records would be more accurate. After interviewing fiscal administrators, supervisor chiefs and firefighters, we found that fiscal records over-reported exposures both for numbers of firefighters present and hours worked at Ground Zero, as payroll codes were for operations related to WTC, but not actually taking place within the Ground Zero exposure perimeter. Supervisor work records provided a more accurate account of Ground Zero exposure, but firefighter identity and hours were frequently missing from the fiscal file because payroll codes were for regular firefighting duties. After completing these 2 databases, our next step will be comparison to the WTC medical-exposure database. A final cumulative exposure matrix will then be constructed for future health outcomes analyses.

Date	Fiscal Database	Supervisor Database	Identity Matches	Total Work Hours	Matches
11/01	972	968	217 (22%)	2	(0.2%)
06/02	160	106	59 (37%)	21	(13%)

**Understanding the Motor Impairment after Stroke: Stretch-Dependent Weakness in Hemiplegia.** H.J. Park, D. Weisz, PhD, and J-M Gracies, MD, PhD. Department of Neurology, Mount Sinai School of Medicine, New York, NY.

Patients with hemiplegia share a clinical feature called spasticity, which is an increase in reflex responses to stretch at rest. It is not established whether and how such abnormal sensitivity of stretch receptors may also impact descending motor command. Twelve patients with hemiplegia (age 43±13, 7F) and twelve healthy controls (age 50±8, 3F) performed maximal voluntary isometric elbow flexions and extensions in two positions: elbow flexed at 100° and at full extension minus 10°. Mean Rectified Voltage (MRV) from surface agonist and antagonist electromyograms was measured over 500 ms of maximal contraction. In the paretic arm, there were trends for marked decreases in agonist recruitment when the elbow was extended, both in the flexors (-38%, p=0.06) and in the extensors (-38%, p=0.27). Co-contractions were significantly greater than in healthy controls during all efforts. Flexor co-contraction increased when the elbow was extended, whereas extensor co-contraction was unchanged. To reflect motor command quality we calculated a Coefficient of Efficiency (CE) [Agonist MRV - Antagonist MRV] for each effort in each elbow position. Normalized to healthy dominant arm, the CEs of elbow extension and flexion in the paretic arm were 8% and 12% respectively, in the flexed position vs. 1.5% and 6% respectively, in the extended position. Our results indicate that tonic recruitment of stretch receptors in the elbow flexors impairs motor command for both flexion and extension. This may suggest the need for lengthening interventions of this muscle group to improve reaching function in hemiplegia.

**Apoptosis Signals Are Activated Immediately after Subarachnoid Hemorrhage.** F.M. Patterson, F.A. Sehba, and J.B. Bederson. Department of Neurosurgery, Mount Sinai School of Medicine, New York, NY.

Approximately 30,000 North Americans suffer from subarachnoid hemorrhage (SAH) each year and it accounts for 5–10% of all stroke cases. Acute (≤48 hours) ischemic brain injury is associated with most deaths after SAH. Death of neurons and endothelial cells via apoptosis is observed both in human and experimental SAH. The present project is designed to study the temporal profile of activation of apoptosis during the first 48 hours after experimental SAH. SAH was induced in the rat using the endovascular filament model. Animals were sacrificed 10 minutes, 1, 3 or 6, 24 or 48 hours after SAH. Time matched shams were used as controls. Adjacent 8 um brain sections immunostained for caspase-3 and DAPI were used to detect apoptotic cells. Caspase-3 and DAPI immunofluorescence examined in frontal and dorsal cerebral cortex, striatum and hippocampus and dual labeled cells were counted. An increase in dual labeling with time delineates cells undergoing apoptosis. In this ongoing study so far we have observed the presence of caspase-3 labeling in the

brains of animals sacrificed 3 hours after SAH. Dual DAPI labeling of caspase-3 positive cells indicated nuclear deformity confirming an apoptotic event. These results indicate that apoptotic signals are activated early after SAH.

**Needs Assessment Study Establishing a Scientific Study of Siddha Medicine Treatments of HIV/AIDS.** D. Pooran, N. Hennig, MD/PhD, K. Baban, S. Ikeda, and H. Sacks MD/PhD. Thomas C. Chalmers Clinical Trials Unit, Mount Sinai School of Medicine, New York, NY.

Gandepam is a non-governmental organization in Tamil Nadu, South India utilizing Siddha medicine, an ancient East Indian tradition, to treat HIV/AIDS. The goal of the assessment was to set up an objective study of Siddha medicine's treatment of HIV/AIDS patients. India has the third highest HIV/AIDS infection rate in Asia and Tamil Nadu has 44.7% of the AIDS cases in India (Population Foundation of India, 2000). Despite the Indian government's attempt to provide free ARVs, many patients have no access to treatment and depend on traditional healers for care. Siddha practitioners suggest that their treatment is most effective for WHO's Stage 1 & 2 HIV/AIDS patients, thereby adding to rather than replacing ARV therapy. Therefore, a scientific examination of the effectiveness of Siddha treatments will be beneficial. The assessment included investigation of a Siddha clinic, a Siddha hospital, and several clinical laboratories. The primary finding was the need for two independent laboratories to conduct ELISA, Western Blot, CD4/CD8, and HIV Viral Load tests in order to evaluate the Siddha diagnosis and how HIV/AIDS patients progress through treatment. The Meenakshi Mission Hospital Laboratory and Lister Metropolis Clinical Laboratories are able to conduct reliable blood tests of the study subjects. Another significant finding was the need for a locked file cabinet in which to maintain the confidentiality of patient records (consent, name/address, picture, etc.). However, more work needs to be done to ensure patient safety and confidentiality in examining the effectiveness of Siddha medicine treatments.

**Improving Breastfeeding in East Harlem: Developing an Appropriate and Sustainable Curriculum for Breastfeeding Educators in the Mount Sinai And East Harlem Communities.** C.L. Quinn, E. Garland, and J. Rethy. Department of Community Medicine and Preventive Health, Mount Sinai School of Medicine, New York, NY.

This project created a sustainable breastfeeding curriculum for health care providers in the Mount Sinai community, through collaboration with lactation consultants from Maternal Child Health and community-based providers. Current curricula for breastfeeding education directed at Mount Sinai residents in Ob/Gyn and Pediatrics, medical students, and community health educators such as WIC nutritionists were surveyed and evaluated. Breastfeeding outreach in the community was observed at Mount Sinai breastfeeding classes and support groups and WIC office visits. The information obtained from observation and evaluation was used in collaboration with lactation consultants to identify topics for inclusion in breastfeeding curricula. A thorough review of current breastfeeding literature was conducted. New curricula appropriate to each group of providers were developed, consisting of PowerPoint presentations with fully referenced notes for presenters. This project resulted in materials for sustainable, appropriate breastfeeding education to providers in the East Harlem community. A pre- and post-test with content questions was developed for the purpose of evaluating the curricula.

**Background:** Research in recent years has proven the benefits of breastfeeding. The Healthy People 2010 report from DHHS set a target for breastfeeding initiation of 75%. However, breastfeeding rates, particularly among women on Medicaid, remain low. In 2000, only 20% of mothers on Medicaid discharged from Mount Sinai were breastfeeding exclusively. There is currently no formal curriculum for health care providers at Mount Sinai or community-based groups for providing breastfeeding counseling and support. In order to improve breastfeeding, all providers should be trained in breastfeeding counseling and solving common problems.

**Food Availability in the Urban Environment of East Harlem.** C.J. Raines and M.P. Galvez, Department of Community and Preventive Medicine and Pediatrics, Mount Sinai School of Medicine, New York, NY.

According to the New York City Department of Health, 43% of New York City children are overweight. Poor diet is a major risk factor for obesity. Yet, little is known about how the physical or "built environment" impacts children's dietary habits. "Growing Up Healthy In East Harlem," a community-based participatory research project, will address the environmental determinants of childhood overweight unique to the urban built environment of East Harlem. A survey of East Harlem zip codes 10029 and 10035 was performed through (a) direct observation via walking tours of the neighborhoods and (b) compiling information from the New York State Department of Agriculture. A series of maps depicting the food environment of East Harlem has been developed using the geographic information systems software package, ArcGIS. These maps illustrate food sources (fast food stores, restaurants, bodegas, supermarkets, and specialty stores) and their proximity to schools and neighborhood housing. These data highlight the limited availability of high quality fresh fruits and produce and the abundance of food stores with unhealthy foods located in this community. Further analysis will examine baseline demographics of the East Harlem community, and how availability, proximity and density of resources impact diets of East Harlem children. Maps will also serve as a community resource in order to highlight healthy food stores in East Harlem. The implications of this study include the need to address factors at both the individual level when recommending dietary changes and at the community level when addressing deficiencies in the local food environment.

**Internalized Homonegativity and Unsafe Sex in MSM.** P. Saadai, BA, F. Muench, MA, and J. Morgenstern, PhD. Department of Psychiatry, Mount Sinai School of Medicine, New York, NY.

**Background:** Previous research has identified internalized homonegativity (IH) in gay men and women as a correlate with indicators of psychological distress, such as depression, anxiety, or poor self-esteem. It has been hypothesized that IH is related to behaviors with important clinical consequences such as unsafe sexual behavior, although results have been mixed.

**Objective:** The aim of this study is to examine the relationship between Internalized Homonegativity and unsafe sexual behavior in a population of men who have sex with men (MSM).

**Methods:** Participants were 183 MSM from the New York City area who self-identified as sexually compulsive and completed a one-time survey which assessed unsafe sexual practices and IH. The relationship between IH and sexual risk taking was analyzed.

**Results:** IH scores of our sample on the IHNI scale were analyzed in comparison to a normative sample ( $n=241$ ). The compound IH score in our sample of SC MSM score was significantly higher  $t(182)=3.385$ ,  $p<0.001$ . A one-way ANOVA comparing those who had and had not engaged in unprotected anal sex on  $>2$  occasions over 90 days prior to assessment showed that there was a significant mean difference on the IH scale between these two groups,  $F=5.81$ ,  $p<0.01$ . Finally, a Pearson Correlation between overall IH and SC on the YBOCS scale revealed a weak significant correlation,  $r=1.93$ ,  $p<0.01$ .

**Conclusion:** Findings regarding the relationship between increased IH and unsafe sexual behavior have important clinical implications for the treatment of gay men as well as in HIV and STI prevention and treatment in this population.

**A Survey of International Disaster Mental Health Services.** S.H. Sanchez and C.L. Katz, MD, Director, Acute Care Psychiatric Services, Mount Sinai Hospital, New York, NY.

Disasters' effects on survivors, the families of victims, emergency workers, and the affected community can be devastating. The response to disasters must be multi-dimensional, including provision for food and shelter, attention to medical needs, and reinstatement/revision of the destroyed infrastructure. Yet, it is believed that immediate and long-term mental health concerns are either ignored or assigned low priority. This project surveyed 196 English-speaking, international non-governmental agencies (NGOs) as listed on the United Nations website, [www.reliefweb.int](http://www.reliefweb.int), to determine to what extent this observation is true at the international level. Primary information was drawn from websites (with no technical diffi-

culties), although direct contact by email was utilized in some cases to supplement website information. NGOs were included for analysis if their mission/vision statement(s) revealed agency goals that could reasonably be interpreted to encompass mental health. Of the 196 surveyed, 119 agencies/NGOs were included for further analysis. Major criteria examined include whether each agency mentioned any international relief/development program that addresses mental health concerns (62); existence of within-agency mental health staff, volunteers, or consultants (30); existence of procedures for implementing disaster-related mental service (19). All 196 agencies/NGOs reviewed were included in determining whether there were existing mental health services for their own staff (5). Given the prevalence of untreated mental illness worldwide and the likely adverse impact that crisis situations have on this baseline, the scarcity of disaster mental health and mental health development services among international NGOs appears to be a matter of concern for policy-making.

**The Extent of Integrated Pest Management Adoption in the East Harlem Community as an Alternative to Traditional Pest Control.** N.A. Schmelzer, G. Rosenberg, and B. Brenner. Department of Community and Preventative Medicine, Mount Sinai School of Medicine, New York, NY.

Growing Up Healthy in East Harlem, a community intervention study, 1998–2003, recognized the relationship between health status and housing environments of East Harlem residents, and a need for affordable, safe and effective pest control services, with community education, to reduce risk factors for asthma and exposure to neurotoxic chemicals among children. It was demonstrated that Integrated Pest Management (IPM) was effective in reducing household cockroach infestation and the use of chemical pesticides. This project investigated the types of pest control methods currently available to households in East Harlem, in order to determine the extent of IPM adoption and to highlight barriers to its adoption. Twenty-one businesses and community intervention projects which provide pest control services in East Harlem were identified and contacted. Eight responded. Many businesses refused to be surveyed regarding their pest control practices. Of those willing to discuss their techniques, all had universally adopted the term IPM to describe their preferred method of pest control, although their specific practices were widely inconsistent. Overall, only three of the eight providers surveyed strictly adhered to complete IPM procedures. The other five reported barriers to strict IPM implementation, such as lack of resident education, cost, and poor sanitation and maintenance. IPM must be applied within East Harlem in a manner that is consistent, effective and reliable. Guidelines following a uniform procedure for IPM should be established, with licensed exterminators held to this standard. Additionally, residents should be made knowledgeable about safe pest control practices so they can act as informed consumers.

**Normal Morphology of the Human Cerebellar Vermis in vivo: an MRI Evaluation of the Angular Relationships among the Vermian Lobules.** M.B. Schwartz, BA, and T.P. Naidich, MD, FACC. Department of Radiology, Mount Sinai School of Medicine, New York, NY.

**Background:** Recent neuroimaging studies have provided qualitative data on the changes in normal vermian morphology with age and gender, and on pathologic changes in vermian morphology in autism, schizophrenia, ethanol abuse, and congenital malformations. Quantitative data on vermian areas and volumes are sparse, inconclusive or frankly contradictory. To our knowledge, there have been no studies to provide quantitative normative data on the orientation and angular interrelationships among the individual lobules.

**Hypotheses:** (a) Measurement of the radial pattern of the vermian white matter (arbor vitae) on T2-weighted midsagittal magnetic resonance images (MRI) will establish normal ranges of lobar orientations and angular interrelationships among the vermian lobules. (b) These relationships will show limited reproducible variations with age and gender.

**Methods:** Retrospective analysis of midsagittal T2-weighted MRI's was performed for 100 male and 100 female patients, distributed evenly across all decades of age, whose studies were interpreted as "within normal limits." The angles among the branches of the central digitations of white matter to each lobule were measured directly from the computer images and correlated with standard measures of angles and lengths of the skull base and midline brain parenchyma.

**Results:** Preliminary results indicate that the angular relationships among the vermian lobules are highly consistent and independent of age and gender in all patients older than ten years. **CONCLUSION:** This study proves the two hypotheses correct. These normative data are expected to serve as baseline for the future study of vermian pathology.

**Ultrasound Technology in Assessing Anisotropic Loss in Osteoporotic Trabecular Bone.** S.S. Seo, L. Cardoso, K. Jepsen, and M.B. Schaffler. Orthopaedic Research, Mount Sinai School of Medicine, New York, NY.

Ultrasound (US) is a rapidly developing technology widely used for measuring bone density and assessing bone loss in patients. Like bone densitometry, US is currently limited because it does not consider directionally specific changes in microarchitecture when bone becomes osteoporotic. However, unlike bone densitometry, the US signal contains microarchitectural information, which if accounted for properly can improve prediction of bone strength and fracture risk. In the current study we examined cancellous bone samples obtained from Dr. Schaffler's NASA/NSBRI studies of immobilization-induced bone loss and treatment with bisphosphonate antiresorptive drugs. Cancellous bone cubes from immobilized (IM) and bisphosphonate-treated (IM+BIS) animals were examined, as were samples from control and drug treated control animals. Ultrasound was used to assess bone mechanical properties in specific anatomical directions (SI, AP, ML). Additionally, a structural parameter accounting for volumetric orientation was determined using Biot's Theory. Quantitative changes in structure are being measured from micro CT images (studies ongoing). Among all groups, mechanical properties were significantly greater in the SI direction than in transverse directions. Both IM and IM+BIS bones showed significant losses in mechanical properties overall. However, immobilized bone lost the most mechanical integrity in the SI direction, while IM+BIS bone showed proportional loss in all directions. These suggest that anti-resorptive therapy maintained the normal cancellous bone anisotropy and structural scaffolding even with reduced bone mass, and should profoundly improve the recovery potential following normal use. Assessment of anisotropic properties of cancellous bone is possible using US, and should improve the diagnosis of bone diseases and effectiveness of bone therapies.

**Barriers to Influenza Immunization in an Elderly Urban Population.** R.M. Small and M.E. Foley, EdD, RN. Department of Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY.

**Objective:** In East Harlem, adult hospitalization admission rates for pneumonia and influenza are 90% higher compared to New York City as a whole. Influenza immunization rates remain below the Healthy People 2010 goal of 90% vaccination coverage of the elderly, with lowest immunization rates among minority populations. The purpose of this study was to identify barriers to influenza vaccination uptake in an elderly minority clinic population residing in Harlem and East Harlem, New York City.

**Methods:** Observational, cross-sectional, survey study. Using a face-to-face survey, patients (n=60) and providers (n=20) were interviewed at an urban geriatric clinic serving over 2500 elderly patients per year. The patient survey asked about demographics, general health, and perceived barriers to immunization. The provider survey elicited responses on immunization practices, vaccination management, and perceived barriers to immunization.

**Results:** Overall, 75% of the respondents were immunized for the last flu season. The most commonly reported barrier from all patients was the concern of getting influenza from the vaccine. Of those not immunized, 33% thought they would get the flu from the immunization. By ethnicity, 31% of African American patients believed the vaccine caused the flu; 23% of Hispanic patients were concerned about an adverse reaction. Cost and access to care were not barriers. Synthesized provider responses corroborated patient findings.

**Conclusions:** Despite practice initiatives to improve vaccination rates, immunization rates remain below the national objective. Community health care providers must increase awareness of the need for vaccination, address public misconceptions through patient education, and reduce missed opportunities for vaccination.

**Combining Systemic Retinoids with Biologics for Moderate to Severe Psoriasis.** E.C.A. Smith<sup>1</sup>, C. Riddle, MD<sup>2</sup>, M.A. Menter, MD<sup>2</sup>, and M. Lebwohl, MD<sup>1</sup>. <sup>1</sup>Department of Dermatology, Mount Sinai School of Medicine, New York, NY and <sup>2</sup>Baylor University Medical Center, Department of Dermatology, Dallas TX.

Psoriasis affects approximately 2% of the population and often presents a therapeutic challenge to physicians. Patients with severe psoriasis often require combinations of systemic therapy to control their disease. Until recently, the only systemic therapies were methotrexate, cyclosporine, and acitretin. With the emergence of new biologic therapies, dermatologists now have a wider array of tools for use against this disease. The mechanism of action of the systemic agents commonly used differs from the newer biologics, suggesting that when combined, these therapies may have additive effects. Thus data is needed to determine the safety, tolerability, and efficacy of the biologic agents when added to the other systemic therapies. There is little experience with acitretin and biologics. The aim of this study was to ascertain the efficacy, safety, and tolerability of acitretin when combined with biologic agents for moderate to severe psoriasis. To determine this, patients with psoriasis who were treated with acitretin and a biologic were identified and their charts retrospectively reviewed. Of the 14 patients treated with acitretin and a biologic, four patients cleared, six patients improved 90%, two improved 75%, one improved 50%, and one had no change. During treatment with acitretin and biologic, five patients required no adjunctive treatment. Three patients were able to stop narrow-band UVB therapy after an average of 2.33 months of combination therapy. Only one patient continued to need phototherapy (UVB) after addition of the biologic. Thus, acitretin combined with biologics offers a promising method of managing refractory psoriasis.

**Risk Factors for Increasing Aortic Intima-Media Thickness among the Elderly.** A.E. Soumekh, M.E. Goldman, and L.B. Croft. The Zena and Michael Weiner Cardiovascular Institute, Mount Sinai Medical Center, New York, NY.

Studies have shown that carotid intima-media thickness is an excellent marker of subclinical atherosclerosis. Little research has focused on thoracic aortic intima-media thickness and its relationship to cardiovascular risk factors and coronary artery disease. The purpose of our study was to use transthoracic echocardiography (TEE) to determine the risk factors for aortic intima-media thickening (aIMT) and identify a correlation between increasing IMT and coronary artery disease (CAD). The study population consisted of 55 patients (mean age = 66 yr, range 21 to 93) referred to Mount Sinai Hospital's Non-invasive Cardiology Laboratory for a TEE. Each patient's demographics, cardiovascular risk factors and pertinent medical history were recorded. After completion of the TEE with a 7.5 MHz probe, an echocardiologist blinded to the results of the patient's information identified and measured aortic plaque morphology and thickness and IMT. Among all patients, significant increases in aIMT were seen with diabetes (0.146 cm, p<0.05), hyperlipidemia (0.133 cm, p<0.01) and hypertension (0.184 cm, p<0.01). Increased IMT also correlated with CAD: subjects with CAD had an average of 0.156 cm greater aIMT (p<0.01). Subgroup analysis of patients over 65 years old showed similar trends in diabetes (0.145 cm, p<0.05), hypercholesterolemia (0.037 cm, p>0.05), hypertension (0.147cm, p>0.05), and CAD (0.070 cm, p>0.05). Therefore, our pilot study demonstrated that increased aortic IMT is associated with cardiovascular risk factors and CAD, irrespective of age. Increased aortic IMT may be a marker of diffuse vascular disease with manifestations in the coronary, cerebral and vascular circulation.

**Computational Meta-analysis of Quantitative Trait Loci (QTLs) and Microarray Gene Expression Databases to Generate Composite Genomic and Transcriptomic Renal Disease Maps.** K.V. Star and E.P. Böttinger. Department of Medicine, Mount Sinai School of Medicine, New York, NY.

Quantitative trait locus (QTL) is a polymorphic locus containing alleles that differentially affect the expression of a specific phenotypic trait. The purpose of QTL research is to find the genes underlying these traits. QTLs have been mapped in inbred species: rodents, plants, and insects. Despite this progress, finding the genes underlying quantitative traits remains a challenge. We use a combination of microarray data, human genome linkage, QTLs, and comparative genomics to find new genes and pathways

associated with common human diseases. In order to move from QTLs to genes we have generated a comprehensive QTL database of *Mus musculus*, *Ratus norvegicus* and *Homo sapiens* using data from PubMed, Online Mendelian Inheritance in Man, UCSC Genome Browser, Mouse Genome Informatics and Rat Genome Database. To make this tool available to the research community, we have developed a user interface for high throughput mapping of genes to QTL regions. Currently the database is mined for genes from microarray experiments of kidney disease mouse models generated in our laboratory and ENU mutagenesis datasets. As we found that the majority of quantitative trait loci map to syntenic blocks, comparative genomics is used to narrow these QTL regions and to decrease the number of candidate genes. Focusing on renal diseases, we illustrate how the use of innovative genetical genomics strategies may facilitate disease gene discovery.

**Nursing Assistants as Observers of Behavior and Medication Administration in a Nursing Home Setting.** H.L. Takusagawa, B. Fridman, MD, and K. Boockvar, MD, MS. Brookdale Department of Geriatrics and Adult Development, Mount Sinai School of Medicine, New York, NY.

Certified Nursing Assistants (CNAs) provide up to 90% of the direct care received by a nursing home resident. Past studies have revealed that increasing CNA involvement in the clinical decision making team could increase CNA job satisfaction and decrease turnover rate. This study examined the reliability and validity of CNA observations of residents' behavior, mood, physical functioning, and medication administration. We developed a survey of questions derived from the Minimum Data Set (MDS), a federally mandated quarterly resident assessment. Our survey was administered to the nurses (n=17) and CNAs (n=26) of 29 residents diagnosed with dementia or depression living in the Jewish Home and Hospital, a 500-bed academic, urban nursing home. Nurse and CNA responses were compared to each other as well as to recorded data from the resident's current actual MDS and nursing Medication Administration Record (MAR). Agreement was ascertained using the kappa statistic, a measure of agreement beyond that expected by chance. CNA reports of behavior, mood, and physical functioning had good (kappa 0.44–0.79) and variable (kappa 0.16–0.68) agreement with nurses and the actual MDS, respectively. Agreement between CNA reports of drug administration and the MAR was poor (kappa 0.00–0.30). Good agreement between CNAs and nurses suggests that CNAs' observations of residents' psychological and physical function are reliable and fairly accurate. CNAs may occupy a unique niche in which they can provide naturally blinded assessment of symptomatic response to drug treatments, without bias from awareness of actual medication administration.

**A Retrospective Study on the Long-Term Efficacy of Acetylcholinesterase Inhibitors (AChEI) on the Course of Alzheimer's Disease (AD).** J.Y. Tang, A. Atri, MD, J.J. Locascio, PhD, L. Yap, PhD, and J.H. Growdon, M.D. Alzheimer's Disease Research Center (ADRC), Massachusetts General Hospital, Boston, MA.

Alzheimer's Disease (AD) is a neurodegenerative disorder that leads to dementia, resulting in cognitive, functional, and behavioral disturbances. As the chief biochemical abnormality in AD is impaired acetylcholine neurotransmission, short-term therapy for managing AD patients involves augmenting neurotransmitter activity by inhibiting the enzymatic hydrolysis of acetylcholine with AChEIs. These drugs have been shown to improve symptoms in clinical studies ranging from six months to a year, but there are limited data on their long-term efficacy. To correct this gap in information, we compared the mean slope of decline in AD patients treated with AChEIs (n=448) to the decline in untreated patients (n=310). We hypothesized that treatment would produce a shallower slope. A retrospective design was used, selecting from the MDC ADRC database probable AD patients treated with AChEI between 1998 and 2003, and a comparison group from between 1990 and 1995, before the introduction of AChEIs. Linear regression analyses and Student t-tests were used to compare the rates of change on a cognitive measure, the Blessed Dementia Scale (BDS), and a functional measure, Activities of Daily Living (ADL), between the two groups. Performance on BDS of the untreated group deteriorated by 4.4±0.3 points per year vs. 3.0±0.3 points per year in the treated group (p=0.001), favoring AChEI therapy. There was no significant detectable effect on function (p=0.11). Our findings indicate that AChEIs lessen the slope of cognitive decline in AD, and support their use beyond one year of treatment.

**A Volumetric MRI Study on Impulsive Aggressive Patients with Borderline Personality Disorder.** R. Trisdorfer, A.S. New, R. Newmark, E. Hazlett, and M. Buchsbaum, Department of Psychiatry, Neuroscience PET Laboratory, Mount Sinai School of Medicine, New York, NY.

**Background:** Patients with borderline personality disorder (BPD) frequently suffer from impulsive aggression (IA), which poses a serious threat to themselves and others. MRI studies have shown decreased brain volume in the amygdala, hippocampus, frontal lobe, and cingulate in patients with BPD.

**Methods:** Sixteen controls (9 male, 7 female) and 14 BPD patients (10 male, 4 female) with IA, age- and sex-matched, underwent MRI imaging. While blinded to subject diagnosis, coronal images of the brain were outlined and volumes calculated using a computer program delineating Brodmann areas (BAs). Gray matter volume relative to whole brain volume in BAs in the frontal cortex and cingulate gyrus were evaluated with STATISTICA.

**Results:** In the frontal cortex, volume was entered into a group (BPD, NC) x region (dorsal, medial, orbital) x BA (44, 45, 46; 9, 24, 32; 11, 12, 47) x hemisphere (R, L) mixed factorial ANOVA, no significant interactions were found. With sex as an additional grouping variable, female BPD patients showed a significant increase, and male patients a decrease in gray matter in the medial frontal cortex (BAs 9, 24, 32) compared to controls (F(2, 52)=4.78, p<0.02). In the cingulate gyrus, volume was entered into a group (BPD, NC) x BA (25, 24, 31, 23, 29) x hemisphere (R, L) mixed factorial ANOVA, no significant interactions were found. Using sex as an additional grouping variable, in the right cingulate (BA 31), female BPD patients showed an increase, and male patients showed a decrease in gray matter (F(4, 104)=2.6, p<0.04).

**Conclusions:** Male BPD patients with IA show decreased gray matter in the medial frontal cortex and right cingulate, supporting the results of previous volumetric MRI studies. Future studies coregistering the MRIs to PET scans will be undertaken to assess differences in brain activity.

**Hopelessness as a Marker for Trauma-Related Distress in Primary Care Pediatrics.** A. Tzavaras, D. Steinbaum, and D. Laraque. Division of General Pediatrics, Mount Sinai School of Medicine, New York, NY.

**Background:** Currently available psychosocial screening tools used by pediatricians do not screen for trauma-related distress.

**Objective:** We hypothesize that the presence of hopelessness can function to identify trauma-related distress in an inner city population of children. Specifically, this study will assess the sensitivity and specificity of a single hopelessness question used in a currently available psychosocial screening tool to identify children with symptoms of trauma-related distress.

**Methods:** A cross-sectional psychosocial study of 300 patients is being conducted at the Pediatric Associates Practice, Division of General Pediatrics of Mount Sinai Medical Center in New York City, looking at psychosocial dysfunction. We report the results of 66 patients, ages 8–10.

**Results:** Preliminary data reveal that the "hopelessness question" detected 89% of children in need of further evaluation for trauma.

**Conclusions:** Hopelessness in this inner city population of children is associated with the presence of trauma-related distress.

**Estimation of the Prevalence of Epilepsy in the Multiethnic Community of Washington Heights/Inwood, New York City, 2003.** L. Ungsuan and D.C. Hesdorffer. Gertrude H. Sergievsky Center, Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY.

Several studies have examined the prevalence of epilepsy in relatively homogenous populations, but few studies have investigated its prevalence in ethnically diverse communities. Previous reports suggest that minorities have a higher prevalence of epilepsy (1–3), but fall short of providing detailed information on ethnicity, seizure type, and etiology. In light of this gap in knowledge, this study intends to estimate the prevalence of epilepsy in Washington Heights/Inwood, NYC, where a majority of residents are Latino or African-American. Prevalent cases of epilepsy were identified after reviewing admission and discharge diagnoses, medical record notes, or imaging/EEG results for patients attending the New York Presbyterian Hospital Emergency Departments (NYPHED) and the Allen Pavilion Emergency Department. Review was restricted to residents of

zip codes 10031–10034 and 10040. This numerator is expected to underestimate the number of prevalent cases in the community, since patients with epilepsy may seek care elsewhere. Therefore, we plan to apply capture-recapture methodology (CRM), using all NYPHED contacts during the 6-month study period to estimate the denominator population reported by the 2000 U.S. Census. If this method gives an accurate estimate of the denominator population, CRM will then be used to estimate the numerator for prevalence, based upon the identified cases and cumulative patient visits. If CRM fails to estimate the denominator population, then the prevalence of epilepsy in the NYPHED alone will be calculated. By advancing our knowledge of the burden of epilepsy in a diverse, urban community, this study will provide the basis for future resource development and intervention planning.

1. CDC. Prevalence of self-reported epilepsy—United States, 1986–1990. *MMWR* 1994; 43:810–811, 817–818.
2. Haerer AF, Anderson DW, Schoenberg BS. Prevalence and clinical features of epilepsy in a biracial United States population. *Epilepsia* 1986; 27(1):66–75.
3. Cowan LD, Bodensteiner JB, Leviton A, Doherty L. Prevalence of the epilepsies in children and adolescents. *Epilepsia* 1989; 30:94–106.

**Effects of Low-Carbohydrate Diets on Cognitive Functions.** B.R. Vaughan, C.V. Mobbs, and F. Isoda. Fishberg Neurobiology of Aging Laboratories and Brookdale Department of Geriatrics, Mount Sinai School of Medicine, New York, NY.

Despite widespread interest in low-carbohydrate diets, surprisingly few studies have actually examined the effects of low-carbohydrate diets in animal models. Dr. Mobbs' laboratory has shown that a low-carbohydrate Atkins-type diet does not reverse obesity in laboratory mice. However, the Atkins-type diet is relatively high in protein and it may not actually cause ketogenesis by itself. In fact, recent data from Dr. Mobbs' laboratory suggests that a true ketogenic diet (used to treat epilepsy), which is relatively low in protein as well as carbohydrates, may in fact be useful to reduce obesity. However, some evidence suggests that ketogenic diets may impair certain cognitive functions. A plausible mechanism for these impairments is that ketogenic diets may reduce epilepsy by interfering with excitatory amino acid transmission (especially glutamate release), and it is well-established that interference with the glutamate system in particular may produce cognitive impairments. Nevertheless, effects of ketogenic diets on cognitive function and the glutamate system have not been examined in detail. We have now examined the effects of the ketogenic diet on memory function, using spontaneous reversal on a T-maze, and that memory function if mice were on the diet less than one month. However, we did find that the diet increased body temperature significantly. This observation suggests that the ketogenic diet may facilitate weight loss by increasing metabolic rate. We are currently assessing memory functions in mice on the ketogenic diet for more than one month.

**Survey Investigating the Association between Internet Use and High Risk Sexual Behavior among Men Who Have Sex with Men.** C.M. Vaughn and Dr. S.E. Goldstone. Mount Sinai School of Medicine, New York, NY.

Recently, there has been a troubling rise in the incidence of STDs among men who have sex with men (MSM). Past studies have linked outbreaks to Internet chat rooms. While studies have been done, there has been no substantial research to determine why the Internet has become a popular place for MSM to meet other men. In addition to answering that question, I also wanted to discover if MSM thought of Internet "hook-ups" as risky, and if risk behavior varied depending on the venue in which MSM meet each other. I also wanted to see patterns of drug use during sex. I created a survey that was given to 300 MSM by myself and filled out anonymously. The survey was also placed online at gayhealth.com, where it was filled out by an additional 300 men. While work still needs to be done, based on preliminary data, 65% of MSM who filled the survey out online meet people online for sex. Of those, 54% did drugs during their last sexual experience. Thirty-five percent who rated meeting people online for sex as risky were still willing to engage in risky sexual behavior. After further development, the results of this survey will provide useful information for public health officials trying to reduce STD risk among MSM and create more effective methods of preventive outreach.

**Pur-Alpha Functions in RNA Targeting to Dendrites.** D.B. Weinreb and E.M. Johnson. Department of Pathology, Mount Sinai School of Medicine, New York, NY.

The Pur protein family in humans consists of four members which are highly conserved throughout evolution. The first Pur family member to be identified, Pur-Alpha, interacts with both single-stranded DNA and RNA and has been implicated in recruitment of regulatory proteins during DNA replication, gene transcription and RNA transport. Genetic inactivation of mouse PURA causes defects in brain development and death. The association of Pur-Alpha with BC1 RNA, implicated in targeting mRNA for translation in dendrites, strongly suggests a similar role for Pur-Alpha. Recent studies have described a protein/mRNA complex from the mouse brain containing Pur-Alpha, BC1 RNA, the fragile X mental retardation protein (FMRP) and Staufen, the latter two of which are involved in translation and RNA transport respectively. Presently, we have used immunofluorescence cytochemistry and confocal laser microscopy to examine the presence of Pur-Alpha, FMRP and Staufen in embryonic day 18 rat hippocampal neurons grown in culture for 10–20 days. We have demonstrated that Pur-Alpha and Staufen are each present in the cell body and the dendrites, but not the axons, of cultured hippocampal neurons. Pur-Alpha levels peak in the dendrites on the sixteenth day of culture and decline at day 18. Furthermore, confocal microscopy has allowed us to co-localize Pur-Alpha in these neurons with FMRP and Staufen. Collectively, these results indicate an essential interaction between Pur-Alpha, Staufen, FMRP and MAP-2 in targeting mRNA to dendrites in developing hippocampal neurons. Future studies will employ RNA Immunoprecipitation (RIP) to identify mRNA molecules targeted to dendrites by these proteins.

**Magnetic Resonance Imaging of Subclinical Atherosclerotic Disease: a New Quantitative Method to Evaluate Plaque Burden.** K.B. Weinschelbaum, S.H. Aguiar, V. Mani, D.D. Samber and Z.A. Fayad. Imaging Science Laboratories, Mount Sinai School of Medicine, New York, NY.

The aim of this study was to use magnetic resonance imaging (MRI) to quantify the burden of atherosclerotic disease in extended areas of the aorta and carotid arteries. Cardiovascular events are clinical expressions of atherosclerosis resulting from long-term systemic pathology of arterial walls. MRI of subclinical atherosclerosis may provide an important and original quantitative profile of systemic disease in patients. Subjects at intermediate to high risk for cardiovascular disease (n=98, aged 55±20.4 years, range 9–87 years, 33% females) underwent high-resolution black-blood MRI of the aorta and extracranial carotid arteries. For each subject, cross-sectional images of the aorta (n=36–48) and carotids (n=12–24) were analyzed. Average arterial wall area (AWA), average wall thickness (AWT), and maximal wall thickness (MWT) were measured. Men had greater carotid AWT and MWT than women (2.3±0.7 vs. 2.1±0.6 mm, p=0.0407; 6.4±2.8 vs. 4.9±1.8 mm, p=0.0039), but there was no statistical difference when normalized to body surface area (BSA). Men had greater aortic AWA than women (153.5±64.7 vs. 128.2±55.8 mm<sup>2</sup>, p=0.0291), but when normalized to BSA there was no statistical difference. All carotid and aortic measurements increased with age (p<0.0001), and wall thickening was observed at earlier ages in the aorta than in the carotids. Aortic AWA normalized to BSA showed high correlation with age (R-squared=0.4397, p<0.0001). Black-blood MRI may be a useful, non-invasive method to quantify burden of atherosclerotic disease in patients. This project may establish the basis for further population studies on risk stratification and for guiding treatment in primary prevention of cardiovascular events.

**Analysis of Bone Resorption in the Human Femur.** J.C. Williams, M.A. Cordova, D.C. Casagrande, J.E. Bird, D.M. Laudier, R.N. Levy, C.J. Teranova and K.J. Jepsen. Leni and Peter W. May Department of Orthopaedics, Mount Sinai School of Medicine, New York, NY.

Recent literature has shown ambiguity regarding bone mineral density (BMD) scans, the current standard to assess bone fragility. BMD, because it is a complex measure, does not provide insight into the biological mechanisms involved in age-related bone loss and changes in microarchitecture. The goal of this study was to investigate the progression of bone loss in the femur, as part of a global study of the entire skeleton. Non-decalcified, plastic-embedded transverse sections were prepared

from nineteen human femurs at 30% and 50% of the length from the proximal end. Each section was imaged using a high-resolution digital camera (10 micrometers/pixel), and measures of bone loss were obtained using image analysis software. These measures included marrow area (MA) and intracortical porosity (ICP) normalized by total area (TA). The ratio MA/TA has been shown to be nearly constant ( $\sim 0.20$ ) early in life, independent of sex and stature. Age-related changes in the ratios MA/TA and ICP/TA thus reflect endosteal expansion and cortical bone loss, respectively. Endosteal area (MA/TA) increased in a uniform manner (slope= $1.12 \pm 0.18$ ,  $p < 0.02$ ) as a function of age and this was similar at the 30% and 50% sites. However, the age-related increase in intracortical resorption (ICP/TA) was twice as great at the 50% site compared to the 30% site. The ratio (MA+ICP)/TA increased with age at both sites. The majority (85%) of this bone loss was due to MA expansion. This data provided important insight into the timing and magnitude of femoral bone loss. Collaborative research involving matched radii found a nearly identical pattern of bone loss, suggesting that the mechanism of bone loss occurs systemically, a finding that has not been equivocally found using BMD.

**Role of KLF6 in Liver Development.** X. Zhao, N. Matsumoto, and S.L. Friedman. *Liver Diseases*, Mount Sinai School of Medicine, New York, NY.

KLF6 is a ubiquitously expressed tumor suppressor inactivated in several cancers. KLF6 knockout mice die by fetal day E12.5, with poor formation of blood vessels and no discernible liver. In parallel, ES stem cells lacking KLF6 have been examined for their capacity to differentiate along tissue-specific lineages. The aim of our project was to explore the role of KLF6 in liver development. Although KLF6 is expressed throughout the period of differentiation, we hypothesized that KLF6 expression during a specific time period is enough to ensure proper hepatic differentiation. We assessed the ability of KLF6  $-/-$  embryonic stem (ES) cells to develop into hepatic endoderm. While wild-type ES cells can be driven towards an hepatic lineage under defined culture conditions (Kubo A, et al., *Differentiation* 2004; 131:1651–1662), KLF6  $-/-$  ES cells minimally differentiate into endoderm precursor cells, expressing only the early hepatic marker gene AFP but not later liver-specific genes such as albumin and TTR. This data suggests that KLF6 is not required for early hepatic development, but is required for more complete differentiation. We also examined KLF6 mRNA in wild-type and KLF6  $+/-$  mice after partial hepatectomy. While KLF6 is induced in both wild-type and heterozygous mice after hepatectomy, its expression level is 50% lower in the heterozygotes. We will next examine whether reduced expression of KLF6 delays or abrogates liver regeneration in heterozygous mice. These experiments provide insights into liver development, which may clarify the basis for liver regeneration, and possibly lead to innovative treatments for patients with liver disease.

## Errata

“Ethical Differences Between Socialized and HMO Systems,” Guest Editors: Martin H. Savitz and Michael M. Rivlin. *Mt Sinai J Med* 2004; 71(6):392–400. Page 394, col. 1, para. 2 should read:

The Trust and Health Authorities have to live within their budgets and are not permitted to overspend. By the government not providing any extra funds to support the recommendations made by NICE, the result is that lifeboats are being moved around the deck, rather than any extra lifeboats being provided.

Page 400, col. 2, para. 1 should read:

A general practitioner I had discussed the case with said that he would have accepted the donation....