AHRQ AND NIH PROGRAM OFFICER PANEL DISCUSSION
Session Chair: Orringer E
1University of North Carolina Chapel Hill, Chapel Hill, NC, USA
A panel of NIH and AHRQ program officers will discuss their institutions, institutes, and the role of program officers in extramural grant support. Panel members will discuss opportunities for trainees to interact with program officers to facilitate career development. The research focus and areas of emphasis for extramural grants, and career development awards will be discussed. The panel will then take questions from the audience.

WRITING A SUCCESSFUL CAREER DEVELOPMENT AWARD: TIPS AND PITFALLS
Session Chairs: Seely EW, Gelato M
1Brigham and Women’s Hospital, Boston, MA, USA; 2Stony Brook University, Stony Brook, NY, USA
Career development awards (also called K awards) provide an important step in the evolution to independent grant funding. This interactive workshop will review the purpose of K awards, the varied options for K award funding, and provide tips for success in your K application. You will receive perspectives and advice from senior investigators, current K recipients as well as from NIH to help you achieve success in your K application. Specifically, we will review choosing the K award that is right for you, defining your research question, writing your research plan, crafting your career development plan, the role of your mentor in your K award, the K award review process and revising your K award application. Co-sponsored by the Association for Patient Oriented Research.

REDCAP – PLANNING, COLLECTING, AND MANAGING DATA FOR THE CLINICAL AND TRANSLATIONAL RESEARCH ENTERPRISE
Session Chair: Harris D
1Vanderbilt University, Nashville, TN, USA
REDCap (Research Electronic Data Capture) is a software program designed to assist research teams with data planning, capture, storage and dissemination. The program was created to provide researchers an ‘easy way to do the right thing’ when planning and implementing study data collection strategies. REDCap software is available at no financial charge to academic and nonprofit institutions through a consortium network (www.project-redcap.org). Within this growing network of 192 institutional partners, REDCap is supporting approximately 15,000 end-users and 7,000 research-related projects. The software fills a common need at research institutions, providing cost-efficient, secure, centralized web-based data collection services for diverse research portfolios. The centralized data collection model protects all stakeholders (institution, researcher and research participant) by offering a secure alternative to spreadsheets and insecure file-based database programs. This panel presentation includes experts from Vanderbilt University (Paul Harris), Mayo Clinic (Michael Lin), Cleveland Clinic (John Sharp), and the Medical University of South Carolina (Bhad Obeid). Panel topics will include: (A) REDCap Project Overview – Supporting Data Capture, Management and Dissemination; (B) REDCap Consortium Overview – Supporting Diverse Environments; (C) REDCap Permutations – Supporting Diverse Study Designs; and (D) Real-World Research Projects – Supporting Diverse Research Teams.

PROFESSIONALISM IN TRANSLATIONAL SCIENCE TRAINING
Session Chair: Pichert JW
1Vanderbilt Medical School, Nashville, TN, USA
A critical community study was going wrong. Dr. ___ one of the investigators, heard of it and yelled angrily at a meeting of the research team’s academic members, “I don’t have time for careless so-called colleagues and lazy research assistants to screw up my hard work.” Then she turned to leave and barked, “You people better not eat or sleep until you’ve fixed this mess.”

MENTOR TRAINING TRIAL: A NATIONAL CTSA STUDY
Session Chair: Fleming M
1University of Pittsburgh, Pittsburgh, PA, USA; 2Mailman School of Public Health of Columbia University, New York, NY, USA
This session will present pediatric, clinical and translational research that focuses on the impact of disruptive behaviors that threaten C&T research quality. Without proper tools and commitment, C&T researchers seem to tolerate some disruptive behavior despite its potential to threaten patient safety, harm team morale and increase costs. Addressing unprofessional behavior in C&T research begins with a commitment to reduce tolerance for such behavior and requires (a) an organizational infrastructure, (b) a tiered “disruptive behavior pyramid” to guide interventions, and (3) training elements and resources adaptable to organizations that conduct high quality C&T research. Hickson GB, Pichert JW, Webb LE, Gabbe SG. A complementary approach to promoting professionalism: identifying, measuring and addressing unprofessional behaviors, Acad Med 82:1040–1048, 2007.

BALANCE IN EXPERTISE: BUILDING NEW MODELS IN CLINICAL AND TRANSLATIONAL RESEARCH
Session Chair: Mitchell P
1University of Washington, Seattle, WA, USA
The purpose of this concurrent session is to highlight interdisciplinary research spanning the spectrum of translational research from bench science to community practice. Panelists will illustrate current findings from different translational perspectives. Interdisciplinary collaborations representing medicine, molecular biology, nursing, social work, and other disciplines will demonstrate the strength of these approaches in research. Examples will showcase research in genomics, women’s health, and health disparities. Moderator, Pamela Mitchell (University of Washington). Panels: Elaine Larson (Columbia University), Deborah Lyons (Virginia Commonwealth University), Loretta Sweet-Jemmott (University of Pennsylvania)

LONGEVITY’S IMPACT ON TRANSLATIONAL SCIENCE
Session Chairs: Stronge B, Bernard MA
1University of Texas Health and Science Center at San Antonio, San Antonio, TX, USA; 2National Institutes of Health, Bethesda, MD, USA
The increases in longevity from 1900 to the present have resulted largely from improvements in prenatal and neonatal care, public health and treatment of infectious diseases. In 1900, the three leading causes of death were by infectious diseases. Today, the three leading causes of death are age-related diseases, including heart disease, cancer, and stroke. There is a growing consensus that additional increases in longevity may come by targeting the aging process, thereby simultaneously targeting multiple diseases. Preclinical studies have revealed a wealth of therapeutic targets and at least one compound that slows aging and increases longevity in mice. The speakers in this session will discuss the barriers to translation of preclinical research, the pitfalls encountered in clinical trials of antiaging interventions and the implications of life-extension for health care and public policy.

DEVELOPMENTAL ORIGINS OF ADULT HEALTH AND DISEASE
Session Chairs: Smoyer W, Ungar E
1The Ohio State University, Columbus, OH, USA; 2Massachusetts General Hospital; Boston, MA, USA; 3Harvard Medical School, Boston, MA, USA
This session will present pediatric, clinical and translational research that focuses on the impact of major adult diseases, including heart disease, obesity, and diabetes. The session will begin with an overview of the early observations and subsequent research leading to the development of our understanding of how early life events, including the prenatal period, can have a major impact on the subsequent health of individuals throughout their lives. This overview will be followed by three presentations focused more specifically on how the spectrum of preclinical to T1 to T4 research on the fetal origins of three of the most common and important human diseases (heart disease, obesity, and diabetes) is improving our understanding of the origins and potential interventions for human disease.

MOVING FROM K TO R: COMPETING SUCCESSFULLY FOR YOUR NEXT GRANT
Session Chairs: Moore C, Begg MD
1University of Pittsburgh, Pittsburgh, PA, USA; 2Mailman School of Public Health of Columbia University, New York, NY, USA
Scholars will learn how to compete successfully for their next NIH grant application, be that an independent K award (K01, K08, K23) or an R-series grant (R01, R33, R21). By discussing specific “scenarios” in which K2 scholars have competed successfully for their next NIH grant, scholars will learn about strategies that work and common mistakes to avoid. For example, scholars who currently have a K2 award but would benefit from an additional mentored K award will learn how to develop an argument justifying why they need a K01, K08, or K23 from the NIH, including what changes or additions to their K2 plan would be needed. Scholars will also learn key differences between a small grant (R03) and an exploratory/predevelopmental grant (R21), the benefits and risks associated with these mechanisms, and under what circumstances such mechanisms should be used. Finally, scholars will learn how to maximize their chances of competing successfully for R01 support, including how to avoid common mistakes made by new investigators as well as specific scenarios when recruiting a more senior investigator to serve as a “co-principal investigator” should be considered. Examples of successful applications will be discussed, and audience participation will be encouraged.

MENTOR TRAINING TRIAL: A NATIONAL CTSA STUDY
Session Chair: Fleming M
1University of Wisconsin, Madison, WI, USA
The purpose of this seminar is to present the initial findings of a 16 site national mentor training trial led by a research team at the University of Wisconsin Madison Institute
for Clinical Translational Research. A total of 285 mentor-mentee pairs across the sites were randomized into a control of experimental group. The mentees were primarily K scholars. Mentors assigned to the intervention arm of the trial participated in an 8 hour training program delivered over four sessions. The training was delivered at each site by two local facilitators who participated in a two day trainer of the trainer workshop. Pre-post measures focused on changes in active mentoring and mentoring activities of the mentors as reported by both the mentee and the mentor. The session will present baseline data and the mentor training experience across the 16 sites. The post-intervention interviews of the 285 mentor-mentees will be completed in the summer of 2011. This is the first large scale educational trial to test the effectiveness of a mentor training program for mentors who conduct clinical translational science. The 16 site committee who participated in this trial, expect the training curriculum tested in this study, will provide the framework for mentor training across the CTSA's.

CREATING NETWORKS FOR TRAINING IN HEALTH AND HEALTHCARE DISPARITIES RESEARCH

Session Chair: Bibbins-Domingo K1
1. University of California, San Francisco, San Francisco, CA, USA

Research in health and healthcare disparities is an important component of clinical and translational research. Training programs that prepare scholars to conduct research in health and healthcare disparities must consider the multifaceted nature of this research. This session brings together leaders from across CTSA and RCMI who are actively engaged in developing networks of training programs in health and healthcare disparities. The aims of this panel discussion are (a) to discuss components of successful training programs in disparities research and challenges in the development of such programs, and (b) to highlight current efforts in the development of networks across institutions engaged in training in disparities research.

HEALTH CARE REFORM – THE NECESSITY OF TRANSLATIONAL SCIENCE

Session Chair: Rich E2
2. Mathematica Center on Health Care Effectiveness, Princeton, NJ, USA

The Educational Session Health Care Reform – The Necessity of Translational Science will be led by Eugene Rich, M.D., Senior Fellow and Director at Mathematica’s Center on Health Care Effectiveness (CHCE). The five main objectives of this session are to (1) summarize the evidentiary questions posed by current health systems problems, (2) review the types of scientific inquiry relevant to answering these questions, (3) outline the opportunities to support evidence-based approaches to health care reform, (4) summarize some barriers to success in using translational science to guide health care reform, and (5) identify next steps for evidence based health care reform. The introduction and main presentation, The Scientific Foundation for Evidence-based Health Care Reform, will be given by Eugene Rich. Following the main presentation Ann Bonham, Ph.D., Chief Scientific Officer at AAMC, Lisa Rubenstein, M.D., M.S., P.H., Professor of Medicine at VA Greater Los Angeles and UCLA, and a Senior Natural Scientist at RAND and Hoangmai (May) Pham M.D., M.P.H., Senior Advisor, Center for Medicare and Medicaid Innovation will provide a reaction to the main presentation and personal comments on the topic. Appropriate development and application of translational science can and should play a critical role in improving the quality and efficiency of US health care.

OBESITY: WHAT ARE THE CRITICAL ISSUES, WHERE IS THE EVIDENCE BASE, AND HOW DO WE DEVELOP SOLUTIONS?

Session Chair: Vollmer SH1
1. University of Alabama at Birmingham, Birmingham, AL, USA

Nationally experienced Responsible Conduct of Research (RCR) educators and resource developers will explain the new NIH requirements for teaching RCR, which include face-to-face training. The speakers will offer methods and curricula that have proved successful in meeting these requirements in different contexts; an emphasis will be placed on teaching effective collaboration skills. On-line resources will be presented, including a knowledge base of wisdom, techniques and educational resources, CTSiPedia, which offers useful advice when faced with a specific question (on topics ranging from biostatistics to reproducible results to residency training), and a narrative tool for teaching decision making when faced with an ethical choice.

DATABASES FOR CLINICAL TRANSLATIONAL RESEARCH: REPURPOSING AND DESIGNING FOR UNANTICIPATED NEEDS

Session Chairs: Pollock BH1, Sullivan DC2
1. University of Pittsburgh, Pittsburgh, PA, USA, 2. Duke University, Durham, NC, USA

The use of databases for clinical and translational research with an emphasis on database design considerations to support future unanticipated needs will be discussed. Imaging measures can serve as end points for clinical outcomes. As new ‘imaging biomarkers’ are being developed and applied, it is critical that the way in which an image was collected and the way it was measured (person or algorithm, software revision, observation conditions, etc.) be recorded in a secure, standardized fashion. We will discuss database design requirements for research image sharing to support future needs. Administrative health care databases have been developed for: tracking quality and volume, billing, health services planning, and public health surveillance. When repurposed, they offer an extremely useful research resource. Rigorous and innovative study design can typically make use of this wealth of information to provide meaningful answers to significant health care questions. We present an example of how administrative databases can be repurposed to estimate the prevalence of undiagnosed disease. Selection of appropriate administrative databases, their flaws and strengths, and innovative uses will be discussed. The data already collected in various clinical and epidemiological studies often contain subsets that could be aggregated for secondary analyses, including those used for comparative effectiveness research. However, the lack of sufficient meta data describing these studies often prevents these subsets from being identified and utilized. We present a graphical user interface for the representation of such meta data, to facilitate not only the acquisition, storage, and primary analysis of a particular study’s data, but also to enable data sharing through novel query tools for unplanned analyses across studies with different designs and populations.

BEST PRACTICES IN COMMUNITY ENGAGED RESEARCH

Session Chair: Yukich C1
1. University of Pittsburgh, Pittsburgh, PA, USA

Community Engaged Research (CEnR) includes the community as an equal partner in the research process and is an important component of translational science. CEnR provides for different methods for research that the community wants, and that benefits the community. Community Based Participatory Research (CBPR) engages community organizations to be part of the entire research process, from conceptual formation and protocol design, to implementation through the use of data and translation in policy and practice. School Based Research (SBR) is a specialized part of CBPR that works with an important and interesting population. Schools are part of the community, but also their own small community. Practice Based Research (PBR) is conducted in medical or other health care settings, with an emphasis on rapid translation of research evidence into practice. It engages community organizations and clients. CEnR may use Community Health Workers (CHW) as part of the research or intervention team. This panel will provide a practice-based look at CEnR.
NEW MODELS FOR DRUG DEVELOPMENT

Session Chairs: Karen Xu, Whiteley RJ
Tufts University, Boston, MA, USA; University of Alabama, Mobile, AL, USA

Where will the life-saving and life-extending drugs of tomorrow come from? Is it clear that the extant model of drug development is yielding too few new products to sustain the growth of the research-based pharmaceutical industry? And when those are discovered, will it be possible to develop new treatments that will make them effective in more cases than those in which they are currently used? These are questions that arise when one reviews the current thinking on science- and infrastructure-based recommendations toward drug discovery and development. The new models of drug development are needed to ensure that newer and better medicines continue to be developed to treat a host of diseases for which inadequate or no treatments currently exist. This session will explore current trends in drug development, the challenges faced by practitioners in the design, development, and validation of new drugs, and the potential benefits and drawbacks of these approaches.

MEETINGS WITH NIH AND AHRQ PROGRAM OFFICERS

Session Chairs: Darnaud NL, Ulline R
NIH and AHRQ Program Officers will meet with small groups of scholars to discuss their individual career development plans, including grant application strategies.

Program officers from different institutes will be available for a 1½ hour block that scholars can utilize to have direct discussions with NIH and AHRQ staff about research, training, and career development grants in clinical and translational research.

TRACETORIES FOR SUCCESS IN CLINICAL RESEARCH: NO ONE PATH FITS ALL

Session Chair: Schoenbaum E
Albert Einstein College of Medicine, Bronx, NY, USA

In today’s world early investigators are faced with competing demands that can aid or abet successful research careers. Careers are variously affected by medical subspecialty, institutional resources, student loans, family life, etc. How one navigates opportunities and demands can make a difference in satisfaction and success as a clinical researcher. This session offers the “career stories” from three clinical researchers who are on different paths and each is successful. This session is targeted to clinical research scholars and early investigators. After the presentations, questions will be taken.

FOUNDATION OPPORTUNITIES IN BASIC, TRANSLATIONAL, AND CLINICAL RESEARCH TRAINING

Session Chair: Myers E
Doris Duke Charitable Foundation, New York, NY, USA

Many private foundations support career development programs in biomedical research. In this session, we will hear from three foundations that have programs for physician-scientists in early career stages with a focus on basic, translational, clinical, and health services research. The Career Award for Medical Scientists from the Burroughs Wellcome Fund supports physician-scientists who are in advanced postdoctoral/fellowship training, and the award extends into the early years of faculty service. Projects are in basic biomedical, disease-oriented, translational, or molecular, genetic, or pharmacological epidemiology research. The Clinical Scientist Development Award from the Doris Duke Charitable Foundation is an award for Investigators or Assistant Professors to facilitate the transition to independent clinical research careers. Projects cover a range of research areas from mechanisms of disease to health outcomes. The Doris Duke Charitable Foundation also has a program that supports one year of mentored clinical research for medical students. For nearly 40 years, the Robert Wood Johnson Foundation Clinical Scholars program has fostered the development of physicians to be leaders in research areas such as problems of health care delivery and financing, clinical decision making, and health care policy. The over 1100 graduates of the program have become a critical mass guiding changes in the US health care system. During the session, the three programs will be described, including programmatic goals, eligibility and selection criteria, and information on outcomes of program alumni when available.

OPPORTUNITIES FOR RESEARCH CAREER DEVELOPMENT THROUGH THE VA

Session Chair: Gleason T
Department of Veterans Affairs, Washington, DC, USA

The Department of Veterans Affairs (VA) Office of Research and Development has a rich research training history of clinician and nonclinician scientists interested in advancing knowledge for issues related to Veterans’ health. This session will be an opportunity to hear about the VA research career development and career path, especially for those interested in pursuing clinical research. Funding opportunities and real life examples will be presented.

CAN PHARMACOGENETICS DELIVER ON PERSONALIZED HEALTHCARE? LESSONS LEARNED

Session Chairs: Trikalinos T, Khoury M
Tufts Medical Center, Boston, MA, USA; Centers for Disease Control and Prevention, Atlanta, GA, USA

Over the past few years, technological advances allowed the rapid generation of torrents of genetic and genomic data, thereby presenting the opportunity to improve patient care and public health through numerous genomically applications. At the same time, translation of these data into knowledge and evidence-based action is severely lagging. Evidence on the relationship between genomic factors and clinical outcomes, and the costs, benefits and harms of genomic applications in real-world settings takes long to generate and is at risk of being obsolete by the time it is published. Of equal importance, the existing framework for evaluating the clinical utility of genomic applications is not optimal, and this complicates the translational process. Realizing the promise of genomics in treating and preventing disease, improving health, and reducing health disparities is the major challenge faced by comparative effectiveness researchers. The first talk will provide an introduction to translational research in genomic applications in practice and prevention, and outline what expectations are realistic. The second talk will discuss current thinking on science- and infrastructure-based recommendations towards facilitating the discovery and validation of pharmacogenetic markers, and speeding
their thoughtful translation and integration into clinical practice, with emphasis on cancer conditions. The third talk will describe approaches to evaluating and interpreting evidence on pharmacogenetic tests by virtue of applied examples. The fourth talk will provide a method for identifying individual worker exposure to aggression as counters and questionnaires are expected to specify more events than standard methods, providing a more accurate count of actual verbal and physical aggression exposure than other methods. Questions are collected prospectively in inpatient psychiatric settings. METHODS/STUDY POPULATION: This pilot study determines the feasibility of using an event counter to measure aggression exposure. Handheld counters will be used by clinical staff on 2 randomly selected adult units for consecutive periods after data is collected by standard methods and by questionnaire on 4 incident units. RESULTS/ANTICIPATED RESULTS: Using counters and end of shift logs, clinician aggression exposure will be identified. It is anticipated that counter methods will provide a more accurate count of actual verbal and physical aggression exposure than other methods. Questionnaires are expected to specify more events than standard methods, giving that standard methods are only used when injury or actual physical restraint of a patient occurs. Questionnaires document a broader range of behaviors, but do not provide a method for identifying individual worker exposure to aggression as counters do. Use of counters will also be compared to self report of perceived aggression exposure via survey.

**RESULTS/ANTICIPATED RESULTS:** Rates of aggression exposure currently measure only the most severe events and underestimate the actual exposure of workers to aggression, where most events are never counted. The ability to identify actual aggression exposure levels and evaluate effects of varied exposure may lead to identification of health and work outcomes. In addition a measure of the current state of exposure is provided so that efforts to reduce aggression exposure can be monitored for their effectiveness.

**A RETROSPECTIVE STUDY OF MORTALITY AND ADHERENCE AMONG HIV/AIDS PATIENTS AT ALERT HOSPITAL**

Aron H1, Bahuir E1, Harris C2

1 Stanford School of Medicine, Palo Alto, CA, USA; 2 Albert Einstein College of Medicine, New York, NY, USA

**OBJECTIVES/SPECIFIC AIMS:** The objective of this study is to characterize the HIV/AIDS inpatient population at the All African Leprosy Tuberculosis Rehabilitation Research, and Training Center (ALERT), one of the few facilities in Ethiopia providing long-term care to HIV/AIDS patients. We aimed to study the mortality rate, most prevalent opportunistic infections, and adherence to treatment. The characterization of the HIV/AIDS patient population at ALERT will be instrumental for the hospital as they attempt to improve the standard of care for their patients and advocate for funding to augment their inpatient services and diagnostic capabilities.

**METHODS/STUDY POPULATION:** This was a retrospective chart review of 276 patients admitted to the inpatient HIV/AIDS treatment services at ALERT in 2008. We stratified the data by age, gender, CD4 count, WHO staging and ART treatment. RESULTS/ANTICIPATED RESULTS: Preliminary data analysis showed the top four most prevalent opportunistic infections to be tuberculosis, pneumonia, cryptococcal meningitis, and CNS toxoplasmosis. We found that 40% of the patients in the cohort never started treatment, even though close to 95% of the patients had a CD4 count of less than 350 which is the WHO cutoff CD4 count to start treatment. Close to 70% of the patients on ART treatment had good adherence (approximately 95% adherence) based on self-report.

**DISCUSSION/SIGNIFICANCE OF IMPACT:** We observed the hospital mortality rate (approximately 45%) to be higher than the overall HIV/AIDS mortality rate for the country (35%). We are currently conducting further statistical analysis to assess the effects of the top four opportunistic infections, adherence, as well as other variables such as CD4 count and WHO staging on mortality using regression models. We hope to discover more explanations and make deductions through further analysis of the data.

**ACUTE PREDICTORS OF POSTCONCUSSION SYMPTOMS (PCS)**

Babcock Cimpanio L1, Byczkowski TL1, Bazarian JJ2

1 Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, USA; 2 University of Rochester Medical Center, Rochester, NY, USA

**OBJECTIVES/SPECIFIC AIMS:** The objectives are to determine (1) incidence of PCS and acute clinical variables associated with PCS in children with acute brain injury (mTBI). METHODS/STUDY POPULATION: This is a subanalysis of children <19 years in a previously established mTBI cohort. Variables were collected prospectively in the emergency department (ED). A 3 month follow-up call included the Rivermead Post-Concussion Symptom Questionnaire (RPCQ). PCS was defined as having ≥3 symptoms on the RPCQ that were worse than pre-mTBI. Bivariate and multivariable analyses were conducted to examine the associations of variables to PCS. RESULTS/ANTICIPATED RESULTS: 508 of 652 children enrolled completed the follow-up. 29.9% had PCS. Children with PCS were similar to those without PCS in terms of gender, race, mechanism severity, prior TBI, GCS, amnesia, abnormal brain CT, and receipt of PIS instructions. However, they were older (μ = 14.4 vs. 12.7 years) and significantly more likely to have lost consciousness (LOC) (61 vs. 50%), headache (HA) (94 vs. 66%), or nausea/vomiting (NV) (44 vs. 33%). We also found that the individuals with a longer school absenteeism (μ = 7.9 vs. 2.3 days) and pursuing a lawsuit (20 vs. 6%) than those without PCS. Multivariable analysis showed that age (OR 1.1, 95% CI 1.0, 1.2) and HA (OR 2.2, 95% CI 1.3, 3.6) were associated with PCS, however, gender, GCS, amnesia or NV were not. Those with LOC were more likely to develop PCS but this association was NS (OR 1.3, 95% CI 0.96, 2.4). When HA was removed from the model, NV became associated with PCS. DISCUSSION/SIGNIFICANCE OF IMPACT: One-fourth of children with mTBI seen in the ED develop PCS. Older children with LOC plus headache or nausea/vomiting should be considered at risk of developing PCS.

**ARE THE SCORES PRODUCED BY ADVERSE DRUG EVENT QUESTIONNAIRES DISCORDANT WITH THE ACTUAL PROBABILITY OF A DRUG/ADVERSE EVENT ASSOCIATION?**

Source: 1 Pakistan, 2 Yale University School of Public Health, New Haven, CT, USA

**OBJECTIVES/SPECIFIC AIMS:** Causality assessment questionnaires (CAQs) are psychometric scales that are often used to help drug experts to make transparent assessments of potential causal relationships between drugs and adverse events (AEs) while maintaining inter- and intra-rater reliability. A CAQ score threshold is usually chosen to distinguish plausible causal associations from immissible ones. We hypothesize that the scores produced by such expert-weighted CAQs are often discordant with the actual probability of a drug-AE association.

**METHODS/STUDY POPULATION:** We used two weighting schemes derived for the Koh CAQ, one expert-weighted and the other probabilistic, to test if the scores produced from the expert-weighted version of the scale were ever discordant with the actual probability of a drug-event association.

**RESULTS/ANTICIPATED RESULTS:** We found that the probability that scores produced for two drug-AE evaluations would be discordant with the actual probability of each drug-AE association increases monotonically over the majority of possible score thresholds. DISCUSSION/SIGNIFICANCE OF IMPACT: The results indicate that the scores produced by the expert-weighted Koh CAQ are often discordant with the actual probability of a drug-event association. We anticipate that this is a property of all CAQs and that derives scores from expert-weighted responses. The implication is that the use a score threshold above which a drug-event is considered plausible might in some cases be irrational (from a decision-theoretic point of view) for expert-weighted CAQs. Similarly, there might be situations where comparing scores produced by an expert-weighted CAQ to identify the most likely causal drug for an AE would be irrational.
ASSOCIATION OF SERUM ALBUMIN WITH MARKERS OF NUTRITIONAL STATUS IN HIV INFECTED AND UNINFECTED RWANDAN WOMEN

Dusangike N1, Anostat N2, Hoover D1, Shu Q1, Kiefe E
1Einstein College of Medicine, Bronx, NY, USA; 2Rutgers University, Piscataway, NJ, USA; 3NY Medical College, Valhalla, NY, USA

OBJECTIVES/SPECIFIC AIMS: Serum albumin is often used to measure nutritional status. We assessed the association of albumin with other measures of nutritional status in Rwandan women.

METHODS/STUDY POPULATION: We enrolled 710 HIV-positive and -negative women in a cross-sectional study. Data collected included medical and demographic parameters, CD4 count, albumin, anthropometric measurements and results of a Bioelectrical Impedance Analysis (BIA) performed by trained study nurses.

RESULTS/ANTICIPATED RESULTS: In a separate age adjusted linear regression model for each outcome in HIV-negative women, serum albumin was not significantly associated with BMI, p = 0.20, FFMI, p = 0.07 or FI, p = 0.47 and had a weak significant association with TTS, p = 0.049. In HIV+ women albumin was significantly associated with all outcomes in models adjusting for age and CD4 cell count. BMI, FFMI, FI and TTS, p < 0.003. An interaction term between HIV status and serum albumin was significant for all outcomes in models fit to all women.

DISCUSSION/SIGNIFICANCE OF IMPACT: Serum albumin did not predict BMI, FFMI or FFMI in HIV-negative women, suggesting that it is not a good marker of nutritional status. Its association with these measurements in HIV-positive women may result from its known value as a measure of advanced illness. This suggests that albumin should not be used as a proxy for nutritional status without further study of its association with validated measures.

BEHAVIOR, PSYCHIATRIC DIAGNOSES AND WEIGHT IN EARLY CHILDHOOD

Lowry KE12, Lavigne N3
1Children’s Memorial Hospital, Chicago, IL, USA; 2Northwestern University, Chicago, IL, USA

OBJECTIVES/SPECIFIC AIMS: Obesity is a known risk factor for poor behavioral control and psychiatric comorbidities. Existing research has not examined behavioral outcomes or psychiatric diagnoses in children 5 years of age or younger. This study examined the association between child weight and 1) parent-reported behavior problems, 2) observed noncompliance, 3) the presence or absence of psychiatric diagnoses, and 4) whether demographic variables moderated these associations.

METHODS/STUDY POPULATION: This was an archival review of a cross-sectional observation study. Participants were 283 2- to 5-year-old children (M = 3.7 yrs). Data was collected during home visits and included (1) parent-report questionnaires, (2) a semistructured parent interview, and (3) a standardized play observation. Subsequently, trained mental health professionals reviewed the protocols in their entirety and assigned psychiatric diagnoses if warranted.

RESULTS/ANTICIPATED RESULTS: Parent-reported externalizing behavior problems (B = 0.319, SE B = 0.157, p = 0.04) and observed noncompliance (B = 46.557, SE B = 21.955, p = 0.04) were significantly associated with higher child weight. Lower family SES (B = 8.087, SE B = 4.047, p = 0.003) was also associated with higher child weight. The impact of externalizing behavior problems on weight was stronger in girls (B = 0.706, SE B = .341, p = 0.04). Child race/ethnicity was not associated with child weight. Parent-reported internalizing behavior problems and psychiatric diagnoses were not associated with child weight.

DISCUSSION/SIGNIFICANCE OF IMPACT: Child externalizing behavior problems were associated with higher weight in young children. These findings suggest that parents may perceive the behavior of heavier children to be difficult to manage, but these families may not receive intervention as the intensity of behavioral problems were not severe enough to warrant psychiatric diagnoses.

BIOMARKERS OF METABOLIC SYNDROME PREDICT ACCELERATED DECLINE OF LUNG FUNCTION IN NYC FIREFIGHTERS THAT WERE EXPOSED TO WORLD TRADE CENTER PARTICulates

Naweed B1, Comfort A2, Ferrier N1, Kwon S1, Ronn WN3, Prezant DJ4, Weiden MD5, Nolan A6
1New York University School of Medicine, NY, USA; 2NYC Fire Department, Brooklyn, NY, USA

OBJECTIVES/SPECIFIC AIMS: The first year post 9/11/2001, the FEVI of FDNY rescue workers declined 439 ml, stabilizing to a 25 ml/year decline in the subsequent 7 years. Airflow obstruction predominated in firefighters who sought a specialty pulmonary evaluation for treatment. We are investigating the relationship between biomarkers of metabolic syndrome (MS) and decline in lung function.

METHODS/STUDY POPULATION: Treatment cohort (N = 1720) was stratified by FEVI into obstructed, FEVI < 76% predicted (LLN), or normal airflow, FEVI>176%. A pilot analysis assayed 41 patients’ serum drawn 5 months post 9/11 for 15 biomarkers of MS by Lumixine, (obstructed N = 10, normal N = 31). All patients had normal pre-9/11 lung function. Serum cholesterol (CHOL) and triglycerides (TG) were available on 15 patients, 20/157 were obstructed. Data presented as means ± SD; p values ≤0.05 by t-test considered significant.

RESULTS/ANTICIPATED RESULTS: BMI at time of serum sampling were no different between normal and obstructed individuals. At suboptimally PFT, obstructed patients had higher BMIs with an accelerated decline in lung function post 9/11, increased airway reactivity, and evidence of airway trapping based on elevated RV when compared to normals. Obstructed subjects had significantly greater CHOL and CHOL/HDL ratios; higher levels of eSe-Selectin, TPAL-1 and sICAM, and a trend towards elevated levels of TG and C-peptide.

DISCUSSION/SIGNIFICANCE OF IMPACT: Blood drawn post-WTC exposure identified a subgroup of patients with markers of MS. This subgroup had subsequent increased weight gain and decline in lung function. The finding of MS biomarkers prior to lung function decline raises the possibility that the combination of stressful exposure and mediators of MS interact and promote lung injury.
P11
CONNECTIVE TISSUE DISEASE ASSOCIATED VASCULOPATHIC WOUNDS
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OBJECTIVES/SPECIFIC AIMS: Lower extremity ulcers are a known complication of connective tissue diseases (CTD). The primary hypothesis of this research is that delayed wound healing in CTD is a manifestation of vasculogenic and angiogenic pathways, and that lower-extremity ulcers associated with CTD will provide a useful compartmental model for studying these pathways. METHODS/STUDY POPULATION: Retrospective chart review was completed on consecutive patients scheduled in the Georgetown University Hospital Center for Wound Healing between January 1 and March 31, 2009. Exclusion criteria included absence of an open ulcer or failure to be evaluated during the study period. Data collected included demographics; ulcer location and duration; ulcer size; outcome of surgical interventions including debridement, grafting, and wound vacuum closure device; and comorbid conditions including CTD, diabetes and vascular disease. The primary end point was correlation between wound duration and CTD. The secondary end points were outcomes, including healing, time to healing, and surgical interventions in the patients with CTD compared to those without CTD. RESULTS/ANTICIPATED RESULTS: Of the 520 scheduled patients, 337 had an open ulcer. The remaining 183 patients either did not attend the visit, or did not have an ulcer at the time of the visit. Of the patients with ulcers, 23.7% had an underlying CTD. Diabetes was present in 191 patients (56.6%); venous disease in 125 (37.1%) and arterial disease in 109 (32.3%). In this consecutive cohort of patients presenting to a tertiary wound healing center, 23.7% had associated CTD. We intend to use delayed wound healing in CTD as a model for studying tissue markers of angiogenesis and vasculogenesis on formalin fixed paraffin embedded specimens.

P13
DENTAL SERVICE UTILIZATION AND ASSOCIATED FACTORS AMONG LATINO ADOLESCENTS IN CALIFORNIA
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OBJECTIVES/SPECIFIC AIMS: The objective of this study is to identify and explain disparities in dental service utilization among Latino adolescents in California. METHODS/STUDY POPULATION: For this secondary analysis, the 2007 CHIS adolescent questionnaire was used, based on a random digit dialing telephone survey. The odds ratios (OR) and 95% confidence interval (CI) were calculated using multiple logistic regression modeling, taking into account the complex survey design and sample weights. RESULTS/ANTICIPATED RESULTS: A total of 1,769 Non-Hispanic white and 1,227 Latino adolescents participated. Language spoken at home (English or Spanish), immigrant status and race were all significant determinant of frequency of dental visits. Latino (OR = 0.49 CI 0.53–0.68); immigrants (OR = 0.52 CI 0.37–0.74), and adolescents that spoke Spanish at home (OR = 0.60 CI 0.43–0.84) were less likely to have a dental visit in the past year. In terms of preventive visits, immigrants (OR = 0.87 CI 0.60–1.25), Latino (0.91 CI 0.72–1.15), and adolescents that live in a Spanish speaking household (OR = 0.93 CI 0.76–1.13) had less preventive visits, although not significant. Adolescents with dental insurance were more likely to have had a past year dental visit. DISCUSSION/SIGNIFICANCE OF IMPACT: The Latino population is the fastest growing and the largest minority group in the U.S. One-half of the Latino population is younger than 27 years of age, and 20 percent of all children younger than 5 years of age are Latinos. In California, the most populous state, Latinos surpassed whites as the state’s largest racial/ethnic group amongst children: yet, little is known about dental service utilization and associated factors among Latino adolescents in California. This study will help identify and explain disparities in this understudied population. Without this basic understanding, these inequities cannot be addressed.

P15
DISPARITY IN ETOLOGY AND LENGTH OF STAY IN WOMEN WITH CHRONIC PELVIC PAIN: CALIFORNIA HOSPITAL DISTRICT DATA
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OBJECTIVES/SPECIFIC AIMS: The objective is to determine the disparity and predictors of etiology and length of hospital stay among women admitted to California hospitals with the diagnosis of Chronic Pelvic Pain (CPP) during years 2001–2007. This study will test the hypotheses: (1) young, uninsured women of minority group more are likely to be diagnosed with an infectious etiology of CPP relative to whites. METHODS/STUDY POPULATION: Admission data from California women hospitals were reviewed and analyzed for the time period of 2001 to 2007. Eligibility included women diagnosed with CPP aged 18 years and older that were hospitalized due to infections or noninfectious etiology during the periods 2001–2007. We analyzed the data using descriptive, bivariate and multivariate statistics. RESULTS/ANTICIPATED RESULTS: Of the 122,001 patients with CPP, 120,131 (98.8%) were due to infectious diseases and 1,841 (1.5%) were due to noninfectious diseases. The etiology of CPP hospitalization varied by age, race/ethnicity, and insurance status (p < 0.05). Blacks and hispanics, age 35–64 years, with medical/medicare had higher odds of being hospitalized due to infectious type relative to white (p < 0.05). The percentage of CPP subjects hospitalized due to infection decreased overtime (99% in 2001 versus 97% in 2007, p < 0.05). Subjects with infectious causes had higher adjusted odds of being hospitalized relative to those admitted due to infectious causes (p < 0.05). Median length of stay was 2 days for white and 3 days for others. Infectious CPP stayed more days than non infectious one (p < 0.05). DISCUSSION/SIGNIFICANCE OF IMPACT: Our data showed an increase in the hospitalization due to infectious CPP over time as well as disparity in the etiology and length of hospital stay. Since CPP is a diagnosis of exclusion with broad implications to society, more attentions are needed related to diagnosis of CPP among minority uninsured women.
INTERPRETING CHANGE IN CEREBRAL PALSY: VARIABILITY BETWEEN INDIVIDUAL PERCEPTIONS AND STANDARDIZED MEASURES

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OBJECTIVES/SPECIFIC AIMS: To establish minimal clinically important differences (MCIDs) for three common cerebral palsy (CP) outcome measures. METHODS/STUDY POPULATION: 122 children (79 male) ages 4–12 years with CP, as well as parents and medical professionals, provided concurrent ratings of clinical status in several domains (gross motor, self-care, social function, quality of life, and overall functioning). The Gross Motor Function Measure-66 (GMFM, Pediatric Evaluation of Disability Inventory (PEDI), and Cerebral Palsy Quality of Life Questionnaire for Children (CP-QOL) were administered at baseline and 6 months. We compared outcome measure changes scores with changes in status ratings using established methodology for calculating MCIDs to describe the relationships between measures and status ratings.

RESULTS/ANTICIPATED RESULTS: MCIDs could not be established. The average outcome measure change scores across five categories of improvement/worsening did not show a pattern. No relationship could be established between degree of change in respondents’ clinical status ratings and the change in scores on the GMFM, PEDI, or CP-QOL.

DISCUSSION/SIGNIFICANCE OF IMPACT: The methodology used to establish MCIDs in this study was not effective for the GMFM, PEDI, or CP-QOL. These findings highlight the difficulty of defining and documenting ‘meaningful’ change when evaluating interventions for children with CP.

P22

LEFT VENTRICULAR HYPERTROPHY (LVH) AMONG AFRICAN AMERICAN (AA) AND NON-AA CHILDREN WITH PRIMARY HYPERTENSION

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OBJECTIVES/SPECIFIC AIMS: LVH has been shown to be more prevalent among African American (AA) children with primary hypertension (HTN) compared to non-AA children with primary HTN. It is unclear whether this difference in the prevalence of LVH persists after adjusting for various clinical characteristics. The objective of the study was to determine the impact of race on LVH in children with PHTN.

METHODS/STUDY POPULATION: Cross-sectional study of 140 children aged 5–21 seen at 3 tertiary medical centers from 1995–2005 for initial evaluation of PHTN.

RESULTS/ANTICIPATED RESULTS: Univariate logistic regression revealed a 2.6 times increased odds of LVH in AA versus non-AA children. Overweight/obesity may play a larger role in the development of LVH than race in children with PHTN.

DISCUSSION/SIGNIFICANCE OF IMPACT: AA children with primary hypertension have more LVH at initial presentation, however the effect of race in children with PHTN is likely to have LVH than non-AA children. Overweight/obesity may play a larger role in the development of LVH than race in children with PHTN.

P23

PREDICTORS OF FOREARM FRACTURE RISK IN AFRICAN AMERICAN CHILDREN

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OBJECTIVES/SPECIFIC AIMS: Pediatric forearm fractures are increasing in incidence. Modifiable factors, including overweight status and/or deficient bone health (low dietary calcium intake and hypovitaminosis D), may contribute to risk and are prevalent in African American (AA) children. Our objective is to determine the association of forearm fractures with weight and bone health in AA children.

METHODS/STUDY POPULATION: This case-control study is enrolling AA children, ages 5–9 years, with and without forearm fractures. BMI, calcium intake, serum 25-hydroxy vitamin D level and bone mineral density (BMD) are measured. Bivariable and multivariable analyses test associations of weight and bone health with fracture status.

RESULTS/ANTICIPATED RESULTS: We have enrolled 65 cases and 72 controls. Mean age and proportion who were male did not differ comparing cases to controls. Mean BMI percentile for cases (73.1 ± 28.5) was significantly higher than controls [59.0 ± 30.1] (p = 0.008). More cases (30/58, 52%) than controls (22/68, 32%) had a BMI ≥ 85th percentile (OR = 2.2, 95% CI = 1.1–4.6). There was no difference in proportion of cases (24/52, 46%) and controls (19/63, 30%) meeting recommended daily dietary calcium intake for age (OR = 2.8, 95%CI = 0.9–8.3). Mean 25-hydroxy vitamin D level for cases [21.7 (± 6.9) ng/mL] was similar to controls [22.6 (± 7.3) ng/mL] (p = 0.45). Proportion of cases (29/59, 49%) and controls (27/68, 39%, OR = 1.5, 95% CI = 0.7–3.0) with vitamin D insufficiency and mean total body z-score for cases [0.7 (± 1.0)] versus controls [1.0 (± 1.1)] were not statistically different.

DISCUSSION/SIGNIFICANCE OF IMPACT: These data support an association between overweight status and risk for childhood forearm fracture. Our findings also suggest that vitamin D status and BMI may play a role in the increasing rates of childhood forearm fracture.

P24

PREVALENCE AND RISK FACTORS FOR VITAMIN D DEFICIENCY IN IBD IN NORTH FLORIDA

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OBJECTIVES/SPECIFIC AIMS: Vitamin D (vit D) is important in adaptive immunity and inflammation. Deficiency is more prevalent in inflammatory bowel disease (IBD) than in the general population. Identified risk factors for vit D deficiency in IBD suggest a nutritional deficiency as the underlying etiology, however, the major source of vit D is through sun exposure. We performed an IRB approved prospective cohort study to determine the prevalence of vit D deficiency in the IBD population in Northern Florida and assess risk factors for deficiency. METHODS/STUDY POPULATION: Between Aug and Oct 2010, 117 adult IBD patients seen in the UF/IBD clinics were consented and enrolled. Deficiency is defined as a 25-hydroxyvit D (25-OH D) level of <20 ng/mL and insufficiency as a level of 20–29 ng/mL.

Data collected included dietary intake of vit D, sun exposure history and colorimeter readings, BMI, medications, small bowel resections, disease activity, CRP and serum 25-OH D. Patients with suboptimal vit D levels were started on supplementation and a follow-up level was obtained. RESULTS/ANTICIPATED RESULTS: Of the 117 patients, 92.3% are white, 47.9% male, 69.2% CD and 26.5% UC. The mean age is 41.9 yrs, mean BMI 25.9, mean CRP 7.5. 35.9% were on a biologics, 29.9% on steroids, 23.9% on a multivitamin and 22.8% on vit D supplements. The mean vit D level was 26.6 (range 4–93). Deficiency was found in 24.5% and insufficiency found in 46.2%. Univariate and multivariate analysis will be performed when enrollment is completed.

DISCUSSION/SIGNIFICANCE OF IMPACT: With the preliminary data, the prevalence of suboptimal vit D levels in IBD patients is 70.7%. Despite our location in a geographic region with an adequate duration of sunlight appropriate for vit D synthesis, there is still a surprisingly high prevalence of deficiency. Future studies will determine the effect of adequate vit D supplementation on the course of IBD.
P28

PROGNOSTIC DEMOGRAPHIC AND TUMOR CHARACTERISTICS IN BREAST CANCERS WITH 25-OH VITAMIN D LEVELS

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OBJECTIVES/SPECIFIC AIMS: There is a paucity of research examining vitamin D levels and prognostic variables in breast cancer patients. The aim of this study is to identify the associations between 25-OH vitamin D levels, demographic variables, and prognostic pathological characteristics of breast cancers. METHODS/STUDY POPULATION: This study cohort consists of 155 women who underwent breast cancer surgery at the University of Rochester between 1/09 and 9/10. Vitamin D levels were obtained shortly before or following surgery. Prognostic variables included age, race, menopausal status, Oncotype DX score, TNM staging, ER status, PR status, and HER2 expression. ANCOVA, linear regression, and logistic regression were used to determine the association between prognostic variables and 25-OH vitamin D levels.

RESULTS/ANTICIPATED RESULTS: Non-Caucasian (OR = 3.8, p < 0.01) and premenopausal (OR = 3.5, p < 0.01) breast cancer patients were significantly more likely to have suboptimal 25-OH vitamin D levels than Caucasian and postmenopausal patients, respectively. A significant correlation (r = 0.42, p < 0.04) between decreasing vitamin D levels and increasing Oncotype score was noted. Breast cancer patients who had ER- and triple-negative breast tumors were more likely to have suboptimal levels of 25-OH vitamin D (ER- OR = 2.4, p = 0.07) (triple-negative OR = 2.6, p = 0.09). Women with invasive breast tumors had lower mean 25-OH vitamin D levels (invasive: 30.5 ng/ml vs. in situ: 39.6 ng/ml; p < 0.04) than women with in situ tumors.

DISCUSSION/SIGNIFICANCE OF IMPACT: Breast cancer patients with suboptimal vitamin D levels were more likely to have tumors with more aggressive tumor profiles, worse prognostic markers (ER- and triple-negative tumors), and high recurrence risk (Oncotype scores). Further research is needed to elucidate the biological relationship between vitamin D and breast cancer.

P29

PROGNOSTIC FACTORS FOR LEFT ATRIOVENTRICULAR VALVE REPLACEMENT FOLLOWING PRIMARY ATRIOVENTRICULAR SEPTAL DEFECT REPAIR

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OBJECTIVES/SPECIFIC AIMS: Development of significant left atrioventricular valve (LAVV) regurgitation occurs in some patients following atrioventricular septal defect (AVSD) repair, necessitating additional surgical interventions, including valve replacement. Descriptions of the medical course of these patients are sparse and consistent prognostic factors for LAVV replacement have not yet been identified.

METHODS/STUDY POPULATION: The experience of the Pediatric Cardiac Care Consortium (1982 to 2007) was reviewed to identify early outcomes of and prognostic factors for LAVV replacement following primary AVSD repair. RESULTS/ANTICIPATED RESULTS: Three hundred seventy patients with previously repaired AVSDs who underwent replacement of the LAVV were included in the analysis–243 underwent LAVV repair, 127 LAVV replacement. Median time to first reoperation following primary repair was 0.67 years in the repair subgroup and 0.18 years in the replacement subgroup.

DISCUSSION/SIGNIFICANCE OF IMPACT: Early mortality after LAVV replacement in patients with previously repaired AVSDs can be predicted by the presence of Down syndrome and prothetic valve size/weight ratio. The ability to predict outcomes may be useful in choosing between valve repair and replacement strategies.

P30

RISK BEHAVIORS AMONG RECENTLY INCARCERATED HIV-INFECTED INJECTION DRUG USERS

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OBJECTIVES/SPECIFIC AIMS: HIV-infected injection drug users (IDUs) are frequently incarcerated. The period immediately following incarceration has been associated with increased high-risk sexual activity and increased frequency of illicit drug use. The purpose of this study was to describe patterns of drug-injecting behaviors of HIV-infected IDUs following incarceration, and to assess whether these risk behaviors differed among IDUs with and without successful virologic suppression in response to antiretroviral therapy.

METHODS/STUDY POPULATION: We assessed needle-sharing and shooting gallery attendance among HIV-infected injection drug users who were followed in a community-based cohort study. We compared frequency of high-risk behaviors from visits when participants reported recent incarceration to those when no incarceration was reported. The proportion of IDUs reporting risk behaviors was then compared for those receiving or not receiving effective antiretroviral therapy.

RESULTS/ANTICIPATED RESULTS: From 1998–2010, 437 IDUs contributed 2075 study visits to the dataset. Incarceration was reported at 413 study visits. Among visits following a reported incarceration, participants were more likely to report needle sharing (23% vs. 12%) and shooting gallery attendance (9% vs. 1%) than if no incarceration occurred. IDUs with elevated HIV RNA were equally likely to engage in high risk behaviors as IDUs with undetectable HIV RNA.

DISCUSSION/SIGNIFICANCE OF IMPACT: Among HIV-infected IDUs, HIV transmission risk behaviors are particularly common during periods following incarceration. IDUs who are not effectively treated with ART, and as a result are more infectious, are no less likely to engage in high risk behavior.

P31

SYSTEMIC, BUT NOT VASCULAR INFLAMMATORY BURDEN INCREASES WITH AGE AND PROMOTES A HIGH-RISK PHENOTYPE ACROSS AFRICAN AMERICAN–CAUCASIAN ETHNICITY

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OBJECTIVES/SPECIFIC AIMS: Invasive: 30.5 ng/ml vs. in situ: 36.9 ng/ml; p < 0.04) than women with in situ tumors. This study cohort consists of 155 women who underwent breast cancer surgery at the University of Rochester between 1/09 and 9/10. Vitamin D levels were obtained shortly before or following surgery. Prognostic variables included age, race, menopausal status, Oncotype DX score, TNM staging, ER status, PR status, and HER2 expression. ANCOVA, linear regression, and logistic regression were used to determine the association between prognostic variables and 25-OH vitamin D levels.

RESULTS/ANTICIPATED RESULTS: Non-Caucasian (OR = 3.8, p < 0.01) and premenopausal (OR = 3.5, p < 0.01) breast cancer patients were significantly more likely to have suboptimal 25-OH vitamin D levels than Caucasian and postmenopausal patients, respectively. A significant correlation (r = 0.42, p < 0.04) between decreasing vitamin D levels and increasing Oncotype score was noted. Breast cancer patients who had ER- and triple-negative breast tumors were more likely to have suboptimal levels of 25-OH vitamin D (ER- OR = 2.4, p = 0.07) (triple-negative OR = 2.6, p = 0.09). Women with invasive breast tumors had lower mean 25-OH vitamin D levels (invasive: 30.5 ng/ml vs. in situ: 39.6 ng/ml; p < 0.04) than women with in situ tumors.

DISCUSSION/SIGNIFICANCE OF IMPACT: Breast cancer patients with suboptimal vitamin D levels were more likely to have tumors with more aggressive tumor profiles, worse prognostic markers (ER- and triple-negative tumors), and high recurrence risk (Oncotype scores). Further research is needed to elucidate the biological relationship between vitamin D and breast cancer.

P32

THE EFFECT OF TASK PRIORITIZATION ON PERFORMANCE OF UPPER AND LOWER LIMBS DURING DUAL TASK IN YOUNG AND OLD INDIVIDUALS

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OBJECTIVES/SPECIFIC AIMS: Many activities of daily living involve simultaneous performance of upper and lower limbs. However, the effect of aging on subtask performance during dual-tasking with specific task prioritization is not well studied. We investigated the effect of age on upper and lower limb performance during walking while carrying a tray under specific task prioritization.

METHODS/STUDY POPULATION: Sixteen old (63–86 years) and 18 young (17–28 years) adults performed two single tasks (walking of preferred pace, holding a tray while standing) and two dual tasks (walking while holding a tray focusing attention on the tray stable-WTAT, and walking while holding a tray focusing attention on walking: WTAW). Four gait parameters and the maximum range of tray tilt were measured. RESULTS/ANTICIPATED RESULTS: During WTAT compared to single task, both age groups showed significant change in upper and lower limb performance. Old individuals showed more increase in tray tilt, but less change in gait performance compared to young individuals. During WTAW, there was no significant change in either tray stability or gait performance except reduced stride length in both groups. During WTAT, the maximum range of tray tilt was significantly greater in older group showed higher dual task cost (change compared to single task) on tray stability and lower costs on gait compared to the young group (56.3% versus 16.7%, p = 0.03).

DISCUSSION/SIGNIFICANCE OF IMPACT: Task prioritization during dual tasking IDUs with elevated HIV RNA were equally likely to engage in high risk behaviors as IDUs with undetectable HIV RNA.

P33
**P35**

**TRAUMATIC EVENTS IN WOMEN VETERANS: PATTERNS ASSOCIATED WITH DEPRESSION, PTSD, BORDERLINE PERSONALITY DISORDER, AND COMORBID PTSD AND BORDERLINE PERSONALITY DISORDER**

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OBJECTIVES/SPECIFIC AIMS: To study the association between type of lifetime traumatic events and diagnosis of PTSD+BPD. METHODS/STUDY POPULATION: Cross-sectional study of a Midwestern cohort of VA enrolled women veterans. Participants (N = 875) completed a computer-assisted telephone interview assessing demographics, childhood and adult rape history, combat and civilian traumas, and self-report of lifetime diagnoses of depression, PTSD, or BPD. Subjects with other mental health diagnoses were excluded. Analyses were conducted using contingency tables and chi-square tests. RESULTS/ANTICIPATED RESULTS: Depression was diagnosed in 36% of participants, PTSD in 23%, BPD in 2%, and BPD+PTSD in 4%. Women with PTSD+BPD were more likely to report having been raped two or more times (75%) compared to women with depression (37%), PTSD (50%), or BPD (55%) (p < 0.0001). More participants with PTSD+BPD (58%) and BPD (55%) had their first rape in childhood, compared to those with depression (35%) or PTSD (36%) (p< 0.0001). Women with PTSD+BPD (64%) were more likely to report rape in two or more time periods (childhood, adult civilian life, or military life) compared to those with depression (22%), PTSD (31%), or BPD (40%) (p< 0.0001). Women with BPD+PTSD (61%) were more likely to report three or more types of trauma (childhood rape, adult rape, combat trauma, or civilian trauma) compared to those with depression (24%), PTSD (40%), or BPD (40%) (p < 0.0001). DISCUSSION/SIGNIFICANCE OF IMPACT: These findings support previous research indicating extensive exposure to lifetime trauma in women veterans. Women with history of childhood rape and exposure to different types of trauma over time are at elevated risk of diagnosis with both PTSD+BPD. Current treatment models focused only on PTSD ignore necessary interventions for BPD.

**P36**

**USING VITAL STATISTICS DATA TO BETTER UNDERSTAND THE GEOGRAPHY OF YOUTH DEATH AND TEEN BIRTH IN CALIFORNIA**

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OBJECTIVES/SPECIFIC AIMS: The U.S. youth death rate is higher than many peer nations and teen birth not only puts an individual adolescent girl's reproductive health at risk, but also poses a threat to long-term community health. State vital statistics data can be used to better understand the geography of youth death and teen birth at a local level. This research examines geographic pockets of excess youth death and teen birth in California and seeks to understand some of the environmental determinants of risk. METHODS/STUDY POPULATION: A geographic information system was used to develop age and gender adjusted standardized mortality rates (SMRs) among youth age 0 to 19 years at the zip code level. For teen birth, the percentage of births to females was compared to both teen death rate by zip code. Resulting maps were subjected to hot spot analysis to find statistically significant clusters for both excess youth death (SMR greater than the crude death rate) and teen birth. Statistical analysis using STATA (STATACorp, College Station, TX) was performed on other available variables to better understand the factors associated with youth death and teen birth.

RESULTS/ANTICIPATED RESULTS: Maps will show the distribution of hot spots of teen birth and youth death in California. Statistical analysis shows the existence of racial and ethnic disparities in teen births and the attainment of prenatal care for young women. Young men, age 15–19 are at highest risk for premature death, particularly during weekends and summer months. DISCUSSION/SIGNIFICANCE OF IMPACT: Geographic and statistical analysis of youth death and teen birth help develop and target preventive strategies to vulnerable youth. Results of this work are intended to support strategic efforts to reduce youth disparities and improve youth well-being in California.

**P37**

**VALIDATION OF AUTOMATED STRATEGIES TO IDENTIFY RISK FACTORS FOR POSTOPERATIVE ACUTE LUNG INJURY**

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OBJECTIVES/SPECIFIC AIMS: Delayed identification of patients at risk for acute lung injury (ALI) may prevent the implementation of all preventive and early treatment strategies. The objective of this study was to develop and validate time-efficient automated electronic strategies for identifying preoperative risk factors for postoperative ALL METHODS/STUDY POPULATION: Following IRB approval, the electronic medical records of 249 patients undergoing high risk surgery were evaluated. Two independent data extraction strategies were compared. The first utilized manual chart review and the second a web-based query-building tool. Web-based searches were derived and refined in a derivation cohort of 83 patients and subsequently validated in an independent cohort of 166 patients. Agreement between the two strategies were assessed. RESULTS/ANTICIPATED RESULTS: Kappa statistics ranged from 0.34 (95% CI 0.00 – 0.66) for admission history for chest pain to 0.38 (95% CI 0.17 – 0.59) for admission history for cirrhosis (95% CI 0.57 – 1.00). Agreements between manual and automated electronic data extraction were almost perfect for 3 variables (diabetes mellitus, cirrhosis, H2-receptor antagonists), substantial for 3 (chronic obstructive pulmonary disease, PPI, statins), moderate for gastroesophageal reflux disease, and fair for 2 variables (restrictive lung disease and amiodarone). The web-based queries performed manual data collection in terms of sensitivities, ranging from 77% to 100% (median = 100%) for automated queries vs. 0% to 100% (median = 87%) for manual data extraction. Specificities were uniformly high (≥97%) for both strategies. DISCUSSION/SIGNIFICANCE OF IMPACT: Automated electronic free text query building is an iterative process, but ultimately results in accurate, highly efficient data extraction. These strategies may be useful when determining risk for time-sensitive conditions such as postoperative ALI.

**P38**

**VIRAL LOAD IS NOT ASSOCIATED WITH ACUTE OTITIS MEDIA (AOM) DEVELOPMENT AFTER UPPER RESPIRATORY TRACT INFECTION (URI) CAUSED BY HUMAN METAPNEUMOVIRUS (hMPV)**

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OBJECTIVES/SPECIFIC AIMS: To compare the rate of AOM complicating URI caused by hMPV and other respiratory viruses and to determine if hMPV viral load is associated with AOM complication. METHODS/STUDY POPULATION: Nasopharyngeal aspirates (NPAs) were collected within 7 d of URI onset as part of a prospective study (2003–2007) of healthy children (6 mos-3 yr) who were followed for 1 y for the occurrence of AOM. Viral studies were performed by culture, respiratory syncytial virus (RSV) EIA, microarray PCR (RSV, parainfluenza 1–3, influenza A and B), and RT-PCR (adenov., entero., rhino- and coronaviruses). Archived NPAs were used for hMPV quantitative PCR. RESULTS/ANTICIPATED RESULTS: Archived NPAs from 633 episodes of 864 URI episodes in 189 children were evaluated. The median age was 18 mos (6–45 mos). Of the 633 URI episodes, 42 (6.6%) were positive for hMPV, 30 (4.5%) had hMPV as the sole virus. Altogether 229 (36%) URI episodes were complicated by AOM, 9 (5%) URI episodes with hMPV as a single virus were complicated by AOM. The rate of URIls complicated by AOM for other viruses was highest with RSV, followed by adenov., influenza-, corona-, entero-, parainfluenza- and rhinoviruses (44, 40, 38, 36, 33, 29 and 28%, respectively). In children with AOM complicating URI, hMPV viral load was lower (median 4.1 x 10^3 copies/ml) than those without AOM (3.1 x 10^3), but the difference was not significant (p = 0.11). hMPV viral load was significantly higher (median 4.4 x 10^3) in children with fever compared to those without (1.6 x 10^3) (p < 0.01). DISCUSSION/SIGNIFICANCE OF IMPACT: hMPV was detected in 6.6% of 633 URI episodes; 4.5% as the only virus. The rate of AOM complicating hMPV-induced URI is 30%. Viral load was associated with presence of fever, but not with AOM development.

**P39**

**VITAMIN D, FASTING GLUCOSE, FASTING INSULIN AND INSULIN RESISTANCE: A CO-TWIN CONTROL ANALYSIS**

IN A COHORT OF ADOLESCENT TWINS FROM RURAL CHINA

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OBJECTIVES/SPECIFIC AIMS: To examine the relationship of 25(OH)D levels with fasting glucose, fasting insulin, and insulin resistance (IR) in rural Chinese adolescent monzygotic (MZ) and dizygotic (DZ) twins using a co-twin control analysis. METHODS/STUDY POPULATION: This report included 534 adolescent twins from the Anqing region of China, aged 13 to 18 years. Adiposity measures included body mass index (BMI), total body fat (BF), and percent body fat (SBF), measured by dual-energy x-ray absorptiometry (DEXA). RESULTS/ANTICIPATED RESULTS: Linear mixed models of the within-pair association showed a significant inverse association between log 25(OH)D and fasting insulin and log fasting HOMA-IR in MZ twins (p<0.05 = −0.37 (0.16), p = 0.02 and (p<0.05 = −0.39 (0.17), p = 0.02, respectively, but no association was found in DZ twins. DISCUSSION/SIGNIFICANCE OF IMPACT: Our co-twin control analysis demonstrated an inverse relationship of vitamin D with fasting insulin and IR in MZ twins, but not in DZ twins, indicating that it is important to take into consideration individual genetic variations.
CLINICAL TRIAL ABSTRACTS

A PILOT STUDY OF LAMIVUDINE IN COMBINATION WITH VORINOSTAT FOR ADULT T-CELL LEUKEMIA/LYMPHOMA

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OBJECTIVES/SPECIFIC AIMS: The primary objective: to determine the safety and tolerability lamivudine +/- vorinostat in adult T-Cell Leukemia/Lymphoma (ATLL). The secondary objectives: to determine overall disease free and overall survival; to assess symptom burden measured by MDASI; to measure changes in histone acetylation, cell cycle and induction of apoptosis; to evaluate changes in HTLV-1 DNA and RNA; to assess changes in cytokine T-lymphocyte effector frequency; and to determine changes in the levels of plasma vascular endothelial cell and basic fibroblast growth factors. METHODS/STUDY POPULATION: Patients will initiate treatment with lamivudine 150 mg bid prior to receiving chemotherapy. Patients will receive two cycles of chemotherapy (CHOP, ESHAP or ICE). Responses following the completion of two cycles of chemotherapy + lamivudine will be evaluated. Patients who achieve a response of stable disease or better will be assigned to successive cohorts: lamivudine alone or in combination with vorinostat 100 mg, 200 mg or 400 mg PO QD X 14 days followed by 7 days rest. A dose escalation, utilizing successive cohorts, will be conducted to determine the maximum tolerated and biologically active dose of vorinostat. A maximum of 24 patients will be recruited. RESULTS/ANTICIPATED RESULTS: In the context of this study, we expect that lamivudine 150 mg bid in combination with vorinostat will be safe and tolerable for ATLL patients. In addition, we anticipate improved survival with decreased symptom burden with this regimen. DISCUSSION/SIGNIFICANCE OF IMPACT: Patients diagnosed with ATLL, there are limited therapeutic options and outcomes are universally fatal. Anti-proliferative regimens have been utilized to initially reduced tumor burden; however, these initial reductions are usually extremely short lived with rapid recurrence of disease. Further clinical research is needed to improve patient survival.

CYSTATIN C AS A PROGNOSTIC MARKER OF WORSENING RENAL FUNCTION IN ACUTE HEART FAILURE

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OBJECTIVES/SPECIFIC AIMS: (1) To determine the sensitivity and specificity of changes in cystatin C as a potential diagnostic marker for worsening renal function (WRF) in patients with acute heart failure (AHF). (2) To determine the predictive value of cystatin C for short term outcomes, length of hospitalization and readmission to hospital. METHODS/STUDY POPULATION: This is an ancillary study of the Diuretic Optimization Strategies Evaluation (DOSE) study, a multicenter, double-blinded, randomized control trial in which 308 patients were admitted for AHF, diuresed with moderate to high dose loop diuretics then followed for 66 days. We will explore the development of WRF using serum creatinine and cystatin C levels. The performance of cystatin C as a marker of WRF will be evaluated by receiver operating characteristics curve analysis to determine the best cutoff. The association between the change in cystatin C, length of hospitalization and readmissions will be determined. RESULTS/Anticipated results: The mean age of the DOSE cohort was 66 years, 27% were women, and 25% African American. 94 patients or 30.5% developed WRF using the creatinine criteria. The mean change in creatinine from 0.3 mg/dL. The median length of stay of the index hospitalization was 5 days. 130 patients (43%) experienced death, rehospitalization, or an emergency room visit within 60 days. DISCUSSION/SIGNIFICANCE OF IMPACT: Cystatin C has emerged as a novel marker of renal function that is independent of age, gender, diet, or lean muscle mass leading to the suggestion that it may be preferred to creatinine as an endogenous serum marker to assess renal function. We anticipate that the results of this study will contribute to the scientific literature on the optimal serum biomarker for early detection of clinically significant WRF.

DETERMINANTS OF INTRAVENOUS ALCOHOL SELF-ADMINISTRATION IN SOCIAL DRINKERS

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OBJECTIVES/SPECIFIC AIMS: The objective of this study was to examine the influence of subjective measures of alcohol effects and personality measures on intravenous (IV) alcohol self-administration in social drinkers. METHODS/STUDY POPULATION: Healthy social drinkers (N = 45) underwent two self-administration sessions; each consisted of a 25-min priming phase where subjects were prompted to push a button to receive individually standardized alcohol infusions, followed by a 2-hour phase with alcohol infusions. The administration measures included number of button presses (NBP), peak (PEAK) and average (AVG) Breath Alcohol Concentration (BrAC), and time to peak BrAC (TP). Subjective measures included Drug Effects Questionnaire (DEQ), Alcohol Urge Questionnaire (AUQ) and Alcohol Effects Questionnaire (AEFQ). Personality measures included the NEO-PI-R, UPPS-P Impulsive Behavior Scale, Barratt’s Impulsivity Scale (BIS) and Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ). RESULTS/Anticipated results: Results indicated a significant positive correlation between motor and attentional impulsivity measures and AVG and PEAK. Sensitivity to reward was positively correlated with AVG, PEAK, and NBP. AEFQ measures were also positively correlated with TP and NBP. The NEO-PI-R and UPPS-P were not correlated with self-administration measures. DEQ measures of drug liking and drug wanting, and the AUQ total score following priming were significantly associated with AVG, NBP and PEAK. Discussion/Significance of Impact: IV Alcohol self-administration measures were significantly associated with measures of impulsivity and reward sensitivity, as well as measures of drug liking and urges during priming. Results support a relationship between impulsivity and priming effects of alcohol and alcohol intake behavior.

IMMUNE RESPONSE TO HUMAN PAPILLOMAVIRUS VACCINE IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE RECEIVING IMMUNOSUPPRESSORS

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OBJECTIVES/SPECIFIC AIMS: Many inflammatory bowel disease patients receive immunosuppressing agents for their disease. It is well documented that patients receiving immunosuppressors are at increased risk of malignancy, including cervical cancer. The long-term goal of this study is to establish the safety and efficacy of the HPV quadrivalent vaccine in preventing cervical neoplasia in IBD patients. The specific aim of this study is to determine the seroconversion to HPV-6/11/16/18 serotypes after vaccination with Quadrivalent HPV vaccine in Puerto Rican IBD patients using immunosuppressing agents. Also we want to determine the prevalence of abnormal cervical histology in Puerto Rican IBD patients. METHODS/STUDY POPULATION: Quadrivalent HPV vaccine will be administered to all participants who are cytologically negative and seronegative, by both ELISA and PCR, for at least one of the HPV serotypes no more than 90 days before study entry. They will be vaccinated at 0, 2 and 6 months. We will collect serum by study participants at months 7, 12 and 30 for assessment of HPV-6/11/16/18 antibody titers. Inclusion criteria for study participants are: (1) a diagnosis of IBD, (2) ages between 9 and 45 years, (3) no previous diagnosis of malignancy or immunologic related condition. Subjects will be recruited at the University of Puerto Rico Center for IBD clinics. RESULTS/Anticipated results: Our hypothesis is that patients with IBD on immunosuppressors therapy will develop seroconversion to HPV vaccine in a similar way than age-, parity-matched healthy controls. Discussion/Significance of impact: The development of an adequate immunoresponse after immunization with HPV vaccine is critical for patients with IBD. Further research in both Puerto Ricans and immunosuppressed population, is warranted to establish effectiveness of HPV vaccine and to develop guidelines for screening and follow-up.
NEUROPROTECTIVE EFFECTS OF COGNITIVE ENHANCEMENT THERAPY AGAINST GRAY MATTER LOSS IN EARLY SCHIZOPHRENIA

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1University of Pittsburgh, Pittsburgh, PA, USA; 2Harvard Medical School, Boston, MA, USA OBJECTIVES/SPECIFIC AIMS: To examine the effects of Cognitive Enhancement Therapy (CET), a comprehensive cognitive rehabilitation program, on gray matter changes in patients with early course schizophrenia. METHODS/STUDY POPULATION: Outpatients in the early course of schizophrenia or schizoaffective disorder were randomly assigned and treated in a two-year trial with CET (n = 30) or an active Enriched Supportive Therapy (EST) control (n = 23), and assessed annual using structural MRI and a comprehensive cognitive battery. CET is an integrated approach to the remediation of social and nonsocial cognitive deficits in schizophrenia that utilizes computer-assisted cognitive training and group-based secondary socialization techniques. EST focuses on illness management and stress reduction through an individualized psychotherapeutic approach. RESULTS/ANTICIPATED RESULTS: Voxel-based morphometry analyses of gray matter change indicated significant differential patterns of density change between treatment groups in a left hemispheric social-cognitive network cluster including the amygdala, fusiform, and parahippocampal gyrus. Subsequent volumetric analyses revealed that while individuals receiving EST showed a loss of gray matter volume in this social-cognitive network over the two years of study, patients receiving CET exhibit a preservation, and at times, significant increases in gray matter volume in these regions. Mediator analyses indicated that CET effects on social cognition were partially mediated by protection against gray matter loss in this social-cognitive network. DISCUSSION/SIGNIFICANCE OF IMPACT: CET is an effective approach for the remediation of social and nonsocial cognitive deficits in schizophrenia that may achieve its efficacy through acting on social cognition brain networks.

PREDICTING CARDIAC DYSFUNCTION DURING CHEMOTHERAPY

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1Vanderbilt, Nashville, TN, USA; 2University of California Los Angeles, Los Angeles, CA, USA OBJECTIVES/SPECIFIC AIMS: Women treated for breast cancer with anthracyclines (AC) are at risk for developing heart failure. Cardiotoxicity is monitored by ejection fraction (EF), an insensitive marker for early cardiac dysfunction. No current biomarkers exist which predict early cardiotoxicity. Neuregulin (NRG) is an essential cardiac growth factor that is activated by physiological stress and exercise signaling through the Her2+ (ErbB) receptors. NRG is critical for maintaining cardiac function and detectable in serum. Therefore, we hypothesized that women treated with AC would exhibit a change in NRG, and this change would detect early cardiac dysfunction. METHODS/STUDY POPULATION: In a prospective study, we enrolled 31 breast cancer women receiving AC. Prior to and following AC treatment, participants completed exercise questionnaires, echocardiograms, and gave a serum sample. Subclinical cardiac dysfunction was defined as >5% decrease in EF from baseline or the development of diastolic dysfunction. RESULTS/ANTICIPATED RESULTS: Of the 31 women treated with AC, 12 patients experienced subclinical cardiac dysfunction. Those who developed subclinical cardiac dysfunction had a statistically significant change in baseline and post AC NRG levels (mean 7.45 ng/ml and 5.96 ng/ml, p = 0.04) versus women with no change in EF (mean 2.90 ng/ml and 2.67 ng/ml, p = 0.14 respectively). Although not statistically significant, women with subclinical cardiac dysfunction also had lower reported baseline physical exercise (16.9 vs. 19.3 Met/h/s/week, respectively). DISCUSSION/SIGNIFICANCE OF IMPACT: In conclusion, NRG levels dropped with AC treatment, and this drop may have prognostic potential for detecting early cardiac dysfunction. Future studies may investigate the effects of an activity intervention prior to AC treatment to determine if physical exercise prevents the decline in NRG levels during AC.

PREPARING THE STUDY DATASET FROM CLINICALTRIALS.GOV FOR ANALYSIS AND USING MESH THESSAURUS FOR REGROUPING CLINICAL TRIALS BY CLINICAL SPECIALTY

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1Duke, Durham, NC, USA; 2Duke, Durham, NC, USA; 3NLM, NIH, Bethesda, MD, USA OBJECTIVES/SPECIFIC AIMS: Development of a relational database for the purpose of analyzing aggregate data from ClinicalTrials.gov and a methodology for regrouping clinical trials by clinical specialty using MeSH thesaurus. METHODS/STUDY POPULATION: A relational database was developed for analyzing entire study dataset downloaded in Sep 2010 from ClinicalTrials.gov as xml files. Studies will be regrouped by 16 clinical specialty using MeSH thesaurus. We developed a methodology for creating, validating, and implementing a subset of the MeSH thesaurus and using it for specialty grouping. MeSH descriptors within this subset are reviewed and annotated by domain experts within each clinical discipline at Duke University. RESULTS/ANTICIPATED RESULTS: A database-based modeling from ClinicalTrials.gov is now ready for analyses. Annotation of MeSH descriptors by domain experts is nearing completion and these can be used to create study dataset for corresponding specialty groups. The data quality review informs each the preparation of each extracted analysis dataset. DISCUSSION/SIGNIFICANCE OF IMPACT: As data accumulate in ClinicalTrials.gov, the ability for aggregated descriptive characterization of the overall portfolio of the clinical research enterprise is increasingly desired. For analyses of the contents of this database, development of a relational dataset is critical. For the purpose of study data analysis within each specialty group as well as comparative analyses with other groups, it is desired to subset studies by clinical specialty. Use of this MeSH-based method meets this need and may be applicable to other purposes. We conclude by discussing the opportunities and challenges of analyzing ClinicalTrials.gov database. Funded by FDA; sponsored by the Clinical Trials Transformation Initiative.

PROSPECTIVE RANDOMIZED CONTROLLED TRIAL OF RESTRICTIVE FLUID MANAGEMENT IN TRANSIENT TACHYPNEA OF THE NEWBORN

Scruggs et al. A1,4, Holzman IR2,3
1Division of Newborn Medicine, Department of Pediatrics, and Department of Preventive Medicine, New York, NY, USA; 4Division of Newborn Medicine, Department of Pediatrics, New York, NY, USA; 3Mount Sinai School of Medicine, New York, NY, USA OBJECTIVES/SPECIFIC AIMS: To determine whether fluid restriction speeds resolution of respiratory distress in neonates with transient tachypnea of the newborn (TTN). METHODS/STUDY POPULATION: Late preterm neonates diagnosed with TTN were randomized to either standard fluid management or restricted fluid management. Neonates in the restricted fluid group received 20 mL/kg/day total fluids less than neonates in the standard fluid group for the first 3 days of life. The primary outcome was duration of respiratory support. Secondary outcomes were length of time to first enteral feed and time to discharge from the NICU. RESULTS/ANTICIPATED RESULTS: Sixty-four patients completed the study protocol. No adverse events due to fluid restriction occurred. Survival analysis demonstrated no difference in duration of respiratory support between the two groups as a whole (p = 0.215). In the subgroup of patients requiring respiratory support ≥48 hours there was a significant reduction in duration of respiratory support among fluid restricted patients (p = 0.0119). DISCUSSION/SIGNIFICANCE OF IMPACT: Transient tachypnea of the newborn is a self-limited respiratory distress syndrome caused by delayed pulmonary salt channel switching and fluid clearance. Although TTN is a common diagnosis, little data underlie fluid management for the disease. In our study, mild fluid restriction was safe in otherwise healthy term and late preterm neonates with TTN. Fluid restriction reduced duration of respiratory distress in neonates with severe TTN. This is the first study to demonstrate benefit of a treatment for TTN beyond supportive care. We recommend mild fluid restriction for all patients with TTN who require respiratory support.

PROTEOMICS IMPROVES THE PREDICTION OF BURNS MORTALITY

Kourtis CC1,4, Hjelm H1, Sprat J1,2, Victor SS3, Jeschke MG1, Hagedo SD1, Bhavnani SK1,2, Luxon BAV, Baisier AR1, Herndon DN1
1Dept. of Surgery, UTMB/SHC, Galveston, TX, USA; 2Inst. for Translational Sciences/Sealy Center for Molecular Medicine/UTMB, Galveston, TX, USA; 3PMCH, UTMB, Galveston, TX, USA OBJECTIVES/SPECIFIC AIMS: Reliable prediction of mortality in severely burned patients remains elusive. Here, we investigated the effect of combining proteomics variables with clinical covariates (inhalation injury, burn size, age) on the early identification of burn patients who will die. METHODS/STUDY POPULATION: 332 children with total burn surface area (TBSA) exceeding 25%, were admitted and consented to an IRB-approved experimental protocol. Serum hormones, acute phase proteins, and cytokines were measured at the time of admission. Mathematical models were used to determine the association of each analyte with patient outcome. RESULTS/ANTICIPATED RESULTS: Principal component analysis demonstrated that serum protein abundance and the clinical covariates each provided independent information regarding patient survival. Because analyses using data-driven generalized additive models demonstrated that the relationships between analytes and mortality were not linear, we performed nonlinear modeling using multivariate adaptive regression splines (MARS). Combining serum analytes with clinical assessments in MARS-based modeling increased overall outcome prediction accuracy from 52% to 81% and increased area under the receiver operating characteristic curve from 0.82 to 0.95. DISCUSSION/SIGNIFICANCE OF IMPACT: These results show that the accuracy of the MARS classifier can be substantially improved by combining protein abundance information with clinical covariates.
THEORETICAL SYNERGY TO IMPROVE POSITIVE HEALTH RESEARCH
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OBJECTIVES/SPECIFIC AIMS: Investigators seeking to enhance positive health have few models to guide their selection of targeted variables. The purpose of this presentation is to describe the linking of two theoretical models to address the psychosocial adjustment of adolescents/young adults (AYA) undergoing stem cell transplant.

METHODS/STUDY POPULATION: Components of the AYA Resilience in Illness Model (RAIM), also called the Adolescent Resilience Model, include protective factors, derived meaning (hope, spiritual perspective), perceived social support from friends and health care providers, family environment (communication, adaptability, cohesiveness), and positive coping (confrontive, optimistic, supportive). Risk factors are illness-related distress and defensive coping. The RIM components are targeted through a therapeutic music video (TMV) intervention based on Robb's Contextual Support Model of Music Therapy. Robb's theory hypothesizes that effective music therapy interventions contain elements of (1) structure, (2) autonomy support, and (3) supportive relationships.

RESULTS/ANTICIPATED RESULTS: Contextual support elements of the TMV intervention influence RIM outcomes via multiple paths. For example, focus on developing the music video supports AYA transition from defensive to positive coping, offers a means to communicate traumatic events and unspoken thoughts and emotions experienced during diagnosis/treatment, and encourages family and provider support. These, in turn, can foster the resilience outcomes of self-transcendence, mastery/confidence, and self-esteem.

DISCUSSION/SIGNIFICANCE OF IMPACT: The theoretical synergy described in this presentation was used to test the TMV throughout a multivariate, randomized clinical trial and provides a model for the synergistic use of theory to inform intervention and study design.

TOPICAL THALIDOMIDE GEL FOR ORAL LESIONS AND RELATED ORAL PAIN ASSOCIATED WITH CHRONIC GRAFT-VERSUS-HOST DISEASE: A PILOT STUDY
Fall-Dickson JM, St. John L, Childs R, Pavletic SZ, Wu T, Cozzarelli T, Schroeder E, Gordon S

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OBJECTIVES/SPECIFIC AIMS: Oral cGVHD affects up to 80% of patients with cGVHD. No optimal therapy exists. This parallel groups, randomized, placebo-controlled, double-blind pilot study tested topical thalidomide gel 20 mg (IND #76,793) versus placebo (Orobase® plain product) in oral ulcerative cGVHD.

METHODS/STUDY POPULATION: The protocol was approved by IRB. Written informed consent was obtained. Patients 18–80 years of age with oral biopsy confirmed cGVHD were eligible. Exclusion criteria included contraindications for thalidomide use, and inability to stop other topical treatments for oral cGVHD.

RESULTS/ANTICIPATED RESULTS: Thalidomide group had no baseline pain score means ranged from mild to moderate. Thalidomide group had no possible related to thalidomide (4 moderate; 1 mild), and 1 mild for placebo. Variable 2/7 in placebo group. There were no serious adverse events. Adverse events were 5 with exception of sensory pain with swallow.

DISCUSSION/SIGNIFICANCE OF IMPACT: Thalidomide was tested for the treatment of oral cGVHD. Thalidomide may be a potential therapeutic option for oral cGVHD.

TRANSLATING EVIDENCE-BASED DIABETES PREVENTION AND SELF-MANAGEMENT EDUCATION INTO A FAITH-BASED SETTING
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OBJECTIVES/SPECIFIC AIMS: Test an evidenced-based lifestyle intervention in a faith-based setting, combining diabetes prevention and self-management education strategies, with explicit incorporation of community-based participatory research.

(1) Examine the effect of an intensive lifestyle intervention on physiological (HbA1c and body mass index [BMI]) and psychosocial (quality of life [QOL], depression, and diabetes risk perception) outcomes in Black women with or at-risk for prediabetes. (2) Examine the effect of an intensive lifestyle intervention on physiological (HbA1c and BMI) and psychosocial (QOL and depression) outcomes in Black women with type 2 diabetes (T2D).

ETHICS ABSTRACTS

CASE STUDIES IN ETHICS IN BIOSTATISTICS: A VICTR PROGRAM IN RCR EDUCATION
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OBJECTIVES/SPECIFIC AIMS: Promote practical understanding of ASAs standards of ethics and core concepts of research integrity and RCR Enhance professional identity and solidarity among VUMC's biostatisticians Leverage biostatisticians' role in VICTR studies to increase the ethical quality of study design and data management, and promote research ethics consultation service to address complex and unusual issues.
DEFINING AND IMPROVING RESEARCH ETHICS CONSULTATION SERVICE OUTCOMES IN A TRANSLATIONAL SCIENCES ENVIRONMENT

Parikh K,^1^ Hyun D,^1^ Hoffner W,^1^ Rassbach C,^1^ DeBiasi R,^1^ Snyder M,^2^ Pater KS,^3^ Lennox R,^4^ Hudmon KS,^1^ Doebbeling B,^5^ Smith R^1^

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OBJECTIVES/SPECIFIC AIMS: (1) To identify barriers to the clinical implementation of pharmacogenomics by clarifying patient perspectives on, and especially concerns about, multiplex clinical pharmacogenomic testing. (2) To explore how patients want to be notified that clinical pharmacogenomic testing is available and how patients prefer to discuss results with their pharmacist, or (2) usual care. Groups will be followed for 6 months. RESULTS/ANTICIPATED RESULTS: The 394 participants had a median age of 51 years (range 18–90), most were female (55.8%), Caucasian (80.1%), and had at least a high school education (97.4%), and reported taking a median of 4 medications (range 1–22). Next steps are to finalize the abbreviated DTC and estimate agreement in medication-related problems. These patients will complete the abbreviated DTC and meet with a pharmacist who will determine the presence of medication-related problems. Receiver-operator characteristic curves will aid in identifying a score to use as a problem predictor. An additional 200 patients will then be randomized to either (1) complete the abbreviated DTC and discuss results with their pharmacist, or (2) usual care. Groups will be followed for 6 months. RESULTS/ANTICIPATED RESULTS: The 394 participants had a median age of 51 years (range 18–90), most were female (55.8%), Caucasian (80.1%), and had at least a high school education (97.4%), and reported taking a median of 4 medications (range 1–22). Next steps are to finalize the abbreviated DTC and estimate agreement in medication-related problems. Identification among study pharmacists (n = 6) prior to initiating prospective data collection. DISCUSSION/SIGNIFICANCE OF IMPACT: This paper identified a gap in the local public health response to the obesity epidemic. Results underscore the importance of taking into account multiple levels of infrastructure in examining predictors of LHD performance and in designing intervention strategies for improving implementation of evidence-based practice in local settings.

THE VANDERBILT EXPERIENCE WITH AD HOC ETHICS REVIEW OF CTSA-SUPPORTED RESEARCH PROPOSALS

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OBJECTIVES/SPECIFIC AIMS: Provide a streamlined method to allow research ethics input prior to the initiation of a clinical study without adding a layer of review. METHODS/STUDY POPULATION: The Vanderbilt Institute for Clinical and Translational Research (VCTR) administers the Vanderbilt CTSAs award and provides opportunities for the design and implementation of TB–T2 human translational research. Proposals go through a review to assure appropriate use of grant and institutional support requests. The process includes biostatistics, human subjects protection, and facilities reviews designed to identify possible enhancements before the endeavor starts. A Scientific Review Committee (SRC) composed of faculty with diverse research experience reviews each proposal and, using the NIH scoring system, rates the merits of the proposal. While administrative review focuses on compliance with regulatory requirements for human research, VICTRs SRC also allows for ethics reviews beyond human subjects protection. Biostatistical review addresses utilities and power to guard against enrolling subjects in trials unlikely to provide measurable effect. The SRC includes a member from The Center for Biomedical Ethics and Society, whose participation provides early input of ethics expertise without an additional step that an ethics consultation might require. RESULTS/ANTICIPATED RESULTS: The SRC has provided ethics reviews over a 3 year period in this way. Issues addressed include anticipated incidental findings, unintended consequences, appropriate study personnel, study design, collaboration, and data management. DISCUSSION/SIGNIFICANCE OF IMPACT: This method allows early feedback and provides the ability to recognize when more detailed ethics discussions or consultation may be warranted.

A SELF-ADMINISTERED QUESTIONNAIRE TO IDENTIFY PATIENTS AT RISK FOR MEDICATION-RELATED PROBLEMS

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OBJECTIVES/SPECIFIC AIMS: (1) Develop a brief self-administered questionnaire to identify patients experiencing medication-related problems, (2) Determine whether incorporation of the questionnaire into community pharmacy practice affects the incidence and type of adverse drug events reported by patients over six months, and (3) Characterize treatment plans created by pharmacists and patients in response to risk information.

METHODS/STUDY POPULATION: The 78 items comprising the original Drug Therapy Concerns (DTC) Scale item pool were administered to 394 patients. Using clinical judgment and factor analysis, we are reducing the item pool for psychometric testing with 200 additional patients. These patients will complete the abbreviated DTC and meet with a pharmacist who will determine the presence of medication-related problems. Receiver-operator characteristic curves will aid in identifying a score to use as a problem predictor. An additional 200 patients will then be randomized to either (1) complete the abbreviated DTC and discuss results with their pharmacist, or (2) usual care. Groups will be followed for 6 months. RESULTS/ANTICIPATED RESULTS: The 394 participants had a median age of 51 years (range 18–90), most were female (55.8%), Caucasian (80.1%), and had at least a high school education (97.4%), and reported taking a median of 4 medications (range 1–22). Next steps are to finalize the abbreviated DTC and estimate agreement in medication-related problems. Identification among study pharmacists (n = 6) prior to initiating prospective data collection. DISCUSSION/SIGNIFICANCE OF IMPACT: n/a

ANALYSIS OF AN ACUTE HEMATOGEOUS OSTEOMYELITIS (AHO) PATHWAY AT CHILDREN’S NATIONAL MEDICAL CENTER (CNMC)

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OBJECTIVES/SPECIFIC AIMS: A clinical pathway was developed at CNMC to standardize care of osteomyelitis. (1) To evaluate AHO pathway implementation through

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prepathway and postpathway comparisons, specifically focusing on percentage of blood cultures obtained, MRI use, and time to MRI. (2) To compare clinical outcomes, specifically length of stay and rates of pathogen identification, between the pre and postpathway groups.

STUDY POPULATION: Retrospective cohort study reviewing patient charts with principal discharge diagnosis of osteomyelitis from prepathway (January 1, 2005 to March 31, 2008) and postpathway (April 1, 2008 to October 31, 2010) periods. Original medical records were reviewed.

RESULTS/ANTICIPATED RESULTS: 46 charts were reviewed, 22 patients in the prepathway group and 24 patients in the postpathway group. Demographic factors between the two cohorts were similar, including age (7 yrs vs. 7.25 yrs) and sex (64% male vs. 58% male) as well as severity level (2.1 vs. 2.1). Since pathway initiation, 96% of the patients received blood cultures compared to only 77% prepathway and 96% of patients had a MRI study for diagnosis compared to 73% prepathway. A clinically significant decrease in time to MRI noted from 48 hours prepathway to 20 hours postpathway. However, mean length of stay was 6.5 days in both cohorts. Pathogen identification was 73% in the prepathway group and only 58% in the postpathway group. DISCUSSION/SIGNIFICANCE OF IMPACT: Implementation of the AHO pathway at CNMC has been successful, with a notable increase in blood culture rates, increase MRI use for diagnosis, and a decrease in time from admission to MRI. However, clinical outcomes like LOS and pathogen identification were not improved. Further investigation is needed to determine why these clinical outcomes were not improved.

ASSOCIATION BETWEEN CARdioselective BLOCKERS TREATMENT AND Mortality AMONG HOSPITALized FOR ACUTE EXACERBATIONS OF CHRONIC OBSTRUCTIVE LUNG DISEASE IN THE PRESENCE OF COMORBID ISCHEMIC HEART DISEASE AND HEART FAILURE

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OBJECTIVES/SPECIFIC AIMS: Background: Beta-blockers (BB) are beneficial in patients with ischemic heart disease (IHD) and heart failure (HF); however there is limited evidence about the benefits or risks of continuing BB therapy during acute exacerbations of chronic obstructive pulmonary disease (AECOPD) among these patients. Objective: To compare outcomes of patients hospitalized for AECOPD with coexistent IHD and/or HF treated with an inhaled bet 2 agonist (B2A) combined with a cardioselective beta-blocker (CSBB) to those treated with a B2A alone.

METHODS/STUDY POPULATION: Retrospective cohort study at 415 hospitals of patients hospitalized for AECOPD with coexistent IHD or HF. Multivariable logistic regression, propensity score adjustment and matching, will be used. Treatment: CSBB in the first 2 hospital days: Outcomes: inpatient mortality, mechanical ventilation started after day 3, readmission for AECOPD, HF or IHD within 30 days. RESULTS/ANTICIPATED RESULTS: Preliminary Results: Of 93,449 patients meeting inclusion criteria 2,806 (28%) were treated with CSBB in the first 2 hospital days; including 35% of patients with IHD, 36% of patients with HF. Compared to untreated patients, those who received a BB were older (median age, 77 vs. 70), had lower inpatient mortality (2% vs. 3.1%, p = 0.0001) and lower AECOPD readmissions (7.4% vs. 8.8%, p < 0.0001). DISCUSSION/SIGNIFICANCE OF IMPACT: Among patients hospitalized for AECOPD with coexistent HF or IHD, CSBB are associated with a decreased risk of in-hospital death. Our current focus is developing propensity-adjusted multivariable models for the association between BB use and outcomes.

BELIEFS AND ATTITUDES OF LUNG CANCER PROVIDERS ABOUT MINORITY PATIENTS

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OBJECTIVES/SPECIFIC AIMS: The outcome of patients with lung cancer remains poor, particularly among individuals of ethnic and racial minorities. Potential sources of disparities have been suggested including patient, system and provider-level factors. In this study, we surveyed physicians to determine their beliefs regarding treatment preferences of minority and nonminority patients with lung cancer.

METHODS/STUDY POPULATION: We provided a self-administered questionnaire to physicians caring for lung cancer patients at 5 medical centers in New York City. The questionnaire asked about physicians’ views with respect to beliefs and preferences of minority and nonminority lung cancer patients.

RESULTS/ANTICIPATED RESULTS: Of 160 eligible physicians, 112 (70%) returned survey responses. Providers were more likely to treat minority patients had higher views of fatalism (lung cancer was meant to be, if diagnosed with lung cancer it is too late to do anything about it, everything is a part of God’s plan; p < 0.0001 for all comparisons). Although providers feel in general comfortable discussing these beliefs, they reported being less likely to do so with the minority patients (p < 0.0001). When compared to white providers believe Hispanic and black patients are less likely to accept surgery as well as other cancer treatments (chemotherapy and radiation therapy). Similarly, providers considered that minorities were more likely to want to involve their family on prognosis discussions and treatment decisions. Finally, providers reported that minorities are less receptive to a DNR directive or palliative care referral.

DISCUSSION/SIGNIFICANCE OF IMPACT: There are significant differences among providers regarding minority preferences and beliefs about lung cancer care. Understanding the influence and relative importance of these factors is an important step towards developing interventions to improve outcomes of minority patients with lung cancer.

CHARACTERISTICS OF PRIMARY CARE PHYSICIANS ASSOCIATED WITH RECOMMENDED CARE FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS

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OBJECTIVES/SPECIFIC AIMS: The objectives of this study were to examine physician characteristics associated with (1) recommended care practices for CSHCN, (2) willingness to care for more CSHCN. METHODS/STUDY POPULATION: Cross-sectional, statewide survey of PCPs in Arkansas. PCPs with a Medicaid caseload of ≥10 children were mailed a paper survey four times over 2 months. Survey content was informed by prior literature defining recommended practices for CSHCN. Predictor variables included physician specialty field, demographics, practice type, and % patients with public insurance. Descriptive and multivariate regression analyses described characteristics of PCPs associated with recommended care practices and a willingness to care for more CSHCN.

METHODS/STUDY POPULATION: Of 565 mailed surveys, 203 (36%) were returned. Half (51%) practiced in a group setting and 37% practiced in a solo/2 person practice, with physicians more likely to see CSHCN. Practicing in a solo/2 person practice was associated with having a written care plan (AOR 9.7, 95% CI 1.2, 6.4).

DISCUSSION/SIGNIFICANCE OF IMPACT: Female physicians and physicians in smaller practices were more likely to deliver recommended practices for CSHCN, but only physicians with a higher % of publicly insured children were willing to care for more CSHCN. Future research should identify barriers to optimal CSHCN care for PCPs who work in larger practices and practices with a greater proportion of privately insured patients.

COST-EFFECTIVENESS OF POSTNEPHRECTOMY SCREENING PROTOCOLS IN THE DETECTION OF RECURRENT CANCER

Suro 1

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OBJECTIVES/SPECIFIC AIMS: To assess the cost-effectiveness of published surveillance protocols designed to detect asymptomatic cancer recurrence after definitive treatment for renal cancer. METHODS/STUDY POPULATION: Using a Markov simulation model, we estimated the cost and benefit of competing published algorithms for surveillance imaging after radical nephrectomy or partial nephrectomy for low stage kidney cancer. We then performed sensitivity analysis around the assumptions for cancer detection with different screening protocols.

RESULTS/ANTICIPATED RESULTS: At a willingness to pay of 100,000 per cancer recurrence detected, the surveillance regimens with the highest costs appeared to be warranted. However, in sensitivity analysis, small changes in assumptions about the sensitivity of different imaging modalities caused lower cost strategies to be as effective with greatly reduced costs.

DISCUSSION/SIGNIFICANCE OF IMPACT: Surveillance of kidney cancer patients in the survivorship period is able to detect recurrent disease in an asymptomatic state. Proposed screening protocols vary extensively in their cost, and may not have significantly different results at a population level in low risk disease.

DEPRESSIVE SYMPTOMATOLOGY AMONG ADULTS WITH ASTHMA: THE ROLE OF ASTHMA SEVERITY

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OBJECTIVES/SPECIFIC AIMS: Epidemiologic evidence shows higher rates of major depressive disorder (MDD) among individuals with asthma. To further understand this association, we examined whether increased asthma severity was associated with symptoms of depression and rates of MDD.

METHODS/STUDY POPULATION: For this purpose, we assessed symptoms of depression among individuals with mild/moderate asthma (n = 32), severe asthma (n = 46) and healthy controls (n = 31) recruited from the Severe Asthma Research Network (SARP). Depression was measured with the Beck Depression Inventory (BDI). In addition to the full score, we created a modified BDI score dropping the 5 items that assess somatic symptoms that may be a result of asthma, e.g., sleep disturbance. RESULTS/ANTICIPATED RESULTS: The sample consisted of 109 individuals (mean age 37 years, 71% female, 84% Caucasian, 11% African American, 12%, with 4% non-Hispanic/Latino ethnicity). Comparisons of means showed symptoms of depression, as assessed by the full and modified scale
scores, among individuals with asthma than controls (p < 0.001). In addition, when compared with individuals with mild/moderate asthma, severe asthmatics reported more symptoms of depression on the modified scale (p = 0.04), with a similar trend using the full BDI (p = 0.06). Of individuals with asthma, 20.3% met the clinical cutoff for MDD as compared to 0% of the controls. Higher depression symptoms trend was observed in the severe asthma group versus mild/moderate asthma (p = 0.065).

**DISCUSSION/SIGNIFICANCE OF IMPACT:** Our findings provide support for higher rates of depressive symptoms among individuals with severe asthma when compared with their mild/moderate asthma counterparts. Further research is warranted.

**RESULTS:**

We interviewed 60 older adults (mean age 78, 62% women, 27% European American, 23% African American, 12% Latino, 37% Chinese American, mean 3 ADL dependencies). 76% of respondents rated their quality of life as good or better. Six domains emerged that dependent elders felt were important to their quality of life: physical (disability); mental (anxiety, depression); social (significance, support); spiritual (religion, purpose); and family (dependence, love).

**DISCUSSION/SIGNIFICANCE OF IMPACT:** In this diverse group of very disabled elders, most rated their quality of life as at least good. Many of the factors that influence quality of life, including role-pace, resilience, religious coping; and social (significance, support), and respect for dignity, are missing from standard assessments of quality of life (e.g., SF-36).

**FEASIBILITY, SAFETY, AND EFFICACY OF A SCALABLE, HOSPITAL AT HOME MODEL OF CARE**

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**OBJECTIVES/SPECIFIC AIMS:** BACKGROUND: Providing hospital-level services in patients’ homes in Hospital at Home models of care for select diagnoses, has proven to be clinically safe, cost-effective, and preferred by patients, caregivers and providers. However, scaling these models has been limited by challenges in providing physician resources into the home. OBJECTIVE: Evaluate the feasibility, safety, and efficacy of a scalable substitutive Hospital at Home model, the Advocate Home Hospitalization Program: Powered by Clinically Home (AHHP) that uses virtual physicians via a 2-way real-time enhanced video.

**RESULTS/ANTICIPATED RESULTS:** The treatment group was more satisfied (p < 0.05) and had lower readmission rates (p < 0.05) with equivalent quality. We anticipate lower costs, lower adverse events, and similar clinical quality. DISCUSSION/SIGNIFICANCE OF IMPACT: AHHP is feasible and efficacious for patients and families. Improved scalability of Hospital at Home models will prove useful to health systems adapting to new paradigms of health service delivery.

**GENDER DIFFERENCES IN PARENTAL PERCEPTIONS OF MENTAL HEALTH NEEDS AND SERVICES**

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**OBJECTIVES/SPECIFIC AIMS:** (1) To evaluate gender differences in mental health service use after referral from a pediatric clinic; and (2) To explore differences in the way parents describe the mental health needs of girls and boys. METHODS/STUDY POPULATION: One hundred forty-eight children aged 2–17 were referred from an urban pediatric primary care clinic to a community children’s mental health clinic. Referring providers completed a form documenting reason for referral and demographics. Mental health service use was obtained from the mental health clinic. In-depth interviews with 37 of the families explored the factors impacting parents’ decisions to attend the mental health evaluation. Univariate analyses were used to examine group differences; regression analyses were used to examine likelihood of attending the initial mental health evaluation. Interviews are being analyzed using grounded theory to examine differences by gender in how parents discuss mental health problems.

**RESULTS/ANTICIPATED RESULTS:** Boys were more frequently referred than girls (91/148 vs. 55/148). Forty-six percent of referred children attended the initial mental health evaluation. Attendance at the initial evaluation did not differ by gender. Logistic regression showed that girls had a 2.45 (95% CI: 1.17 – 5.11) greater odds of having 3 or more mental health visits as compared to boys, with 42% of girls attending 3 or more visits versus 24% of boys (p = 0.03).

Qualitative analyses to enrich these findings are currently underway. DISCUSSION/SIGNIFICANCE OF IMPACT: There were no gender differences in attending the initial mental health evaluation, but girls were more likely to continue with treatment. Qualitative analysis is underway to explore how families describe the mental health needs of boys and girls, and how this may influence service use.

**LENGTH OF STAY FOR PEDIATRIC PSYCHIATRIC PATIENTS: A REASON FOR OVERCROWDING**

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**OBJECTIVES/SPECIFIC AIMS:** We conducted a study of quality of life in a diverse group of very disabled elders, most rated their quality of life as at least good. Many of the factors that influence quality of life, including role-pace, resilience, religious coping; and social (significance, support), and respect for dignity, are missing from standard assessments of quality of life (e.g., SF-36).

**DISCUSSION/SIGNIFICANCE OF IMPACT:** In this diverse group of very disabled elders, most rated their quality of life as at least good. Many of the factors that influence quality of life, including role-pace, resilience, religious coping; and social (significance, support), and respect for dignity, are missing from standard assessments of quality of life (e.g., SF-36).

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*Summerfeld W,* *Sulo S*, *Sacks L*, *Powder S*, *Rakowski R*, *London A*, *Chess D*, *Robinson A*  
1 Advocate Health Care, Park Ridge, IL, USA; 2 Intersections, Bridgeport, CT, USA; 3 London Group Inc, Toronto, ON, Canada

**OBJECTIVES/SPECIFIC AIMS:** BACKGROUND: Providing hospital-level services in patients’ homes in Hospital at Home models of care for select diagnoses, has proven to be clinically safe, cost-effective, and preferred by patients, caregivers and providers. However, scaling these models has been limited by challenges in providing physician resources into the home. OBJECTIVE: Evaluate the feasibility, safety, and efficacy of a scalable substitutive Hospital at Home model, the Advocate Home Hospitalization Program: Powered by Clinically Home (AHHP) that uses virtual physicians via a 2-way real-time enhanced video.

**RESULTS/ANTICIPATED RESULTS:** The treatment group was more satisfied (p < 0.05) and had lower readmission rates (p < 0.05) with equivalent quality. We anticipate lower costs, lower adverse events, and similar clinical quality. DISCUSSION/SIGNIFICANCE OF IMPACT: AHHP is feasible and efficacious for patients and families. Improved scalability of Hospital at Home models will prove useful to health systems adapting to new paradigms of health service delivery.
OBJECTIVES/SPECIFIC AIMS: To determine the length of stay (LOS) of patients with psychiatric diagnoses in an Emergency Department. METHODS/STUDY POPULATION: This is a retrospective cohort study reviewing all children under 19 years of age, who presented to an Urban ED, with psychiatric symptoms, from January 2004 to December 2007. A control group with nonpsychiatric diagnoses was selected over a random 4-day period. ED length of stay (in minutes) was compared to that of patients with psychiatric diagnoses. LOS was determined from the time of triage to disposition (discharge or admission). Patients with psychiatric diagnoses were divided into one of two categories: major psychiatric disorders (bipolar disorder, psychoses, major depression, suicidal attempt or ideation, homicidal ideation, and hallucination) and minor psychiatric diagnoses (ADHD, adjustment disorder, anxiety or panic attack, and behavioral issues). RESULTS/ANTICIPATED RESULTS: A total of 1,468 patients with psychiatric diagnoses visited the ED. The control group had 345 patients. 382 patients were in the major psychiatric diagnoses group and 1,086 patients were in minor psychiatric diagnoses group. Mean LOS of nonpsychiatric patients was 160 minutes (95% CI 142-177), LOS for minor psychiatric patients was 737 minutes (95% CI 670-803) and 1,127 minutes major psychiatric patients (95% CI 972-1,283). The median LOS of nonpsychiatric patients was 129 minutes, minor psychiatric patients 328 minutes and major psychiatric patients 4,37.5 minutes. Kruskal-Wallis test showed a significant difference between each group (p=0.0001). DISCUSSION/SIGNIFICANCE OF IMPACT: Describing the steps and duration of time it takes to treat and discharge pediatric psychiatric patients should be discussed at a National Task Force meeting. Guidelines could then be provided to help relieve the ED of their increasing burden.

NEIGHBORHOOD VIOLENCE AND STRESS: EXPLORING COMMUNITY PERCEPTIONS OF INFLUENCES ON CHILDHOOD ASTHMA

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OBJECTIVES/SPECIFIC AIMS: Disproportionately high asthma morbidity and mortality persists among socioeconomically disadvantaged children. Known environmental risk factors only partially explain persistent disparities. While evidence shows that exposure to chronic stress predicts asthma exacerbations, the impact of neighborhood-level factors on stress and asthma morbidity remains poorly understood. METHODS/STUDY POPULATION: This study utilized a concept map to engage residents, 11 adults and 10 youth, to identify neighborhood factors that may influence, positively or negatively, childhood asthma. Study activities include systematic brainstorming, sorting, rating and cluster mapping activities which characterized perceptions of the factors influencing the care and control of childhood asthma. RESULTS/ANTICIPATED RESULTS: Participants identified 72 discrete items related to asthma such as pollution, stress, shootings, teasing, health insurance, and smoking. Items were organized and prioritized by the group into 5 clusters, such as Environmental Triggers and Stressors. For items related to stressors, visual depictions were created illustrating the pathways by which stressors impact lung function through feelings of anxiety and acute panic responses. DISCUSSION/SIGNIFICANCE OF IMPACT: Utilization of an engaged research approach led to the contextualization of a range of unique neighborhood related stressors. Results will inform testable hypotheses regarding neighborhood influences on childhood asthma care and control in future quantitative research and to inform the design of behavioral and public health asthma care and control programs for youth.

POSTSEXY MORTALITY AND TRANSITION IN THE GLOBAL BURDEN OF DISEASE

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OBJECTIVES/SPECIFIC AIMS: The World Health Organization’s Global Burden of Disease (GBD) reports are an important tool for global health policy makers; however, the accuracy of estimates for countries undergoing an epidemiologic transition is currently a topic of debate. Disease (GBD) reports are an important tool for global health policy makers, however, their accuracy could be improved. Databases for the GBD life table model and served as comparison observed data. RESULTS/ANTICIPATED RESULTS: above age sixty model estimates of survival for both sexes differed substantially from those observed. Prior to the year 1960 for males and 1950 for females, estimated survival tended to be greater than observed; following 1960 for both males and females estimated survival tended to be less than observed. Viewing observed and estimated survival separately, observed survival past sixty increased over the years considered. For males, the increase was from a mean (SD) probability of 0.32 (0.06) to 0.46 (0.1). For females, the increase was from 0.26 (0.06) to 0.65 (0.08). By contrast, estimated survival past sixty decreased over the same period. Among males, estimated survival probability declined from 0.54 (0.2) to 0.09 (0.06). Among females, the decline was from 0.36 (0.12) to 0.15 (0.08). DISCUSSION/SIGNIFICANCE OF IMPACT: These results show that the GBD mortality model did not accurately estimate survival past sixty as developed countries transitioned in the twentieth century and may be similarly flawed in developing countries now undergoing transition. Estimates of older-age populations and their attributable disease burden should be reconsidered.

RELIABILITY OF SAFE HOSPITAL CARE FOR CONGESTIVE HEART FAILURE PATIENTS

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OBJECTIVES/SPECIFIC AIMS: To determine the reliability of inpatient health care delivery for congestive heart failure patients – hospitalizations free of adverse events (AE). METHODS/STUDY POPULATION: All patients hospitalized with congestive heart failure from January 1, 2003 to December 31, 2007 were included. Clinical records, administrative data and AE data repositories were utilized for abstraction of information. The Global Trigger Tool methodology identified AEs – unplanned illness resulting from evaluation or treatment of medical conditions. Multivariate regression analyses determined patient characteristics related to occurrence and timing of an AE. Time-dependent analyses were performed to determine cumulative density, hazard and probability density functions. Recurring conditions and of competing causes of AEs were analyzed. RESULTS/ANTICIPATED RESULTS: One thousand seven hundred eleven patients hospitalized with CHF with mean age 83 years and 44% were men. Mean Charlson Index was 3.8 (sd 2.4). 38% had at least one AE (requiring additional monitoring or higher). Spontaneous hazard rate in the time to first AE was 0.019 events per hour. None of the patient-specific characteristics collected statistically influenced the probability of an AE occurring. However, age and Charlson Index were related to time to first AE. Of those who had AEs, 35% had at least one more. 70% of events occurred within 72 hours of admission (90 = 0.20). Event recurrence was not markedly influenced by patient characteristics. Medication related adverse events occurred more frequently and sooner during the hospitalization. DISCUSSION/SIGNIFICANCE OF IMPACT: National reports indicate that care is not getting safer. Majority of work to date focused on the patient state. Analysis methods for assessing AE must begin to include aspects of care delivery system. These offer the highest potential to mitigating AE.

SCREENING AND INTERVENTIONS FOR SUBSTANCE USE IN DENTAL CLINICS: A SURVEY OF DENTISTS ON CURRENT CLINICAL PRACTICES, POLICIES AND BARRIERS

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OBJECTIVES/SPECIFIC AIMS: Substance use has substantial effects on oral health, and dental visits provide an opportunity to address substance use disorders. We surveyed dentists to learn whether they might play a role in substance use screening and interventions. METHODS/STUDY POPULATION: All dentists active in the PEARL dental practice-based research network were invited to complete a web-based survey in summer 2010. The 41-item survey assessed clinic policies and dentists’ practices, attitudes, and perception of barriers regarding screening, counseling, and referrals for substance use. RESULTS/ANTICIPATED RESULTS: One hundred forty-three dentists completed the survey (68% response rate). Almost all respondents felt it was important to screen patients for tobacco (99%), alcohol (92%) and illicit drug (93%) use, though actual screening rates were much lower: Counseling or referrals were infrequently provided for users of alcohol (29%) and illicit drugs (2%), but were more common for tobacco (63%). The most frequently identified barrier to addressing substance use was insufficient knowledge/training. Other barriers were lack of referral sites, staff resistance, and time constraints. If reimbursement were available, many dentists said they would offer counseling and assistance for tobacco (67%), alcohol (52%), and illicit drugs (48%); an affirmative response was significantly more likely among the 43 dentists who saw Medicaid patients (p < 0.01). DISCUSSION/SIGNIFICANCE OF IMPACT: Dentists recognize the importance of screening for substance use, but lack the clinical training and systems that might allow them to intervene. If these barriers were reduced, dentists could be willing partners in addressing substance use disorders.

TELEMEDICINE TO IMPROVE DEPRESSION CARE IN HOME-CARE

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OBJECTIVES/SPECIFIC AIMS: Telehealth is commonly used in homecare to manage illnesses for elderly patients, but typically not for depression. The goals of this Cornell
reliance on clinical research in the policymaking process encourages the adoption of policies in 2002 and 2010. Psychiatric hospitals, although other states have proposed similar policies. My study in New Jersey, New York, and Virginia) have established regulations that require the provision of smoking treatment facilities as a condition of licensure.

This paper reviews the public commentary and background information on proposed policies, which enabled patients to report on mood, antidepressants, and request telehealth nurse phone calls. Each telehealth nurse received a full day of DCM training. As a pilot, all consenting patients received the protocol. Eligible patients were age 65+, consented or admitted with a depression diagnosis or on antidepressants, English or Spanish speaking, and nondenominated. Patients received the telemonitor, which collected data and transmitted it to the agency. The telehealth nurse managed the patients’ depression. Research assistants conducted in-home interviews to assess symptoms and satisfaction with the protocol. Telehealth nurses were surveyed about the protocol. RESULTS/ANTICIPATED RESULTS: We recruited a diverse sample of 48 English and Spanish speaking patients. Patients and nurses reported high levels of satisfaction. Among patients with depression, baseline mean severity scores were “Markedly Severe” (HAMDII). At follow-up, mean scores were “Mild.” DISCUSSION/SIGNIFICANCE OF IMPACT: Results support the feasibility of using homecare’s existing telemonitors to provide DCM. Acceptance levels were high across both patients and telehealth nurses. Preliminary findings suggest that symptoms improved, although this outcome must be verified in a randomized trial.

THE EFFECTS OF A HEALTH INFORMATION TECHNOLOGY SUPPORTED QUALITY IMPROVEMENT INITIATIVE ON HEALTH CARE DISPARITIES Jean-Jacques M1, Thompson JA2, Persell SD3, Haanain-Wynia R2, Baker DW2
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OBJECTIVES/SPECIFIC AIMS: To assess the impact of a multifaceted health information technology supported quality improvement (QI) initiative on racial disparities in the quality of ambulatory care. METHODS/STUDY POPULATION: In February 2008, a QI initiative consisting of point of care reminders, clinical decision support, and regular audit and feedback to providers was implemented throughout a large academic general internal medicine practice. The QI initiative targeted 17 measures of chronic disease and preventive care. The chronic disease measures included process of care and intermediate outcome measures for coronary heart disease, heart failure, hypertension, and diabetes; the preventive care measures included cancer screening, women’s health, and immunization. Time series models were used to assess changes in the proportion of patients satisfying each quality measure, stratified by race, and changes in racial disparities for each quality measure from February 2008 through February 2010. RESULTS/ANTICIPATED RESULTS: Quality of care improved for 14 of 17 measures for white patients and 10 of 17 measures for black patients. Quality improved for both black and white patients for 3 of 8 process of care measures, 4 of 5 preventive care measures, but none of the 4 intermediate outcome measures. Of the 8 measures with racial disparities at baseline, disparities declined for 3, remained stable for 1, and increased for 1 measure after implementation of the QI initiative. DISCUSSION/SIGNIFICANCE OF IMPACT: Generalized QI initiatives (i.e., programs that aim to improve the quality of care for patients overall but are not specifically tailored to address healthcare disparities) may lead to some improvements in racial disparities in the quality of chronic disease and preventive care, but will not be sufficient to eliminate healthcare disparities.

THE ROLE OF SCIENTIFIC EVIDENCE IN CREATING TOBACCO POLICIES FOR THE DISADVANTAGED Apollonio D1
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OBJECTIVES/SPECIFIC AIMS: Although clinical research often identifies effective public health interventions, many are not enacted into policy, leading to unnecessary death and disease. This problem is particularly acute in research on tobacco use, which causes 435,000 annual deaths in the United States and over 80% of all lung cancer deaths. Approximately 200,000 of these deaths occur in alcohol, drug abuse and mental health populations in treatment, where smoking rates are 2–4 times that of the general population. Existing literature reports that smoking cessation therapy is effective in these populations, but only three states mandate that such therapy be made available in treatment facilities as a condition of licensure. METHODS/STUDY POPULATION: This paper reviews the public commentary and background information on proposed and existing state policies to assess how the use of clinical evidence in the policymaking process is associated with legislative and regulatory outcomes. To date three states (New Jersey, New York, Virginia) have established regulations that require the provision of smoking cessation therapy in residential substance abuse treatment centers and/or psychiatric hospitals, although other states have proposed similar policies. My study population consists of a retrospective review of these state-level policies, enacted between 2002 and 2010. RESULTS/ANTICIPATED RESULTS: I hypothesize that increased reliance on clinical research in the policymaking process encourages the adoption of laws that provide disadvantaged populations in treatment the right to tobacco cessation treatment. DISCUSSION/SIGNIFICANCE OF IMPACT: Few studies attempt to identify how clinical research is translated into public health interventions or what encourages the enactment of such evidence-informed policy: Yet this knowledge is critical in ensuring that clinical research findings are used to save lives.

THE WHAT AND WHEN OF HOW HOSPICE NURSES PREPARE FAMILIES FOR DEATH Kahn RA
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OBJECTIVES/SPECIFIC AIMS: Hospice nurses are usually responsible for preparing the family for death, but little is known about what is included in such preparation. The aims of this study were to: (1) Identify the content and timing of nurses preparation of families for death, (2) Describe how RNs tailor such messages and (3) The differences between hospice certified and other nurses concerning preparing families. METHODS/STUDY POPULATION: Mailed surveys were sent to all 1,542 RN members of HPNA who identified “hospice” as their primary practice. Data was extracted from the survey using Cardiff Teleforms. Descriptive and comparative statistical analysis was conducted using R (http://www.r-project.org). RESULTS/ANTICIPATED RESULTS: The response rate was 56.7%. Most nurses agreed that families can be prepared for physical changes (97.3%) and for care giving tasks (96.7%). Preparation information is usually given at admission (88.9%) or when the patient’s condition (70.6%) changes. Preparation is usually done over time (79.6%). Most preparation is tailored. Factors affecting the tailoring of the messages include: patient signs/symptoms (85.7%), how much the family wants to know (84.9%), family cultural background (84.6%), and family education (84.4%). Certified nurses were more likely to work for a longer time in hospice, larger agencies and have case management responsibilities. There were no differences in educational status between groups. Certified nurses were more likely to agree that families can be prepared for care giving tasks (p = 0.03), to use written materials (p = 0.01) and to discuss symptoms such as dysphagia (p = 0.02), cold extremities (p = 0.02) and vital sign changes (p = 0.07). DISCUSSION/SIGNIFICANCE OF IMPACT: The results of this study may be used to support development and testing of education for nurses and a tailored intervention for family caregivers that will assist with preparation for the patient’s death.

TO YELP (.COM) OR NOT? RELATIONSHIP BETWEEN CONSUMER GENERATED CONTENT RATINGS AND MEASURED PATIENT SATISFACTION IN HOSPITALS Bardach NJ1, Dudley RA1
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OBJECTIVES/SPECIFIC AIMS: Patient experience ratings of hospitals are posted on national public reporting and consumer generated content (CGC) websites for use in patient hospital choice. We sought to assess how hospitals were rated on a CGC website compared to the scientifically generated ratings on a national public reporting website. METHODS/STUDY POPULATION: Data sources: The most current patient satisfaction ratings for all hospitals online at Hospitalcompare.hhs.gov (Oct 2008–Sept 2009). We limited our sample to the most popular cities on Yelp.com and searched for the remaining hospitals on Yelp.com and gathered the following: overall rating (scale 1–5 stars), number of ratings, distribution of ratings, and time period in which the ratings were given. We compared overall distributions of scores and correlation (Pearson’s product moment) of individual hospital performance between the two sources. RESULTS/ANTICIPATED RESULTS: Of the hospitals in the national dataset (N = 4358), 807 were in a popular Yelp city: Of those, 465 had any ratings on yelp.com (range: 1–74 ratings, mean: 5 ratings per hospital), with ratings dated from 5/9/2005 to 12/12/2010. The distribution of ratings between the two sources were similar, with more high ratings than low, but more very low ratings than low-middle ratings. The correlation was 0.40 between hospitals with high ratings on both sites (p < 0.001). DISCUSSION/SIGNIFICANCE OF IMPACT: Though consumer generated ratings of hospitals are not scientifically generated, they have some numerical similarity to scientifically designed measures of patient satisfaction. The information on consumer generated websites may be a useful additional resource for patients looking to choose a hospital.

UNDERSTANDING CONTRIBUTORS TO RACIAL DIFFERENCES IN VARYING LEVELS OF BLOOD PRESSURE CONTROL IN DURHAM, NORTH CAROLINA Simmons DN1, Grubber J1, Bosworth H2
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OBJECTIVES/SPECIFIC AIMS: Potential explanatory factors for hypertension control may be associated with blood pressure (BP) control ranges among different races. METHODS/STUDY POPULATION: Baseline data for hypertensive patients was obtained from a five-year RCT. Various factors were examined by BP control status. Since the optimal level of BP control is unclear and may vary with certain patient populations, BP levels were stratified. Logistic regression was used to determine the association
between race and controlled BP (120–139 mmHg and/or 80–89 mmHg) relative to both uncontrolled BP (<140 mmHg and/or <90 mmHg) and more tightly controlled BP (<120 mmHg and/or <80 mmHg), with and without adjustment for potential explanatory factors of racial differences in BP control. RESULTS/ANTICIPATED RESULTS: The odds of having uncontrolled BP relative to controlled BP were higher in African Americans than in Caucasians (age-adjusted OR = 3.2). The age-adjusted association between African Americans and uncontrolled BP was reduced by at least 10% when financial situation (OR = 2.9) or BMI (OR = 2.7) were included. The association was decreased when both factors were included in the model simultaneously (OR = 2.5). Although not statistically significant, the odds of tightly controlled BP relative to controlled BP were also higher in African Americans than Caucasians (48% versus 44%, OR = 1.2, 95% CI 0.8–1.7). No other statistically significant disparities were shown for two ranges of controlled BP categories. DISCUSSION/SIGNIFICANCE OF IMPACT: Modifiable factors, like BMI, may be used to reduce the racial differences in cardiovascular morbidity. In the subset of participants whose BP was controlled at baseline, there were no significant racial disparities, though African Americans were more likely to have higher control–diastolic BP <80 mmHg may increase cardiac event risk in patients >65 years old.

**UNDERSTANDING DEPRESSION AMONG DIVERSE AFRICAN AMERICAN WOMEN**

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OBJECTIVES/SPECIFIC AIMS: The purpose of the study was to foster greater understanding about the relationship of selected biological, psychological, and cultural factors to depressive symptoms among African American women. METHODS/STUDY POPULATION: The sample was comprised of 63 African American women from an urban community (n = 15), a community based primary healthcare center (n = 23), and a small private academic institution (n = 25). These women participated in a health and wellness empowerment session which included their completion of a battery of self-report assessment measures, participation in a focus group, and involvement in an educational presentation about depression. Quantitative data analyses were carried out through the use of SPSS-X.

RESULTS/ANTICIPATED RESULTS: Depression was reported highest among the community group; yet the clinical sample of women most reported being formally diagnosed with depression. For the total sample, depression scores were found to be significantly and positively associated with negative and ruminative thinking/automatic thoughts, self-esteem, stressful life events, social support, and depression stigma. Depression was found to be significant and negatively associated with resiliency and spiritual well-being. The strongest predictors of depression for the total sample were negative and ruminative thinking and low self-esteem. DISCUSSION/SIGNIFICANCE OF IMPACT: It is crucial that careful attention be provided to heightening awareness of the unique risk and protective factors for African American women relative to depression. It is essential that culturally relevant strategies and models for the prevention of disease and the promotion of mental wellness among African American women from diverse sectors of the community be discerned.

**WARFARIN ANTICOAGULATION AFTER TOTAL HIP OR KNEE REPLACEMENT – INR PATTERNS AND CLINICAL OUTCOMES**

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OBJECTIVES/SPECIFIC AIMS: To evaluate clinical practice INR patterns and outcomes associated with warfarin use in patients managed in a university-based antithrombosis clinic (ATC). METHODS/STUDY POPULATION: This was a retrospective observational cohort study of patients undergoing total knee or hip replacement (TKR or THR), receiving warfarin prophylaxis within 24 hours of surgery, who were referred to the ATC for anticoagulation management (January 1998–January 2009; follow-up: 3 months postsurgery).

RESULTS/ANTICIPATED RESULTS: 400 patients (male: 64%) were evaluated (TKR: 55%, THR: 45%). Mean age (± SD) was 58.4 ± 12.5 years. Mean length of hospital stay was 5.0 ± 1.9 days, and mean length of warfarin therapy was 50 ± 21 days (including outliers). Mean time required to reach therapeutic INR range of 2–3 was 10.0 ± 9.1 days. The within-patient proportion of INR levels spent in therapeutic range was 28 ± 18%, while the proportion in extended therapeutic range (INR 1.8–3.2) was 39 ± 25%. The within-patient proportion of INR levels spent below therapeutic range was 65 ± 22.6% for INR < 2 and 37.7 ± 21.6% for INR < 1.5. Major bleeding occurred in 2 (0.45%) patients. Symptomatic venous thromboembolism (VTE) occurred in 16 (4%) patients (8 inpatients, 8 outpatients), with a total of 14 (47.5%) events occurring at INR < 2, versus 2 (12.5%) at INR > 2 (p = 0.05).

DISCUSSION/SIGNIFICANCE OF IMPACT: Despite close monitoring, warfarin use was associated with significant time spent below acceptable anticoagulant levels, which resulted in high rates of symptomatic VTE. That the majority of events occurred at INR levels <2 may indicate the need for more aggressive anticoagulation in the acute postoperative phase.

**WHAT DO THEY WANT NOW? CONTACTS BETWEEN HOSPICE AND FAMILY IN THE LAST WEEK OF LIFE**

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OBJECTIVES/SPECIFIC AIMS: There is limited information published about the last week of life in a home hospice. Examining this period can yield much information that may improve care during the final days. The purpose of this study was to describe the reasons and outcomes of contacts, and most frequent symptoms addressed in the last week of life.

METHODS/STUDY POPULATION: This descriptive study used six months of records provided by a Midwest hospice. Records from patients who resided in their home, did not receive crisis care and died between January and June, 2008 were examined. Data was extracted and reviewed by trained RNs. SPSS 16 was used for descriptive date analysis.

RESULTS/ANTICIPATED RESULTS: 175 patient charts revealed 2,284 contacts. The mean contacts per patient was 12.59 (range 2–29). Most contacts were initiated by the hospice staff (70.6%) or family (29.3%). The most frequent reasons include: symptom management (48.5%), emotional support (24%), personal care (21.2%) and death (13.7%). The most frequent outcomes were: instruct family (40.65%), RN notified (20.8%) and medication change (7.8%). Symptoms were addressed in 62.6% of the contacts with the most frequent including: increased sleeping or fatigue (28.6%), weight loss (28.5%), incontinence (24.0%), pain (23.7%), breathing changes (21.2%) and coma (20.9%). DISCUSSION/SIGNIFICANCE OF IMPACT: Understanding the reasons for contacts in the last week of a hospice patients’ lives can give insight into the questions and problems in family care giving during that time. Future research is needed to explore the differences between documented symptoms and information provided to the family. Interventions need to be developed and tested to provide for the informational needs of family caregivers in the last week of life.

**WHAT INFLUENCES TARGETED DEPRESSION VIDEO VIEWERS’ INTENTIONS TO DISCUSS DEPRESSION?**

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OBJECTIVES/SPECIFIC AIMS: Depression care disparities are partly due to stigma inhibiting disclosure of patients’ symptoms. Social marketing may reduce stigma and nondisclosure of depression symptoms. Targeted social marketing interventions to reduce stigma may be more effective than nontargeted interventions. We seek to answer two questions. Do depression video public service announcements (PSAs) designed to target gender and income improve viewers’ intention to discuss depression with a professional, compared to nontargeted depression PSAs and control? Using the Theory of Planned Behavior (TPB), how does targeting improve that intention? METHODS/STUDY POPULATION: In two studies using factorial designs, participants will be randomly assigned to view either a fully targeted (gender and income); partially targeted, or nontargeted PSA or control. Study 1 will assess reliability of study instruments and the degree of targeting (measured as identification) of the PSAs. Study 2 will provide estimates of intention to disclose depression symptoms and the relationships (using structural equation modeling) among intention, targeting concordance, TPB constructs, and participant characteristics (depression symptoms and beliefs, demographics). RESULTS/ANTICIPATED RESULTS: We expect targeting concordance to be significantly and positively associated with identification with depression PSAs and intention to disclose depression symptoms, and identification to modify the effect of viewing the PSAs on viewers’ intention. Subjective norms and attitudes about disclosing depression symptoms will be the most salient constructs of the TPB affected by viewing the PSAs. DISCUSSION/SIGNIFICANCE OF IMPACT: Anticipated results will provide evidence that targeting of social marketing-based depression stigma reduction strategies can be more helpful than nontargeted strategies and which aspects of targeting are most effective.
increase in model discrimination (AUC 0.85, p < 0.001). After multivariate adjustment, mortality was associated with female gender (odds ratio [OR] 1.69, 95% confidence interval [CI] 1.10–2.60; p = 0.02) and MELD score (OR 1.13 for 1-point increase; 95% CI 1.11–1.16; p < 0.01). There was a statistically significant interaction between MELD score and gender (p = 0.04). Therefore, our final, simplified model included MELD score, gender, a MELD–gender interaction term, and mechanical ventilation, which retained a significant association with mortality (OR 4.90; 95% CI 2.70–8.91; p < 0.001). The model discrimination was good in our development cohort (AUC 0.85) and validation cohort (AUC 0.91).

**DISCUSSION/SIGNIFICANCE OF IMPACT:** In ESLD patients, a simple model incorporating MELD score and mechanical ventilation has superior discrimination than APACHE II score in predicting hospital mortality. Gender disparities do exist, and these findings must be confirmed in other populations.

**A TIME-SENSITIVE MULTINOMIAL PREDICTIVE MODEL FOR DIAGNOSIS OF ACUTE HEART FAILURE SYNDROME**

**OBJECTIVES/SPECIFIC AIMS:** To discriminate patients with acute heart failure syndrome (AHFS) among those with symptoms suggestive of acute coronary syndrome (ACS). METHODS/STUDY POPULATION: We used data from all adult patients with symptoms suggestive of ACS enrolled in the ACI-TIPI clinical trial. Potential risk factors included demographics, presenting symptoms, past medical history and initial 12-lead ECG. We used multinomial logistic regression to construct a multivariable model simultaneously predicting the relative odds of AHFS, acute myocardial infarction (AMI), angina, nonischemic cardiac disease, pulmonary disease and noncardiac disease for gender, age, pulmonary rales, chest pain, shortness of breath and ECG variables.

**RESULTS/ANTICIPATED RESULTS:** Among 8,347 patients, 4,289 (51.4%) men and 4,058 (48.6%) women with mean age 59 years, final diagnoses were AHFS = 742 (9.9%), AMI = 684 (8.2%), angina = 1,329 (15.9%), nonischemic cardiac disease = 2,300 (28.6%), pulmonary disease = 642 (7.7%) and other noncardiac diseases = 2,778 (33.3%). Presence of rales strongly differentiated AHFS from all other diagnoses. A chief complaint of shortness of breath also differentiated AHFS from cardiac and non-cardiac diagnoses but not from pulmonary disease. Ischemic ECG changes and chest pain as chief complaint differentiated AMI and angina from AHFS and others. Females were more likely to have nonischemic cardiac or noncardiac diagnoses. Older patients were more likely to have ischemic cardiac diagnoses and less likely to have nonischemic, noncardiac and pulmonary diagnoses.

**DISCUSSION/SIGNIFICANCE OF IMPACT:** Age, gender, 12 lead ECG and three clinical history variables can clearly differentiate cardiac and noncardiac outcomes for patients with suspected ACS using information easily available within 10 minutes of initial patient evaluation.

**ASSESSING THE IMPACT OF BIOMEDICAL RESEARCH**

**OBJECTIVES/SPECIFIC AIMS:** The objective of this study was to assess the impact of a research study on the knowledge base, change in policy and change in practice. METHODS/STUDY POPULATION: We assessed the impact of the Ocacular Hypertension Treatment Study (OHTS), a NIH clinical trial that demonstrated the safety and efficacy of ocular hypertensive medication in the prevention of glaucoma. Bibliographic analysis was performed on 26 peer-reviewed journal articles resulting from OHTS. Additional research outputs and activities were also examined to locate evidence of research impact.

**RESULTS/ANTICIPATED RESULTS:** Traditional bibliometric analysis was not sufficiently robust enough to adequately assess the impact of OHTS findings and resulting synthesis into clinical practice. Health outcomes not discernable by bibliometric analysis include practice guidelines, CPT Codes, and curriculum materials, among others. Therefore, we developed a model-based framework reflective of the biomedical research process which included contribution to the knowledge base; change in understanding of a disease; change in policy; change in practice; change in community health; or change in public law or policy. Our framework for assessing the impact of biomedical research has been implemented in a hands-on, web-based site, the Becker Medical Library Model for Assessment of Research Impact. DISCUSSION/SIGNIFICANCE OF IMPACT: There are a number of resources available to track diffusion of impact above and beyond citation analysis in order to provide a meaningful assessment of policy, practice and health outcomes. The Becker Medical Library Model for Assessment of Research Impact (http://becker.wustl.edu/impact/assessment) can help biomedical researchers quantify and document translational impact.

**ASSESSMENT OF TWO NOVEL EMERGENCY TRACHEOTOMY PRODUCTS**

**OBJECTIVES/SPECIFIC AIMS:** (1) This cadaver trial will serve as an initial proof of concept and means of optimization of two novel tracheotomy products. (2) This cadaver trial will estimate key outcomes of the two devices for FDA 510(k) clearance and academic publication.

**METHODS/STUDY POPULATION:** (1) Eight nonembalmed cadavers will be first used for proof of concept testing and optimization of the product design. (2) Twelve nonembalmed cadavers will then be randomized to tracheotomy, then cricothyrotomy by the current standards of care or using the novel products. One emergency medicine physician will then perform the indicated procedure. The study will measure the success rate of obtaining a patent airway by validation with a bronchoscopic scope. Parameters to measure include: speed, success rate, number of attempts, location of insertion, and subjective ease of use.

**RESULTS/ANTICIPATED RESULTS:** The eight initial cadavers have shown positive results in reducing speed, increasing success rate, and increasing ease of use. Device modifications are currently being prototyped for the second trial. DISCUSSION/SIGNIFICANCE OF IMPACT: The current emergency cricothyrotomy kits require a high level of skill and up to 70% of the patient population can sustain debilitating complications resulting from improper procedure. Under the current airway protocol, these patients are indicated to receive an emergency cricothyrotomy, which is a temporary airway that must be repaired within 24 hours and replaced with a definitive tracheostomy procedure for long-term ventilation. The novel products for tracheostomy represent opportunity for safer and more efficacious cricothyrotomy as well as the first device indicated for performance of emergency tracheostomy. The performance of emergency tracheostomy will bring a higher standard of care to the prehospital, in-hospital, and battlefield emergency health care providers.
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DIABETES KNOWLEDGE IN PREADOLESCENTS WITH TYPE 1 DIABETES

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OBJECTIVES/SPECIFIC AIMS: To evaluate preadolescents’ diabetes knowledge and the relationships among knowledge, daily care behaviors, and behavioral adherence. METHODS/STUDY POPULATION: Eighty-three preadolescents ages 9–11 (M age = 10.82 ± 0.76 yrs) diagnosed with T1D for a mean of 4.18 yrs (± 2.64 yrs) completed the Diabetes Knowledge Test (DKT) and a self-report of behavioral adherence. Parents completed a 24-hour recall interview detailing daily diabetes care. Children were in adequate metabolic control (HbA1c = 8.04 ± 1.15%), 55% were prescribed conventional insulin regimens, with the remainder prescribed more intensive regimens (22% multiple daily injections; 23% insulin pump). RESULTS/ANTICIPATED RESULTS: On the DKT, preadolescents averaged 70% correct. Most commonly missed items involved nutrition or acute complications (e.g., ketones, hypoglycemia). Diabetes knowledge was not significantly associated with age, disease duration, or regimen type. Controlling for insulin regimen, greater diabetes knowledge was associated with more frequent BG checks (F (1,379) = 6.40, p < 0.01, R2 = 0.02). No significant relationships with HbA1c or behavioral adherence emerged. DISCUSSION/SIGNIFICANCE OF IMPACT: Results suggest that youth diabetes knowledge is adequate, yet knowledge about nutrition and acute complications could be improved. Although parents are often involved in care, preliminary results suggest that youth diabetes knowledge is also important and is associated with more frequent BG monitoring. Preadolescents are assuming increased self-care responsibilities, and providing targeted education to enhance parent and youth knowledge may buffer against the deterioration in diabetes care more common in adolescence. Further studies assessing changes in diabetes knowledge over time and relationship with more specific diabetes-care behaviors are warranted.

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ELEVATED RED BLOOD CELL DISTRIBUTION WIDTH IS ASSOCIATED WITH SEVERE CORONARY ARTERY DISEASE IN PATIENTS WITH UNSTABLE ANGINA OR NON-ST-ELEVATION MYOCARDIAL INFARCTION

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OBJECTIVES/SPECIFIC AIMS: Red blood cell distribution width (RDW) is a quantitative measure of the variability in size of circulating erythrocytes. Higher levels of RDW have been associated with increased mortality among patients with heart failure, myocardial infarction, coronary artery disease (CAD) or undergoing angiography. Our aim in this study is to examine the role of RDW as an indicator of the severity of CAD in patients with unstable angina (UA) or non-ST-elevation myocardial infarction (NSTEMI). METHODS/STUDY POPULATION: We conducted a retrospective chart review of all adult patients admitted to our institution in 2007 with a diagnosis of UA or NSTEMI who underwent coronary angiography. RESULTS/ANTICIPATED RESULTS: High RDW was noted in 101 (20%) of the 503 study subjects. These patients were more likely to be females (53% vs 42%, p = 0.04), have heart failure (50% vs 31%, p = 0.0001), and a lower hemoglobin level (11 vs 13 g/dL, p = 0.0001) than those with a normal level. High RDW was associated with a higher recurrence to CABG (16% vs 9% p = 0.05), suggestive of a higher disease burden. In a multivariable logistic regression analysis with age, sex, hemoglobin, heart failure, dyslipidemia, and family history of CAD as additional covariates, high RDW was found to be a statistically significant independent predictor for needing CABG (OR = 2.29, 95% CI (1.11 to 4.74)). DISCUSSION/SIGNIFICANCE OF IMPACT: Patients with high RDW require CABG more often than those with normal RDW. RDW can be an additional tool for risk stratification of patients with UA or NSTEMI.

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FEASIBILITY AND UTILIZATION OF PATIENT REPORTED OUTCOMES TO MEASURE QUALITY OF LIFE AND DISEASE OUTCOMES IN CROHN’S DISEASE

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OBJECTIVES/SPECIFIC AIMS: (1) To assess feasibility and accuracy of web-based reporting of PRO quality indicators, quality of life and medication adherence) in patients with Crohn’s disease (CD) (2) To determine the impact of capturing PRO and decision support on clinical decision making and outcomes for patients with CD. METHODS/STUDY POPULATION: This pilot study, funded by ACC clinical research awards, is designed as a two-armed, prospective, randomized clinical trial with changes Short Inflammatory Bowel Disease Questionnaire (SIBDQ) as primary outcome. Patients are randomized to receive intervention (self management + physician alerting) or control (web access without self-management or alerting). RESULTS/ANTICIPATED RESULTS: The first phase of the study (design and development of web portal) is completed. The second phase of the study (randomized control trial) is ongoing. 151 patients agreed to be part of study. Seventy-one logged-in in Crohn’s Promise at least once and entered details of CD (median age, 43.4 ± 13.5; women, 64.8%, white 97.2%). 62 patients (87.3%) reported all CD meds that were consistent with that documented in electronic health records. 5 alerts fired so far with a median SIBDQ change of 6 points. DISCUSSION/SIGNIFICANCE OF IMPACT: Crohn’s Promise allows easy capture and tracking of patient reported outcomes and phenotype information that can be used in routine clinical practice and translational research. Once logged-in, majority of the patients can enter details about CD and PRO without any additional assistance. Further research needs to be done to understand behavior of patients who never log-in for order in Crohn’s Promise to serve as a representative cross-institutional platform to improve patient care and facilitate translational research.

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FREE GINGIVAL MARGIN RESPONSES TO MARGINAL RESTORATION PLACEMENT

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OBJECTIVES/SPECIFIC AIMS: The purpose of this research is to observe the clinical behavior of the dentogingival complex dimension (DGCD) on the facial aspect of teeth and prepared to receive a crown and its final placement. The specific aim of this study is to: (1) Determine the DGCD at baseline; (2) Determine the position of the crown marginal line using the free gingival margin as reference at 3 and 6 months of final crown placement; (3) Determine periodontal status at baseline, after 3 and 6 months. METHODS/STUDY POPULATION: At baseline, before tooth preparation for crown placement. PRO placement a mean of 3 mm probing depth, bleeding on probing and the DGCD will be taken. After tooth preparation, the distance between the osseous crest and the crown margin position will be measured, without any prior recommendation, where to place the margin location given to the restorative dentist. A questionnaire will be provided to the restorative dentist about prosthetic outcome. Parameters will be examined at 3 and 6 months after crown placement and plaque accumulation, sulcus probing depth, and bleeding on probing will be measured, as well the distance between the free gingival margin and the crown preparation line. RESULTS/ANTICIPATED RESULTS: Our central hypothesis is that there will be no negative effect on gingival health (inflammation and aesthetics) (gingival recession), if the restorative dentist places the margin of a crown preparation at 2 mm from the osseous crest. DISCUSSION/SIGNIFICANCE OF IMPACT: The work proposed will determine the DGCD and free gingival margin responses, and will provide evidence-based information to achieve healthy gingiva and aesthetics. By identifying important measurements that can help prevent the occurrence of alterations such as inflammation and recession, we will be able to achieve a successful treatment.

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HIGH ANTIPHOSPHOLIPID ANTIBODY LEVELS REFLECT CHRONIC ENDOTHELIAL DAMAGE IN NON-AUTOIMMUNE-ASSOCIATED THROMBOSIS

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OBJECTIVES/SPECIFIC AIMS: Persistently elevated antiphospholipid antibody (aPL) levels are associated with an increased risk of arterial and venous thrombosis, but factors that may affect aPL Ab levels are not well studied. We conducted a cross-sectional study to explore factors associated with high aPL Ab levels and lupus anticoagulant (LAC) positivity in people without autoimmune diseases, hospitalized with deep vein thrombosis (DVT), pulmonary embolism (PE) or a cerebrovascular accident (CVA). METHODS/STUDY POPULATION: We included patients hospitalized in a large urban tertiary care center with a primary discharge diagnosis of DVT, PE or CVA, who had lupus anticoagulant (LAC), anticardiolipin, anti-beta2 glycoprotein I, and antiphosphatidylserine IgG, IgM, and IgA measured. RESULTS/ANTICIPATED RESULTS: 95 patients with DVT or PE, and 180 patients with CVA were included. Statin use was associated with OR of 14.6, 95%CI (2.0, 103.2), p = 0.008 of either LAC positive or at least one aPL Ab > 40 units, compared with people without statin use in a multivariate model. Furthermore, patients who had low LDL and were on statins were 46.9 times more likely to have at least one aPL Ab > 40 units and/or LAC positive, 95% CI (2.4, 917), p = 0.011, compared with people with low LDL, not on statins. Patients with DVT or PE who had type 2 diabetes (T2DM) were
4 times more likely (95% CI (1.1, 15), p = 0.04) to have at least one low positive aPL Ab, compared with DVT or PE patients without T2DM, even after adjusting for age, race, and ethnicity. DISCUSSION/SIGNIFICANCE OF IMPACT: High levels of aPL Ab may reflect long-standing endothelial damage caused by long-standing hyperlipidemia and T2DM.

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**HISTORIC PROSTATE CANCER SCREENING AND TREATMENT OUTCOMES FROM A SINGLE INSTITUTION**

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OBJECTIVES/SPECIFIC AIMS: To determine the current and historic outcomes of individuals diagnosed and treated for prostate cancer in a single institution. We compare outcomes between PSA screened individuals and those diagnosed without a PSA screen. We compare the outcomes from different treatment options selected within our population.

METHODS/STUDY POPULATION: Setting. Marshfield Clinic, the largest private multispecialty group practice in Wisconsin, providing health care services annually to approximately 385,000 unique patients. Participants. Individuals who have been diagnosed with prostate cancer in our tumor registry between 1960 and 2009. Methods: We collected the age at diagnosis; stage and grade of the tumor; PSA values before, at, and after diagnosis; initial cancer treatment; follow-up time; subsequent treatments; evidence of metastasis; age of death, and cause of death if known; through electronic chart abstraction from the tumor registry and the electronic medical record. This study was approved by the Marshfield Clinic IRB. RESULTS/ANTICIPATED RESULTS: The average age of prostate cancer diagnosis has decreased from age 70–71 to 67. This decrease in age occurred with increased PSA screening. Currently approximately 74% of those diagnosed have at least one PSA test. Age, grade, and stage were the biggest predictors of prostate cancer outcome. We did not detect survival differences between prostate cancer treatments when age, stage, and grade were controlled. DISCUSSION/SIGNIFICANCE OF IMPACT: Individuals diagnosed and treated for prostate cancer within the Marshfield Clinic follow national trends with a decreased age of diagnosis with the advent of PSA screening. Treatment outcomes were comparable to national trends.

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**HOW DOES MOTIVATION AFFECT POSTOPERATIVE WEIGHT LOSS?**

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OBJECTIVES/SPECIFIC AIMS: Few studies have examined patients’ motivations for undergoing bariatric surgery. We aim to determine the effects of readiness to change on postoperative outcomes. METHODS/STUDY POPULATION: 116 consecutive patients undergoing bariatric surgery (RYGB, laparoscopic gastric banding (LGB) and sleeve gastroectomy (SG)) were administered questionnaires at preoperative and 6 months postoperative visits to assess motivation for surgery and readiness to change (University of Rhode Island Change Assessment, URICA). Data were analyzed with ANOVAs and Pearson’s chi-squared as appropriate. RESULTS/ANTICIPATED RESULTS: Preoperatively, RYGB and SG patients were more confident of postoperative success than LGB patients (RYGB, 94%, LGB, 84.5%, SG, 93.8%; p = 0.028). Across the surgery types, there was no difference in RTC scores (RYGB, 11.5; LGB, 11.9; SG, 11.7; p = 0.60). There was a trending positive correlation between RTC scores and 6 months excess weight loss (%EWL) (r = 0.19, p = 0.06). There was a significant decrease in RTC scores between preoperative and 6 month post op visits (10.7 vs 9.2, p < 0.01) and a significant positive correlation between this difference and % EWL at 6 months (r = 0.48, p = 0.01). For all procedures, there was a positive significant correlation between patient confidence of success at 6 months post op and % EWL at 6 months (r = 0.51, p < 0.01). DISCUSSION/SIGNIFICANCE OF IMPACT: This is the first study assessing the effects of readiness to change on postoperative outcomes across all surgery types. RTC scores may affect short term weight loss. There was a significant change in RTC scores pre- and postoperatively; and this change is correlated with increased weight loss at 6 months post op. Identifying strategies to augment RTC may be useful in ensuring long term weight loss.

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**NEEDS AND CONCERNS OF THE ELDERLY AND THEIR CAREGIVERS IN A RURAL SETTING IN VELLORE, SOUTH INDIA**

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OBJECTIVES/SPECIFIC AIMS: The majority of India’s rural elderly are often neglected by their caregivers. The social support provided for the elderly population in the Sathumadurai village of Vellore, South India has not been studied previously.

(1) To identify needs and problems of the elderly regarding social support. (2) To identify needs and problems of caregivers regarding relationships with the elderly. (3) To determine suggestions the elderly and caregivers have for improving quality of life in a rural setting. METHODS/STUDY POPULATION: This qualitative and cross-sectional study was conducted in India, and the analysis was conducted at the Vanderbilt School of Medicine. Focus group discussions were conducted for groups of female caregivers, male caregivers, and female elderly. A questionnaire was administered to the elderly population to provide a larger perspective regarding elderly social support. RESULTS/ANTICIPATED RESULTS: Rural elderly who were older, had a lower SES, or no income had decreased social support by caregivers. Collecting information regarding the needs of the elderly and their caregivers is vital to determining the services provided to these groups. An elderly daycare in the village was implemented as a result of this study.

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**OBESITY, VITAMIN D DEFICIENCY AND CARDIO-RENAL RISK FACTORS IN AFRICAN AMERICAN CHILDREN: NATIONAL HEALTH AND NUTRITION SURVEY 2002–2004 DATA**

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OBJECTIVES/SPECIFIC AIMS: The recent data reveals prevalence of Vitamin D deficiency is higher than expected in children, particularly among the African American ethnicity. Prevalence of obesity is also high in this population. Thus, we looked at the relationship among obesity, vitamin D deficiency and various cardiac-renal (CR) risk factors independently and in clusters, in AA children. METHODS/STUDY POPULATION: A cross-sectional analysis of children between the ages of 6–17 years from the National Health and Nutrition Survey conducted between 2002–2004 was performed. Serum 25 (OH)D deficiency was defined as 30 ng/ml. Statistical analysis was done using SUDAAN software program. RESULTS/ANTICIPATED RESULTS: There were 1506 AA children, boys 51.4%, Tall 71.9%, obese 22.2%, high BP 9%, with dyslipidemia 40.8% and those with high fasting blood sugar 5.7%. There were significant differences in the distribution and the mean of VitD level according to age, gender, obesity status and the lipid profile. Further, the odd ratio to have VitD deficiency was significant when obesity and high blood pressure were combined using statistical regression modeling, however, there was no association noted when nonobese and high BP were combined. When obese and normal BP were combined there was a significant association noted again. DISCUSSION/SIGNIFICANCE OF IMPACT: There was significant increase in the risk of vitD deficiency observed in obese children. This risk was 2 fold higher than the controls when obese children had high BP. Therefore, the risk of vitD deficiency is perhaps a nutritional rather than an inherited effect. These findings shed light into the pathophysiology of CR risk factors in this population.

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**ORBITAL FRACTURE CLINICAL DECISION RULE DEVELOPMENT: BURDEN OF DISEASE AND USE OF A MANDATORY ELECTRONIC SURVEY INSTRUMENT**

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OBJECTIVES/SPECIFIC AIMS: In preparation to derive a clinical decision rule (CDR) to improve use of CT for diagnosing orbital fractures, the authors sought to estimate the annual incidence of orbital fractures in emergency departments (EDs) and the usage of computed tomography (CT) to make these diagnoses. The authors also sought to evaluate a mandatory electronic data collection instrument (EDCI) administered to providers to facilitate data collection. METHODS/STUDY POPULATION: National estimates were made by analyzing the 2007 NHAMCS database, while hospital system billing and coding data was used to make local estimates. An EDCI was integrated into the CT ordering system such that providers had to complete the form in order to perform a CT. Since the EDCI had to be filled out for every CT ordered, data collection efficiency was measured by compliance (counting the number of unrealistic data collection instrument answers), and by timing a convenience sample of providers completing the EDCI. RESULTS/ANTICIPATED RESULTS: Out of 116.8 million ED visits in the U.S. in 2007, the 4.1 million patients were treated for injuries of the eye and face. Of those, 820,252 patients underwent CT imaging, with 102,999 patients (12.5%) diagnosed with an orbital fracture. In our local hospital system with 122,500 annual ED visits, 752 CTs were performed, with 172 (22.7%) with associated orbital fractures. The EDCI compliance rate was 94.9%, and took less than 5 minutes to complete. DISCUSSION/SIGNIFICANCE OF IMPACT: National and local data demonstrate a low yield
for CT imaging in identifying orbital fractures. Hands-free data collection using a mandatory electronic data collection instrument linked to computerized provider order entry can provide prospective, consecutive patient data needed to develop a CDR for the selective use of CT imaging in orbital trauma.

P114 OUTCOMES IN CLOSTRIDIUM DIFFICILE TOXIN-/DNA+ DIARRHEA

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OBJECTIVES/SPECIFIC AIMS: Clostridium difficile (CD) is an important cause of healthcare associated diarrhea and death. Symptoms are due to toxin-mediated injury. Immunity is associated with asymptomatic carriage. Observations that some patients with toxin- diarrhea have CD by culture or PCR and reports of rare toxin- patients with severe disease have led to calls for toxin tests to be replaced by DNA detection. We hypothesized that CD complications should be rare in toxin- patients and that most toxin-/DNA+ patients are immune carriers. As a preliminary test, we retrospectively determined the frequency of CD complications and duration of diarrhea among inpatients tested for CD toxins.

METHODS/STUDY POPULATION: Medical records were reviewed for inpatient admissions with CD toxin test(s) 2005–2009. A convenience sample from 2009 had stool tested by CD PCR. All cause mortality and CD complications (e.g., colitis, megacolon, colectomy) were tabulated for 2005–2009. Diarrhea days (≥3 stools/day) were measured for 2009.

RESULTS/ANTICIPATED RESULTS: For 2005–2009, 1107/7319 (15.1%) patients were toxin+ during 1247/8866 (14.1%) admissions. CD complications were documented in 6/1107 (0.5%) toxin+ and 2/6621 (0.03%) toxin- patients (p < 0.05). The 6 month all cause mortality rate was 14.4% (n = 180) for toxin+ patients vs. 9.5% (n = 727) in toxin- patients (p < 0.001). In 2009, toxin+ patients (n = 200) had 3.25 [95% CI 2.83, 3.67] diarrhea days versus 2.43 [2.31, 2.54] days in toxin- patients (n = 1495). Among 50 PCR tested patients, toxin+/DNA+ patients (n = 5) had 3.25 [95% CI 4.93] diarrhea days while toxin-/DNA- patients (n = 19) and toxin-/DNA+ patients (n = 26) had 2.44 [1.43, 3.45] and 2.52 [1.73, 3.32] diarrhea days.

DISCUSSION/SIGNIFICANCE OF IMPACT: CD complications were rare. Toxic- patients may have less diarrhea than toxin- patients. A prospective observational study is planned to measure outcomes in toxin+/DNA+, toxin-/DNA+, toxin-/DNA- inpatients with diarrhea.

P115 PATIENT-CENTERED ONLINE MANAGEMENT OF PSORIASIS: A RANDOMIZED CONTROLLED EQUIVALENCY TRIAL

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OBJECTIVES/SPECIFIC AIMS: Previous research suggests that technology-enabled healthcare delivery may improve patient satisfaction, reduce costs, and improve access to dermatologic specialty care. Rigorous outcomes research utilizing validated outcomes measures are scarce, but necessary for adoption of novel healthcare delivery models. The purpose of this study was to compare the clinical equivalence of a novel patient-centered online healthcare delivery model with standard in-office care for the follow-up management of psoriasis patients.

METHODS/STUDY POPULATION: Sixty-four participants with psoriasis were randomized to receive follow-up care either in-office or online over a 24-week period. Clinically validated disease severity and quality of life measures, including the Dermatology Life Quality Index (DLQI) were used to assess the effectiveness of each care model. RESULTS/ANTICIPATED RESULTS: Both the in-office and online groups showed improvement in psoriasis disease severity as measured by mean improvement in PASI after 24 weeks (online group: μ = –3.2, p = 0.0015). No significant differences existed in the mean change in PASI between the two groups (Mean difference in PASI change = 0.6, 95% CI –2.0 to 2.3, a priori delta = 2.5). IGA and DLQI scores also improved during the study period, and no significant differences existed between the in-office and online groups (p = 0.7).

DISCUSSION/SIGNIFICANCE OF IMPACT: Compared to traditional in-office care, the patient-centered online model resulted in similar improvements in psoriasis disease severity and quality of life. Patient-centered online care can be an effective alternative to standard in-office care for the follow-up management of psoriasis.

P116 PATTERNS OF VERBAL DEFICITS IN CHILDREN WITH CHROMOSOMAL ABNORMALITIES

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OBJECTIVES/SPECIFIC AIMS: Patients with Williams syndrome (WS) and Turner syndrome (TS) have characteristic cognitive deficits with selective sparing of verbal abilities. However, studies suggest that only some verbal abilities are spared while others are impaired. We aim to examine specific areas of verbal functioning to determine which are disproportionately impaired in children with WS and TS.

METHODS/STUDY POPULATION: We have administered the Wechsler Scale of Intelligence for Children, Fourth Edition (WISC-IV) and the NEPSY Developmental Neuropsychological Battery to 88 subjects ages 6 to 17 (6 WS boys, 7 WS girls, 49 TS girls, 26 typically developing girls). We are still recruiting and will be testing more WS and TD subjects. Specific verbal abilities tested include: vocabulary, similarities, meaning comprehension, phonological processing, speeded naming, and comprehension of instructions. Between-group comparisons on verbal subcales will be conducted using multivariate analyses of covariance and linear regression models. RESULTS/ANTICIPATED RESULTS: Preliminary analysis confirms that there are significant differences in overall verbal abilities between the 3 groups (average verbal IQ is 92, 54, and 117, for TS, WS, and TD, respectively). TS subjects tend to perform consistently across verbal subtests. Qualitatively, girls with TS have slightly lower scores in phonological processing and speeded naming compared to their other subtest scores. Children with WS have disproportionately low scores in vocabulary, comprehension, and comprehension of instructions. DISCUSSION/SIGNIFICANCE OF IMPACT: The pattern of impairment of specific verbal abilities can offer clues about the root cause of the overall verbal deficit. It may also help therapists to utilize intervention approaches that are more tailored to their patients’ strengths and weaknesses.

P117 PERFORMANCE OF VISUAL METHODS FOR CERVICAL CANCER SCREENING AMONG HIV-INFECTED WOMEN IN WESTERN KENYA

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OBJECTIVES/SPECIFIC AIMS: Visual inspection-based methods for cervical cancer screening are being promoted in resource-limited settings, albeit with limited evaluation in HIV-infected women. Thus, we compared the performance of two visual inspection techniques among HIV-infected women in Kenya.

METHODS/STUDY POPULATION: Women underwent cervical cancer screening at the two hospital-based HIV clinics in Kisumu. One site performed primary screening using visual inspection with acetic acid (VIA), while the other site performed visual inspection with Lugol’s iodine (VILI). Positive results on either screening exam were confirmed with colposcopy and cervical histology. Women in the VIA group were offered same-day colposcopy. In the VILI group, women were given a return appointment on a different day in order to allow the iodine staining to fade.

RESULTS/ANTICIPATED RESULTS: Between October 2007 and May 2010, 3,490 women underwent cervical cancer screening. There was no difference in average age (34.7 vs. 35.6), CD4+ T-cell count (387/µL vs. 374/µL) or WHO stage between the women who underwent VIA versus those who underwent VILI. The overall test-positive rate was 19% (452/2349) for VIA and 15% (112/781) for VILI (p < 0.25). The positive predictive value of VIA for CIN2/3 was 34.5% and for VILI was 46% (p < 0.05). In the VIA group, 3.7% women did not undergo colposcopy versus 17 (12.9%, p < 0.05) in the VILI group. DISCUSSION/SIGNIFICANCE OF IMPACT: VIA may be a superior method to VIA for diagnosis of CIN2/3 among HIV-infected women in resource-limited settings, although referral for colposcopy led to higher rates of loss-to-follow-up. Validation of see-and-treat strategies using VILI should be explored to capitalize on the relatively high positive predictive value of this test.

P118 PILOT ANALYSIS OF RISK FACTORS FOR JOINT PAIN OVER 12 WEEKS IN WOMEN TAKING AROMATASE INHIBITORS

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OBJECTIVES/SPECIFIC AIMS: Over 100,000 breast cancer patients begin a 5-year course of aromatase inhibitors (AIs) each year to prevent cancer recurrence. While AI-related joint pain likely leads to nonadherence, adequate data on joint pain predictors and trajectories are needed. We studied joint pain over patients’ first 12 weeks of AI therapy.

METHODS/STUDY POPULATION: Postmenopausal female outpatients initiating AI (N = 52) completed a baseline survey prior to AI initiation, and followup surveys every 2 weeks thereafter for 12 weeks. Pain was measured in 16 joints using a 0–10 numeric rating scale. Baseline risk factors assessed included performance status, physical function, comorbidities, menopausal symptoms, time since menopause onset, age, education, social support, and depression. Exploratory linear regression with clustered robust standard errors was used to analyze risk factors individually for worsening pain.

RESULTS/ANTICIPATED RESULTS: Mean age was 61.7 years (SD = 9.6). Most women were fully active (n = 21) and not depressed (n = 47) at baseline. Mean worst pain in any joint prior to AI initiation was 2.7 (SD = 3.0). Women who had worse performance status (β = 1.10 [1.03–1.19], more severe menopausal symptoms (β = 0.29 [0.12–0.46]), worse physical function (β = 0.10 [0.03–0.21]), or existing musculoskeletal...
comorbidities (β = 3.0 [1.6–4.4]) at baseline had greater risk for increasing joint pain over 12 weeks. DISCUSSION/SIGNIFICANCE OF IMPACT: In measuring and describing joint pain over the course of AI therapy, findings from the Breast Cancer Adjuvant Therapy cohort are expected to help inform adherence interventions, toward ensuring the clinical effectiveness of AIs in preventing cancer recurrence.

RURAL-URBAN URBAN-URBAN RURAL DISPARITIES AMONG BREAST CANCER PATIENTS ELIGIBLE FOR POSTMASTECTOMY RADIATION THERAPY

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OBJECTIVES/SPECIFIC AIMS: We previously reported that rural patients receive lower rates of postmastectomy radiation therapy (RT) relative to their urban counterparts. We hypothesized that rural patients would have poorer survival resulting from this disparity in use of RT. METHODS/STUDY POPULATION: We used the Surveillance, Epidemiology, and End Results database to identify BCa patients treated with mastectomy in Sacramento and its surrounding 13 counties between 2000 and 2006. Patients were without distant metastases and had tumors >5 cm size or >4 metastatic lymph nodes. A United States Department of Agriculture scale designated counties as rural or urban. Metsaristio et al. developed models predicted a similar disease-specific mortality. Other than rural-urban status, covariates included age, race/ethnicity, tumor size, tumor grade, hormone receptor status, number of nodal metastases, and use of RT. We further stratified our models for use of RT and county status. Risks of mortality were reported as hazard ratios (HR) with 95% confidence intervals (CI). RESULTS/ANTICIPATED RESULTS: Of 1,507 patients, about 39% did not receive RT and 56.5% were from urban counties. Multivariate analysis showed rural status did not influence OS (HR 0.94, CI 0.75–1.18; p = 0.61) or DSS (HR 0.92, CI 0.71–1.20; p = 0.56); patients not receiving RT had an increased risk of all-cause mortality (HR 1.82, CI 1.43–2.32; p < 0.001) and disease-specific mortality (HR 1.69, CI 1.27–2.24; p < 0.001). Among rural patients, lack of RT negatively influenced OS (HR 1.55, CI 1.07–2.25; p = 0.02) and DSS (HR 1.57, CI 1.02–2.42; p = 0.04). DISCUSSION/SIGNIFICANCE OF IMPACT: Rural status does not appear to be an independent predictor of OS or DSS. Our data indicate that the survival disparity noted among rural BCa patients may be due, in part, to decreased use of RT in rural populations.

SOCIAL MECHANISMS OF TRANSDISCIPLINARY TEAMS

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OBJECTIVES/SPECIFIC AIMS: Determine social structuring mechanisms and how they emerge in Cross Disciplinary Team Science. METHODS/STUDY POPULATION: A descriptive case study on the identification of theoretical and emergent codes that describe the social interactions of actors part of networks charged with crossing disciplinary and social boundaries will be used. Sampling will be drawn from the National Urea Cycle Disorders Consortium. Data will be collected that is ultimately relevant to the network (macro) policy, team (meso) evaluation, and individual (micro) experience. A five phase approach will include a network level survey about competing and complimentary values, a national focus group, individual interviews, team observations, and a F2F local focus group. Sociograms will be created using Atlas.ti software and an analysis using Linguistic Inquiry and Word Count (LIWC) software. RESULTS/ANTICIPATED RESULTS: A micro-meso level analysis will consider the role of reciprocity in the shaping of identity in TD and diverse teams. This process allows for the micro level exchanges between actor agents and their respective disciplines. Within these relationships social mechanisms can be observed that are both the product of and contributors to knowledge creation and ultimately contribute to the macro level context. DISCUSSION/SIGNIFICANCE OF IMPACT: This study will test generally under tried theories of social dynamism and emergence embedded in CDTS. It will provide empirical inquiry into the definition and mechanisms of CDTS emergence and present study was designed to evaluate the role of interaction in the emergence of new knowledge through a focus on the micro-meso relationships. These discoveries will prove critical in identifying natural conditions, policy creation, leadership characteristics, and training necessary for truly effective CDTS.

SURVIVAL TREE ANALYSIS: BRANCHING OUT TO REFINE TRANSPLANTATION SYSTEM

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OBJECTIVES/SPECIFIC AIMS: The Lung Allocation System (LAS) model was developed using Cox regression to balance transplant urgency with transplant benefit. LAS poorly predicts posttransplant survival (1-yr AUC = 0.58). Survival trees may provide a more clinically useful tool and may more accurately predict transplant survival as it yields interpretable subgroups and include interactions and nonlinear associations. The purpose of this study is to explore the utility of survival trees for assessing posttransplant survival in order to refine lung organ allocation. METHODS/STUDY POPULATION: Lung transplant recipient transplanted between 1998–2009 were identified in the United Network for Organ Procurement and Transplantation Network database. Multiple imputation was performed for missing data. Survival trees were fit in R statistical software to formulate a prognostic model of transplant survival over 5 years. RESULTS/ANTICIPATED RESULTS: Survival tree analysis provided comparable results to existing models with a highly significant results (p < 0.01) and a hazard ratio of 1.6 between the best and worst subgroups, but also offered a more clinically interpretable model based on specific patient subgroups, rather than weighted linear combinations. Preliminary results reveal significant predictors of 5 year survival occurred at split points such as wedge pressure of 12 mmHg, O2 of 2.5 L, age of 63 years and several values of cardiac output. DISCUSSION/SIGNIFICANCE OF IMPACT: Subsequent analyses should explore ensemble models and resampling approaches to further improve the prognostic value of tree models. The use of this approach should be considered in further refinements of the LAS given its clinical interpretation and potential for fitting more complex relationships.
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THE USE OF TELEMEDICINE FOR QUANTITATIVE ASSESSMENT IN BATTEN DISEASE

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OBJECTIVES/SPECIFIC AIMS: Batten disease is an inherited rare neurodegenerative disease of childhood. The Unified Batten Disease Rating Scale (UBDRS) is a reliable research tool designed to quantify disease progression, but was designed for in-person administration. Our objective was to determine the validity of the UBDRS and assess the reliability and feasibility of telemedicine administration of the UBDRS subjects with juvenile Batten disease (INCL, CLN3 disease). We hypothesized that the UBDRS is a valid tool that can be administered reliably by telemedicine.

METHODS/STUDY POPULATION: UBDRS validity was assessed in 80 subjects with INCL. The reliability of tele-administration of the UBDRS was evaluated in 8 subjects. RESULTS/ANTICIPATED RESULTS: Both the physical (r = 0.73, p < 0.001) and capability subscales (r = 0.73, p < 0.001) of the UBDRS correlated strongly with age. The physical subscale correlated with the capability subscale (r = 0.73, p < 0.001), but did not correlate with the behavior subscale (r = -0.02, p = 0.85). These results demonstrate face, convergent, and discriminant validity. Correlation between raters in telemedicine administration of the UBDRS physical subscale was 0.95 (p < 0.01), indicating excellent reliability. DISCUSSION/SIGNIFICANCE OF IMPACT: The UBDRS is a valid instrument in Batten disease. Our results indicate that it is feasible to administer the UBDRS reliably with telemedicine. Telemedicine can be a useful research tool in rare neurological disease research.

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USE OF ELECTRONIC HEALTH RECORD DATA IN CLINICAL RESEARCH

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OBJECTIVES/SPECIFIC AIMS: With the increased use of electronic health records (EHRs), there is a growing opportunity for secondary use of this clinically rich data in research. Four use cases will be presented. While challenges exist with this type of data, there are distinct advantages to using this data in several research contexts. METHODS/STUDY POPULATION: A review of the recent literature on secondary use of EHR data shows four major use cases: (1) research subject recruitment, (2) disease registries, (3) comparative effectiveness research, and (4) to record adverse events for postmarketing evaluation of drugs and devices. RESULTS/ANTICIPATED RESULTS: Some of the studies represent early pilot work with full utilization of secondary data yet to come; this is particularly true in research subject recruitment. Research registries is the most mature of these uses with many medical centers actively maintaining registries and clinical data repositories for research. Comparative effectiveness research is a newer phenomenon but important from a funding standpoint, likely to produce more secondary use. Drug and device safety is a high priority but few studies have examined this issue from using EHR data. DISCUSSION/SIGNIFICANCE OF IMPACT: Secondary use of EHR data in research is a growing branch of medical informatics. As EHRs propagate, there are also increasing societal concerns about privacy and security which must be addressed. The federal incentives to adopt EHRs and the Meaningful Use requirements may enhance the potential of use of EHR data in research.

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BRCA1 METHYLATION IS A MARKER OF TRIPLE NEGATIVE AND BASAL-LIKE BREAST CANCERS

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OBJECTIVES/SPECIFIC AIMS: Triple negative (TN) breast cancers are aggressive and overrepresented in young patients and women of African ancestry. Basal-like (BL) tumors, a subset of sporadic TN tumors, share morphological and gene expression features with tumors from BRCA1-mutation carriers, suggesting similar aberrations affecting BRCA1. We explore BRCA1 inactivation and its association with TN and the BL subtype. METHODS/STUDY POPULATION: Using MSP and immunohistochemistry, 202 primary breast cancers, including 107 African Americans were analyzed for BRCA1 promoter methylation and expression of ER, PR, HER2, EGFR and cytokeratin 5/6. Intrinsic molecular subtyping was evaluated by cDNA microarrays. Tumor subtypes were correlated with BRCA1 methylation and clinicopathologic features. RESULTS/ANTICIPATED RESULTS: Among 198 breast cancers, 28% were TN. BRCA1 methylation was detected in 43% of TNs and 17% of non-TNs (p < 0.001). Proportion of BRCA1 methylation differed by subtype (p < 0.01) and was highest in the BL tumors. Interestingly, BRCA1-methylated TN tumors had better outcome than unmethylated TN tumors (p = 0.034). Gene expression data confirmed BRCA1-methylated cases fall in the BL subtype, and show lower BRCA1 and higher FABP1 mRNA expression compared to all other tumors. DISCUSSION/SIGNIFICANCE OF IMPACT: BRCA1 inactivation via promoter methylation occurs in half of sporadic TN and BL breast tumors and may be an early event in the development of a subset of these tumors, as observed in BRCA1-mutation carriers. Our findings justify PARP inhibition strategy for treatment and/ or prevention of hereditary and sporadic BRCA1-mutant TN and BL breast cancers. Supported by HCI K12CA139160 and P50-CA58223-09A1.
P113 ABSENCE OF DYSTROPHIN COMPROMISES THE PASSIVE PROPERTIES OF THE EXTENSOR DIGITORUM LONGUS MUSCLE IN MICE
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OBJECTIVES/SPECIFIC AIMS: Absence of dystrophin, a cytoskeletal protein, causes Duchenne muscular dystrophy (DMD). DMD is a lethal muscle wasting disease that affects 1:3,500 boys. In dystrophin deficient muscle, the sarcolemma gets damaged by contraction force. Subsequent, the muscle undergoes a pathological change where muscle cell is replaced by fibrotic tissues. Little is known about the passive properties of the dystrophin deficient muscle. Here, we hypothesize that the change in muscle pathology renders the muscle stiffer. Dystrophin is also highly expressed at the muscle-tendon junction (MTJ). Thus, we further hypothesize that dystrophin deficiency compromises the MTJ strength.

METHODS/STUDY POPULATION: To test these hypotheses, we examined the stress-strain response in the extensor digitorum longus (EDL) muscle of mdx mouse, a mouse model for DMD.

RESULTS/ANTICIPATED RESULTS: At the ages of 2, 6, 14 and 28 months, the mdx EDL muscles were significantly stiffer than those of age-matched normal controls. Further, the mdx EDL muscle showed a higher relaxation rate. In normal and 5–6 month-old mdx mice, muscle failure occurred within the muscle. Interestingly, in 24 month-old mdx, the muscle failed at the proximal MTJ. Electron microscopy revealed substantial MTJ degeneration in aged but not young mdx mice.

DISCUSSION/SIGNIFICANCE OF IMPACT: In summary, our results suggest that the passive properties of the EDL muscle and MTJ strength are compromised in mdx. More importantly, the increase of muscle stiffness could contribute to the immobilization observed in DMD patient. Our findings open the door to investigate whether novel gene/cell pharmacological therapies can halt the deterioration of the passive properties and improve mechanical function.

P114 APOTOTIC ROLE OF NOTCH-NFKB PATHWAY IN T-ALL THERAPEUTIC RESPONSE
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OBJECTIVES/SPECIFIC AIMS: Relapse is a major problem in acute lymphoblastic leukemia (ALL), the most common cancer among children. Elevated expression of NFKb target genes was associated with increased ALL relapse. NFKb regulates survival, migration and invasiveness of cancer cells – important features contributing to relapse – and thus NFKb inhibition was suggested to be included to existing therapeutic protocols. On the other hand, there are examples indicating that intracellular stress activates NFKb pro-apoptotic function. Anticancer drugs often cause such stress, for instance, DNA damage response. We asked how NFKb function is altered by intracellular stress induced by conventional anti-ALL therapy and whether inhibition of NFKb benefits current protocols.

METHODS/STUDY POPULATION: FACS, qRT-PCR, siRNA, confocal microscopy, immunoprecipitation, mass spectrometry: Cell cultures with or without stromal cell feeder layers and leukemic mice.

RESULTS/ANTICIPATED RESULTS: Our data indicate that inhibition of NFKb or NOTCH1, a developmental factor activating NFKb in T-ALL, decreased cell death induced by etoposide, bortezomib or vincristine. We provide a mechanistic explanation to clinical observations showing lack of improvement from additional courses of treatment combining dexamethasone (partially acts via inhibition of NFKb) and vincristine (induces stress associated with mitotic perturbations). However, we suggest that it is still important to inhibit the cell migration and invasion arms of NOTCH and NFKb activities. We therefore propose to focus on the downstream target genes involved in these processes, such as CCR7. Understanding the NFKb response to chemotherapy will help to design a more effective combination strategy that will prevent relapse.

P115 ASSESSMENT OF A PORCINE DIAPHRAGM AND GOLD NANOMATERIAL COMPOSITE FOR WOUND HEALING
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OBJECTIVES/SPECIFIC AIMS: The purpose of this study was to assess the biocompatibility of a diaphragm and gold nanomaterial composite and determine its ability to promote cell attachment and proliferation for wound healing. METHODS/STUDY POPULATION: Porcine diaphragms were collected, decellularized, and cross-linked to gold nanorods (AuNR) and nanoparticles (AuNP) at various concentrations. Scanning electron microscopy (SEM) was used to evaluate scaffold morphology and confirm the presence of gold nanomaterials. Cell Proliferation Reagent WST-1 was used to assess the viability of cells on the composites relative to decellularized scaffolds.

RESULTS: The LIVE/DEAD Viability/Cytotoxicity Kit was used to visualize cell attachment and morphology. Enhancement of L-929 proliferation was assessed using Quant-iT PicoGreen dsDNA Reagent. Ability of the composites to reduce the number of free radicals was measured using the OxiSelect ROS Assay Kit. SEM images depicted gold nanomaterials dispersed on a diaphragm microstructure that was maintained throughout the cross-linking process. Cross-linked, AuNP-1X and AuNP-4X were both biocompatible as Decellularized while AuNR-1X was less biocompatible than Crosslinked. Confocal microscopy images depicted primary cell morphology and an increase in the number of attached cells. Cells with AuNR-1X showed an initially higher cell population while AuNP-1X and AuNP-4X showed greater proliferation. Increasing AuNP concentrations on the composites resulted in increasing free radical levels. DISCUSSION/SIGNIFICANCE OF IMPACT: The diaphragm and gold nanomaterial composites used demonstrated good biocompatibility, cell attachment and proper morphology, and enhanced cell proliferation with free radical generation being dependent on particle shape and concentration.
Some recoil may occur as the stent dissolves, but healing while the stent is intact will be evaluated. One cohort will be monitored for 6 months post–stent dissolution be implanted at the lesion site and monitored by ultrasound and intermittent angiography.

OBJECTIVES/SPECIFIC AIMS: We aimed to develop an inexpensive method to profile miRNA in urine for biomarker identification. METHODS/STUDY POPULATION: Duplicate 50 ml urine samples were obtained from 20 volunteers. RNA was extracted from cells and from ultra-filtered exosome preparations. One cDNA library was transcribed from 20 barcode-samples. Synthetic RNA was included for calibration, and miRNA profiles were based on read frequencies. RESULTS/ANTICIPATED RESULTS: Participants' age was 23–31 years. Medical history, physical examination and laboratory evaluation were normal. Cells in urine were scarce and median RNA recovery was 10 ng per 50 ml, while exosomes yielded additional 80 pg RNA per sample. On average, 440,000 reads were recovered per sample, miRNA constituting 31%. MiRNA differed in cells and exosomes, but a more striking difference was noted between genders. An unexpected finding involved the abundance of miR-124 and miR-9, both considered brain-specific. In addition, miR-320a, also found in neurons, was the most abundant miRNA in urine yet differed between genders and between urine fractions. Test-retest variability (r = 0.67) was lower than between-subject variability (r = 0.39 for exosomes and 0.57 in cells). DISCUSSION/SIGNIFICANCE OF IMPACT: Our study shows the feasibility of multisample urine miRNA profiling by bar-coded sequencing. Meaningful profiles are observed despite minute amount of RNA. The observed variability, presumably due to differences in cell populations, suggests a role for urine miRNA as biomarkers of disease progression and response to treatment, but also as a diagnostic aid.

BAR-CODED SMALL RNA DEEP SEQUENCE PROFILES OF URINE CELL AND EXOSOME MICRorna

BDCA-1 EXPRESSION DEFINES FUNCTIONALLY DISTINCT SUBSETS OF HUMAN MYELOID DENDRITIC CELLS

CD11c+ cells were sorted by expression of BDCA-3+,BDCA-1+ or BDCA-3+,BDCA-1–. Gene expression analysis revealed distinct gene expression profiles in BDCA-1+ and BDCA-1– DCs. BDCA-1+ and BDCA-1– DCs demonstrated differential cytokine production in response to agonist. Moreover, incubation with CD40L and poly I:C induced more robust cytokine responses from BDCA-1+ DCs, while LPS and siRNA induced greater responses from BDCA-1– DCs. DISCUSSION/SIGNIFICANCE OF IMPACT: We show that BDCA-1+ expression defines functionally distinct DC subsets. These data suggest their roles in immune regulation may be determined by the agonist rather than cell type. The preferential response of cell types to different agonists is also likely important in immune responses to pathogens.

BIOABSORBABLE STENTS FOR INTERIM RELIEF OF PULMONARY ARTERY STENOSIS IN A PRECLINICAL PEDIATRIC MODEL

OBJECTIVES/SPECIFIC AIMS: (1) Determine the time course and severity of pulmonary artery stenosis (PAS) elicited by intravascular injury methods. (2) Determine the histology of stenotic pulmonary arteries after stent-induced dilation and stent bioabsorption. (3) Evaluate vessel growth after stent bioabsorption. METHODS/STUDY POPULATION: We will generate a novel model of PAS in juvenile pigs using an intravascular balloon that delivers a vessel sclerosant to simulate disease. The stent will be implanted at the lesion site and monitored by ultrasound and intermittent angiography. After stent bioabsorption, histologic vessel changes from dilation injury and healing will be evaluated. One cohort will be monitored for 6 months post–stent dissolution to evaluate the somatic growth of the disease segment after intervention. RESULTS/ANTICIPATED RESULTS: We anticipate that bioabsorbable stents will alleviate PAS. Some recoll may occur as the stent dissolves, but healing while the stent is intact will result in a larger vessel diameter. We further hypothesize that later somatic growth will be inhibited by scarring that occurs as the result of angioplasty injury. DISCUSSION/SIGNIFICANCE OF IMPACT: Bioabsorbable stent expandable stents are marketed for adult use. Currently, stents intended for biliary or renal applications are placed in large vessels of children, but can be too large or rigid for smaller patients. Coronary stents developed for small arteries can fit the large vessels of small children, but cannot be further dilated to accommodate somatic growth. Bioabsorbable coronary stents can be implanted in locations that will undergo growth. Prior to creating a narrowing from surrounding somatic growth, the stent dissolves and prevents the need for later surgical intervention.
OBJECTIVES/SPECIFIC AIMS: We seek to understand correlates of chronic stress and their influence on the development of substance use in a population-based cohort (OYSUP). METHODS/STUDY POPULATION: We evaluated clinical and salivary RNA metrics and differential expression of candidate genes in saliva samples from 48 individuals (31% female, 55% ever-smoking) randomly selected from two groups stratified by high versus low severe negative life events as measured by Life Events and Difficulties Schedule (Brown & Harris, 1978). We used multiple analytical platforms, multiple reference genes and 18 replicates of all gene expression assays. We chose candidate genes previously identified as differentially expressed in a genome-wide scan of RNA in 11 caregivers of brain cancer patients and 10 control subjects matched on age, gender, ethnicity and marital status and free of major stressors during the prior year.

RESULTS/ANTICIPATED RESULTS: We observed significant differences in smoking status (r = 0.035) and RNA integrity score (r = 0.039) between stress groups. We analyzed qPCR data using both comparative standard curve and relative standard curve methods because 34% of assays had efficiency estimates <90%. Assay data showed high linearity and low variability. We observed significant under expression of 5 assays in the high stress stratum using both methods, 4 of which interrogate glucocorticoid receptor regulated genes. Analyses showed significant associations of RNA yield, integrity score, gender, ever-smoking and/or stress with results of normalized gene expression in 22/37 assays. DISCUSSION/SIGNIFICANCE OF IMPACT: A gene expression signature of chronic stress previously observed in hematopoietic samples is observed in the unfractinated saliva of young adults.

COAGULATION MONITORING DURING NEONATAL AND PEDIATRIC EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

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OBJECTIVES/SPECIFIC AIMS: To compare means of coagulation monitoring during ECMO. METHODS/STUDY POPULATION: Prospective observational study of ECMO patients in a tertiary PICU. Anti-FXa, antithrombin (AT) and factor VIII (FVIII) were measured in blood samples collected at 6, 12 and every 24 hours on ECMO. Demographic and clinical data were collected prospectively. RESULTS/ANTICIPATED RESULTS: Twenty-eight patients age 1 day-18 years were enrolled from 04/2008 to 03/2010. Median age was 9 days (IQR: 3 days-10 years), median ECMO duration was 4 days (IQR: 2.5-12 days) and primary ECMO indications were: respiratory failure, 15(28/53.6%), cardiac failure, 7(28/25%), extracorporeal cardopulmonary resuscitation, 5(28/17.8%), and sepsis, 12(38.6%). Median anti-FXa was 0.4 IU/ml (IQR:0.2-0.6), median AT was 59% (IQR:46-69) and median FVIII was 59%(95%CI:36-92). Median ACT was 210 sec (IQR:200-225) and median Heparin infusion rate was 35 U/kg/hour (IQR:15-50). Anti-FXa, AT and Heparin infusion rate increased with each day on ECMO by 0.01 IU/ml (95% CI:0.00-0.01, p = 0.001), 1% (95%CI:17-1.33%, p < 0.001) and 0.73 U/kg/hour (95% CI:0.53-0.93, p < 0.001), respectively. ACT decreased with each day on ECMO: -0.52 sec (95% CI: -0.83-0.21, p = 0.001). FVIII remained stable throughout the ECMO course and patients with high FVIII did not appear to develop heparin resistance. Anti-FXa and AT activity were positively correlated with Heparin infusion rates (r = 0.44, p < 0.001 and r = 0.35, p < 0.001), while there was no correlation between ACT and Heparin infusion rate (r = 0.08, p = 0.863). These results were maintained after controlling for blood product administration. DISCUSSION/SIGNIFICANCE OF IMPACT: Patient data shows anti-FXa and AT are warranted to determine their usefulness for ECMO coagulation monitoring.
cells which play an important role in asthma, respond to glucocorticoids in a manner which parallels the response to steroid therapy seen in asthma patients. Using comparative proteomics we selected proteins in GC-resistant eosinophils in order to identify cellular markers of steroid resistance in asthma. METHODS/STUDY POPULATION: Proteomic data of over 200 proteins in steroid-resistant eosinophils were used as reference set to seek biomarkers of steroid responsiveness in cells obtained from patients with steroid resistant, steroid refractory and steroid sensitive asthma. RESULTS/ANTICIPATED RESULTS: Our study showed that steroid resistant eosinophils display considerable alterations in their proteomic profile, resulting in activation of protein phosphatase 5, dephosphorylation of GC receptors and defect in induction of DUSP1 protein. We surmise that identified components of the GC signaling pathways may serve as potential diagnostic markers of steroid resistance in patients with severe asthma. DISCUSSION/SIGNIFICANCE OF IMPACT: The absence of therapeutic alternatives in severe asthma with resistance to steroids poses a genuine health challenge and also a financial burden, as steroid-resistant patients account for more than 50% of asthma-related healthcare costs. These results are expected to have a significant impact because; the identified mechanisms and their components are highly likely to provide new targets for therapeutic interventions, as well as potential diagnostic markers for steroid resistance.

DIFFERENTIAL PROTEIN EXPRESSION IN SMALL INTESTINAL CARCINOID TUMORS

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OBJECTIVES/SPECIFIC AIMS: Small intestinal carcinoids (SICs) are often detected late in their clinical course. Little is known about the molecular pathways important (p = 0.053) was noted for NAA in males with CPPS. In the OGM, 2D COSY results showed significant increase in glutamate and glutamine (Glx), phenylalanine (Phe) and aspartate (Asp) in males with CPPS. DISCUSSION/SIGNIFICANCE OF IMPACT: Neuronal markers of steroid loss or damage may be associated with CPPS pathophysiology and gender bias in pain processing may exist.

DETECTING NEUROCHEMICAL CHANGES IN CHRONIC PELVIC PAIN SYNDROME (CPPS) USING MAGNETIC RESONANCE SPECTROSCOPY (MRS)

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OBJECTIVES/SPECIFIC AIMS: We aimed to measure changes in cerebral metabolites in patients compared with CPPS METHODS/STUDY POPULATION: In this study, we compared male patients (n = 9) with diagnosed CPPS with age-matched males with no pain history (n = 9) and also with female patients (n = 10) with diagnosed CPPS using proton MR spectroscopy collected at 3T. Single voxel MRS were acquired in two pain processing cortical regions (anterior cingulate gyrus (ACG) and occipital grey matter (OCM)). Proton MRS spectral analysis was performed by using the linear combination model which provided absolute concentrations and neurotransmitter ratio concentrations. One-dimensional raw spectra of correlation spectroscopy (COSY) were concatenated into 2D COSY. RESULTS/ANTICIPATED RESULTS: Comparison of the 1D MRS results from the OGM of male with CPPS and male controls only showed a trend of reducing concentration of N-acetyl (NAA)/creatine (Cr)/PCr in males with CPPS (p = 0.053). We report for the first time, 2D COSY data acquired in patients with CPPS which revealed significant increase in Threonine/Cr in males with CPPS in the OGM. When female patients with CPPS were compared with males with CPPS, 1D MRS showed significant changes only in the ACG: concentrations of both glutamate and macromolecules were reduced in males. Also a close trend towards significance

DEVELOPING A PRACTICAL BRAIN-COMPUTER INTERFACE SYSTEM BASED ON EEG

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OBJECTIVES/SPECIFIC AIMS: Brain-computer interface (BCI) technology aims to establish a direct link for transmitting information between the brain and external devices. It has the potential to offer a natural and rich control signal for robotic devices, prosthetic limbs, or functional electrical stimulators to reanimate paralyzed limbs. Our group’s research interest is to translate basic BCI research into clinically viable BCI devices. We propose electrocorticography (ECoG) as a realistic approach that strikes an optimal balance in the tradeoffs associated with neural signal quality, invasiveness, system complexity, and maintenance. METHODS/STUDY POPULATION: We have conducted preclinical ECoG studies with a direct focus on decoding hand posture from ECoG signals. We implemented custom-designed miniature high-density ECoG grids over the hand area of the motor cortex in neurological patients undergoing subdural epilepsy monitoring. Participants performed various hand movement tasks, including a self-paced individual finger movement task and an object-grasping task. RESULTS/Anticipated Results: The high-gamma band of ECoG signals recorded from the motor cortex shows a significant increase in power during hand movement, and it encodes significant information about hand grasping movement. When we regressed powers of various frequency bands against the first three principal components of hand movement, the high-gamma band yields a high r2 value, indicating that ECoG signals encode significant information about hand grasping movement. We accurately predicted hand flexion based on ECoG signals. DISCUSSION/SIGNIFICANCE OF IMPACT: This suggests that it may be possible to restore basic hand function for daily activities using an ECoG-based BCI system.

DIFFERENTIAL HOST TRANSCRIPTIONAL RESPONSE ACROSS CLINICAL MALARIA STATES

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OBJECTIVES/SPECIFIC AIMS: Malaria is a leading cause of morbidity and mortality worldwide. Though Plasmodium falciparum accounts for most malarial fatalities, infection with P. falciparum is not always synonymous with disease. A large percentage of children in endemic areas carry this parasite without characteristic fevers. Furthermore, of those who are symptomatic, only a subset will develop a severe disease syndrome, which are associated with a 15% mortality rate. Why some individuals develop symptomatic disease and/or severe disease is not clearly understood. However, patterns of host immunity and specific pro-inflammatory cytokines have been associated with these different clinical states. We aimed to explore the role of the immune system, and more broadly the host response, across the different clinical states. METHODS/STUDY POPULATION: We studied human whole genome transcription expression profiles ex-vivo from children admitted with coma and P. falciparum parasitemia in Blantyre, Malawi during the 2009 malarial season. If an asymptomatic parasite burden was found on routine outpatient visits following their hospital stay, another sample was drawn. Transcriptional profiles from both severe and asymptomatic visits were compared to healthy control patients. RESULTS/Anticipated Results: Individual genes as well as gene sets obtained from KEGG and the literature associated with CM vs. other clinical states were identified. Individual genes were significant if p value = <0.01 and fold change = ≥1.6. Gene set significance was determined using the Gene Set Enrichment Analysis (GenePattern, Cambridge, MA) software. DISCUSSION/SIGNIFICANCE OF IMPACT: This data provides insight into the pathophysiology of the clinical malaria states and may contribute to identification of adjunctive therapy to improve survival rates.
in the development of metastasis. We have recently developed a Protein Pathway Array to screen for changes in protein and phosphoprotein expression in tissues. The objective of our study was to identify key pathways important in the mechanism of SIC metastasis development.

OBJECTIVES/STUDY POPULATION: Primary tumors and liver metastases from 5 patients with metastatic SICs were harvested. Extracted proteins were separated by SDS gel, and Western blots were performed with 136 antibodies. Band densities were determined using BioRad Image System. Significant Analysis of Microarray was used to select the proteins differentially expressed between different groups. Unsupervised hierarchical clustering analysis was performed. RESULTS/ANTICIPATED RESULTS: Of the 136 proteins analyzed, 52 proteins were expressed in these samples. 9 proteins were up-regulated in primary SICs compared with matched normal small bowel mucosa. Cyclin E was down-regulated in primary SIC tissue compared to normal small bowel mucosa. Compared to normal liver tissue, SIC liver metastases demonstrated up-regulation of P-ERK and p72 but down-regulation of CDK2 and CDC25B. When comparing primary SIC with their paired liver metastases, cyclin E demonstrated a significant up-regulation in the liver metastasis. DISCUSSION/SIGNIFICANCE OF IMPACT: Few studies have compared gene or protein expression in primary and metastatic SIC tumors resected simultaneously. Our findings using a Protein Pathway Array reveal changes in a limited number of proteins, suggesting that these may be targets for therapy.

DATA M ETHYLA TION PROF ALITY OF BARRETT'S ESOPHAGUS IN PUERTO RICAN HISPANICS
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OBJECTIVES/SPECIFIC AIMS: The objective of this project is to establish a DNA methylation profile for use in cancer surveillance in Barrett's esophagus patients. The objective will be achieved through two specific aims: (1) To determine the prevalence of DNA promoter hypermethylation and mRNA levels of expression of 7 candidate genes in Barrett's esophagus with different grades of dysplasia and adenocarcinoma; and (2) To validate a methylation profile for Barrett's esophagus predictive of esophageal cancer development. METHODS/STUDY POPULATION: Samples from Barrett's esophagus and esophageal adenocarcinoma will be collected from participants. A risk factor questionnaire, electronic data, and clinical information on the patient will be administered prior to endoscopy. DNA promoter hypermethylation of candidate genes from gDNA will be assessed using MethyLight assay. Epigenetic gene silencing will be confirmed by RT-PCR analysis. Differences in methylation patterns associated with different dysplastic Barrett's esophagus, and esophageal adenocarcinoma will be assessed using multimodal regression models. RESULTS/ANTICIPATED RESULTS: The anticipated result of this study is to predict the development of esophageal adenocarcinoma from Barrett's esophagus based on a DNA methylation profile. DISCUSSION/SIGNIFICANCE OF IMPACT: Barrett's esophagus is a major risk factor for esophageal adenocarcinoma. Identifying biomarkers for screening Barrett's esophagus patients at high risk of cancer would allow us to do early intervention such as endoscopic therapy and chemoprevention.

EFFECT OF GADOLINIUM CONTRAST ON IRON METABOLISM PATHWAYS AND INHIBITION BY IRON CHELATOR
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OBJECTIVES/SPECIFIC AIMS: Nephrogenic systemic fibrosis (NSF) is characterized by tissue accumulation of iron and infiltration of fibrocytic cells. Cellular pathways that participate in iron dysmetabolism of NSF are unknown. CD163-Ferroportin pathway is central to iron mobilization in the body. METHODS/STUDY POPULATION: We evaluated the in vitro effects of gadolinium contrast (Omniscan) on cultured human peripheral blood mononuclear cells (PBMC). PBMC were cultured with Omniscan (0.1 to 2.5 mmol/Kg BW). Between Day 5–8, adherent cells were isolated and evaluated with flow cytometry and immunofluorescence for phenotype and protein expression confirmed with western blot. We performed additional in vitro studies with oral iron chelator deferoxamine to evaluate its effect on Omniscan-induced changes. Immunohistochemistry was performed on NSF biopsy specimen for cellular markers. RESULTS/ANTICIPATED RESULTS: Omniscan treatment induced increased number of adherent spindle cells. Omniscan-treated tissues strongly expressed markers of iron metabolism compared to CD163, HO-1, H-Ferritin and Iron export protein- Ferroportin, and less Hepsidin. Iron chelator significantly decreased the development of CD163+ adherent spindle cells. Spindle cells in NSF skin biopsies expressed CD163 and Ferroportin. DISCUSSION/SIGNIFICANCE OF IMPACT: Omniscan induces development of CD163+ spindle cells in vitro and CD163+ / Ferroportin+1+ cells accumulate in human NSF. Activation of CD163-Ferroportin pathway and inhibition of hepcidin in vitro by Omniscan, taken along with inhibition of CD163+ spindle cell differentiation by deferiprone suggests a potential role of CD163 pathway and iron export in NSF pathogenesis.

EFFECT OF MILD THERAPEUTIC HYPOTERMIA ON FENTANYL AND MIDAZOLAM CLEARANCE IN A RAT MODEL OF CARDIAC ARREST
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OBJECTIVES/SPECIFIC AIMS: Concern regarding unknown drug dose-response relationships complicates medication dosing during therapeutic hypothermia after cardiac arrest (CA). Cooling (<32°C) is known to substantially decrease cytochrome p450 (CYP)-mediated drug metabolism in vitro and limited data suggest that levels of drugs that are CYP3A substrates increase clinically. The study objective was to determine the clearance of the clinically relevant CYP3A substrates fentanyl and midazolam during mild therapeutic hypothermia following CA. METHODS/STUDY POPULATION: An asphyxial CA rat model was used and body temperature (33°C or 37.5°C) was controlled by surface cooling 1 h postsutural to mimic the timing and target temperature achieved clinically. Fentanyl (50 μg/kg/h) or midazolam (1 mg/kg/h) was given IV and plasma levels were assessed over 8–10 h by UPLC-MS/MS. Clearance was calculated by noncompartmental pharmacokinetics. Metabolite hepatic microsomal formation rates were measured in vitro at 37°C and 33°C and Michaelis-Menten parameters were determined. RESULTS/ANTICIPATED RESULTS: The temperature groups were well-matched. Cooling reduced the systemic clearance for both midazolam (66.4 ± 9.5 to 56 ± 9.1 mL/min/kg) and fentanyl (61.5 ± 11.5 to 48.9 ± 8.6 mL/min/kg). Microsomal metabolism formation rates were lower at 33°C and were driven by reductions in maximal enzyme velocity rather than affinity. DISCUSSION/SIGNIFICANCE OF IMPACT: Cooling to 33°C after CA modestly decreases midazolam and fentanyl systemic clearance in rats. Given that cooling is applied for 24–48 h after CA in patients, and that hepatic clearance may be compromised, consideration of the impact of therapeutic hypothermia on concurrent drug therapy is warranted. Support: K23NR024145, R01GM073031, S10RR023461, NS03018.

EFFECT OF SEX AND ANALGESICS IN MOUSE NOCICEPTION MEASURED BY A NEUROSPECIFIC ASSAY
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OBJECTIVES/SPECIFIC AIMS: There is ample evidence that nociception and opioid analgesia are impacted by sex and that women have lower tolerance to several stimuli (heat, pressure, electrical, and cold) compared with men. Here we study the effect of sex and analgesics on nociception in C57Bl/6, using an assay that delivers sine-wave electrical stimuli at 2000, 250, and 5 Hz in order to preferentially stimulate Aβ, Aδ, and C fibers, respectively. METHODS/STUDY POPULATION: The stimulation at each frequency is delivered at predetermined increments, audible vocalization is defined as the nocifensive behavior, and the intensity of stimulation that elicits vocalization as current vocalization threshold cVT. We measured cVT before and after administration of morphine intrathecally (0–2 μg/kg). RESULTS/ANTICIPATED RESULTS: During basal conditions, C57Bl6 males had significantly higher mean cVT compared with females in 2000, 250, and 5 Hz. With increasing doses of morphine, cVT percent change from baseline increased and were significantly higher in response to 5 Hz compared with 250 and 2000 Hz. Current vocalization threshold percent change from baseline at 1 h was significantly ordered: 5 Hz > 250 Hz > 2000 Hz (p < 0.0001) and 250 Hz > 2000 Hz (p = 0.0082). These results suggest that the response to 5 Hz simulation was mostly affected by morphine. By 3 hours after morphine injection, there was no overall effect of morphine on cVT (p = 0.1263). DISCUSSION/SIGNIFICANCE OF IMPACT: While females have lower cVT than males at baseline, opioid-analgesia was not impacted by the animal’s sex. Therefore, using sine-wave electrical stimulation at frequencies that reportedly preferentially stimulate Aβ, Aδ, and C sensory nerve fibers, this nociceptive assay enables the evaluation of sex-related differences and its impact on opioid analgesia in mice.

EFFECT OF VITAMIN D3 ON MUSCLE FIBER SIZE
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OBJECTIVES/SPECIFIC AIMS: Histological analysis of muscle biopsies in adults with vitamin D deficiency reveals a predominance of type 2 (T2, fast-twitch) muscle fiber atrophy. We sought to determine whether supplementation with vitamin D3 in individuals with vitamin D insufficiency affects the change in muscle fiber cross-sectional area (CSA) over 4 months. METHODS/STUDY POPULATION: In this randomized, double-blind, placebo-controlled pilot study, 16 healthy women (65–85 years old) were randomized to receive 4000 IU or 8000 IU vitamin D3 weekly for 12 weeks. CSA of T1, T2, and type 2d muscle fibers was measured by microscopy. RESULTS/ANTICIPATED RESULTS: CSA at 12 weeks increased significantly in both treatment groups compared with baseline. CSA of T2d fibers increased more in the 8000 IU group compared with the 4000 IU group (2.0 ± 0.3 vs. 0.7 ± 0.2%). CONCLUSION: Vitamin D3 supplementation improved CSA of type 2d fibers in women with vitamin D insufficiency. Further study is needed to confirm these findings.
EXPRESSSION OF INFLAMMATORY CYTOKINES BY EXCESS ADIPOSE TISSUE IN PATIENTS WITH GYNECOLOGIC MALIGNANCIES

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OBJECTIVES/SPECIFIC AIMS: To compare levels of gene expression for TNFa, IL-6, IL-10 and leptin in tissues from obese and lean individuals with gynecologic malignancies and healthy controls.

METHODS/STUDY POPULATION: This is a retrospective study of patients of the gynecology-oncology group at Stony Brook University Medical Center between 2006–2008. Patients from control group underwent abdominal operations for benign conditions. Obesity was defined based on body mass index (BMI). Pieces of omental adipose tissue were collected during surgery. Relative amounts of RNA were calculated for IL8, TNFa, IL-6, IL-10, CD68 and leptin and normalized to GAPDH. Age and smoking status of cancer and control groups were compared with t- and chi-square tests. Levels of IL8, TNFa, IL-6 and CD68 were compared with obese and lean patients with t-test. Parameters different between cancer and control groups were included in the multivariable logistic regression model.

RESULTS/ANTICIPATED RESULTS: The sample size was 78. There were 46 cancer patients and 32 controls. Mean age of cancer patients was 59.6 ± 51.2 in control group (p = 0.001). There were 24 patients with endometrial malignancy, 17 with ovarian and 5 with cervical cancer. Majority (67.4%) of cancer patients had stage 1 disease. There were 23.9% vs 21.9% smokers (p = 0.83) in both groups. Significant differences were found between lean and obese patients in the levels of IL8 (p = 0.014) and CD68 (p = 0.018), but not in the other genes. IL8, TNFa, IL-6 or IL-10 were not associated with cancer status of patients. Leptin expression had weak negative correlation with cancer (OR = 0.95, 95% CI [0.84–0.97], p = 0.006).

DISCUSSION/SIGNIFICANCE OF IMPACT: IL8, TNFa, IL-6 or CD68 expression by adipose tissue is not associated with positive cancer status. Leptin has mild protective association against cancer.

FISH OIL PROTECTS AGAINST DIET-INDUCED INSULIN RESISTANCE AND MODIFIES CERAMIDE COMPOSITION AND MITOCHONDRIAL PHYSIOLOGY IN SKELETAL MUSCLE

P165

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OBJECTIVES/SPECIFIC AIMS: Omega3 fatty acids (EPA, DHA) have documented health benefits, including protection from development of insulin resistance. We investigated how fish oil affects muscle mitochondrial function and ceramide content as potential mechanisms of these insulin sensitizing effects.

METHODS/STUDY POPULATION: Mice were fed for 10 weeks with normal fat diet (NFD, 10% fat), high fat diet (HFD, 60% fat), or high fat diet + fish oil (HFD+N3, 60% fat with 3.4% n-3s from DHA and EPA). Results/anticipated results: Glucose tolerance (OGTT) significantly declined in HFD but not HFD+N3. Quadriceps muscle oxidative capacity (high-resolution respirometry) was significantly higher in HFD and HFD+N3 compared to NFD. Respiratory control ratios and P/O measurements indicated higher mitochondrial efficiency in HFD compared to NFD or HFD+N3. H2O2 production (Amplex Red) and NADPH oxidase activity (lucigenin) were similarly elevated in all groups. Quadriceps muscle oxidative capacity (high-resolution respirometry) was significantly higher in HFD and HFD+N3 compared to NFD.

DISCUSSION/SIGNIFICANCE OF IMPACT: Fish oil protects against diet-induced insulin resistance and modifies muscle mitochondrial function and ceramide content.

FUNCTIONAL ACTIVATION AND CONNECTIVITY DIFFERENCES IN ADOLESCENT MARIJUANA USERS EXPERIENCING REWARDS AND LOSSES

P166

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OBJECTIVES/SPECIFIC AIMS: The purpose of this study was to investigate reward circuitry in adolescent marijuana users, who have an increased risk for a future substance use disorders. It is possible that the increased risk for substance use disorders may be related to alterations in reward circuitry.

METHODS/STUDY POPULATION: We compared 15 frequent marijuana-using adolescents (>5 uses per week) and 15 nonuser controls performing task a computer task where they were required to guess whether a simulated coin flip would be heads or tails and perform a perceptual motor control task. Participants were instructed that they would win 1 dollar for each correct guess and lose 1 dollar each incorrect guess, however the task was programmed so wins and losses were equal regardless of choices.

RESULTS/ANTICIPATED RESULTS: Across all participants, ‘wins’ were associated with cingulate, middle frontal, superior frontal, inferior frontal gyrus and declive activations, and ‘losses’ were associated with cingulate, middle frontal and occipital gyri and declive activations. Marijuana users had greater
middle and inferior frontal gyri, caudate and caudato-putamen activity during wins and greater anterior and posterior cingulate, middle frontal gyrus, insula, castrum and declive activity during. We next found evidence for group differences in functional connectivity among these regions following both conditions. DISCUSSION/SIGNIFICANCE OF IMPACT: These findings provide evidence that adolescent marijuana use is associated with altered regulation of reward, although it is unclear if this alteration is a consequence of marijuana use or a preexisting trait. These results provide supportive evidence that alterations in reward circuitry may contribute to the increased risk for future substance use disorders in adolescent frequent marijuana users.

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**FUNCTIONAL COOPERATIVITY BETWEEN THE KLF6-SV1 AND C-MYC ONCOGENES IN THE PROGRESSION OF PROSTATE CANCER IN VIVO**

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OBJECTIVES/SPECIFIC AIMS: Prostate cancer (PCa) is the second leading cause of cancer-related death among males in the United States. Beyond the burden in lives affected and lost, more than 192,280 new PCa cases are projected in 2010 alone. Thus, the need to define the genetic basis of this disease is clear. The development of genetic information in mouse models is a high priority in PCa research. As mice do not spontaneously develop prostate cancer, most of the PCa mouse models involve transgenic overexpression of oncogenes, or targeted deletion of tumor suppressor genes using knockout technology. However, highly penetrant models of widely dispersed metastatic disease have yet to be developed. To address this problem, we have developed a new mouse transgenic model of PCa that combines transgenic overexpression of oncogenic KLF6-SV1 and the proto-oncogene c-Myc. METHODS/STUDY POPULATION: The development of genetically relevant mouse models is a high priority in PCa research. Most advanced/metastatic murine models of prostate cancer do not recapitulate the human disease. To address this problem and investigate whether the concurrent overexpression of KLF6-SV1 and c-Myc accelerates prostate cancer progression, we have generated a novel double transgenic mouse model that overexpresses both human KLF6-SV1 and human c-Myc. RESULTS/ANTICIPATED RESULTS: Histology of the double transgenic mice prostate displays a very advanced and aggressive tumor with evidence of stromal invasion, higher Gleason scores (Gleason 10) compared to mice overexpressing either c-Myc (Adenocarcinoma, Gleason 6–7) or KLF6-SV1 (PIN, Gleason 3) alone. DISCUSSION/SIGNIFICANCE OF IMPACT: This finding highlights the potential functional cooperativity between two prostate cancer relevant oncogenes in driving the progression of the disease in a novel mouse model.

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**GENE VARIANTS ON THE NPY RECEPTOR AND WEIGHT REGAIN AFTER GASTRIC BYPASS SURGERY**

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OBJECTIVES/SPECIFIC AIMS: Bariatric surgery is considered the most effective therapy for long-term weight loss in severely obese patients. However, even after experiencing extreme initial weight loss, some patients fail to maintain their reduced weight. We hypothesized that obesity-related haplotypes in FTO, MC4R, NPY2R and NPF2R would be related to postsurgical weight regain. METHODS/STUDY POPULATION: We examined the prospective associations between these gene haplotypes and 4-year weight regain in subjects who were previously severely obese ($n = 212$, age $= 45 \pm 11$ years, BMI $= 46.7 \pm 7.5$ kg/m², $83\%$ female) and underwent Roux-en-Y gastric bypass surgery at Montefiore Medical Center, New York, NY. RESULTS/ANTICIPATED RESULTS: Weight regain from 2 to 6 years post surgery (BMI change $= 3.2 \pm 3.6$ kg/m²) was not associated with FTO, MC4R, or NPF2R. Patients with obesity-related haplotypes of NPY2R however had greater weight gain (an additional $1.1 \pm 0.5$ kg/m²) at 6 years than those who did not ($p < 0.05$). DISCUSSION/SIGNIFICANCE OF IMPACT: Gastric bypass patients who are carriers of obesity-related NPY2R haplotypes may be more susceptible to weight gain in the long term. The weight regain associated with NPY2R is consistent with the presurgical weight association. Risk haplotypes in the NPY2R gene may identify post-surgical subjects who need more focused weight maintenance intervention.

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**GENOTYPE-PHENOTYPE RELATIONSHIPS IN SCHIZOPHRENIA**

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OBJECTIVES/SPECIFIC AIMS: Schizophrenia is a psychiatric disorder with a worldwide prevalence of nearly one percent. Symptoms consist of delusions, hallucinations, emotional blunting and cognitive deficits. Symptoms develop in early adulthood, and typically lead to lifelong disability. Heritable factors significantly contribute to the risk of developing schizophrenia, however, these factors are heterogeneous and are not fully characterized. DNA copy number variants (CNVs) are rare genetic changes that contribute to schizophrenia risk in some individuals, most likely by altering levels of gene expression. The objective of this project is to characterize phenotypes of brain structure, cognition, and symptoms in individuals with schizophrenia who have CNVs. METHODS/STUDY POPULATION: Our research group has a well-characterized sample of individuals with schizophrenia. Data available from these subjects include structural MRI brain scans, measures of symptoms, and cognitive testing. CNVs are ascertained using comparative genomic hybridization. Individuals with novel CNVs will be of particular interest, and we will also be able to characterize potential relationships between common CNVs and phenotypes. RESULTS/ANTICIPATED RESULTS: CNVs identified on chromosomes 2, 17, and 22 are of particular interest. These CNVs are in regions that contain genes important for brain development and function. Phenotypic information from these individuals and other subjects will be presented. DISCUSSION/SIGNIFICANCE OF IMPACT: This project will advance knowledge of the genetic factors that contribute to schizophrenia and how they relate to psychiatric phenotypes, which will be informative for finding new treatments based on mechanisms of illness.

**P172**

**HPV IS HIGHLY PREVALENT IN THE ORAL CAVITY**

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OBJECTIVES/SPECIFIC AIMS: The objective of this cross-sectional study was to determine the prevalence of, and risk factors for oral HPV using 2 sets of broad spectrum primers. METHODS/STUDY POPULATION: As part of a case-control study of prostate cancer in Ashkenazim, oral rinse samples were collected as a source of genomic DNA. A random convenience sample of 317 extracted DNA samples was tested for using FAP59/64 and MY09/MY11 primers that preferentially amplify beta/gamma and alpha HPV types, respectively. The HPV DNA types were confirmed by dot blot hybridization and/or direct sequence analysis. Risk factors for oral HPV were evaluated by logistic regression, chi-square and Fisher's exact tests. RESULTS/ANTICIPATED RESULTS: 37% (117/317) tested positive for HPV, of which 16% were alpha, 63% were beta, 8% were gamma, and 13% were mixed genera. HPV(+) compared to HPV(-) groups had mean age of 70 y (SD = 5.1) versus 68 y (SD=1) ($p = 0.01$), were divorced/separated (p = 0.02), less likely to have a history of prostate cancer ($p = 0.047$) and reported $\geq 7$ ETOH drinks/wk ($p = 0.058$). There were no significant associations with smoking, sun exposure, presence of tonsils, STIs, education, diet and/or autoimmune diseases. Age $>60$ years had an adjusted OR 2.7 [1.2, 6.5] for oral HPV. Military service was the only significant risk for beta HPV (OR 2.8, p = 0.04). DISCUSSION/SIGNIFICANCE OF IMPACT: A significant proportion of head and neck squamous cell carcinomas (HNSCC), including oral cancers, are associated with HPV. However, the prevalence of the broad range of HPV types has not been determined for the oral cavity. The predominant HPV types are in 3 different genera (alpha, beta, and gamma) and require specialized primers for their detection. Using alpha and beta/gamma HPV primers, oral HPV prevalence was 38% with predominance of (64%) beta HPV. Risk of oral HPV increased with age and military service increased the risk for beta HPV.

**P173**

**IDENTIFICATION OF SSRI RESPONSE BIOMARKERS FOR DEPRESSION BY UTILIZING A PHARMACOMETABOLOMICS-INFORMED PHARMACOGENOMIC APPROACH**

Hettinger S, Zhu H, Jenkins GD, Biermann J, Snyder K, Drews M, Fiehn O, Zong Z, Schidt D, Mrazek DA, Kaddurah-Daouk R, Weinfels RB

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OBJECTIVES/SPECIFIC AIMS: Major depressive disorder (MDD) is a common psychiatric disease. Selective serotonin reuptake inhibitors (SSRIs) are an important class of drugs used to treat MDD. However, many patients do not respond adequately to SSRI therapy. We applied a pharmacometabolomics-informed pharmacogenomic research strategy to identify citalopram/esctolapram treatment outcome biomarkers. METHODS/STUDY POPULATION: Metabolomic profiling using a gas chromatography-mass spectrometry platform was performed for plasma samples from 20 escitalopram remitters and 20 nonremitters who were enrolled in a large SSRI pharmacogenomic trial at Mayo. Pharmacometabolomic “signals” were then pursued by performing pharmacogenomic investigation of the possible role of inheritance in variation in response to SSRI treatment of MDD. RESULTS/ANTICIPATED RESULTS: Metabolomic analysis of MDD patients treated with SSRIS showed that baseline plasma glycine level was negatively associated with treatment outcome ($p = 0.0054$). Genotyping of tag single nucleotide polymorphisms (SNPs) for genes encoding glycine synthesis and degradation enzymes was then performed in 529 DNA samples from the Mayo Clinic SSRI study. The rs19975461 SNP in the glycine dehydrogenase gene was associated with treatment outcome phenotypes in both the initial study and 1245 MDD patients in the STAR*D.
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P174

IDENTIFYING THE SOURCE OF RESISTANCE TO EXCITOTOXIC CELL DEATH: IMPLICATIONS FOR HUNTINGTON’S DISEASE

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OBJECTIVES/SPECIFIC AIMS: The death of specific neuronal populations is the cause of cognitive and motor dysfunction in multiple disorders. There are several neurodegenerative diseases or injuries that have a common factor in their progression, for example: Huntington’s disease (HD), Alzheimer’s disease, traumatic brain injury, multiple sclerosis, Parkinson’s disease, and spinal cord injury are just some that are thought to get worse through excitotoxicity, which is the over-activation of neurons to the point of cell death. In HD, a specific and distinct population of cells in the striatum degenerates. It is important to learn more about the role of excitotoxic cell death in this disease, and identify factors that can help to prevent this excitotoxic cell death.

METHODS/STUDY POPULATION: Mice are great models to study human diseases as well as excitotoxicity because they can express a human mutant protein, and we can investigate the direct effects of an excitotoxin. We have developed a new line of an HD mouse model on a vulnerable strain background, and have tested it for susceptibility. We are also using a microarray analysis to identify the pattern of genes that are unique to older mice which carry the human HD transgene.

RESULTS/ANTICIPATED RESULTS: Our studies reveal that one of our mouse models of HD displays a surprising resistance to striatal neurodegeneration with age when vulnerability to excitotoxic cell death is tested. A small but selective set of genes are activated in this group that displays activated resistance to cell death.

DISCUSSION/SIGNIFICANCE OF IMPACT: Identifying cellular mechanisms that make neurons resistant to excitotoxicity may point the way to powerful new therapies that could alleviate the symptoms in HD and many other neurodegenerative disorders, reducing the financial, emotional and physical burden caused by these disorders.

P175

IMPLEMENTING WARFARIN PHARMACOGNOMICS

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OBJECTIVES/SPECIFIC AIMS: Variability in warfarin doses, up to 10-fold, includes a prominent genetic component. We tested whether the association between stable warfarin dose and genetic variants was replicated in BioVU the Vanderbilt DNA Databank that links DNA samples from >100,000 patients to de-identified EMRs, and if implementing the published IWPC algorithm using genetic and clinical data improved dose prediction.

METHODS/STUDY POPULATION: Fift een SNPs in CYP2C9, VKORC1, CALU, CYP4F2, EPHX1, and GGCX were analyzed. Log-transformed median steady-state warfarin dosage was associated with European Americans on stable doses of warfarin (NLP positive predictive value >98%).

RESULTS/ANTICIPATED RESULTS: Our studies reveal that one of our mouse models of HD displays a surprising resistance to striatal neurodegeneration with age when vulnerability to excitotoxic cell death is tested. A small but selective set of genes are activated in this group that displays activated resistance to cell death.

DISCUSSION/SIGNIFICANCE OF IMPACT: Identifying cellular mechanisms that make neurons resistant to excitotoxicity may point the way to powerful new therapies that could alleviate the symptoms in HD and many other neurodegenerative disorders, reducing the financial, emotional and physical burden caused by these disorders.

P177

INFLUENCE OF EXERCISE TRAINING ON ENDOTHELIAL CELL PHENOTYPIC HETEROGENEITY BETWEEN CORONARY AND SYSTEMIC VASCULATURES IN HYPERCHOLESTEROLEMIC SWINE

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OBJECTIVES/SPECIFIC AIMS: The purpose of this study was to test the hypothesis that the atherosclerotic coronary endothelium expresses higher levels of pro-oxidant and lower levels of antioxidant protein compared to the systemic conduit arteries, and that exercise training decreases heterogeneity of endothelial cell phenotype between coronary and systemic vessels.

METHODS/STUDY POPULATION: Fourteen male hypercholesterolemic swine exercise trained for 16–20 weeks (n = 7) or remained sedentary (n = 7). At sacrifice, endothelial cells were mechanically scraped from isolated segments of carotid, brachial, femoral, renal, and right coronary arteries (RCA).

RESULTS/ANTICIPATED RESULTS: Expression of pro-oxidant (p67phox) and antioxidant (SOD1 and SOD3) markers in the RCA was not different compared to the carotid artery (predicators > 0.05), but was elevated compared to the renal, femoral, and brachial arteries in sedentary animals (all predictors < 0.05). In contrast, exercise trained animals exhibited increased p67phox protein expression in the RCA compared to all systemic arteries (all predictors < 0.05), whereas no differences were detected in either SOD1 or SOD3 expression throughout the vasculature (both C < 0.05).

DISCUSSION/SIGNIFICANCE OF IMPACT: We conclude that exercise training is associated with decreased heterogeneity of antioxidant, but not pro-oxidant, protein expression between coronary and systemic conduit artery endothelium. Supported by P01 HL052490 (MHL) and T32 AR048523 (GHS and JP)

P180

INSULIN STIMULATES AMINO ACID TRANSPORTER EXPRESSION IN SKELETAL MUSCLE OF YOUNG AND OLDER ADULTS

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OBJECTIVES/SPECIFIC AIMS: Healthy, non-diabetic older adults are resistant to the anabolic effect of insulin on skeletal muscle proteins. Recently, amino acid transport has been identified as an important contributor to mTORC1 activation and muscle protein synthesis. Insulin stimulates the transcription of amino acid transporters, enhances localization of amino acid transporters on the cell membrane, and increases transporter activity. Therefore, we hypothesized that aging may blunt amino acid transporter expression in response to an insulin infusion, thereby reducing intracellular amino acid availability.

METHODS/STUDY POPULATION: Five younger and older adults were studied at baseline and during a local insulin infusion in one leg increasing leg plasma insulin to postprandial levels without decreasing amino acid concentrations. Muscle biopsies were taken before, 1.5 and 3 h during insulin infusion. Biopsies were analyzed for mRNA expression of L-type (LAT1/SLC7A5), A-type (SNAT2/SLC38A2), protein-assisted (PAT1/SLC6A1) and cationic (CAT1/SLC7A1) amino acid transporters utilizing RT-PCR.

RESULTS/ANTICIPATED RESULTS: There were no baseline differences in amino acid transporter mRNA expression between young and older subjects (p > 0.05). Insulin increased LAT1/SLC7A5, PAT1/SLC38A1 and CAT1/SLC7A1 mRNA expression similarly in both age groups at the 3 h time point (p < 0.05). DISCUSSION/SIGNIFICANCE OF IMPACT: These data suggest that the ability of insulin to stimulate amino acid transporter expression is not reduced in healthy older adults. Future studies should focus on other mechanisms leading to insulin resistance of muscle protein anabolism in healthy aging.

P181

INTRAUTERINE EXPOSURE TO DIABETES AND BODY MASS INDEX IN HISPANIC CHILDREN

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OBJECTIVES/SPECIFIC AIMS: Our aim is to determine whether intrauterine exposure to gestational diabetes mellitus (GDM) is associated with increased body mass index

P176

INDOLEALIME 2,3 DIOXYGENASE (IDO) IN PREECLAMPSIA

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OBJECTIVES/SPECIFIC AIMS: Decreased human placental IDO activity is associated with preeclampsia (PreE). In addition, low mouse IDO activity has been associated with fetal-placental rejection and high blood pressure, both of which are key PreE phenotypes. Yet, the role of IDO in PreE is unknown. Why. We therefore generated an IDO-deficient (IDO–KO) C57BL/6 (C57) mouse model to test the hypothesis that IDO–KO will result in PreE.

METHODS/STUDY POPULATION: Wild type (WT) C57 females crossed with WT C57 males are syngeneic control (SC) dams. IDO–KO females crossed with IDO–KO males are syngeneic knockout (SK) dams. At gestational day (GD) 11 uterine was assayed for protein concentration. Vascular reactivity of aortas and mesenteric arteries at GD18 was examined using wire and pressurized myograph, respectively. RESULTS/ANTICIPATED RESULTS: SK dams demonstrated a significantly higher proteinuria than SC dams (SK: 4334 ± 104 ug/mL vs SC: 2976 ± 160 ug/mL, p < 0.001). Vascular reactivity of aortas and mesenteric arteries at GD 18 was examined by using wire and pressurized myograph, respectively. At all doses of acetylcholine (Ach), aorta from SK dams exhibited a decrease in relaxation compared to SC dams (% relaxation at 3 nM Ach; SK: 95 ± 4 vs SC: 98 ± 5, p < 0.001). In mesenteric arteries, the vasodilatory responses to Ach and sodium nitroprusside were similar between the groups. Initial preliminary BP measured by radiotelemetry suggests that mean arterial pressure at the end of pregnancy is higher in the SK versus SC dams (SK: 126 mmHg vs SC: 115 mmHg).

DISCUSSION/SIGNIFICANCE OF IMPACT: We conclude that loss of IDO leads to endothelial dysfunction in aorta and increased proteinuria in pregnancy. Given recent data placing a primary role of fetal tolerance in the pathogenesis of preeclampsia, these data support that IDO is important in the initiating steps of preeclampsia.
IRF8 ALLELE ASSOCIATED WITH MULTIPLE SCLEROSIS MODULATES SERUM INTERFERON ALPHA AND SEROLOGIC PROFILE IN SYSTEMIC LUPUS ERYTHEMATOSUS

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OBJECTIVES/SPECIFIC AIMS: Alleles of IRF8 have been associated with susceptibility to both systemic lupus erythematosus (SLE) and multiple sclerosis (MS). While interferon alpha (IFN-α) is thought to be causal in SLE, recombinant type I IFN is used as a therapy in MS. We investigated whether the IRF8 alleles associated with these two diseases were associated with differences in serum IFN-α or serologic profile in SLE patients. METHODS/STUDY POPULATION: The rs12444486 and rs17445836 single nucleotide polymorphisms (SNPs) in IRF8 were genotyped with Taqman primer-probe sets. We studied 548 SLE patients (258 African-American, 147 European-American, and 143 Cretan) and 526 controls matched by ancestry background association between IRF8 and SLE at the MS-associated rs17445836 SNP (18 m, 30 m, 18 m, and 2 4 m, 7 0 m, 7 0 m, and 0 0 m, p = 0 09), even after adjusting for maternal BMI. DISCUSSION/SIGNIFICANCE OF IMPACT: Based on information reported by participant’s mothers, we have found a trend towards greater BMI z-scores in Hispanic children exposed to GDM in utero compared to nonexposed Hispanic children. Current work is underway to directly measure the height, weight and total body fat of an expanded number of GDM exposed and nonexposed offspring. This work is the first to examine the relationship between exposure to maternal diabetes in utero and childhood adiposity in the Hispanic population, a high-risk group and the fastest growing segment of the United States population.

LOWE SYNDROME-LIKE PHENOTYPE CAUSED BY A LARGE DELETION THAT INCLUDES CLCN5: A NOVEL CONTIGUOUS DELETION SYNDROME

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OBJECTIVES/SPECIFIC AIMS: To clarify the genetic basis of our patient’s unusual constellation of clinical findings. METHODS/STUDY POPULATION: The subject of this study is a 5-year-old male with clinical features partially consistent with a diagnosis of Lowe syndrome (LS): low molecular weight proteinuria with hypercalciuria and nephrocalcinosis, developmental delay, recurrent seizures, cryptorchidism and stunted growth. However, hypopituitarism (partial TSH and complete GH deficiencies), microcephaly, cleft palate and absence of cataracts have not been described in the context of LS. RESULTS/ANTICIPATED RESULTS: The large deletion (LS) but our patient did not. Mutations in CLCN5 were then sought since the renal phenotype of Den’s disease is indistinguishable to that of LS: most CLCN5’s exons failed to amplify but our patient did not. Mutations in CLCN5 were then sought since the renal phenotype of Den’s disease is indistinguishable to that of LS: most CLCN5’s exons failed to amplify by standard PCR. SNP genotyping revealed a 3.5 MB deletion at Xp11.22 (Illumina 650 GWAS Sequencing across the deletion breakpoint revealed two distinct direct repeats with an intervening inverted repeat. A potential secondary structure derived from these repeats suggests “slipped mispairing” as the cause for this gross deletion. DISCUSSION/SIGNIFICANCE OF IMPACT: Beside CLCN5, the deleted interval contains 14 genes. Of these, the only well-recognized disease-causing gene is SHROOM4. Variants in this gene are associated with Stosco dos Santos syndrome, which is characterized by mental retardation, seizures and stunted growth. We propose that the unusual phenotype of our patient is due to a novel contiguous deletion syndrome. The possibility of a deletion hot spot is currently being investigated on a group of patients with large but unmapped deletions in the same genomic region.
translational research aims to understand the pathogenesis of PE. **METHODS/STUDY POPULATION:** We evaluated BBB function and the plasma and urine levels of MBG and angiogenic factors in a rat model of PE. Human brain microvascular endothelial cells (HBMEC) were utilized to examine any alteration in monolayer permeability caused by MBG. In HBMEC, the phosphorylation of ERK1/2, Jnk, p38, and Src was evaluated with MBG and Apoptosis was evaluated. The effect of MBG on endothelial tight junction proteins was determined. Urinary MBG and angiogenic factors were detected in the normal and PE patients. **RESULTS/ANTICIPATED RESULTS:** Our data indicate increases in BBB permeability in the PE rats and that urinary excretion of MBG is increased. MBG induced an increase in monolayer of HBMEC permeability. MBG caused a significant decrease in the phosphorylation of ERK1/2 and activated the phosphorylation of Jnk, p38, and Src. MBG significantly increased the expression of caspases 3/7, indicating the activation of apoptosis. MBG causes the disruption of endothelial adherent tight junction proteins. The urinary excretion of MBG is higher in PE patients compared to normal. An angiographic imbalance was observed in PE patients compared to normal. **DISCUSSION/SIGNIFICANCE OF IMPACT:** We propose the novel hypotheses that MBG precedes PE, MBG causes the disruption of tight junction proteins leading to BBB hyperpermeability via activation MAPK which triggers apoptotic mechanisms resulting in cerebral edema that is a common feature of PE, and angiogenic factors released in this process serve as biomarkers of the extent of vascular imbalance.

**MICROVASCULAR METHODS FOR TRANSLATING GENETIC FINDINGS INTO PREVENTIVE INTERVENTIONS**

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**OBJECTIVES/SPECIFIC AIMS:** Genetic research on behavioral outcomes holds promise for enhancing the effectiveness of preventive interventions, but poses considerable challenges given the dynamic interplay between genes and environment. We introduce a novel research design, called microtrials, as a means of translating basic genetic findings into prevention trials. Microtrials are defined as randomized experiments testing the effects of relatively brief and focused manipulations designed to suppress specific risk mechanisms, but not to bring about full preventive effect. Findings from microtrials can be used in the development or refinement of targeted preventive interventions. This presentation has three specific aims: (1) present findings on risk mechanisms associated with depression; (2) discuss a set of microtrials designed to test the malleability of these mechanisms in high-risk samples; (3) clarify how findings from these microtrials will be used to refine preventive interventions.

**METHODS/STUDY POPULATION:** We present data from two studies of stress-triggered depression involving nearly 500 recently unemployed adults. **RESULTS/ANTICIPATED RESULTS:** Findings implicate several phenotypic and genotypic risk factors that exacerbate the effects of stressors on the development of severe depression or anxiety. Data link these general risk factors to specific mediators thought to be malleable mechanisms and plans for testing their effects in a series of microtrials designed for individuals at greatest risk, based on phenotypic and genotypic data, and discuss how to use the results of microtrials to build next-generation preventive interventions specifically tailored to high-risk populations.

**DISCUSSION/SIGNIFICANCE OF IMPACT:** We propose the novel microtrial design to test the malleability of these mechanisms in high-risk samples; (3) clarify how findings from these microtrials will be used to refine preventive interventions. **METHODS/STUDY POPULATION:** We present data from two studies of stress-triggered depression involving nearly 500 recently unemployed adults. **RESULTS/ANTICIPATED RESULTS:** Findings implicate several phenotypic and genotypic risk factors that exacerbate the effects of stressors on the development of severe depression or anxiety. Data link these general risk factors to specific mediators thought to be malleable mechanisms and plans for testing their effects in a series of microtrials designed for individuals at greatest risk, based on phenotypic and genotypic data, and discuss how to use the results of microtrials to build next-generation preventive interventions specifically tailored to high-risk populations.

**NOVEL DIETARY TREATMENTS FOR ANOREXIA NERVOSA IN CHILDREN**

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**OBJECTIVES/SPECIFIC AIMS:** To define the dietary characteristics that lead to inpatient admission for the treatment of anorexia nervosa (AN) and children and use this information to refine a rat model of AN. This modified rat model of AN can then be used to screen novel dietary treatments for AN insuring that only the most efficacious interventions are tested clinically. **METHODS/STUDY POPULATION:** 15 females, 12–18 years, were administered a food frequency questionnaire (FFQ) and 24 h dietary recall to assess changes in diet that lead to inpatient admission. Data from diet questionnaires was used to refine a rat model of AN to more closely mimic the human condition. This rat model of AN was subsequently used to determine the effects of a low leucine diet on recovery time (time to 100% of pre-AN weight) and body fat content assessed by quantitative magnetic resonance. **RESULTS/ANTICIPATED RESULTS:** Dietary intake in pediatric AN patients was 1448 ± 181 kcal in the 6 mo prior to admission (FFQ) which had dropped to 1371 ± 295 kcal immediately prior to admission (24 h recall). The macronutrient content of the diet did not change over time (57% carbohydrate, 26% fat, 17% protein). So, AN was induced in Sprague Dawley female rats via free access to a running wheel and 1 h access to low fat diet per day. Upon reaching 75% of initial body weight (AN), rats were refed either a moderate fat, high protein diet (25% fat, 29% protein, control) or the same diet with a low leucine content (LoLeu). Rats recovered to 100% of initial weight after 4 d of refeding with a total of 11% body weight whereas the LoLeu rats took 12 d to recover and had only 4% body weight. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The LoLeu diet is not a suitable treatment for AN. However, we have developed a good rat model for preclinical testing of novel AN dietary treatments.

**NUTRIENT INTAKE AND SUPPLEMENT USE IN CHILDREN WITH AUTISM SPECTRUM DISORDERS**

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**OBJECTIVES/SPECIFIC AIMS:** To examine dietary intake and supplement use in children with autistic spectrum disorders. **METHODS/STUDY POPULATION:** The DSIR software was used to analyze nutrient intake and supplement use on 126 three day diet records of children with ASD aged 2–11 in a multicenter study of dietary behaviors and nutrition
status. Usual intake was compared to the IOM’s Dietary Reference Intakes (DRI). The percentage of children meeting recommended nutrient intakes and the level of consuming nutrients above the Upper Limit (UL) from food alone were determined. Nutrients provided by dietary supplements were assessed and compared to the recommended intakes in the diet and to ULs for children. RESULTS/ANTICIPATED RESULTS: Diets were not met in many participants for vitamin D (89%), vitamin A (67%), and calcium (55%). Fruits and vegetables were described as “good” by children age 5–21 years with SMA types II or III who were able to cooperate with physical therapist (PT) and live within 60 miles of study center. DETERMINATIONS USED: Participants have expressed interest in the study and will be scheduled for the study. RESULTS/ANTICIPATED RESULTS: One participant has completed the PST program without study-related adverse events, reports of pain, or loss of strength. He progressively increased his diet, achieved appropriate physical exertion levels, and completed outcome measure visits successfully. Two additional participants have enrolled, and 12 additional participants will start PST shortly. Overall, the study is the first to provide preliminary data on PST as a potentially feasible, safe, and effective intervention in children and adolescents with SMA.

P198 PILOT STUDY OF PROGRESSIVE STRENGTH TRAINING IN SPINAL MUSCULAR ATROPHY
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OBJECTIVES/SPECIFIC AIMS: The objective of this study is to obtain preliminary data on the feasibility, safety, and effectiveness of a supervised, home-based, progressive strength training (PST) exercise program in children and adolescents with spinal muscular atrophy (SMA). Specific Aim 1: Ascertain the feasibility of participation in the PST program after start of PST exercise program. Specific Aim 2: Determine the safety and tolerability of PST in study population. Specific Aim 3: Determine candidate outcome measures at baseline and at weeks 6, 12, and 16 after start of PST.

METHODS/STUDY POPULATION: Methods: A nonblinded pilot study. Study population: children age 5–21 years with SMA types II or III. All participants are able to cooperate with physical therapist (PT) and live within 60 miles of study center.

RESULTS/ANTICIPATED RESULTS: One participant has completed the PST program without study-related adverse events, reports of pain, or loss of strength. He progressively increased his diet, achieved appropriate physical exertion levels, and completed outcome measure visits successfully. Two additional participants have enrolled, and 12 additional participants will start PST shortly. Overall, the study is the first to provide preliminary data on PST as a potentially feasible, safe, and effective intervention in children and adolescents with SMA.

P199 PTEN ASSOCIATION WITH MTOR PATHWAY ACTIVATION AND OUTCOMES IN BLADDER CANCER
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OBJECTIVES/SPECIFIC AIMS: We have recently identified mTOR pathway activation in urothelial carcinoma (UCa). We next sought to determine the relationship of PTEN, an upstream negative mediator of mTOR, to mTOR activity and outcomes in UCa patients. METHODS/STUDY POPULATION: Patients with UCa (n = 118) were examined for PTEN expression, including intensity of expression (0 to 3) and predominant subcellular localization (nuclear/nonnuclear). Results were correlated with the presence of lymph node (LN) metastases, recurrence-free survival (RFS) and overall survival by univariate and multivariate analysis. PTEN intron/exon mutational analysis was performed by DGGE and mutational status was correlated with PTEN protein expression in 91 specimens.

RESULTS/ANTICIPATED RESULTS: The majority of patients (91/118, 81%) demonstrated moderate to intense expression of PTEN. PTEN was primarily localized to the nucleus in 30/116 (26%) patients. In LN metastases, reduced PTEN intensity was associated with an increased percentage of phospho-mTOR cells (p = 0.02). PTEN mutational analysis identified 3 variants (c.132C>T, c.511C>G, c.892C>G) which were associated with absent PTEN protein expression and diffuse phospho-mTOR expression. Reduced RFS was correlated with positive surgical margins (p = 0.09), carcinoma in situ (p = 0.09) and nuclear PTEN (p = 0.08). Reduced overall survival was significantly associated with metastases (p = 0.04) and nuclear PTEN expression (p = 0.04). Stepwise multivariable analysis showed an association between reduced RFS and LN metastases (p = 0.03), carcinoma in situ (0.05) and nuclear PTEN (p = 0.07). DISCUSSION/SIGNIFICANCE OF IMPACT: alterations in PTEN appear to need further study to target mTOR pathway activity in UCa, although few mutations result in reduced PTEN expression. Nuclear localization of PTEN is a relatively new finding and its function in mediating cancer behavior is under investigation.

P200 REAL-TIME LASER SPECKLE IMAGING AS A DIAGNOSTIC TOOL IN THE TREATMENT OF PORT WINE STAIN THROUGH IMAGE-GUIDED LASER SURGERY
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OBJECTIVES/SPECIFIC AIMS: Improve the treatment efficacy of port wine stain birthmarks (PWS) using laser speckle imaging (LSI) as a means to develop image-guided...
 laser surgery. METHODS/STUDY POPULATION: PWS are vascular malformations seen in approximately 12,000 births a year. LSIs is a technique in which imaging of coherent light remitted from an object results in a speckle pattern. The spatiotemporal statistics of this pattern is related to the movement of optical scatterers, such as red blood cells, and image processing algorithms are applied to produce speckle flow index (SFI) maps, which are representative of tissue blood flow. If performed in real time, the SFI can be an important role in image-guided surgery for the treatment of PWS.

RESULTS/ANTICIPATED RESULTS: In general, SFI values within treated regions showed a progressive decrease with each treatment pass, as well as a border of hyperemia surrounding the treated region. With real-time feedback, the physicist was in most cases able to achieve uniform vascular shutdown in the region of interest. DISCUSSION/SIGNIFICANCE OF IMPACT: The SFI, within image-guided surgery, can provide an objective measure for determining blood flow, which is essential in the treatment of PWS. Furthermore, the SFI has great potential for application in a wide range of disciplines, such as neurosurgery and ophthalmology.

REMOTE PROGRAMMING OF COCHLEAR IMPLANT

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OBJECTIVES/SPECIFIC AIMS: Evaluate the combination of teledermatology and smart programming software to remove cochlear implant face-to-face programming and to improve programming efficiency without impacting the quality of the clinical outcome, the subject's ability to hear well. METHODS/STUDY POPULATION: Subjects are adult cochlear implant recipients. An audiologist is located in a different room than the subject. Using remote desktop technology to control and to monitor a local computer in front of a subject, the audiologist remotely supervises the interaction between the subject and smart programming software. The remotely programmed result is compared with the subject's own traditionally programmed result. RESULTS/ANTICIPATED RESULTS: Preliminary data showed no clinically significant differences between the remotely programmed result and the subject's own traditionally programmed result. DISCUSSION/SIGNIFICANCE OF IMPACT: A cochlear implant (CI) is an electronic hearing device, designed to help people who are deaf or hard of hearing. Surgically implanted into the cochlea, CI provides electrical stimulation to the neurons. A face-to-face session is required with an audiologist to custom "program" the device for each individual. Based on the patient's self-report of audibility, the audiologist adjusts the current level delivered through the electrodes in order to achieve the appropriate loudness. Most rural areas do not have CI audiologists available, and long travel distances may cause patients to arrive tired and tense, increasing the potential for a poor programming session. Although previous studies demonstrated the feasibility to remotely program a CI, a local representative has always been present at the subject's location in order to facilitate the process. This study uses smart programming software to eliminate local representative presence, improving efficiency of remote programming procedure.

RESISTANCE TO ANNEXIN A5 ANTICOAGULANT ACTIVITY IN CHILDREN WITH RHEUMATIC DISEASE CORRELATES WITH PERSISTENT ANTIPHOSPHOLIPID ANTIBODIES AND THROMBOSIS

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OBJECTIVES/SPECIFIC AIMS: Annexin A5, a potent anticoagulant protein, shields phospholipids on vascular endothelial cells from availability for coagulation reactions. Disruption of this shield by antiphospholipid (aPL) antibodies may play a role in the pathogenesis of antiphospholipid antibody syndrome (APS). In this study, we investigated the association between aPL antibodies and annexin A5 resistance (ASR) in children with rheumatic diseases. METHODS/STUDY POPULATION: Clinical and laboratory data were collected from 90 children with rheumatic diseases. All patients were tested for lupus anticoagulant (LA), anticardiolipin (aCL) and anti-β2 glycoprotein I (anti-β2GPI) antibodies. A novel assay, ASR, was performed measuring coagulation times in the presence and absence of annexin A5. RESULTS/ANTICIPATED RESULTS: Patients with persistently positive aPL antibodies had significantly lower mean ASR levels compared to patients with no aPL antibodies (Persistent positivity of one or more aPL antibodies: mean ASR = 202.58 ± 43.91 vs. 247.10 ± 35.35, p<0.001). Patients with an underlying diagnosis of primary APS, SLE, SS or MCTD had significantly higher prevalence of persistently positive aPL antibodies (p = 0.001), thrombotic events (p = 0.014) and lower mean annexin ASR (p = 0.003) as compared to the remainder of the group. Patients with thrombotic events also had significantly lower mean ASR (p = 0.048). DISCUSSION/SIGNIFICANCE OF IMPACT: The ASR assay is the first mechanistic assay targeted at the underlying pathogenesis of APS. This is the first report demonstrating that children with rheumatic diseases and persistently positive aPL antibodies demonstrate resistance to annexin A5 anticoagulant activity. Furthermore, patients with prior history of thrombosis were also shown to have reduced ASR.

RESTING STATE NETWORKS IN EARLY STAGE PSYCHOSIS

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OBJECTIVES/SPECIFIC AIMS: Investigate differences in functional connectivity between patients with early stage psychosis and healthy control subjects. METHODS/STUDY POPULATION: Nine male patients (age 18–27) with early stage psychosis, and 9 healthy controls, matched for age and handedness. RESULTS/ANTICIPATED RESULTS: Quantitative comparison of resting default mode network activation maps between healthy controls and patients with early psychosis shows significantly greater activation lateralized to right dorsolateral prefrontal cortex (DLPFC) and right posterior parietal cortex (p < 0.01, k = 50), similar to the findings of Calhoun and colleagues, when masked to display only DMN network components (masked by HC average DMN at p < 0.001). DISCUSSION/SIGNIFICANCE OF IMPACT: There is increasing evidence of anomalous functional connectivity in patients with psychosis, with some studies reporting decreases in connectivity and others hyperconnectivity. Our results indicating early stage psychosis is associated with decreased functional connectivity and are consistent with reports of disrupted white matter connectivity (Kubicki et al., 2007), which could produce the hyperconnectivity observed in the patient sample.

SIMVASTATIN EFFECTS ON MEVALONATE PATHWAY TARGETS IN THE LUNG

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OBJECTIVES/SPECIFIC AIMS: Simvastatin (Sim) inhibits allergic airway inflammation in the ovalbumin (OVA) mouse model. To transition from animals to humans, we investigated whether systemic treatment with Sim inhibits mevalonate (MA) pathway targets in mouse lung and human airway epithelial cells. We hypothesized that Sim treatment of mice and human airway epithelial cells inhibits total cholesterol (TC) synthesis and alters HMG-CoA reductase (HMGR) expression, the target of the statins. METHODS/STUDY POPULATION: BALB/c mice were sensitized/exposed to 1%OVA aerosol for 2 weeks. Sim 40 mg/kg was injected intraperitoneal at 30 min before OVA nebulization. HBE1 cells were treated with Sim 10 μM or 20 μM for up to 16 hrs. TC content in whole lung homogenates and HBE1 whole cell lysates was determined. HMGR protein was determined in cell cytosolic and membrane fractions by Western blot. RESULTS/ANTICIPATED RESULTS: In mice, TC content did not differ between OVA or air controls, and Sim did not alter TC content. In HBE1 cells, 16 hrs Sim treatment caused a dose-dependent 30% decrease in TC, and Sim 20 μM caused a time-dependent decrease in TC. In mice, Sim decreased HMGR protein expression (100 kDa) by 56% in the OVA group, with no change in the air controls. In HBE1 cells, Sim 20 μM treatment for 4 hrs decreased HMGR protein expression (60 kDa) by 52.6%. DISCUSSION/SIGNIFICANCE OF IMPACT: Sim did not alter lung TC content, but may reduce TC in the airway epithelium via HMGR inhibition. Airway epithelial changes in TC and HMGR expression may be good indicators that statin reached the airway. HMGR enzyme activity and/or statin drug levels may be better indicators of drug reaching the target tissue. Further work and validation of these results will yield a protocol for determining whether orally ingested statins in human asthmatics reach the airway epithelium.
and somatic hypermutation (SHM)-induced affinity maturation, and that SHM is an antigenic stimulus is unknown. We propose that HCV-IgG ICs simulate B cell expansion immune complexes (ICs). MC is a clonal B cell lymphoproliferative disorder, yet its cryoglobulinemia (MC), a vasculitis caused by rheumatoid factor (RF)-containing Igs and test whether they depend upon SHM.

OBJECTIVES/SPECIFIC AIMS: 

Ig variable (V) region RT-PCR was performed on three HCV MC patients’ singly-autoreactive germline Igs and expansion of polyreactive, “natural antibodies”.

Autoreactivity arises from antigen-dependent SHM, as opposed to nondeletion of RF activity, suggesting that context-specific pairing of appropriate IgH and Igk, in addition to SHM, is necessary for these Igs’ RF activity.

MIXED CRYOGLOBULINEMIA FACTOR ACTIVITY IN HEPATITIS C VIRUS-ASSOCIATED VENTRICULAR REMODELING AND FUNCTION IN PATIENTS WITH SEVERE AORTIC STENOSIS

OBJECTIVES/SPECIFIC AIMS: 

The diabetic heart exhibits increased left ventricular (LV) mass and reduced ventricular function. However, this relationship has not been studied in patients with aortic stenosis (AS). Our objective was to determine how diabetes mellitus (DM) impacts LV remodeling and function in patients with severe AS.

METHODS/STUDY POPULATION: 

Echocardiograms were performed on 114 patients with severe symptomatic AS (mean age 82 years, 47% female, mean annular valve area (AVA) 0.59 cm², mean LV ejection fraction (EF) 50%, 47% diabetic) and included measures of LV remodeling and LV function. Multivariable linear regression models investigated the independent effect of DM on these aspects of LV structure and function.

RESULTS/ANTICIPATED RESULTS: 

Among diabetics (n = 60), diabetes (n = 54) had increased LV mass, LV end-systolic dimension, LV end-diastolic dimension, and decreased LVEF and longitudinal systolic strain (p < 0.01 for all). In multivariable analyses adjusting for age, sex, systolic BP, AVA, BSA, and CAD, DM was an independent predictor of increased LV mass (β = 26.6, p = 0.01), LV end-systolic dimension (β = 0.5 cm, p = 0.008), and LV end-diastolic dimension (β = 0.3 cm, p = 0.025). After additionally adjusting for LV mass, DM was associated with reduced systolic strain (β = 1.9%, p = 0.023) and a trend toward reduced EF (β = 5%, p = 0.09). DISCUSSION/SIGNIFICANCE OF IMPACT: 

DM has an additive adverse effect on hypertrophic remodeling—increased LV mass and larger cavity dimensions—and is associated with reduced systolic function in patients with AS beyond known factors of pressure overload. Given the adverse effects of LV hypertrophy and dysfunction in patients with AS, our findings may have important clinical implications.

THE EFFECT OF LOW DOSES OF PLASMAID DNA IN THE CONTROL OF AUTOIMMUNE DIABETES

OBJECTIVES/SPECIFIC AIMS: 

The aim of this study is to evaluate the role of sequences of plasmid DNA in the control of autoimmune diabetes. METHODS/STUDY POPULATION: 

Mice were induced to develop diabetes with daily applications of streptozotocin (STZ). A group received plasmid STZ + DNA and the other group only STZ. After the treatment, the pancreatic lymph nodes cells were cultivated and stimulated or not with insulin. These cells were analyzed by flow cytometry (FACS) and the pancreas of each animal was removed for histological analysis.

RESULTS/ANTICIPATED RESULTS: 

FACS analysis showed reduction in the number of insulin-specific T CD8 cells in the groups treated with DNA. These cells showed a memory phenotypes labeled by CD44/CD62Llo and CD44hi/CD62Lhi. T CD4 cells did not exhibit significant reduction between the groups. In the pancreatic histology it was possible to observe reduced inflammatory infiltrates with better preservation of the islets in the group treated with DNA than in the group treated with STZ.

DISCUSSION/SIGNIFICANCE OF IMPACT: 

The treatment with plasmid DNA sequence reduced the number of infiltrating TCD8 cells in the pancreas, enhanced the preservation of the islets. These data showed that the treatment with the DNA sequence was capable to reduce the inflammatory injury in the pancreas, suggesting that this strategy could be efficient for the treatment of this pathology.

STRESSORS OF PEDIATRIC CANCER CARE: THE IMPORTANCE OF INTERPERSONAL INTERACTIONS

OBJECTIVES/SPECIFIC AIMS: 

As the understanding and treatment of cancer continues to improve, the population of long-term adolescent and young adult (AYA) survivors continues to grow. As a result, AYA patients, their families and healthcare providers face a potentially long and stressful shared illness experience.

METHODS/STUDY POPULATION: 

Phase 1, the current study, focuses on the interactions of AYA patients and their primary caregivers in the family unit. This relationship is particularly important as it has a major influence on the AYA’s psychological and physical well-being, while serving as the primary support system for dealing with treatment procedures and coping in general during this unique developmental life stage.

Phase 2 will explore the interactions between pediatric patients, their primary caregiver, and their physicians in the healthcare setting. Phase 3 will consist of an intervention for healthcare providers based on findings from Phases 1 and 2.

RESULTS/ANTICIPATED RESULTS: 

Phases 1 and 2 will identify the common cancer care stressors experienced within the family unit (i.e., AYA patient and his/her primary caregiver) and the healthcare setting (i.e., AYA patient and his/her primary caregiver and healthcare provider), respectively. Phase 3 will be used to assess an intervention designed for healthcare providers that is intended to lessen the stressors within pediatric cancer care. DISCUSSION/SIGNIFICANCE OF IMPACT: 

Findings from this program of research have the potential to guide future policy so as to promote health and well-being in cancer survivors and their caregivers, as well as ensure more efficient and cost-effective utilization of healthcare resources.

THE ADVERSE IMPACT OF DIABETES MELLITUS ON LEFT VENTRICULAR REMODELING AND FUNCTION IN PATIENTS WITH SEVERE AORTIC STENOSIS

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OBJECTIVES/SPECIFIC AIMS: 

The diabetic heart exhibits increased left ventricular (LV) mass and reduced ventricular function. However, this relationship has not been studied in patients with aortic stenosis (AS). Our objective was to determine how diabetes mellitus (DM) impacts LV remodeling and function in patients with severe AS.

METHODS/STUDY POPULATION: 

Echocardiograms were performed on 114 patients with severe symptomatic AS (mean age 82 years, 47% female, mean annular valve area (AVA) 0.59 cm², mean LV ejection fraction (EF) 50%, 47% diabetic) and included measures of LV remodeling and LV function. Multivariable linear regression models investigated the independent effect of DM on these aspects of LV structure and function.

RESULTS/ANTICIPATED RESULTS: 

Among diabetics (n = 60), diabetes (n = 54) had increased LV mass, LV end-systolic dimension, LV end-diastolic dimension, and decreased LVEF and longitudinal systolic strain (p < 0.01 for all). In multivariable analyses adjusting for age, sex, systolic BP, AVA, BSA, and CAD, DM was an independent predictor of increased LV mass (β = 26.6, p = 0.01), LV end-systolic dimension (β = 0.5 cm, p = 0.008), and LV end-diastolic dimension (β = 0.3 cm, p = 0.025). After additionally adjusting for LV mass, DM was associated with reduced systolic strain (β = 1.9%, p = 0.023) and a trend toward reduced EF (β = 5%, p = 0.09). DISCUSSION/SIGNIFICANCE OF IMPACT: 

DM has an additive adverse effect on hypertrophic remodeling—increased LV mass and larger cavity dimensions—and is associated with reduced systolic function in patients with AS beyond known factors of pressure overload. Given the adverse effects of LV hypertrophy and dysfunction in patients with AS, our findings may have important clinical implications.
THE ROLE OF TRPV1 IN MORTALITY AND IMMUNE RESPONSE DURING MURINE SEPSIS

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OBJECTIVES/SPECIFIC AIMS: Transient receptor potential vanilloid 1 (TRPV1), a nonselective cation channel expressed in sensory neurons, has a pivotal role in nociception. Therapies targeting TRPV1 are being tested in humans and animals to treat pain syndromes. Studies show that TRPV1 has a role in sepsis and the purpose of this study is to determine whether its effect on survival and immune response is beneficial or harmful. METHODS/STUDY POPULATION: We studied effects of genetic [TRPV1-knockout (KO)] or wild-type (WT) mice] and pharmacologic TRPV1 disruption with resiexercisein (RTX, an agonist) or capsaicin (CPZ, an antagonist) on mortality, bacterial clearance, and cytokine response during LPS or cecal ligation and puncture (CLP)-induced sepsis. RESULTS/ANTICIPATED RESULTS: After CLP, TRPV1-KO had increased mortality risk [2.17 (1.23 to 3.81)] hazard ratio (95% CI), p = 0.01] compared with WT. Further, intrathoracic RTX vs. vehicle increased mortality risk [1.80 (1.05 to 3.2)] hazard ratio (95% CI), p = 0.03] in WT but not in TRPV1-KO mice. After LPS, neither genetic disruption nor pharmacologic activation of TRPV1 with RTX had a significant effect on survival compared with controls. In contrast, after LPS, pharmacologic disruption of TRPV1 with CPZ, compared with vehicle, increased mortality risk [1.92 (1.02 to 3.61)] hazard ratio (95% CI), p = 0.04] in WT animals. Further, after CLP, increased mortality in RTX-treated WT animals was associated with higher blood bacterial count (p = 0.0084) and nitrate/nitrite levels and down regulation of TNF-alpha expression (p = 0.004] compared with controls. DISCUSSION/SIGNIFICANCE OF IMPACT: Disruption of TRPV1 can affect mortality, blood bacteria clearance, and cytokine response in sepsis. This is relevant as TRPV1 disruption is being investigated as pain therapy in humans.

P217

TRANSLATIONAL APPROACH TO ASSESSING CARDIOPROTECTIVE EFFICACY OF A NOVEL ANNEXIN-AI TRIPETIDE IN SEVERAL PRECLINICAL MODELS OF MYOCARDIAL ISCHEMIA/REPERFUSION

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OBJECTIVES/SPECIFIC AIMS: Myocardial ischemia/reperfusion (I/R) injury remains a major cause of cardiovascular morbidity and mortality following cardiac surgery. Using several preclinical models of myocardial I/R, we tested the cardioprotective efficacy of a novel tripeptide (ANXA1sp) derived from a glucocorticoid-regulated protein Annexin-A1. METHODS/STUDY POPULATION: In vitro simulated I/R: Adult rat ventricular cardiomyocytes (ARC) were incubated in normal or high glucose (25 mM), with and without ANXA1sp (30 μM) for 24 h, subjected to 2 h oxygen-inotropic or vasopressor support. RESULTS/ANTICIPATED RESULTS: After I/R, Sprague-Dawley rats underwent 75 min of mild hypothermic cardiopulmonary bypass (CPB) with 45 min of cardioprotective arrest (CA) in 4 groups: normo- and hyperglycemic (20 mM), with and without ANXA1sp (30 μM) for 24 h, subjected to 2 h oxygen-inotropic or vasopressor support. Efficacy endpoints were scored based on extent and intensity. RESULTS/ANTICIPATED RESULTS: Higher immunoreactivity for Silver and FAS were detected in the melanoma cases than in the benign and dysplastic nevi cases which was statistically significant (p = 0.001 and p < 0.0015, respectively). DISCUSSION/SIGNIFICANCE OF IMPACT: This study showed that we identified at least two melanoma markers SILV and FAS by mass spectrometry on formalin fixed paraffin embedded sections when comparing metastatic melanoma with a benign nevus. Additional proteins that were found significant by mass spectrometry can now be analyzed by this method on a large scale basis in future studies.

P219

VALIDATION OF TANDEM MASS SPECTROMETRY STUDY

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OBJECTIVES/SPECIFIC AIMS: The incidence of melanoma continues to rise every year, yet the ability to treat advanced disease has not changed. Our previous and current studies aim to identify melanoma markers on FFPE sections by comparing a metastatic melanoma sample and benign nevus with improved protein extraction, gel separation and mass spectrometry analyses. Once this method is validated, additional proteins identified as significant in melanoma cases using mass spectrometry can then be analyzed on a large scale basis in future studies. METHODS/STUDY POPULATION: The melanoma cells or melanocytes were harvested from laser microdissection and then proteins were extracted and analysed by LC mass spectrometer. Data from mass spectrometry studies showed 300 proteins that are differentially expressed between metastatic melanoma and nevi with high significance. Of the proteins, we found two published possible melanoma markers including SILV and fatty acid synthase (FAS) that were in the top 20 most significant proteins to validate the mass spectrometry results using immunohistochemical stains. 32 formalin fixed paraffin embedded sections were retrieved from our archives including 12 benign nevi, 7 dysplastic nevi, and 13 melanoma cases. The stain patterns were scored based on extent and intensity. RESULTS/ANTICIPATED RESULTS: Higher immunoreactivity for Silver and FAS were detected in the melanoma cases than in the benign and dysplastic nevi cases which was statistically significant (p = 0.001 and p < 0.0015, respectively). DISCUSSION/SIGNIFICANCE OF IMPACT: This study showed that we identified at least two melanoma markers SILV and FAS by mass spectrometry on formalin fixed paraffin embedded sections when comparing metastatic melanoma with a benign nevus. Additional proteins that were found significant by mass spectrometry can now be analyzed by this method on a large scale basis in future studies.

P221

VIP AND BOSENTAN: A SUPERIOR COMBINATION AGAINST PULMONARY HYPERTENSION

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OBJECTIVES/SPECIFIC AIMS: Despite considerable advances in the treatment of pulmonary arterial hypertension (PAH), the condition remains highly fatal. There is now considerable appeal for combining multiple drugs. Our objective is to answer the questions: Is a combination of a selective and a nonselective cationic intestinal peptide (VIP) with endothelin receptor antagonist bosentan more effective than either drug alone in treatment of experimental PH? METHODS/STUDY POPULATION: A single injection of monocrotaline (MCT, s.c.) in rats resulted in PH, with RV hypertrophy (RVH), pulmonary vascular remodeling, and lung inflammation in 3 weeks. The pathology was uniformly fatal within 2 weeks. Three weeks after MCT injection, rats received either placebo or were treated with bosentan (po), VIP (ip), or both. After hemodynamic measurements, rats were euthanized and examined for pathologic evidence of pulmonary vascular thickening in lung sections; the degree of RVH and the severity of lung inflammation, assessed by inflammatory cell infiltrates, scored 0–4. Survival was monitored for 45 days after MCT injection. RESULTS/ANTICIPATED RESULTS: MCT caused significant elevation of RV pressure, thickening of smaller pulmonary arteries, perivascular inflammation, and RVH. Treatment with either VIP or bosentan, significantly attenuated all measures of PAH, except for RVH. Rats receiving both VIP and bosentan had the lowest RV pressure, the least vascular thickening, and RVH, and no lung inflammation. All MCT-treated rats were dead within 3–5 weeks after its injection. Bosentan or VIP alone significantly reduced mortality (70% survival, p < 0.01), and all rats receiving both drugs remained alive (100% survival, p < 0.01). DISCUSSION/SIGNIFICANCE OF IMPACT: Combined therapy with bosentan and VIP improve the likelihood of success in reversing pathologic features of PH, and thus improving the outlook for patients with PAH.

A1

CHILDREN WITH ACUTE CNS DISORDERS USE MORE HOSPITAL RESOURCES THAN DO CHILDREN WITH OTHER ACUTE DISORDERS

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OBJECTIVES/SPECIFIC AIMS: We aimed to determine whether children with acute CNS disorders use more hospital resources than do children hospitalized for other conditions. METHODS/STUDY POPULATION: We studied all 960,022 nonfederal hospitalizations of children 29 days to 19 years old in 2005 in 11 states, including 37% of the US pediatric population. Using ICD-9 codes, we identified 103,961 patients with acute CNS disorders and dichotomized them both by treatment at a general versus children's hospital and by use of ICU resources. Length of stay (LOS) and cost of stay (in 2003 dollars) were then calculated. RESULTS/ANTICIPATED RESULTS: Children with acute CNS disorders had nearly 3x greater ICU use than other hospitalized children (30.6% vs 10.6%, p < 0.001) and were much more likely to be hospitalized at a children's hospital (53.9% vs 40.2%, p < 0.001). Admission to the ICU and admission to a children's hospital were both associated with greater resource use regardless of disease status. Overall, mean LOS was 5.5 days for CNS patients and 4.3 days for non-CNS patients, and the mean costs were nearly twice as high for CNS patients than for non-CNS patients ($11,402 vs. $6,525, p < 0.001). DISCUSSION/SIGNIFICANCE OF IMPACT: Children with acute CNS disorders receive more critical care and are more often admitted to children's hospitals than are other hospitalized patients or children with other acute conditions. The origin of greater resource use for CNS patients should be explored with

A1
A2

ICU USE AND MORTALITY ARE HIGHER AMONG CHILDREN WITH ACUTE CNS DISORDERS THAN CHILDREN WITH OTHER ACUTE DISORDERS

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OBJECTIVES/SPECIFIC AIMS: We aimed to determine whether children with acute CNS disorders receive more critical care and have higher mortality than children hospitalized for other conditions.

METHODS/STUDY POPULATION: We studied all 960,022 nonfederal hospitalizations of children 29 days to 18 years old in 2005 in 11 states, comprising 37% of the US pediatric population. Using ICD-9 codes, we identified 103,961 patients admitted with acute CNS disorders and classified them as traumatic or nontraumatic. We generated age- and sex-adjusted national hospitalization estimates using Census data from the CDC.

RESULTS/ANTICIPATED RESULTS: Nationally, 276,119 children were hospitalized with an acute CNS disorder (3.83/1,000), epilepsy (53.9%) and mild TBI (16.6%) were the most common. Children with acute CNS disorders had nearly 3x greater ICU use than other hospitalized children (30.6% vs. 10.6%, p < 0.001) and made up over a quarter (26.1%) of patients receiving ICU care. Although accounting for only 10.8% of hospital admissions, acute CNS disorders accounted for nearly half (46.3%) of deaths (4,754) nationally. Among ICU patients, children with CNS disorders had higher in-hospital mortality (4.8% vs. 1.6%, p < 0.001) and made up 53.7% of deaths.

DISCUSSION/SIGNIFICANCE OF IMPACT: While accounting for a minority of hospital admissions, children with acute CNS disorders more often receive critical care and have higher in-hospital mortality than do children hospitalized for other reasons. A focus on this population has the potential to greatly benefit the outcomes of critically ill children.

A3

A PILOT STUDY TO IMPROVE PROSPECTIVE MEMORY PERFORMANCE IN PARKINSON DISEASE

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OBJECTIVES/SPECIFIC AIMS: Prospective memory, or the ability to remember to carry out previously formed intentions, is essential for functional independence. Individuals with Parkinson disease (PD) have prospective memory deficits which are associated with reduced health-related quality of life. Implementation intentions are a mnemonic strategy designed to improve prospective memory. The purpose of this pilot study was to test the feasibility and potential efficacy of implementation intentions for individuals with PD.

METHODS/STUDY POPULATION: Volunteers with PD (N = 8; age: M = 66.6, SD = 6.5) performed a computerized prospective memory test on two separate occasions about 6 months apart. For the baseline testing session, all participants performed the test under general instructions. For the follow-up testing session, four participants repeated the test under general instructions (control group), and four participants received implementation intentions training before repeating the test (intervention group).

Prospective memory accuracy (proportion correct out of 24 tasks) was compared across groups and testing sessions. RESULTS/ANTICIPATED RESULTS: The groups had similar prospective memory performance at baseline (control: M = 0.65, SD = 0.11; intervention: M = 0.60, SD = 0.19). At follow-up, the intervention group’s accuracy improved 23% (M = 0.83, SD = 0.12), while the control group’s remained relatively stable (M = 0.63, SD = 0.16). All intervention participants improved from baseline to follow-up compared to only 2 control participants.

DISCUSSION/SIGNIFICANCE OF IMPACT: Prospective memory is a clinically-relevant cognitive problem in PD; however, there are currently no rehabilitative efforts aimed at addressing it. These results suggest that implementation intentions training is a feasible and efficacious intervention for prospective memory impairment in PD. More rigorous and controlled testing of the effect of implementation intentions is warranted.

A4

THE LIVE DONOR CHAMPION: FINDING LIVE DONORS BY SEPARATING THE ADVOCATE FROM THE PATIENT

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OBJECTIVES/SPECIFIC AIMS: Reported barriers to identification of a live donor include inadequate education, lack of resources, and reluctance to initiate conversations about donation. In general, patients with ESRD are hesitant to discuss their illness and the difficulties associated with dialysis. However, friends or family members are often eager to spread awareness about their loved one’s plight and are empowered by advocating for them. We hypothesize that separating the advocate from the patient will help alleviate the communication barrier experienced by ESRD patients, and lead to increased live donor transplantation.

METHODS/STUDY POPULATION: We conducted a pilot study of 15 adult kidney transplant candidates who had been on our wait-list at least 3 months and lacked any potential live donors. Each recipient selected a Live Donor Champion (LDC): a friend or family member willing to advocate for them and spread awareness of ESRD and live donor transplantation. The candidate and LDC attended 5 monthly meetings that addressed topics ranging from basic transplant education to methods to initiate conversations. Outcomes included comfort level with initiating a conversation, live donor recruitment, and transplantation.

RESULTS/ANTICIPATED RESULTS: Comfort with initiating conversations about kidney transplantation increased throughout the program. Six potential donors initiated contact and four had reached Phase 2 evaluation. Four program participants accepted deceased donor organ offers, despite the fact that three had repeatedly declined previous offers. They attributed their acceptance to increased knowledge gained through the program.

Two patients received a live donor transplant. DISCUSSION/SIGNIFICANCE OF IMPACT: Transplant candidates are ill-equipped to seek live donors. By separating the advocate from the patient, understandable concerns about initiating conversations are reduced.

A5

COMPLEMENTARY AND ALTERNATIVE MEDICINE USE IN A PEDIATRIC SUBSPECIALTY POPULATION

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OBJECTIVES/SPECIFIC AIMS: The purpose of this study was to solicit information on CAM usage from parents seeking care for their children in a pediatric subspecialty clinic.

METHODS/STUDY POPULATION: A previously field-tested survey of CAM usage was adapted for the clinic population. The survey consisted of general demographic questions and specific questions on CAM use. Parents of patients followed in the Pediatric Rheumatology Division at an academic medical center were invited to complete the survey in 2010.

RESULTS/ANTICIPATED RESULTS: Of 202 consecutive parents who completed the survey, the majority were mothers (88%) with a mean age of 42 years responding on behalf of their children, who were predominantly female (66%) with a mean age of 12 years. The majority of the respondents were white (91%), 3% were Asian and 2% African American. 63% of patients had juvenile arthritis, although children with other chronic conditions were also included. Overall, 51% of patients were current CAM users or had taken some form of CAM in the past. Of the CAM users, 41% had a parent or family member with a history of CAM use compared with 15% of non-CAM users. Multivariate logistic regression will be used to further explore factors significantly different in CAM users versus nonusers.

DISCUSSION/SIGNIFICANCE OF IMPACT: We found that CAM use is extensive in patients with chronic diseases followed in a pediatric subspecialty clinic. Family use of CAM may be associated with patient CAM use. This is of great importance because little is known about the benefits or potential harms of CAM despite its widespread use. It is important for physicians to understand factors that influence decisions to use CAM in children and what benefits parents are seeking with CAM use.

A6

CARE TRANSITIONS AMONG OLDER ADULTS WITH SCHIZOPHRENIA

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OBJECTIVES/SPECIFIC AIMS: Introduction: Adults who struggle with schizophrenia are living longer. At the same time, data suggest that older adults living with schizophrenia have poor physical health. The purpose of this abstract is to present findings from a qualitative study that explored the understanding of physical health among older adults with schizophrenia. In gathering the individual perspectives, participants described how they deal with care transitions and the impact on their physical health.

METHODS/STUDY POPULATION: Methods: A grounded theory study was conducted among 28 older adults with schizophrenia that live in a variety of settings using semistructured interviews and participant observation.

RESULTS/ANTICIPATED RESULTS: Results: Dealing with care transitions was a process that evolved from the data. Some participants described how they were well-prepared to live independently and some participants described how they would never be prepared to live independently. Participants also described how their process of dealing with care transitions could impact their physical health.

DISCUSSION/SIGNIFICANCE OF IMPACT: Older adults with schizophrenia deal with care transitions are impacted through the neurocognitive issues and symptoms of schizophrenia, the medical system, and level of preparation for independent living. These findings provide insights for the design of future research interventions and clinical practice to promote optimal physical health outcomes for older adults with schizophrenia.
**DEVELOPMENT OF A STRUCTURED PARENT TRAINING PROGRAM FOR YOUNG CHILDREN WITH AUTISM**

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**OBJECTIVES/SPECIFIC AIMS:** Autism spectrum disorders (ASD) are characterized by deficits in social interaction, communication, and the presence of repetitive behaviors. In addition, up to 70% of children with ASDs have behavior problems such as tantrums, aggression, and noncompliance and most show deficiencies in adaptive functioning. Parent training has received much interest due to the central role that parents have in promoting the development of their children with autism. This study aimed to develop a 24-Week Parent Training manual for preschool-age children with ASDs and behavioral problems and then evaluate its feasibility and preliminary efficacy. **METHODS/STUDY POPULATION:** Investigators initially made modifications to the Research Units in Pediatric Psychopharmacology: Parent Training (RUPP-PT) manual to insure it was appropriate for preschool age children. The newly developed PT program was then pilot tested in a sample of 16 families who had a preschooelver with ASD and disruptive behaviors. 14 of 16 families completed the intervention. Subjects included 7 children with autism, 9 with PDD-NOS. 81% are Caucasian, 13% Latino, 6% other. 7 are in special education; 9 are in mainstream. **RESULTS/ANTICIPATED RESULTS:** Changes in noncompliant, hyperactive, and irritable behavior from baseline to week 24 were significant and produced robust effect sizes (ES) (Home Situations Questionnaire ES = 1.73; Aberrant Behavior Checklist (ABC)). Irritability ES = 1.04; ABC-Hyperactivity ES = 0.92). Age equivalent gains on the Vineland were 6 months in Daily Living Skills, 13 months in Communication, and 14 months in Socialization. Finally, parents attended 94% of the 11 core sessions. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Preliminary data provide support for the effectiveness and acceptability of this structured parent training manual for young children with ASD.

**THE SCHOOL-BASED RESEARCH AND PRACTICE NETWORK**

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**OBJECTIVES/SPECIFIC AIMS:** The University of Pittsburgh School Based Research and Practice Network (“Network”) was established in July, 2008 and brings together research investigators and public, private, and parochial schools for grades K–12, with the purpose of creating more community-based research in schools and to improve the school environment through outreach and education. **METHODS/STUDY POPULATION:** Between 2008 and 2010 Network staff met with superintendents and key administrators in 42 of 44 school districts in Allegheny County, PA (1.2 million people) to establish communication and identify research interests and priorities. In addition, Network staff outreached to researchers from the University of Pittsburgh, Carnegie Mellon University, and the University of Pittsburgh Medical Center to identify projects appropriate for school environments. **RESULTS/ANTICIPATED RESULTS:** To date, more than 100 researchers have completed the Network’s novel training which helps them understand the advantages and pitfalls of doing research with schools. In addition, the Network has facilitated the placement of research activities in interested schools, now totaling 23 investigators and 7 research projects in over 100 public, private, and parochial schools. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Research with schools is an essential part of community engaged research and translation. The work of the Network facilitates both translation of methods and results between the research and school communities. The Network’s methodology and functions can be easily emulated in other regions and states, with benefits for all participants.

**ATTENTION TO FACES AND BRAIN RESPONSES IN AUTISM**

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**OBJECTIVES/SPECIFIC AIMS:** Face perception is impacted in autism spectrum disorder (ASD). Event-related potential (ERP) studies reveal significant delays at basic stages of face processing, as indexed by a face-sensitive component, the N170. The current study examined the relationship between attention to faces and brain responses in ASD. We specifically investigated whether (a) N170 latency normalizes when point of gaze is controlled or (b) slowed processing is evident irrespective of point of gaze. We predicted that children with ASD would exhibit longer N170 latencies irrespective of the facial feature to which they attended. **METHODS/STUDY POPULATION:** Children with ASD and typically developing children matched for age, sex, IQ, and handedness participated in the study. Participants viewed neutral faces while EEG was recorded continuously at 250 Hz. To manipulate visual attention, the position of a fixation crosshair preceding faces directed attention to either the (a) eyes, (b) nose, or (c) mouth; a fourth presentation condition used (d) no fixation crosshair. N170 latency and amplitude were extracted across six electrodes over the left and right lateral posterior scalp. **RESULTS/ANTICIPATED RESULTS:** Repeated measures ANOVA revealed (a) shorter latencies to faces in the right hemisphere irrespective of group or fixation position, (b) longer latency in the ASD group irrespective of hemisphere or fixation position, and (c) for both groups, shorter N170 latency to eyes relative to noses, mouths, or with no crosshair, all of which were equivalent. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Children with ASD showed delayed latency of face-related brain responses independent of visual attention. These findings emphasize the importance of understanding the temporal dynamics of social brain function in ASD and offer insight into therapeutic strategies.

**IMPLICATIONS OF ARTERIAL CALCIFICATION ON STENT FUNCTION**

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**OBJECTIVES/SPECIFIC AIMS:** Endovascular stenting of the superficial femoral artery (SFA) is sweeping the world. As promising as these stent therapies are, there has been a relatively high rate of stent fractures observed during patient follow-up. This research proposes to study the influence of arterial calcification on stent fracture. Models of the SFA will be developed for uncalcified, severely calcified, and average calcified SFA in patients with peripheral arterial disease (PAD). The stent fatigue for each condition will be studied and compared. **METHODS/STUDY POPULATION:** A detailed examination of clinical patient data and intravascular ultrasound imaging measurements will be obtained from the Peripheral Vascular Core Laboratory at the Cleveland Clinic. Subjects for this study will be aged 18 and above, with a gender and racial mix characteristic of the population with PAD, included in the Cleveland Clinic, Vascular Surgery IRB-approved Registry. **RESULTS/ANTICIPATED RESULTS:** We will test the hypothesis that arterial calcification adversely affects stent durability, increasing stent fracture. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Stent fracture is a serious problem because it could lead to vascular complications such as renousus and stent occlusion. However, there is little information available on the interplay between vessel pathology and stent function, specifically the effect of arterial calcification on stent fracture. A calcified environment changes arterial mechanical properties and vessel dynamics, which can adversely affect stent function. Calcium can cause higher compressive stresses and uneven loading conditions, which can lead to a higher incidence of stent failure. Identifying these mechanical factors will allow design of stents that withstand these forces.