Department of Pediatrics Spring Research Day Abstracts
Friday, April 12, 2013
Health Sciences Learning Center

Department of Pediatrics Spring Research Day
Abstract Booklet
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RESIDENT RESEARCH

****PAS Poster Symposium**

TRENDS IN TOBACCO AND MARIJUANA USE AMONG COLLEGE FRESHMEN

Kelly Bush, Lauren Kacvinsky, Megan Moreno

Background: Tobacco has often been considered a 'gateway' drug to subsequent marijuana use. Few studies have examined the trajectory of tobacco and marijuana use as adolescents enter college. **Objective:** The purpose of this longitudinal study was to evaluate patterns of tobacco use and their association with subsequent marijuana use among college students during their freshman year.
Design/Methods: Incoming college students from two universities (one on the West Coast and the other in the Midwest) were randomly selected from university registrar lists for recruitment. Participants completed phone interviews before entering college (Time 1) and one year later (Time 2). Interviews assessed tobacco and marijuana use, including lifetime and current (past 28 day) use. The TimeLine FollowBack tool was used to assess quantity and frequency of use in the past 28 days and written notes were used to record participant answers. Analysis included Wilcoxon sign rank tests and logistic regression.
Results: Of 338 participants, 315 completed both interviews (93.1% retention rate). Overall, 56% were female, 75% were Caucasian and 59% were from the Midwestern university. At Time 1, 104 (33%) participants reported lifetime tobacco use and 43% of these reported current use. Tobacco users were more likely to report lifetime marijuana use than tobacco non-users (OR 23.3, 95% CI: 11.9-45.7). Of current tobacco users, 53% reported current use of both tobacco and marijuana. Average tobacco episodes per month were similar among users of tobacco only and concurrent users of tobacco and marijuana (5.6 to 7.5). By Time 2, 66% of participants who reported current tobacco use at Time 1 remained current users with an average of 33.6 tobacco episodes per month. Of these, 53% reported concurrent marijuana use. Overall, concurrent users of both substances at Time 2 averaged significantly more tobacco episodes per month than current users of tobacco only (41.9 vs. 24.1, p=0.02). While the frequency of tobacco use increased by Time 2 among current users (5.6 to 33.6, p=0.00), the frequency of marijuana use among concurrent users remained similar (13.1 to 16.8).
Conclusions: Individuals who are current users of tobacco products before entering college are more likely to also smoke marijuana. By time 2, students who use both substances report higher frequency of smoking tobacco than students who use tobacco alone. Future work should involve designing educational campaigns highlighting the increased risks of using these substances together.
***Winner of the Region VI Trainee Travel Award
PAS DATE/TIME/LOCATION Session 2195 – Risky Behaviors and High Risk Populations May 5, 2013; 8:00-10:00 AM; Washington Convention Center; Room 145B

****PAS Poster Presentation**

EMOTIONALLY CHARGED SITUATIONS IN PEDIATRIC RESIDENCY: USING MIXED METHODS TO IDENTIFY PREVALENCE AND COMMON THEMES TOWARDS PROGRAM DEVELOPMENT

Andrea Carberry, Mary Ehlenbach, Cathy Lee-Miller, Megan Moreno

Background: Pediatric residency can be psychologically challenging, especially when emotionally charged situations with patients and families occur. Currently, few formalized programs support the psychological well being of residents who experience these situations. This study used surveys and focus groups to globally explore emotionally charged situations during pediatric residency and identify areas for program development.
Design/Methods: Pediatric residents completed surveys assessing the frequency and types of emotionally charged situations they encountered and current supportive measures they used to cope. Focus groups were conducted with select faculty and residents to discuss survey results and develop a formal program to provide support to affected residents. Written notes were taken during focus groups. Analysis included descriptive statistics for surveys and thematic analysis using an iterative process for focus groups.
Results: Of 25 residents surveyed, 20 (80%) endorsed experiencing at least one adverse patient related event. The most common events were unanticipated morbidity, mortality or making a medical error. Twenty-four residents (96%) reported they had been involved in at least one patient or family interaction that left them negatively affected. The most common were interacting with an angry patient or parent or delivering life-altering information. Only 14 residents (56%) reported they had discussed these events with faculty. All surveyed residents reported a desire to discuss such events with faculty. Focus groups identified three themes regarding these events: all involved grief, anger, or doubt. Grief included both the experience after the death or serious decline of a patient OR witnessing the grief of a patient or family member. Anger included interacting with an angry patient or parent AND anger experienced in any work-related situation. Doubt referred to anxiety experienced by residents when learning autonomous patient management.
Conclusions: Emotionally charged situations are encountered frequently during pediatric residency and a lack of structured faculty support was identified. Next steps include development of a faculty support system with a core group of faculty available to address resident needs. Faculty with experience addressing grief, anger or doubt will be recruited for this capacity.
PAS DATE/TIME/LOCATION May 5, 2013; 4:30-7:30pm; Exhibit Hall D/E Walter E. Washington Convention Center; Poster Number: 758

RESPONSE TO HEPATITIS B VACCINATION IN THE AFCH PEDIATRIC CELIAC POPULATION

Matthew Egberg, Dorota Walkiewicz

Background: Studies of adult and pediatric patients with Celiac Disease (CD) have shown insufficient protective antibody titers to Hepatitis B (HB) following the primary vaccination series. The non-response rate in the general healthy population ranges from 5-10%. A gap exists in the literature in regards to pediatric CD populations and the response to vaccination.

Objective: The purpose of this study is to identify pediatric CD patients at the American Family Children's Hospital who received the primary HB vaccination series to HB and investigate their responses to HB vaccination.

Design/Methods: Chart review (electronic and physical) was used to identify AFCH Celiac patients (biopsy changes and positive serology (tTG IgA, tTg IgG, Anti-Endomysial IgA, or Anti-Gliadin IgA) Identified patients were sent an informational letter regarding the nature of the project as well as a laboratory order form for HepBsAb titers. Titer results were faxed to the Department of Pediatric Gastroenterology at AFCH or electronically sent through the electronic medical record.

Results: 44 patients had titers drawn and were available for analysis. 44% of respondents were male and the average age of patients was 10.2 years. 45% had additional co-morbidities. Of the 44 patients, 24 (56%) did not meet the titer threshold for "protective" antibody titers. Of those patients with non-protective titers, the average age was 10.5 yrs. 54% were female (p-values both>0.05). Time between completion of vaccination series and diagnosis of CD was 12.5 yrs in nonresponder group as compared to 8.5 yrs in responders (p-value = 0.0295).

Conclusions: The pediatric CD population at AFCH shows a high rate of response failure to the primary HB vaccination series. Age, gender, and co-morbidities did not have a statistically significant relationship to response failure. A statistically significant relationship was found in the time period between completion of the HB vaccination series and diagnosis of CD, however. The data shows that for each year increase in the time between completion of HB vaccination and diagnosis of CD, the odds of a response was reduced by 17%. After adjusting for age and gender, there was a 31% reduction in response to vaccination for each year increase.

NON-TWIN SISTERS WITH LANGERHANS CELL HISTIOCYTOSIS: A RARE CASE OF FAMILIAL CLUSTERING

Jon Gehlbach, Carol Diamond

Langerhans cell histiocytosis (LCH) is the most common of the histiocytic disorders and can affect multiple different organ systems. It is largely believed to be a non-hereditary and sporadic disease, though clustering within families has been documented on rare occasions. Here we describe an instance of LCH occurring in a pair of non-twin siblings, in which a 4-year-old girl presents with unifocal skeletal disease 6 years after her sister had been treated for multifocal disease at age 11 months. Instances of a rare disease occurring within a family should be considered strong evidence that a genetic component exists for at least a subset of LCH.

****PAS Oral Presentation**

CARDIOPULMONARY RESUSCITATION CERTIFICATION IN HIGH SCHOOL COACHES: A SURVEY OF WISCONSIN HIGH SCHOOL ATHLETIC DIRECTORS

Matthew W Harer, Jeffrey P Yaeger

Background: Cardiopulmonary Resuscitation (CPR) has been shown to increase survival in instances of sudden cardiac arrest (SCA). With an incidence of 3.75/100,000 in children aged 14-24 and a survival rate of only 11%, SCA is a devastating event. Data show that US high school coaches are the first responders to SCA in one-third of high school athlete collapses, but very little is known about these coaches' CPR certification status.
Objective: The primary objective of this study was to assess the prevalence of CPR certification in Wisconsin high school coaches.
Design/Methods: This study was a web-based survey of Wisconsin high school athletic directors. A sixteen-question multiple-choice survey was created, piloted, and developed into an online survey. An email database from the Wisconsin Interscholastic Athletic Association was obtained and the web-survey was distributed to 503 athletic directors. Responses were tabulated through the UW Qualtrics survey website.
Results: There were a total of 240 survey responses, a 48% response rate, reporting that Wisconsin coaches are the primary responders to the majority of collapses (78%). Overall, 75% of survey respondents have an emergency action plan (EAP). Athletic directors with the longest tenure, greater than 12 years, were the most likely to have an EAP in place at their school ($p<0.007$). The majority of Wisconsin high schools (64%) do not require CPR certification of coaches. In fact, only 50% of all coaches are currently CPR certified. When given the choice, 86% of athletic directors either agree or strongly agree that coaches should be CPR certified. Schools with a previous collapse were more likely to require CPR certification ($p=0.11$). Comparing schools that had a previous collapse against those that did not, 81% vs. 73% had an EAP ($p=0.16$).
Conclusions: In Wisconsin, the proportion of coaches who act as the primary responder to a collapse is greater than previously reported. Although EAPs are present in 75% of schools, two-thirds of schools lack any CPR requirements for coaches. The discrepancy between the number of CPR-certified coaches and number of coaches who serve as primary responders is neither safe nor adequate due to the severe consequences of SCA. Pediatricians should advocate for schools to develop EAPs and mandate CPR certification for coaches as two important steps to protect the safety of high school athletes.
PAS DATE/TIME/LOCATION May 5, 2013; 1:00 - 3:00 PM; Room 147A, Walter E. Washington Convention Center, Presentation Time: 2:45 PM

TRAINING PEDIATRIC RESIDENTS FOR RURAL PRACTICE: A LITERATURE REVIEW

Desire Hurst, Kathleen DeSantes, John Frohna

Background: The need for well-trained rural pediatricians is well-documented with nearly one million children living in rural areas with no primary care physician. Despite this need, current pediatric residency training appears to prepare graduates inadequately for these roles, as 30 percent of rural pediatricians report feeling unprepared for their jobs after completing training.
Objective: The aim of this study is to review the literature for residency programs with successful rural training tracks and to identify knowledge, skills, and attitudes needed by pediatricians who wish to practice in rural areas.
Design/Methods: PubMed and Google Scholar were searched using the keywords “rural health,” “rural training track,” “pediatrics,” “curriculum,” “education,” and “residency.” Articles were limited to those discussing specific curriculum content, education goals, and descriptions of successful rotations. Additionally, websites of pediatric programs with rural components were investigated.
Results: A total of 22 articles met the selection criteria, the majority relating to family medicine training programs. Only three articles specifically addressed pediatrics. Several themes emerged as important for successful rural training tracks including lectures on rural health specific topics, close communication between primary and rural sites, complete immersion into the community during rotations, excellent preceptors, and continuity of care. Skills described as especially necessary for the rural pediatrician were neonatal resuscitation/stabilization, emergency medicine, behavioral and psychiatric management, and long-term care for children with complex medical issues. Unfortunately, there were no recommendations on how to teach these pediatric-specific skills described in literature. Additionally, the pediatric residencies with rural rotations did not list specific educational objectives.
Conclusions: While there is no well-defined pediatric rural training curriculum described in the literature, certain themes of other specialties’ successful rural training tracks may provide a basic guide on how to develop one in the near future.

DEVELOPMENT OF ADOLESCENT SCREENING QUESTIONNAIRE AT A COMMUNITY HEALTH CENTER

Jennifer Jones, Dipesh Navsaria

Objective: The purpose of this study is to describe the development of an adolescent screening questionnaire to efficiently screen for multiple adolescent risk factors during health supervision visits at a community health center.

Design/Methods: A screening tool was developed for use in annual health supervision visits for ages 11-20 using components of AMA Guidelines for Adolescent Preventive Services Middle-Older Adolescent Questionnaire (GAPS), Bright Futures supplemental questionnaire 15-17 year visits, CDC Youth Risk Behavior survey, and original material. A panel of adolescent providers including two physicians, 3 resident physicians and 1 psychologist from the community health center completed 2 rounds of evaluations and provided feedback on content and use of screening tool. A focus group of 13-14 year old teenagers from the community evaluated the tool on ease of use, format, and reading level.

Results: The screener contains 54 questions on 3 pages. Bright Futures questionnaire supplied 70% of questions with modifications made to 16% of the questions, 6% from the GAPS Middle-Older Adolescent Questionnaire with modifications to 17% and 26 % original material. Original material focused on behaviors providers identified as high yield and applicable to our patient population not included on other questionnaires.

Conclusions: The screening tool developed allows for efficient and comprehensive risk assessment at start of health supervision visit. It allows providers to focus on areas of concern and can assist in tailoring specific preventative counseling and intervention programs to meet the needs our adolescent population.

THE FREQUENCY OF SCREEN-TIME DISCUSSIONS AT WELL-CHILD VISITS BY PEDIATRIC RESIDENT AND FACULTY

Jessica Miesfeld, John Frohna

Background: The time children spend watching TV, playing video games, and using a computer for non-schoolwork purposes ("Screen Time") has greatly increased in recent years. The AAP recommendations for well child visits include advising to limit screen time. Recently, more emphasis has been given to discussing the quality of screen time along with quantity given the ever increasing prevalence of screens in our society.

Objective: This study looks at the practices of pediatric residents and faculty members when it comes to discussing screen time at well-child visits for preschool and school-aged children.

Design/Methods: Pediatric residents at all levels of training, as well as general pediatrics and adolescent medicine faculty members, were invited to take a web-based survey. The survey included self-assessment questions on how often the physician asked about quantity of screen time, quality of screen time, and the presence of a TV in the child's bedroom, as well as whether a recent addition to the well-child note templates has increased the practice of asking about screen time.

Results: Response rates were 73% for residents and 62% for faculty. A majority (70-98%) of both residents and faculty ask "most of the time" or more about the quantity of screen time and the presence of a TV in the bedroom for both overweight and healthy children. Residents were significantly less likely (37-50%) than faculty (74-83%) to ask about screen time for a child with multiple medical problems. The majority of both residents (67%) and faculty (59%) feel that the addition of prompts in the well-child note template has increased their practice of asking about screen time at least somewhat. Both residents and faculty were significantly less likely to ask about the quality of screen time (types of programs/games watched and played) for both preschool and school-aged children (3-13% and 30-35% respectively).

Conclusions: Both residents and faculty in our program discuss screen time frequently at well child visits. Only a minority include the quality of screen time in the discussion, however. Adding prompts to the note template appears to have increased the frequency of screen time discussions, and additional prompts about the quality of screen time could be helpful in increasing the discussion of quality as well. Residents are less likely than faculty to talk about screen time for patients with multiple medical problems, which may be secondary to experience and managing time in addressing multiple issues.

****PAS Poster Presentation**

ONLINE RESOURCES FOR PEDIATRIC TYPE 1 DIABETES: WHAT KIDS WANT

Allison J Pollock, Megan A Moreno, M. Tracy Bekx, Ellen L Connor

Background: Over 13,000 youth are diagnosed with type 1 diabetes annually. Diabetes control is often inadequate as adolescents begin to assume their own diabetes care. Online and mobile technology could provide new avenues for young people to gain diabetes education and support.
Objective: The purpose of this study is to evaluate how adolescent patients with type 1 diabetes use online resources to understand and manage diabetes.
Design/Methods: We surveyed patients from outpatient diabetes clinics. Study inclusion criteria were diagnosis of type 1 diabetes, ages 11 through 19 years, and English language. The survey was given online via exam room computers. It contained 35 items that assessed (1) Internet use, (2) perceived utility of diabetes resources and (3) responses to 10 common scenarios. Analyses included Kruskal-Wallis test, Wilcoxon rank sum test, ANCOVA and Chi-square test.
Results: 59 subjects (54% female) completed the survey (response rate=88%); mean age was 14.4 yrs (SD=2.26). When going online to answer diabetes related questions, subjects indicated they accessed the Internet most frequently from "Home" (81%) than all other responses ($p<0.0001$). When asked, "How useful is the Internet in helping you understand type 1 diabetes," 33% of the responders indicated the Internet was useful compared to 28% who did not find it useful. Subjects' responses to common diabetes scenarios included "Go online," "Contact provider" and "Other." When prompted with an emergent situation, "I just had a seizure from hypoglycemia. Where can I get more glucagon?," significantly more subjects indicated "Contact provider" (71%) than all other responses ($p<0.0001$); few subjects indicated "Go online" (5%). When prompted with a sensitive situation, "What should I know about alcohol and drugs related to diabetes?," significantly more subjects indicated "Go online" (67%) than "Contact provider" (33%) ($p=0.027$).
Conclusions: Many adolescents already use Internet resources to improve their diabetes knowledge. In dealing with sensitive topics, many young people go online rather than speaking with a provider. While providers should be the primary resource for emergent patient questions, the availability of online diabetes resources can be a valuable source of diabetes knowledge for young people. Diabetes providers should be familiar with technology that gives patients accurate diabetes information and should be able to make appropriate website and mobile resource recommendations for their patients.
PAS DATE/TIME/LOCATION: May 4, 2013; 1:00 PM - 4:00 PM; Exhibit Hall D/E, Board Number 294

IMPROVING HEALTH LITERACY FOR LOCAL BHUTANESE REFUGEES

Leslie Riopel, Matthew Szadkowski, Halie Anderson, Erin Turner, Cathy Lee-Miller, Evan Kemp, Robert Strait, Desire Hurst, Katie Carlberg, Katie Baker, Sabrina Butteris

Background: Madison has long been a home for refugees from all over the world. After meeting with members of Lutheran Social Services and nurses from the Dane County Department of Public Health, a critical need for basic health education was identified within a group of recently immigrated Bhutanese refugees who have had difficulty establishing medical homes due to basic health literacy challenges.
Objective: It was our goal to continue to investigate the needs of the Bhutanese by hosting focus groups and educational workshops in order to gain insight through the perspective of the Bhutanese. By identifying these needs and providing education, it is our hope to decrease the burden on existing health infrastructure.
Design/Methods: The UW Pediatrics Global Health Track has developed curriculum for three educational sessions regarding the topics of oral health, nutrition, and safety. These sessions incorporated an interactive model of a skit, demonstrations, and discussions. Our community partners provided integral support with curriculum development and with the provision of materials. Using Bright Futures as a guide, we have created a booklet of handouts in English and Nepali that can be used with future refugee groups.
Results: Overall, the project has been well received by both the Bhutanese and our community partners. We found the Bhutanese had many questions regarding dental hygiene, healthy food choices, the growth of their children, and safety. Obesity is a problem for this community as they transition into American culture with exposure to processed foods, a more sedentary lifestyle, and school lunch. Data collected via post session surveys gives us reason to believe the Bhutanese will incorporate the education received into their daily lives. The American Academy of Pediatrics CATCH grant program provided financial support for this project.
Conclusions: This project has been a great opportunity to enhance resident education and community involvement. As residents we learned a lot about advocacy, teamwork, grants, and cultural humility. We also improved our knowledge on the specifics of anticipatory guidance in regards to oral health, nutrition, and safety. We believe that our project has helped strengthen the Bhutanese community in the Madison area by improving their health literacy. We have had the privilege of working with Bhutanese refugees in clinics across the University of Wisconsin system and have been thrilled to find them re-enforce concepts emphasized in our workshops at clinic visits.

ASSESSING THE EFFECTIVENESS OF RESIDENT QUALITY IMPROVEMENT PROJECTS: USING ACUTE OTITIS MEDIA AS AN EXAMPLE

Aaron Van Ningen, Allan Rifkin, Megan Moreno

Background: As a part of maintenance of certification, all pediatricians are required to perform quality improvement projects and in training for this, all residents are required to perform a quality improvement project during residency. It is currently unknown whether resident QI projects lead to improved care of patients.
Objective: This projects aims to assess whether there was a change in practice after a resident QI project.
Design/Methods: This was a quality improvement project performed by retrospective cohort analyses of University of Wisconsin Student Health Service (UHS) patients. Patients with a diagnosis of acute otitis media were evaluated based on type of provider seeing the patient, whether the diagnosis and treatment met AHRQ or AAP recommendations, and general demographic information. The initial period analyzed was between 2/1/11 – 4/30/11. At the end of this period, the findings were presented to UHS staff, after which there were changes in the nursing protocol and medical records workflow. Subsequently, patients seen between 1/1/12-8/31/12 were reviewed to see if there was improvement in guideline adherence.
Results: The two patient populations were similar with respect to age and gender. Overall, there was a significant decrease in the rate of diagnosis of acute otitis media, from 44.6 cases/month prior to intervention (N=131) to 12.7 case/month after intervention (N=114). Overall, there was an improvement in documenting the diagnostic criteria by 17% (50% pre-intervention; 67% post-intervention). The rates of documenting full diagnostic criteria for each provider type before and after intervention are: MD pre = 26%, MD post = 50%, MLP pre = 56%, MLP post = 85%, RN pre = 74%, RN post 75%. There was no significant change in the rate of choosing the correct antibiotics (72% pre-intervention, 68% post-intervention).
Conclusions: Overall, there was a significant reduction in the rate of diagnosis of acute otitis media in this population. Additionally, among those who were given the diagnosis of AOM, a higher percentage had documentation of both signs of inflammation and effusion. The largest change came in patients seen by MLPs. There was no significant change in the rates of choosing antibiotics based on recommendations.

****PAS Poster Presentation**

NORMAL BLOOD PRESSURE IN HEALTHY NEONATES

Natalie O White, Kristi Boelke, John Hokanson, Jens Eickhoff

Background: Despite being one of the vital signs, normative data for systolic and diastolic blood pressure (BP) in healthy neonates is not well defined.
Objective: Our primary objective was to determine the effects of gender, birth weight, gestational age, and measurement site (right arm vs. leg) on BP values.
Design/Methods: We retrospectively reviewed 10,054 paired BP measurements from the right arm and one leg in healthy neonates from the normal newborn nursery at a tertiary care hospital. Gestational age ranged from 35-42 weeks (mean 39 weeks, SD=1.3), and participants were 49% female. BP measurements were obtained using an oscillometric device at greater than 24 hours of life. Nursery policy recommended echocardiography for any baby in which the right arm systolic BP exceeded the leg systolic BP by 15 mmHg or more on repeat measurements.
Results: Based on univariate and multivariate regression analysis, gestational age and birth weight were independent predictors for both systolic and diastolic BP, but gestational age was a stronger predictor than birth weight. There was no statistically significant gender effect detected. Right arm systolic and diastolic BP readings were an average of 1.6 (± 8.5) mmHg ($p<0.001$) and 1.0 (±10.0) mmHg ($p<0.001$) higher than the paired leg pressures, respectively. In 189 neonates (2.1%) the right arm systolic pressure exceeded the leg systolic pressure by at least 15 mmHg on the first measurement, but no babies were found to have a coarctation of the aorta.
Conclusions: Normal BP in newborns at 24 hours of life is determined in part by gestational age and birth weight, but not gender. Interestingly, in healthy neonates leg BP did not overestimate right arm BP as seen in older children. Even in the absence of a coarctation, right arm BP was occasionally much higher than leg BP. This data is clinically relevant as it provides us with normative BP data and could change how we manage and interpret BP in the normal newborn nursery.
PAS DATE/TIME/LOCATION May 5, 2013; 4:15 PM- 7:30 PM; Exhibit Hall D/E, Walter E. Washington Convention Center, Board Number 431

****PAS Poster Presentation**

DISPARITIES IN HEALTH SUPERVISION FOR CHILDREN WITH DOWN SYNDROME

Katie B Williams, Jens Eickhoff, Ellen R Wald, David S Wargowski

Background: Down Syndrome is the most common chromosomal disorder and affects approximately 1/700 live births in the United States. The American Academy of Pediatrics (AAP) published health supervision guidelines for the care of children with Down Syndrome in 2001 to guide primary care practitioners in caring for these medically complex children.
Objective: The purpose of this study is to determine how well the AAP guidelines are followed by well-trained primary care providers practicing in a high quality health system.
Design/Methods: A retrospective chart review of patients with Down Syndrome age ≤ 21 years between March 2001 and July 2012 was conducted. Cervical spine imaging, complete blood counts (CBC), thyroid function tests, audiology exams, and ophthalmology exams were reviewed. Screening was considered compliant if it was completed within 6 months before or 6 months after the recommended date.
Results: 40 children with Down Syndrome with an average age of 9.8 years at the time of chart review were included in the study. The majority of children were Caucasian (85%), had private health insurance (75%), and saw a pediatrician exclusively for primary care (75%). Cervical spine imaging was completed either before or at the recommended age for 95% of the children. Overall compliance with CBC and thyroid function screening was 45% and 64%, respectively. Adherence to audiology and ophthalmology exam recommendations was 38% and 45%, respectively. Overall, as the age of the child increased, the number of encounters with the primary care provider and the compliance with recommended screening decreased. Statistical analysis is ongoing to determine which specific age ranges had the lowest compliance rates with recommended screening and if there are associations between gender, type of health insurance, or type of primary care provider and low adherence to recommended screening.
Conclusions: We found excellent compliance with cervical spine imaging guidelines, but low rates of recommended CBC screening, thyroid function testing, audiology exams, and ophthalmology exams among children with Down Syndrome in a community of well-trained practitioners. It is important to identify specific children at risk for poor health supervision and barriers to adequate care in order to improve the health of children with Down syndrome as the new AAP guidelines (published in 2011) are being implemented.
PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM- 2:00 PM; Exhibit Hall D/E, Walter E. Washington Convention Center, Board Number 120

IS THERE A SEASONALITY TO SNORING AND OBSTRUCTIVE SLEEP APNEA? AN ANALYSIS OF INTERNET SEARCH ENGINE QUERY DATA

David G Ingram, Camilla K Matthews

Background: The successful use of internet search engine query data as a proxy for disease incidence has recently been demonstrated for several conditions, including influenza, depression, and smoking cessation.
Objectives: The primary aim of the current study was to test the hypothesis that there is a seasonal component to snoring and obstructive sleep apnea (OSA) through the use of Google search engine query data. A secondary objective was to evaluate the seasonality of snoring/OSA in children.
Design/Methods: Internet search engine query data were retrieved from Google Trends from January 2004 to December 2012. Monthly normalized search volume was obtained over that nine year period in the United States for each of the following search terms: 'sleep apnea', 'sleep apnea children', 'snoring', and 'snoring children'. In addition, 'sleep apnea' and 'snoring' searches were also examined specifically in Australia. Seasonal effects were investigated by fitting cosinor regression models, and data were averaged by month over the nine year period for visualization.
Results: Statistically significant seasonal effects were found for all search terms with the exception of 'sleep apnea' in Australia, which trended towards an effect. The magnitude, timing, and statistical significance of seasonal effects from cosinor analysis were quantified with amplitude (Amp), phase (Ph), and p-value (p), respectively, as follows: 'sleep apnea' in US (Amp=3.4, Ph=2.6, p=0.003), 'sleep apnea' in Australia (Amp=4.5, Ph=8.1, p=0.07), 'sleep apnea children' in US (Amp=8.2, Ph=2.3, p=0.009), 'snoring' in US (Amp=11.3, Ph=1.6, p=3.5e-15), 'snoring children' in US (Amp=11.3, Ph=3.0, p=0.002), and 'snoring' in Australia (Amp=10.8, Ph=7.9, p=3.5e-9).
Conclusions: Our findings indicate that there is a significant seasonal component to both OSA and snoring internet search engine queries, with the magnitude of this effect appearing to be stronger for snoring than OSA. The peak timing of searches occurred during the late-winter in both the US and Australia. The magnitude of seasonal effect for OSA in children appeared greater than overall OSA searches. These findings should be considered when evaluating patients with suspected sleep disordered breathing.
Pediatric Sleep Medicine Conference; November 7, 2013

IMPROVING THE EFFICIENCY, EFFECTIVENESS, SAFETY, AND PATIENT SATISFACTION OF ADMISSIONS FOR MEDICAL STABILIZATION OF PATIENTS WITH AN EATING DISORDER

Katherine Magnuson, Kristin Shadman, Megan Moreno, David Holz

Anorexa Nervosa and Bulimia Nervosa are life-threatening illnesses that can result in serious morbidity and mortality. Treatment focuses specifically on enabling patients to identify the causes of their eating disorder: a process that requires intensive psychiatric work. When malnourished, patients may be medically unstable, and physically unable, to effectively accomplish this goal. Unfortunately, there is a paucity of literature and lack of evidence based guidelines on medical stabilization or eating disorders for the health care team, often resulting in confusion, inefficiency, and less than optimal patient care. Despite the lack of evidence based guidelines, many healthcare centers have standardized protocols for the medical stabilization of patients with eating disorders. Our goal was to create a multi-disciplinary, standardized protocol/workflow to be used during admissions for medical stabilization of patients with eating disorders.

FELLOW ABSTRACTS

****Oral Presentation - AAAAI**

DIFFERENTIAL EFFECTS OF RHINOVIRUS SPECIES ON COLD AND ASTHMA SYMPTOMS

Bashir H, Bochkov Y, Vang F, Pappas T, Grindle K, Kang T, Salazar L, Anderson E, Turcsanyi S, Evans M, Gangnon R, Kloepfer K, Jackson DJ, Lemanske RF Jr, and Gern JE

Rationale: Previous studies have revealed an increase in asthma exacerbations and rhinovirus (HRV) illness during the spring and fall months. We sought to evaluate HRV infections in children with asthma during these seasons to determine if particular HRV species were associated with greater cold symptoms or loss of asthma control.
Methods: 309 children, 166 with asthma, ages 4-12 years provided weekly nasal mucous samples during the fall and spring seasons. Analysis for common respiratory viruses was done by multiplex PCR. HRV species were identified with partial genetic sequencing. Children and their families concurrently recorded cold and asthma symptoms. Loss of asthma control (LAC) was defined as at least moderate asthma symptoms and increased albuterol use or 20% decrease in peak flow.
Results: Compared to weeks without viral infection, HRV-A, B, and C infections caused greater cold symptoms (mean scores 1.59 vs 3.13, 2.16, and 2.89; $p<0.001$). HRV-A and C infections produced similar cold symptoms ($p=0.64$), and both were associated with increased cold symptoms compared to HRV B infection ($p<0.02$). Compared to HRV-B, HRV-A and C also caused greater asthma symptoms (mean 2.47 and 2.29 vs 1.45, $p<0.02$), and were more likely to cause LAC (mean 16.3 and 15.9 vs 8.5% of infections, $p<0.02$). HRV-B infections were not associated with increased asthma symptoms or LAC.
Conclusions: All HRV species were associated with cold symptoms but only HRV-A and C were associated with increased asthma symptoms and LAC. These findings are important for identifying which viruses should be targeted for anti-viral treatments in children with asthma.
American Academy of Allergy Asthma and Immunology - Annual Meeting; February 22, 2013

****PAS Poster Presentation**

COMBINED PULSE OXIMETRY AND BLOOD PRESSURE SCREENING TO DETECT CRITICAL CONGENITAL HEART DISEASE IN NEWBORNS

Kristi L Boelke, Elizabeth Goetz, John S Hokanson

Objective: Pulse oximetry screening (POx) has emerged as a tool for the detection of critical congenital heart disease (CCHD) in neonates. POx may be less effective in identifying aortic arch obstruction than other forms of CCHD. The use of blood pressure (BP) screening to detect aortic arch obstruction in neonates has not been described previously. This study was performed to assess the impact of adding BP to POx screening to detect CCHD associated with aortic arch obstruction.
Patients and Methods: POx and BP measurements were performed at 24 hours of age or prior to discharge and repeated once if abnormal. A failed screening was defined as a saturation in the foot of less than 95% or a right arm blood pressure that exceeded the leg blood pressure by 15 mmHg or more. Echocardiography was recommended in the setting of a failed BP screening and required in the setting of a failed POx screening. Charts of infants admitted at less than 30 days of age with a diagnosis of congenital heart disease were also reviewed to identify infants with a missed diagnosis of CCHD. **Results:** 10,012 infants completed the screening procedure. 164 (1.6%) neonates required a repeat screening because of an abnormal initial result (139 due to abnormal BP, 13 due to abnormal POx, and 2 with abnormal POx and BP). Ultimately, 12 infants failed the BP screening, 1 infant failed both screenings, and no infant failed only the POx screening. None of the echocardiograms performed in response to screening demonstrated CCHD. No infants were identified who had been discharged home with a diagnosis of missed CCHD. The false positive rate was 0.13% for the BP and 0.01% for the POx screening components.
Discussion: In this study there were no missed cases of CCHD and no CCHD detected by POx or BP screening. Consequently, only the adverse effects of screening could be evaluated. In this population, the need for repeat screening and the final false positive rate of screening was greater for BP screening than for POx screening.
PAS DATE/TIME/LOCATION: May 4, 2013; 1:00 pm− 4:00 pm; Exhibit Hall D/E (Walter E. Washington Convention Center) Board Number 418

****PAS Poster Presentation**

ABNORMAL PANCREATIC ISLET MORPHOLOGY IN ADULT MALE OFFSPRING OF RHESUS MONKEY DAMS EXPOSED TO TESTOSTERONE EXCESS DURING GESTATION

Kimberly L Henrichs, Dawn Belt Davis, David H Abbott,

Background: Male relatives of women with polycystic ovary syndrome (PCOS) manifest symptoms of insulin resistance. Prenatally androgenized (PA) rhesus monkey females born to dams that received exogenous testosterone during gestation are an epigenetic model for PCOS. PA females show variations in pancreatic islet morphology and altered metabolic parameters, both as infants and adults. Their PA male counterparts exhibit comparable impairments in insulin action and secretion. It is not yet known, however, whether PA male monkeys exhibit comparable abnormalities in islet morphology. **Objective**: This pilot study was designed to determine if adult male rhesus monkeys born to testosterone treated dams have alterations in islet morphology similar to their female counterparts. **Methods**: Pancreata from 3 PA and 3 control adult male rhesus monkeys were stained with insulin antibody and the nuclear marker DAPI. Total section area and area of each individual islet were quantified using ImageJ software.
Results: We saw fewer islets per section area in PA (3.53 +/- 0.71 islets per area) compared to C (7.86 islets per area+/- 1.09) males ($p<0.03$). Fractional islet area (% of total area) was similar, but individual islet size was larger ($p<0.001$) in PA males. We found a trend toward larger mean islet size in PA males ($p=0.09$). Overall, the PA males had fewer small and more large islets in a size distribution analysis. **Conclusions**: A reduction in the number of small islets with increased median islet size in PA male monkeys may reflect alterations in islet development or adaptation. These findings are similar to morphological changes seen in PA female monkeys. Diminished islet numbers accompany diminished insulin action and secretion in female monkeys, suggesting that comparable pancreatic islet abnormalities may accompany impaired glucoregulation in both sexes. As prior studies demonstrate that serum androgens do not differ between the PA vs. C, any effect on pancreatic histology reflects altered in utero metabolism, rather than fetal testosterone exposure. Therefore, male relatives of women with PCOS may have altered islet morphology that increases type 2 diabetes risk.
PAS DATE/TIME/LOCATION May 4, 2013; 1:00-4:00 pm; Hall D/E (Walter E. Washington Convention Center); Board Number 329

****PAS Poster Symposium Session – Obesity II: Clinical and Pathologic Correlations**

NON−OBESE GIRLS EXHIBIT DIFFERING METABOLIC EFFECTS OF ECTOPIC FAT BASED ON RACE AND ETHNICITY

Peter M Wolfgram, Ellen L Connor, Jennifer L Rehm, Wei Zha, Jens C Eickhoff, Scott B Reeder, David B Allen

Background: Among obese subjects, racial and ethnic differences exist in adipose tissue deposition and its effect on insulin resistance (IR) severity. Whether such differences are present in non-obese children is unknown.
Objective: Assess IR, ectopic fat (hepatic fat fraction [HFF] and visceral abdominal adipose tissue [VAT]), and subcutaneous abdominal adipose tissue (SCAT) in non-obese African-American (AA), Hispanic (H) and non-Hispanic (NH) White girls.
Design/Methods: Cross-sectional study of HFF (n=57; with characteristics in Table 1) and VAT/SCAT (n=30; 10 AA, 10 H, 10 NH) in non-obese girls. BMI, waist circumference (WC), fasting insulin (FI) and glucose, sex hormone binding globulin (SHBG), estradiol, and HOMA-IR were obtained. 3T MRI measured HFF, VAT, and SCAT by quantitative proton-density fat method. VAT and SCAT were assessed at L4.
Results: HFF correlated strongly with FI, HOMA-IR, adiponectin, and SHBG in H, but not in AA and NH girls (Table 2). At HFF just above the normal range (>2%), H girls have higher FI than either AA ($p<0.05$) or NH ($p<0.01$) girls. VAT correlated with FI and HOMA-IR only in H subjects; however, both H and AA girls had significantly higher FI and HOMA-IR than NH (all $p\leq0.02$) when adjusted for VAT. Among all subjects, WC correlated significantly with HFF($r=0.38$), SCAT ($r=0.86$), FI ($r=0.50$), HOMA-IR($r=0.5$), SHBG($r=-0.57$), and adiponectin($r=-0.45$), and in each case the correlations were stronger than those of BMI-Z to the same studies.
Conclusions: Non-obese girls show metabolic effects of site-specific fat deposition that vary by race/ethnicity. Hepatic fat, and to a lesser extent VAT, affects indicators of IR earlier in H non-obese girls. In non-obese AA and H girls, VAT affects IR indicators more than NH girls. In general, WC appears superior to BMI in predicting HFF and other measures of evolving IR in non-obese girls.
PAS DATE/TIME/LOCATION May 5, 2013; 10:30 am− 12:30 pm; 146A (Walter E. Washington Convention Center)

FACULTY/STAFF PAS POSTER PRESENTATIONS

****PAS Oral Presentation**

HYPOXIC AND EXERCISE VENTILATION IN ADULTS WITH A HISTORY OF PRETERM BIRTH

Melissa L Bates, Emily T Farrell, David F Pegelow, Marlowe W Eldridge

Background: In the United States, 12.8% of babies are born preterm, translating to ~500,000 live births per year. Improvements in perinatal therapeutic care, specifically ventilatory strategies and surfactant use, have improved survival even in very low birth weight infants. However, perinatal elevations in arterial PO2 permanently blunt the hypoxic ventilatory response (HVR) in animal models of premature birth. Whether this is true in humans is unknown.
Objective: We aimed to determine whether the HVR is impaired in adults with a history of preterm birth, both at rest and during exercise.
Design/Methods: We measured ventilation and metabolic parameters in thirteen adults with a history of preterm birth (20-22 years old, <1500 g at birth) and age-matched controls performing incremental cycle exercise to volitional exhaustion while breathing either 21% or 12% O2. Additionally, we measured resting ventilation after five minutes of 21% O2 and after five minutes of 12% O2 breathing.
Results: Control and preterm populations performed equally well in exercise with 21% O2, demonstrating no difference in peak oxygen uptake(VO2). Both groups experienced ~25% decline in peak VO2 with 12% O2. Uniquely, preterm subjects demonstrated marked impairment in the resting HVR (0.14±0.27 vs 0.42±0.28 L/min/-ΔSpO2, p=0.02). Two preterm subjects experienced hypoventilation while breathing 12% O2 at rest. In controls, the impairment in peak VO2 with 12% O2 was inversely related to the resting HVR such that those with a robust HVR experienced less impairment (R2=0.42, p=0.01). This was not seen in preterm subjects.
Conclusions: Preterm and control subjects demonstrated similar exercise capacity in normoxia and hypoxia. In control but not preterm subjects, exercise performance in hypoxia was related to the ability to increase ventilation. This suggests the presence of a compensatory mechanism in preterm subjects with impaired hypoxic ventilation and, of important clinical significance, that preterm individuals may experience life-long alterations in their physiology that should be further explored.
PAS DATE/TIME/LOCATION May 4, 2013; 9:30 – 9:45 AM; Room 145 B

****PAS Poster Presentation**

MATERNAL RISK FACTORS AND SERIAL IRON MEASURES AT BIRTH: PREDICTION OF INFANT IRON STATUS

Sharon E Blohowiak, Christopher L Coe, Pamela J Kling

Background: Development of iron deficiency (ID) in the first months of life is associated with impaired neurocognitive development. Half the iron needed for the first year's growth is acquired before birth. Infants before 1 year of life can develop ID due to maternal and infant risk factors, as well as nutritional and environmental factors. However, initial screening for iron status in the US occurs at the end of the first year.
Objective: We studied the hypothesis that measures of cord blood iron status alone or combined with maternal risk factors would predict hemoglobin (Hb) and iron status at 6-12 months.
Design/Methods: In a prospective study, we enrolled 113 healthy term newborns with ≥1 risk factors for infantile ID; lower socioeconomic status, maternal minority status, anemia, diabetes, and/or fetal growth disturbance. Maternal obesity was also reported. Serial measures of serum ferritin (biochemical index of storage iron) and zinc protoporphyrin/ heme - ZnPP (index of erythrocyte iron), and Hb were measured. The lowest Hb and plasma ferritin measure postnatally at 6 or 12 months were the two study endpoints. ID cutoff for Hb was 11.6 g/dL and ferritin was 11.0 ng/mL. Positive and negative predictive values (PPV and NPV) were determined.
Results: Values for cord ferritin and cord ZnPP were correlated with their respective 6-month parameters, p<0.05. Cord ZnPP correlated with cord ferritin, p<0.05. 24% of infants had low postnatal ferritin levels and 55% of infants had low postnatal Hb levels that fell below their ID cutoff. Having any abnormal cord test of iron status had 29% PPV and 75% NPV for low postnatal ferritin. Having any abnormal cord test of iron status had 60% PPV and 46% NPV for low postnatal Hb, but adding 3 specific risk factors (large for gestation, maternal obesity, and diabetes) improved the cord test's predictive ability, to 63% PPV and 66% NPV.
Conclusions: Our healthy at-risk group of infants had 6-fold higher rate of biochemical ID and 11-fold higher rate of anemia than the rest of the population. Although postnatal factors also impact infantile ID, iron allotment at birth is important. Cord indicators of iron status, alone or in the presence of risk factors, can predict a subset of children who ultimately develop biochemical ID or anemia later in infancy. Earlier identification of these infants may lead to earlier treatment and potential prevention of adverse sequelae.
PAS DATE/TIME/LOCATION May 4, 2013; 1:00 pm– 4:00 pm; Hall D/E (Walter E. Washington Convention Center) Board Number: 608

Oral Presentation

INFUSION OF NK CELLS EXPANDED EX VIVO WITH IL-15 AND 4-1BBL INDUCES GVHD AND ABROGATES GVT EFFECTS AFTER MHC-MISMATCHED ALLOBMT

Brittany L Bowen, Sara E Kelm, Thomas J Esposito, Paul D Bates, Christian M Capitini

NK cell biology after allogeneic bone marrow transplant (alloBMT) is mainly drawn from studies infusing unmanipulated NK cells. We studied the impact of activating murine NK cells with the co-stimulatory molecule 4-1BBL during expansion with IL-15 ex vivo, and then infused these cells to determine safety and efficacy after alloBMT. NK cells were harvested from Balb/c (H-2d), DBA/2 (H-2d), or CB6F1 (H-2d x H-2b) spleens and cultured with IL-15 in the presence of irradiated artificial APCs transfected with or without 4-1BBL. The addition of 4-1BBL+ cells to IL-15 expanded NK cells decreased yields by up to 50%. The combination of 4-1BBL/IL-15 completely abrogated cytotoxicity against Yac-1 lymphoma, whereas IL-15 alone led to augmented IFNγ production and cytotoxicity. No differences were noted in the expression of CD69 or Ly49D activation markers. After T cell depleted (TCD) MHC-mismatched alloBMT (CB6F1→Balb/c), recipients of allogeneic NK cell infusions expanded with IL-15/4-1BBL showed weight loss in a dose-dependent fashion and increased lethality from GVHD. Similar results were also seen with CB6F1→C57BL/6. In addition, graft-versus-tumor (GVT) effects against rhabdomyosarcoma were abrogated when infusing NK cells expanded by 4-1BBL/IL-15 when compared to NK cells expanded with IL-15 alone. After TCD MHC-matched alloBMT (DBA/2→Balb/c), infusion of NK cells expanded with IL-15 or IL-15/4-1BBL did not cause GVHD, implying MHC discrepancies between donor NK cells and GVHD target tissues contribute to the enhanced alloreactivity induced by 4-1BBL. Infusing NK cells expanded with IL-15 alone is safe and effective after alloBMT, whereas the addition of 4-1BBL to the expansion process leads to GVHD induction and decreased GVT.

Undergraduate Symposium; April 18, 2013

****PAS Poster Presentation**

PARENT SAFETY BEHAVIORS AND NEED TO WATCH OVER INPATIENT CARE

Elizabeth D Cox, Pascale Carayon, Kristofer W Hansen, Victoria P Rajamanickam, Roger L Brown, Lori L DuBenske, Linda A Buel

Background: Experts recommend families as partners in ensuring safe care for hospitalized children. Although many parents perceive a need to watch over their child's inpatient care to ensure mistakes aren't made, whether this need translates into their performance of recommended behaviors to reduce medication errors and hospital-acquired infections is unknown.
Objective: We sought to understand how parental need to watch over care is related to their performance of recommended safety behaviors.
Design/Methods: At the child's admission, 172 parents were surveyed about their need to watch over care (single item; 1=agree or strongly agree, 0=neutral or disagree), demographics, and hospitalization factors. At discharge, parents were surveyed about 3 medication safety behaviors (asking providers to name the drug or dose, to read aloud medication labels, or to check drug or infusion accuracy) and 3 hand hygiene behaviors (asking providers to clean hands, likelihood of reminding providers to clean hands when they did not, and comfort reminding providers about this). Logistic regression was used to relate parent need to watch over care to the behaviors, adjusting for demographics and hospitalization factors.
Results: Most parents (77%) reported frequently or very frequently asking healthcare providers for the drug name or dose, while fewer asked a provider to read aloud medication labels (21%) or to check drug or infusion accuracy (29%). Although only 3% of parents asked a provider to clean hands, most were comfortable asking (82%) and were likely to speak up when a provider did not (78%). Needing to watch over care was reported by 38% of parents. In adjusted models, parental need to watch over care was significantly positively related to asking providers for the drug name or dose (odds ratio=2.36, 95% confidence interval 1.02-5.44) and to check drug or infusion accuracy (3.52, 1.74-7.12). Need to watch over care was not significantly related to the other safety behaviors.
Conclusions: Parents who need to watch over care are more likely to engage in specific behaviors around safe medication use, compared to those not perceiving this need. Even among parents who need to watch over care, many do not perform recommended safety behaviors, especially regarding hand hygiene. Improving understanding of parent motivations for performing safety behaviors could help to engage parents as partners in promoting patient safety.

PAS DATE/TIME/LOCATION May 5, 2013; 4:15 PM– 7:30 PM; Exhibit Hall D/E Walter E. Washington Convention Center; Board Number 626

****PAS Poster Presentation**

DEVELOPMENT AND VALIDATION OF PRISM: A SURVEY TOOL TO IDENTIFY DIABETES SELF−MANAGEMENT BARRIERS

Elizabeth D Cox, Katie A Fritz, Kristofer W Hansen, Roger L Brown, Kaelyn E Wiles, Bryan H Fate, Henry N Young, Megan A Moreno

Background: Most children with type 1 diabetes struggle to achieve optimal glycemic control. Although several efficacious resources for improving glycemic control are available, no systematic method exists to identify and address each child and family's unique self-management barriers.
Objective: This study develops and validates PRISM (Problem Recognition in Illness Self-Management), a survey-based tool for efficiently identifying self-management barriers experienced by children or adolescents with diabetes and their parents.
Design/Methods: Adolescents 13 years and older and parents of children 8 years and older visiting for routine diabetes management (n=358) were surveyed. Drawn from existing literature, 31 items on a 5-point Likert scale (1=strongly disagree; 5=strongly agree) were used to capture experiences with self-management barriers. A1c was abstracted from the electronic health record. To develop PRISM, exploratory and confirmatory factor analyses were used to sort the 31 items into meaningful barrier domains. To assess validity, the association of PRISM barrier domain scores with A1c was examined using linear regression.
Results: Factor analyses of adolescent and parent data yielded well-fitting models of self-management barriers, reflecting the following six domains: 1) Understanding and Organizing Care, 2) Regimen Pain and Side Effects, 3) Denial of Disease and Consequences, and 4) Healthcare Team, 5) Family, or 6) Peer Interactions. All models exhibited good fit, with X2 ratios <2.21, root mean square errors of approximation <0.09, Confirmatory Fit Indices and Tucker-Lewis Indices both >0.92, and weighted root mean square residuals <1.71. Greater PRISM barrier scores as reported by adolescents and parents were significantly associated with higher A1cs.
Conclusions: Our findings suggest at least six different types of diabetes self-management barriers which are significantly related to A1c. PRISM could be used in clinical practice to identify each child and family's unique self-management barriers. This would allow existing self-management resources such as diabetes education or health psychology services to be tailored to the family's barriers, perhaps ultimately improving the effectiveness of such services.
PAS DATE/TIME/LOCATION May 4, 2013; 1:00 PM- 4:00 PM; Hall D/E (Walter E. Washington Convention Center) Board Number 300

****PAS Oral Presentation**

OLDER ADOLESCENTS, COLLEGIATE DRINKING, AND INFLUENCE ON FACEBOOK

Jonathan D D'Angelo, Megan A Moreno

Background: Facebook is often used by older adolescents to investigate new college friends. Alcohol displays are frequent on college student profiles and occur in many formats. Little is known about the influence of these displays.
Objective: This study investigated whether viewing different types of multimedia information (cues) on Facebook, such as wall posts, pictures or status updates, were more likely to positively influence adolescent drinking.
Design/Methods: Registrar lists from two large universities were used to randomly select potential participants for recruitment. Eligible participants were between the ages of 17 and 19. Phone interviews were conducted the summer prior to college enrollment. Vignettes were used to assess the influence of Facebook cues on intention to use alcohol. Vignettes are a validated method for assessing participant perceptions through presentation of specific situations. This vignette presented a scenario in which a senior college student's Facebook profile displayed wall-posts, pictures, and status updates that were drinking related ("I'm planning to get totally wasted tonight") or prosocial in nature ("Can't wait to run another marathon"). Participants were asked to report the likelihood (0-6, 0 = not likely) of drinking with that student if together at a party. Analyses included testing for linear trend and planned contrasts.
Results: 315 participants (56% female, 75% Caucasian, 59% University A) completed the phone interview. Results confirmed the hypothesis that a general linear trend existed $F(1,2343) = 71.1 = p < .0001$, such that prosocial wall posts (M = 2.1) were most likely to influence drinking intention, followed by prosocial pictures (M = 2.1), prosocial status updates (M = 1.9), drinking status updates (M = 1.5), drinking pictures (M = 1.4), / and drinking wall-posts (M = 1.3). Wall-posts as a whole were more influential that pictures in impression formation $F(1,666) = 3.6.$, $p < .05$, and pictures were more influential than status updates, $F(1,666) = 3.9$, $p < .05$. **Conclusions:** Adolescents entering college report increased likelihood to drink with those whose Facebook profiles display prosocial interests, compared to those who display drinking information. Further, individuals rely more on other-generated cues such as wall posts to assess individuals via their Facebook profile. Future work could utilize these patterns of impression formation towards designing online interventions.
PAS DATE/TIME/LOCATION May 5, 2013; 3:30 pm−5:30 pm; 151A (Walter E. Washington Convention Center)

THE DEVELOPMENT OF BEST PRACTICE GUIDELINES FOR IMPROVING THE QUALITY OF DOCUMENTATION IN THE ELECTRONIC HEALTH RECORD

Shannon Dean, Joel Buchanan

Background: While there are a number of advantages to documenting in an electronic health record (EHR), such as legibility and accessibility, providers nationally have observed that aspects of the quality of provider documentation decline after implementing an EHR. Concerns generally fall into one of several categories: "note bloat" (the over-inclusion of auto-populated data leading to lengthy, unreadable notes), copy and paste, the loss of the narrative, and the perceived loss of cognitive processing with the use of templates. Providers at our organization raised similar concerns. Because documentation plays such a crucial role in patient care communication, addressing these concerns was considered to be of paramount importance.
Purpose: To address the perceived decline in the quality of documentation after implementing an EHR and to develop a process for establishing best practice guidelines for inpatient provider notes in the EHR.
Description: We convened a task force comprised of faculty physicians, mid-level providers, residents, and members of professional billing, hospital coding, HIM, medical informatics, and ITS staff. We reviewed the literature to identify similar published initiatives. We evaluated sample notes of varying quality from the unique perspectives of each member to identify the essential elements of a progress note. Each element was reviewed in an iterative process until consensus was reached on a best practice for each element. The task force developed two products, a set of "Best Practices for Writing Inpatient Progress Notes" and a standard progress note template reflective of the guidelines. These guidelines focused on the format of the note to enhance the clinical information and reduce the clutter seen in so many electronically generated notes. The guidelines were circulated for approval by the chairs and vice chairs of each clinical department, residency program directors, and medical education leaders. The guidelines were also presented to our Quality Council. The process resulted in hospital wide endorsement of the best practice guidelines and subsequent educational interventions for implementation.
Conclusions: Establishing high quality provider documentation practices in an EHR is a significant challenge. By convening a task force to review the literature surrounding EHR documentation practices, engaging hospital leaders in discourse, and reviewing local examples of varying quality notes, we were able to successfully develop and receive hospital wide endorsement for a set of best practice guidelines for writing inpatient progress notes in the EHR. Organizations currently struggling with similar documentation challenges or those embarking on the implementation of an EHR could consider using similar strategies. Future work will focus on the development of guidelines for other inpatient note types as well as assessing compliance with the guidelines and how that may translate into an overall improvement in the quality of documentation.

Society of Hospital Medicine-- Hospital Medicine 2013 Annual Meeting; May 16, 2013

THE DEVELOPMENT OF BEST PRACTICES FOR WRITING DISCHARGE SUMMARIES IN AN EHR

Shannon Dean

Background: Optimizing transitions of care (TOC) has become a clear focus of national healthcare goals. The discharge (DC) summary is arguably the most important document in the TOC for a hospitalized patient. Ideally, it serves as a summary of the patient's hospital course and discharge diagnoses AND serves as a handoff to the next provider(s) of care. Despite its critical importance, however, the DC summary does not have a historical "best practice" format nor are clinicians generally taught how to write such notes. With the advent of documentation in the EHR, new tools are available to assist clinicians in writing comprehensive DC summaries.
Purpose: To develop a "best practice" guideline and corresponding note template for DC summaries used across all services that is comprehensive, allows recipients to develop a familiarity with the format, and also serves as a guide for those learning how to write a DC summary.
Description: We convened a task force comprised of faculty physicians, mid-level providers, residents, and members of professional billing, hospital coding, HIM, medical informatics, and ITS staff. We reviewed TOC literature, sought expert opinion from TOC researchers, and surveyed skilled nursing facilities to determine the essential components of a DC summary. Each component was then discussed until consensus was achieved on the best practice for that element. The task force developed two products, a set of "Best Practices for Writing DC Summaries in the EHR" and a corresponding note template. The guidelines were circulated for approval by the chairs, vice chairs, and residency program directors of each clinical department and received endorsement. The new template was set as the default for nearly all services when choosing "DC summary" as the note type in the EHR. Resident superusers in each program assisted in educating current residents about the new format. The clinical importance of the DC summary and how to write it was taught to the incoming residents and fellows that started June 2012 during their EHR training.
Conclusions: By convening a task force and engaging hospital leaders, we were able to successfully implement best practice guidelines for writing DC summaries in the EHR. Since mid-July, we have seen an increase in the number of DC summaries prepared using the best practice template. On those services seeing the template by default, 73% of DC summaries are created using the default template. 58% of all DC summaries from our organization are created in this format. A survey of referring providers and skilled nursing facilities is currently underway to assess their satisfaction with the new template. A survey of residents, hospitalists, and mid-level providers is also underway to assess satisfaction with use of the template. Future work will examine the effectiveness of the template in ensuring that elements known to be important for safe TOC are included in the DC summary.

Society of Hospital Medicine-- Hospital Medicine 2013 Annual Meeting; May 16, 2013

THE EFFECTIVENESS OF BEST PRACTICE GUIDELINES IN IMPROVING THE QUALITY OF RESIDENT PROGRESS NOTES IN THE ELECTRONIC HEALTH RECORD

Shannon Dean, Leigh Anne Bakel

Background: While there are a number of advantages to documenting in the electronic health record (EHR), such as legibility and accessibility, providers nationally have observed that aspects of the quality of provider documentation decline after implementing an EHR. Concerns generally fall into one of several categories: "note bloat" (the over-inclusion of auto-populated data leading to lengthy, unreadable notes), copy and paste, the loss of the narrative, and the perceived loss of cognitive processing with use of templates. Despite the issues reported with computerized documentation, there are only a few studies addressing the need to assess and improve the quality of notes written in the EHR. To address similar concerns from providers at two academic institutions, a set of "Best Practices for Writing Inpatient Progress Notes" was developed and implemented with training. The objective of this study is to evaluate the effectiveness of establishing best practice guidelines by evaluating resident notes before and after their implementation. We hypothesize that the quality of resident progress notes, as measured by compliance with the set of established best practices, will improve after educating residents about the guidelines and their importance in documentation quality.

Methods: In this ongoing retrospective cohort study, we examine notes written by first year pediatric residents who did not receive training in the best practice guidelines or corresponding note templates (pre-intervention group). We then examine notes written by first year pediatric residents who did receive training in the best practice guidelines and who also were instructed to use the corresponding note templates (post-intervention group). Eligible notes are evaluated utilizing a scoring tool (Figure 1) that measures compliance with the best practice guidelines. The instrument requires the comparison of two consecutive daily progress notes written by first year pediatric residents on hospital days #2 and #3. Notes are scored on a scale of 0-20 with the various questions having different possible individual scores (0-3). For this preliminary study, notes were scored by the physicians involved in the study at each institution. We then evaluated the mean and median scores from the pre-intervention period and post-intervention period at each institution. Two-sample t-test was performed for the comparisons between the pre and post-interventions within each location. Two-way analysis of variance was performed for the comparison between pre vs. post-interventions for the combined analysis.

Results: Preliminary results are based on the evaluation of 5 notes in the pre-intervention and 5 notes in the post-intervention group at each center. At one center, there was a statistically significant increase in the note score between the pre- and post-intervention groups (13.4 +/-0.55 vs. 15.2+/-1.64, p=0.049). At the second center, no statistically significant increase in the note score between the pre- and post-intervention groups was detected. Combined analysis of the two centers revealed no significant difference between the pre- and post-intervention groups.

Conclusions: Early results at one of the two centers indicates that the incorporation of best practice guidelines for writing notes in the EHR into the training residents receive in the use of the EHR may be effective in improving compliance and in improving the overall quality of electronic documentation practices. Ongoing evaluation of the differences in implementation and training of the best practices between the two centers is needed. A larger sample size of notes is also needed in order provide enough power to detect change at each center as well as for the combined analysis. Finally, inter-rater reliability in scoring the notes must be established among raters at each center as well as between the two centers.

Society of Hospital Medicine-- Hospital Medicine 2013 Annual Meeting; May 16, 2013

CHILD PARTICIPATION IN BEDSIDE ROUNDS: CONSIDERATIONS FOR ENHANCING CHILD PARTICIPATION IN CARE

Lori L DuBenske, Jason Orne, Bret R Shaw,Pascale Carayon, Michelle Kelly, Elizabeth D. Cox

Background: Family-centered rounding, with the entire care team and family present, is recommended to ensure family participation in care for hospitalized children. Prior work assessing participation in pediatrics has focused on the parent and physician, yet addressing child participation is also critical and represents opportunities to learn to manage one's own health encounters. However, despite theoretical promise, no evaluations have addressed the barriers and facilitators to child participation in family-centered rounds.
Methods: Through stimulated recall, 39 interviews of hospitalized children, their parents and health care team members were used to gain perspective on children's participation in family-centered rounds. Directed content analysis was used to sort the interview content into related themes to describe factors that influence child participation during these rounds.
Results: Parents and health care team members favored child participation in rounds, while children are more ambivalent about their interest in rounds. Ten factors related to child participation in rounds were found, including child characteristics, children's reactions to the content and context of rounds (e.g., feeling invisible or excluded, embarrassed), parent roles in the interaction, as well as health care team behaviors and characteristics.
Discussion: Adults including health care team members and parents have the ability to influence children's participation in their care, especially through actions that help the child feel included (e.g., setting an agenda, attending to child's physical comfort, explicit invitations and/or advocating for child for participation).
Society of Behavioral Medicine 34th Annual Meeting and Scientific Sessions; March 22, 2013

FYI, CALL, COME: IMPROVING PERCEPTION OF ADEQUATE COMMUNICATION BETWEEN NURSES AND PEDIATRIC RESIDENTS USING TEXT PAGING GUIDELINES

Mary L Ehlenbach, MD; Katherine Baker, MD; Laura J Ahola, MSN, RN; Thomas B. Brazelton, MD, MPH

Background: We evaluated the perception of adequate communication via text paging before and after implementing text paging guidelines.
Methods: Text paging guidelines were developed after unclear communication in text pages contributed to a sentinel event. All text pages should contain FYI, call, or come to indicate the response expected and the name and number of the sender. One nursing unit piloted the guidelines. Prior to implementation, nurses and pediatric residents were surveyed about their perception of adequate communication via text paging. The nurses were asked to rate two items about how often they received the desired response in a timely fashion using a 5-point Likert scale. The residents were asked to rate three statements about how often they felt text pages adequately communicated the patients acuity, the desired response, and how to reach the sender using the same scale. The nurses were re-surveyed four months after implementation of the guidelines. The residents were re-surveyed ten months after implementation. Responses to survey items before and after implementation of guidelines were compared using unpaired t-test.
Results: After the implementation of the guidelines, the mean response on the survey of nurses to the item When I page an MD/NP, I receive the response I am looking for (i.e., call back) increased from 3.60 (n=25) to 3.89 (n=19), for a mean increase of 0.29 (95% CI -.002 to 0.59, p=0.051). The mean response to the item When I page an MD/NP, I receive a timely response back increased from 3.36 (n=25) to 3.88 (n=16), for a mean increase of 0.52 (95% CI -0.11-0.92, p=0.01). After the implementation of the guidelines, the mean response on the survey of residents to the item I receive pages that adequately communicate the patients acuity increased from 3.29 (n=28) to 3.53 (n=32), for a mean increase of 0.25 (95% CI -0.099-0.59, p=0.16). The mean response to the item I receive pages that adequately communicate what was wanted from me increased from 3.43 (n=28) to 3.84 (n=32), for a mean increase of 0.42 (95% CI 0.1-0.73, p=0.01). The mean response to the item I receive pages that identify the name and call back number of the sender increased from 3.46 (n=28) to 4.00 (n=32), for a mean increase of 0.54 (95% CI 0.29-0.78, p=0.0001).
Conclusion: Text paging guidelines improved the perception of adequate communication on all measures.
Submitted to Pediatric Hospital Medicine: August 1, 2013

****PAS Poster Presentation**

MAINTENANCE INTRAVENOUS FLUID IN HOSPITALIZED CHILDREN: A RANDOMIZED, DOUBLE BLIND, CONTROLLED TRIAL OF 0.9% NACL/DEXTROSE 5% VS. 0.45% NACL/DEXTROSE 5%

Friedman JN, Beck C, De Groot J, Geary D, Sklansky D, Freedman S

Background: Hyponatremia associated with hypotonic maintenance intravenous (IV) fluid administration is increasingly recognized as a cause of morbidity and mortality. Previous research has focused on post surgical and intensive care populations. There have been no trials examining optimal IV maintenance fluid for non-ICU, non-surgical hospitalized children.
Objective: To compare the mean serum sodium (Na) values after 48 hours of IV maintenance fluid therapy between those children given isotonic normal saline (0.9% NaCl/dextrose 5%) and those given hypotonic half normal saline (0.45% NaCl/dextrose 5%).
Design/Methods: We conducted a parallel group randomized controlled trial at a tertiary care children's hospital. Children, 1 month -18 years, with a normal baseline serum Na, who were admitted to a pediatric unit and needed IV maintenance fluids for > 48 hours were randomized to 0.9% NaCl/dextrose 5% or 0.45% NaCl/dextrose 5% at standard maintenance rates. Children with known risk factors for serum Na abnormalities were excluded. The primary outcome was mean serum Na at 48 hours, powered to detect a difference of ≥2.5 mmol/L between the two groups. Secondary outcomes included number of children developing clinically significant hyponatremia or hypernatremia, weight change, hypertension or edema. Randomization was computer generated. Children, parents and the research team were blinded to group assignment.
Results: 110 patients were enrolled; 54 received 0.9% NaCl/dextrose 5% and 56 received 0.45% NaCl/dextrose 5%. There were no significant differences in age, sex, weight, baseline Na or total volume of fluids received during the study. The mean serum Na at 48 hours was 139.9 + 2.7 in the 0.9% NaCl group and 139.6 + 2.6 mmol/L in the 0.45% NaCl group (P=0.71). Similarly, values at 24 hours did not differ between groups (140.5 + 2.7 versus 139.6 + 2.7 mmol/L respectively; P=0.14). The mean weight change (% increase) was 2.4 + 4.6 and 1.1 + 2.5% in the 0.9%NaCl and 0.45%NaCl group respectively (P=0.23). Two patients in each group developed hypertension and 2 patients in the 0.9%NaCl group developed edema.
Conclusions: There were no significant differences in any of the outcome measures between the groups. In the general pediatric non-ICU, non-surgical population studied both IV solutions are likely acceptable options for maintenance fluids, provided that serum Na and fluid balance are carefully monitored.
PAS DATE/TIME/LOCATION May 4, 2013; 10:00AM-11:00AM;

****PAS Poster Presentation**

INTRAPULMONARY ARTERIOVENOUS ANASTOMOSES IN ADULTS BORN PRETERM: EFFECTS OF EXERCISE AND NITRIC OXIDE

ET Farrell, ML Bates, DF Pegelow, M Palta and MW Eldridge

Background: Intrapulmonary arteriovenous anastomoses (IPAVA) are large-diameter pathways present in the normal lung vasculature, which are recruitable in adults by exercise and hypoxia. The majority of humans experience IPAVA recruitment. Given that individuals born preterm can experience arrested lung development and vascular hyperreactivity, we hypothesized that IPAVA recruitment might be blunted or absent in this population. Secondarily, we aimed to determine if nitric oxide is a mediator of IPAVA recruitment during exercise.
Objective: Our aim was to determine if young adults with a history of preterm birth show altered recruitment of IPAVA with exercise compared to term controls. We also aimed to determine if inhaled nitric oxide (iNO) modulates IPAVA recruitment.
Methods: Adults (20-23 years, <1500 g at birth) with a history of preterm birth (PT) and age-matched control subjects (CTLs) were recruited. A saline contrast exchocardiogram was performed at rest and every 10W during an incremental cycle exercise, performed with and without iNO, to evaluate IPAVA patency. The degree of transpulmonary bubble passage was scored using a 0-5 scale.
Results: Transpulmonary passage of saline contrast was observed in all subjects, CTL and PT, during exercise in normoxia, but not at rest. This shows that IPAVA are present and recruitable in PT adults. Furthermore, iNO causes both the recruitment of IPAVA at earlier workloads and an increase in the bubble score at equal workloads in CTL subjects only. Interestingly, because this increase was not present in PT subjects, we conclude that either IPAVA themselves or the signaling pathway(s) regulating their recruitment are altered in this population.
Conclusion: Transpulmonary passage of saline bubble contrast in PT subjects shows that IPAVA are present and recruitable in this population. However, the inability of iNO to increase bubble scores at equal exercise workloads in the PT subjects, in contrast to CTLS, indicates that PT birth may have lasting effects on the pulmonary vasculature and/or the signaling pathways that modulate it.
PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM - 2:00 PM; Hall D/E; Board Number 295

INCREASED RISK FOR ANXIETY AMONG COLLEGE STUDENTS WITH ADHD

Natalie Goniu, Megan Moreno

Attention deficit hyperactivity disorder (ADHD) and anxiety are both psychological disorders that can have adverse effects on college students academically, socially, and psychologically. For adolescents with ADHD who attend college, the concurrent presence of anxiety has the potential to significantly impact academic achievement and overall college experience. The purpose of this study was to determine whether students who screen positive for ADHD are more likely to also exhibit anxiety. Undergraduate students enrolled in an introductory communications class at a large state university completed a secure online survey that included the Adult ADHD Self-Report Scale and Generalized Anxiety Disorder Scale. Analysis included logistic regression, adjusting for gender as well as examining gender in stratified models. Of the 273 responses (73% response rate), 270 were included in data analysis. 62.96% were female, and 90.74% were Caucasian. The mean age was 18.9 (SD=1.1) years. 57 (21.5%) participants screened positive for ADHD, and 141 (52.2%) participants met criteria for anxiety. Screening positive for ADHD was associated with an increased risk of meeting criteria for anxiety (OR=3.3; 95% CI (1.7-6.4), p<0.001). Among participants with ADHD, being female was also associated with an increased risk of anxiety (OR=1.8; 95% CI (1.1-3.0), p=0.03). While many college services target ADHD and anxiety through individual programs, health care professionals should consider screenings and interventions that encompass both ADHD and anxiety.

Society for Adolescent Health and Medicine, Atlanta GA, March 14, 2013

****PAS Poster Presentation**

REGULATION OF RETINAL VASCULARIZATION BY OXYTOCINERGIC SIGNALING

P Halbach, W Luo, DM Pillers, BR Pattnaik

Background: Retinopathy of prematurity (ROP) is primarily a developmental anomaly, caused by a perturbation in retinal vascularization. ROP occurs in infants born at less than 29 weeks gestation and is associated with abnormal expression of vascular endothelial growth factor (VEGF); however, the precise mechanisms that lead to ROP remain unclear. Oxytocin (OXT) is a neuropeptide hormone produced in the hypothalamus. Between 32 weeks of gestation and term, the production of OXT in the fetal hypothalamus increases substantially. Interestingly, oxytocinergic signaling has been implicated in angiogenesis, but its regulation of retinal vascularization remains unexplored.

Objective: To investigate oxytocinergic signaling in the retina, and determine whether it plays a role in retinal neovascularization.

Design/Methods: In human and monkey eye tissue, the mRNA for the oxytocin receptor (OXTR) was detected using RT-PCR. Both OXTR and OXT protein expression were determined by standard immunohistochemistry using human and monkey frozen retinal tissue sections. Cultured human fetal RPE (hRPE) cells were grown to a monolayer and maintained at 37°C and 5% CO2 with a media change every 2 days. hRPE cells treated for 12 hours with 0.1μM, 1μM, and 10μM OXT were evaluated for VEGF and PEDF transcript expression using RT-PCR.

Results: OXTR transcript was expressed in the retina, RPE, and rectus muscle of the human and monkey eye. OXTR protein, however, was only detected in the RPE. OXT was heavily concentrated in the cone photoreceptor outer segments in close proximity to the RPE. hRPE cells treated with 1μM and 10μM OXT exhibited an increase in VEGF transcript, 1.4 and 1.5-fold (p<0.05), respectively, relative to the control.

Conclusions: This study describes the specific localization of the oxytocin receptor to the RPE and oxytocin to the cone photoreceptors of the eye. Oxytocin's up-regulation of VEGF suggests oxytocin plays a role in retinal vascularization. Therefore, individuals born less than 32 weeks gestation may experience unregulated VEGF expression related to oxytocin-deprivation, which contributes to the abnormal neovascularization found in patients with ROP.

PAS DATE/TIME/LOCATION May 6, 2013; 4:15 PM-7:30 PM; Hall D/E, Board Number 730

ADOLESCENTS' DISPLAYS OF DEPRESSION AND STRESS ON SOCIAL MEDIA WEBSITES: THEIR CALL FOR HELP

Erin Kelleher, Megan Moreno

Introduction: Depression is a common disease that often goes undiagnosed in adolescents. The purpose of this study is to see if people posting information referencing depression are receiving help from their friends.

Method: Background information was recorded from 49 profiles. A previous codebook was used and updated. The posts that were coded as depression were references to depression symptoms given by the DSM-4. When a post referenced depression or stress the quote was recoded. The type of reference the quote was and the number of likes and comments were recorded. Information and interactions of the friends who commented or liked a coded post was also documented.

Results: 28.57% (14) displayed either depression or stress references. Out of the displayers, 28.57% (4) displayed depression, 28.57% displayed stress, and 42.86% (6) displayed both depression and stress. 17.60% of communication between displayers and their friends was support offered from the friend. The most common way of support were comments (52.71%) and likes (47.29%). The higher displayers of depression and stress on average displayed more references. For depression references, the most common support was likes (58.50%) and for stress the most common way for support was comments (54.97%). On average, 17.60% of posts and likes on a displayer's wall was support.

Conclusion: Most depression and stress references that were posted in Facebook received support from friends. With this data, professionals that deal with depression prevention and support can better communicate with adolescents.

Department of Pediatrics Research Week

THE USE OF SOCIAL MEDIA IN ADOLESCENTS' WITH MARFAN SYNDROME AND RELATED CONNECTIVE TISSUE DISORDERS

Erin Kelleher, Philip Giampietro, Megan Moreno

Prior studies have highlighted the use of social media among children and adolescents to illustrate depression, anxiety and/or behaviors associated with various health risks. There is a scarcity of literature related to the use of social media in adolescents with genetic conditions as a window to their perception regarding their own condition. To evaluate how adolescents with genetic conditions use social media in this context we propose to undertake a pilot study which highlights a set of connective tissue disorders occurring in adolescents including, Marfan syndrome, Loeys Dietz syndrome, Ehlers Danlos syndrome Type I, II, IV and MASS phenotype. We hypothesize that adolescents affected by these disorders use Social Media to convey their own perceptions of their condition. To evaluate this hypothesis a survey will be administered to children affected with connective tissue disorders between the ages of 11-21 polling participants about their concerns regarding their condition, participation in physical activities, level of self expression and types of social media the used. We anticipate this study will help to provide information for health professionals regarding the concerns expressed by patients with Marfan syndrome and related connective tissue disorders through the use of social media and lead to improvement direct communication. As online communication is expected to keep growing future research should also be aimed at improving mechanisms for internet support.

Department of Pediatrics Research Week

****PAS Poster Presentation**

DELAYED UMBILICAL CORD CLAMPING IN NEWBORNS WITH PRENATAL RISK FOR DEVELOPING INFANTILE IRON DEFICIENCY

Pamela J Kling, Christopher L Coe, Elyssa F Guslits, Anthony P Auger, Theresa W Guilbert, Sharon E Blohowiak

Background: Iron deficiency (ID) in infancy can show impaired metabolism and neural development. In addition to nutritional and postnatal risks, several demographic and perinatal risk factors also increase the prevalence of infantile ID, because half the iron needed to sustain infant growth is usually acquired before birth. Studies show that delayed cord clamping (DCC) at birth with regimented clamping protocols may improve infantile iron status, vs. traditional immediate clamping (ICC). However, it is unknown whether the clinical practice of DCC by waiting until pulsations cease confers a comparable advantage.
Objective: We compared iron status in infancy with clamping after pulsations cease to traditional ICC. **Design/Methods:** The IDA Study in Madison, WI was a double cohort (DCC vs. ICC) observational study of healthy term infants, with demographic and prenatal risk factors for infantile ID (maternal anemia, diabetes, minority status, lower socioeconomic status, or small- or large-for-gestational age). Subjects were enrolled after delivery and timing of cord clamping recorded. Blood was collected at birth, 6 and 12 months for hemoglobin, storage iron using plasma ferritin, and zinc protoporphyrin/heme (ZnPP/H), a measure of erythrocyte iron. Because test abnormalities at 6 months were treated, the primary endpoints were worst hemoglobin or plasma ferritin at 6 or 12 months, and secondary endpoint as worst ZnPP/H.
Results: Clamping time for ICC was <30 seconds and DCC ranged from 30 seconds -11 min, mean 3.7 minutes. Gestational age was 39.1 in ICC (n=220) ICC and 39.7 weeks in DCC (n=91) 91 DCC, $p<0.01$), with neither group experiencing postnatal complications. At 6/12 months, 25% of ICC and 9% had a ferritin <5 percentile (11 ng/mL), $p=0.07$. Group differences in demographic data were controlled for using a propensity score adjustment. At 6/12 months, lowest hemoglobin value was similar between groups, but plasma ferritin was lower in ICC vs. DCC ($p<0.04$). ICC infants were 3.2 times more likely to exhibit ZnPP/H >95th percentile at 6/12 months ($p<0.05$).
Conclusions: DCC in a translational setting improves storage and erythrocyte iron status in those at-risk for developing infantile ID. Incorporating this practice in women with demographic and perinatal risks for infantile ID should improve newborn iron allotment and long-term iron status.
DATE/TIME/LOCATION May 4, 2013; 1:00 pm– 4:00 pm; Exhibit Hall D/E (Walter E. Washington Convention Center); BOARD NUMBER: 609

CYBERBULLYING AMONG COLLEGE STUDENTS

Rajitha Kota, Shari Schoohs, Lyn Turkstra, Meghan Benson, Megan Moreno

Introduction: Bullying is a serious public health problem that can happen at many stages in the life course- from childhood, to adolescence, even to emerging adulthood. Although traditional bullying still exists and remains an important problem, some of this behavior has migrated to an online platform. Through the Internet, children, adolescents, and young adults can use electronic media in ways that harass, humiliate, and even threaten their peers. While much attention has been paid to cyberbullying among younger teens and adolescents, less is known about older adolescents and college students. The purpose of this study was to explore the phenomenon of cyberbullying among diverse groups of college students.
Methods: Participants were recruited through purposeful sampling during the 2011-2012 academic year from a large Midwestern university. Eligible participants were current undergraduate students between the ages of 18 and 22 years; purposeful sampling was used to seek diverse participants from a variety of student organizations. A trained facilitator conducted semi-structured focus groups. Focus group questions were designed to explore students' views and experiences with cyberbullying in college. All data was transcribed and analyzed manually. All transcripts were read separately by three researchers and analyzed for common themes and concepts using the constant comparative method.
Results: A total of 29 students participated in 4 focus groups. The sample was 69% female, 90% Caucasian, average age was 19.48 years, and participants came from a wide range of majors and extracurricular activities. A primary and pervasive theme was that cyberbullying was underestimated in college students, often related to varying perceptions of its definition. One frequently mentioned perception of cyberbullying was a sense of peer pressure related to alcohol use. At the start of nearly every focus group, college students began the discussion indicating that they consider cyberbullying to be largely restricted to middle and high school students. Once prompted with examples based on the definition of cyberbullying, however, students indicated that these behaviors do occur in college. The most commonly reported examples included hacking into others' online profiles, uploading embarrassing pictures without consent, and writing hurtful comments on social networking sites. Another theme was that cyberbullying can be considered humorous, not harmful. Finally, students frequently voiced opposition to university involvement in handling cyberbullying incidents.
Conclusions: Our findings indicate that college students underestimate the concept of "cyberbullying" as a problem in college. However, further prompting from the facilitator indicated that many problematic behaviors still occur within this population. Some students also expressed disinterest in involving school or law enforcement officials in cyberbullying situations. These findings imply that while college students engage in these harmful behaviors, many do not believe that their actions can be considered to be serious or punishable. Future work should focus on exploring the prevalence of cyberbullying in the college student population, avenues for prevention, and how it may differ from bullying in younger populations.
Society for Adolescent Health and Medicine; March 14, 2013

****PAS Poster Presentation**

SEX–SPECIFIC EFFECTS OF HYPERGLYCEMIA DURING PREGNANCY ON OFFSPRING KIDNEY DEVELOPMENT AND RENAL HISTOLOGY

Rebecca S Lundberg, Jeffrey L Segar, Thomas D Scholz, Pamela J Kling

Background: Offspring of diabetic mothers (ODM), especially males, are at risk for adult hypertension, due to changes in postnatal physiology and metabolism. The mechanistic links for this association are unknown, but may be related to aberrant renal structural and functional development. Our group found that 7 month old male ODM were hypertensive compared to male control or female ODM, with some impairment in nitric oxide (NO) signaling found.
Objective: To further these findings, we studied whether the sex-specific differences in hypertension in ODM is associated with developmental alterations in microscopic kidney architecture.
Design/Methods: Pregnant Sprague-Dawley rats were injected with 50 mg/kg streptozotocin (STZ) to generate diabetes mellitus at gestational day 13. Twice-daily SQ insulin maintained blood glucose levels between 150-400 mg/dL. At birth all pups were cross- fostered to non-diabetic dams. Kidneys were harvested, weighed, fixed and sectioned at P1, P21 and 7 months of age. Glomerular generations, glomerular planar surface area/area of cortex (GPSA), glomerular size, and glomerular density were determined from morphometric techniques. Identification of macula densa (MD) and point counting of its nuclei were performed using immunohistochemistry for the enzyme nNOS, which is specific for MD cells.
Results: Male ODM kidney weight/body weight was less than male controls, $P<0.05$, but higher than both control and ODM females, whose ratios did not differ. At P1 and P21, glomerular and MD appearance did not differ between sex or ODM/control groups. At 7 months, glomerular generations and GPSA did not differ between sex or ODM/control groups. Glomerular size was larger and density less in males vs. females ($P<0.0001$), but ODM vs. control did not differ within the sexes. At 7 months, mean cell #/MD was lower in female ODM than all other groups, $P<0.05$.
Conclusions: Although decreased nephron allotment is associated with hypertension, no appreciable differences were found between males with ODM vs. control. Sex differences in kidney weight and MD appearance were seen in ODM. MD cells are specialized distal tubular cells that sense salt and regulate renin release. Cell # in MD can be regulated by angiotensin and further work should examine whether lower cell #/MD is an adaptation to protect ODM females from hypertension.
PAS DATE/TIME/LOCATION May 6, 2013; 4:15 pm– 7:30 pm; ROOM: Hall D/E (Walter E. Washington Convention Center) Board Number: 217

****PAS Oral Presentation**

PBX1/2 ARE REQUIRED IN THE DEVELOPING LUNG MESENCHYME FOR NORMAL POSTNATAL LUNG DEVELOPMENT

David J McCulley, Elizabeth A Hines, Licia Selleri,Xin Sun

Background: Congenital diaphragmatic hernia remains among the most common, lethal congenital birth defects. Despite improvements in the medical and surgical management of patients with diaphragmatic hernia, the genetic basis of the condition remains unclear. The degree of pulmonary hypoplasia and pulmonary vascular disease associated with diaphragmatic hernia varies between patients. A current hypothesis is that a core group of genes is involved in both the development of the diaphragm and the development of the lung and pulmonary vasculature. Mutation of these genes or disruption of their downstream signaling cascades is likely responsible for the severe pulmonary hypoplasia and pulmonary hypertension that affects a subset of patients with congenital diaphragmatic hernia. Recently, a group of genes was identified as playing an important role in development of the diaphragm. Pre–B-cell leukemia transcription factor 1 (Pbx1) was included in this list and its global deletion in mice results in diaphragmatic hernia. Pbx1 is highly conserved in humans and plays an important role in the development of several tissues, however the role of Pbx1 in lung and pulmonary vascular development has not been explored.
Objective: To study the role of Pbx1/2 in the developing lung mesenchyme with a primary focus on postnatal alveogenesis and development of the pulmonary vasculature and vascular smooth muscle. **Design/Methods:** Using a conditional knockout approach in a mouse model, we have eliminated the expression of Pbx1/2 in the developing lung mesenchyme. We have analyzed the phenotype at late embryonic and early postnatal stages and have used immunofluorescent markers to study the effect of loss of PBX1/2 in the developing lung epithelium, airway smooth muscle, vasculature, and vascular smooth muscle.
Results: Loss of PBX1/2 in the developing lung mesenchyme results in mice that have normal embryonic lung development, but fail to undergo postnatal lung maturation. These mice die within the first 21 days of life and have a simplified lung architecture that has failed to undergo normal postnatal alveogenesis. The mutant mice also have evidence of right heart failure with right ventricular hypertrophy and right atrial enlargement.
Conclusions: PBX1/2 is required for normal postnatal lung alveogenesis and loss.
PAS DATE/TIME/LOCATION May 6, 2013; 3:30 pm–5:30 pm (~4:15pm); ROOM: 145B (Walter E. Washington Convention Center)

INVESTIGATION INTO SPIO NANOPARTICLES COUPLED TO A MONOCLONAL ANTIBODY BINDING TO NEUROBLASTOMA

Bryan Menapace, Dana Baiu, Mario Otto

Neuroblastoma is the most common extracranial pediatric solid tumor and is responsible for about 15% of all pediatric cancer deaths. Most patients present with advanced-stage disease upon diagnosis. Current treatments, including surgery, chemotherapy,and radiation, induce significant side effects. Despite highly toxic multimodality therapy, patients with advanced-stage or relapsed neuroblastoma have a poor prognosis. Therefore, more specific and effective cancer therapies are urgently needed. Multifunctional, tumor-targeting nanoparticles have the potential to be a novel tool for a multipronged attack on cancer cells. In this project we test a novel biocompatible nanoconstruct created by coupling superparamagnetic iron oxide nanoparticles (SPIOs) to a humanized monoclonal antibody (hu14.18K322A). The antibody specifically recognizes the GD2 antigen, a disialoganglioside expressed nearly exclusively on tumors of neuroectodermal origin, including neuroblastoma. The aim is to investigate the optimal conditions (particle characteristics, dosage, timing) that permit tumor recognition with the highest selectivity between different types of SPIOs to allow for highly specific and effective simultaneous imaging, drug delivery, and thermotherapy of neuroblastoma.

Gordon Research Conference "Cancer Nanotechnology" July 2013

****PAS Poster Presentation**

COMPARISON OF PAIN MANAGEMENT IN PEDIATRIC AND ADULT TRAUMA PATIENTS

Rebecca Mitchell, Ashley Maglio, James Svenson, Zhanhai Li, Michael Kim

Background: Over last two decades, there have been significant advances in acute pain management in adults and children, however minimal progress has been reported in pain management in patients with multisystem trauma. Historically, pain management for children has been significantly inferior to adults in general and evidenced in those with burns, sickle cell crisis, and fractures. Noting this trend in pain management disparity, we plan to evaluate acute pain management practices between children and adults with multisystem trauma.

Methods: A chart review was performed at a level 1 pediatric and adult trauma center. Data were abstracted on children (<18 years) who had trauma activation from May 2010 through May 2012 and adult (≥ 18 years) patients presenting between May 2010 and December 2011. Data abstracted include demographic information, type of trauma, injury type and location, interventions, pain assessment, analgesic administration, disposition, diagnosis, and injury scores. Also included are time to pain medications and dose. Opioid pain medications included fentanyl, morphine, and hydromorphone. Descriptive statistics was used for data analysis.

Results: A total of 469 pediatric and 331 adult trauma patients were identified. The mean age was 11+-6 yrs in children compared to 48+-21 yrs in adults. There were no significant differences in make-up of patient ethnicity, but there were 47% female adult patients compared to 39% in children. The length of stay in the ED was longer for adults (227+-103 min versus 180+-99 min). There were differences in the proportion of patients who had initial pain assessment documentation: 69% in adults and 61% in children. Proportion of patients who had multiple pain assessments documentation also was higher in adults compared with children (37% vs 29%). Significantly more adults received opioid in the ED (65% vs 50%) than children. The mean time to the first opioid dose was 61+-66 min for adults and 42+-46 min for children. Adults more frequently received multiple doses of opioid than children (64% vs 53%). **Conclusions:** Based on the preliminary data, pain assessment documentation for both adults and children are inadequate. Differences in trauma pain management exist between adults and children. These differences suggest that children receive less pain assessments and opioid analgesia. Additional analysis and studies are needed to fully understand the difference between the two patient populations and to develop programs to improve overall pain management practices.

PAS DATE/TIME/LOCATION May7, 2013; Hall D/E; Board Number 442

Tobacco Use Among Adolescents: Contributions of Social Media

E Peck, M Moreno

INTRODUCTION: Tobacco use among adolescents is epidemic. In recent years, tobacco companies have realized the power of social media as a vehicle for both advertising and maintaining brand loyalty. Similarly, tobacco control organizations are now actively using social networking sites to disseminate anti-tobacco messages. The purpose of this study was to evaluate the presence and influence of pro- and anti-tobacco content on Facebook, specifically focusing on site traffic and interactivity.

METHODS: Using the main Facebook search engine, the terms "tobacco" and "anti-tobacco" were searched at two points in time, approximately 3 months apart (October 2012 and January 2013). The top 40 returned pages were recorded and classified based on content as "pro," "anti," "equivocal," or "unclear." For each page, the date of site creation, type of page, and "likes" were also noted. An in-depth content analysis of specific pages was also conducted, including 3 pages devoted to the top cigarette brands (Marlboro, Camel, and Newport) and 3 tobacco control pages (truth, STAND, and Legacy). Only content written in English was included in the analysis, and no individual identifiers were used.

RESULTS: The top "pro" page (MazayA TobaccO) returned by the "tobacco" search had 56,569 likes as of January, an increase of 45% since October. The top "anti" page (Tobacco Free Florida) had 198,277 likes as of January, a 5% increase since October. Based on "likes," traffic on the "anti-tobacco" sites was much lower than on the "tobacco" sites. With regard to specific content, 7,793 individuals "liked" the top Camel page from October to January; the content of this page was largely user-generated. The truth site, which was designed specifically for teens almost 5 years ago, was also very interactive and had 576,292 likes as of January.

DISCUSSION: Despite the prohibition of ads regarding the sale or consumption of tobacco products, tobacco-related content on Facebook appears to be largely unregulated and easily accessible to adolescents. Tobacco control organizations should emulate truth's approach if they are determined to effectively reach the adolescent population and counter the pro-tobacco movement.

****PAS Poster Presentation**

TLR4 SNPS D299G AND T399I DO NOT CORRELATE WITH EARLY GESTATIONAL AGE IN A POPULATION OF WISCONSIN INFANTS

De-Ann M Pillers, Mei Baker, Steven J Schrodi, Jessica A DeValk, Lydiah J Zyduck, Steven Lund, Bikash R Pattnaik Sara A Tokarz

Background: Toll-like receptors (TLRs) are present in many cell types and serve as the first point of defense in the innate immune system by initiating the inflammatory cascade in response to infection. Single nucleotide polymorphisms (SNPs) are present in many TLR genes and have been associated with many disorders of inflammation. TLR4 D299G and T399I SNPs are associated with increased susceptibility to infection from various pathogens. As inflammation can play a role in the development of preterm labor, TLR SNPs that alter the response to infection may have a different frequency in the preterm population. To this end, we screened a population for a subset of TLR4 SNPs to determine their genotype frequencies in relation to gestational age.

Objective: Screen a large, diverse population of Wisconsin newborns for TLR4 D299G and T399I SNPs and determine the genotype frequency in relation to gestational age.

Design/Methods: Anonymized DNA samples from 2451 infants were obtained in collaboration with the Wisconsin State Laboratory of Hygiene. TLR SNP assays (rs4986790, rs4986791) were purchased from Applied Biosystems Inc (ABI) and run on the ABI StepOnePlus™. Data were analyzed using StepOne™ software v2.2.2. Statistical analysis was carried out in collaboration with the Marshfield Clinic and the National Institute of Standards and Technology.

Results: Our analysis revealed significant differences between genotype frequencies among races, as expected. In addition, the TLR4 SNPs D299G and T399I were in moderate to high linkage disequilibrium. However, we did not find a significant correlation between the 299G and 399I alleles and early gestational age. When adjusting for racial background, we found that among African Americans the 399I allele showed a minor association with later gestational age.

Conclusions: We show that in a population of 2451 Wisconsin infants the TLR4 SNPs D299G and T399I genotype frequencies varied among racial backgrounds and were in linkage disequilibrium. These data are in agreement with current population data. Importantly, our findings are not consistent with current literature that shows a correlation between the TLR4 SNP 299G and 399I alleles and early gestational age. We did find that 399I may exert a small protective effect against preterm birth in African Americans, however further analysis needs to be performed.

PAS DATE/TIME/LOCATION May 5, 2013; 4:15-7:30pm; Hall D/E (Walter E. Washington Convention Center) Board Number 353

OVER-EXPRESSION OF DYSTROPHIN ISOFORM DP71 DOES NOT ALTER THE MOUSE ERG

De-Ann M Pillers Wenxiang Luo, Sara Tokarz, Bikash R Pattnaik

Purpose: Duchenne Muscular Dystophy (DMD) patients show negative scotopic ERG attributed to a reduced b-wave. The mdxCV3 mouse model of DMD also demonstrates abnormal ERG. We previously found that in the mdxCV3 retina b-wave component of the ERG was normal but a superimposed abnormal slow PIII component resulted in the ERG defect. This finding was based on the fact that dystrophin gene product DpP-71 is required for localizing Kir4.1 channel to Muller cell end fit so that absence of Dp-71 resulted in altered distribution of Kir4.1 channels affecting potassium homeostasis. Mice that lack Dp71 however, have normal ERG. In this study we aimed to determine what role over expression of DP-71 will have on the ERG outcome.
Methods: ERG was performed using HMsERG (Ocuscience, Knasas, USA) adapted for using isofluorane anesthetics. Scotopic ERG was performed at half log unit interval from an intensity of 0.03 to 30 mcd.s/m^2. Amplitudes and implicit time for both a- and b-wave was measured and averaged. Experiments were performed using 4-6 weeks old CVD-mice and results were compared using age and sex-matched C-57 mice. Student t-test was used for statistical comparison and a value of $p < 0.05$ was deemed to be significant.
Results: Average a-wave amplitude and implicit time was 191 ± 16 µV and 26 ± 2 mS respectively for C57 mouse vs. 178 ± 19 µV and 24 ± 1 mS for CVD-10 mice using a 3 mcd.s/m^2 flash. In response to a similar flash intensity b-wave values were 422 ± 45 µV and 42 ± 3 mS for C57 compared to 420 ± 78 and 42 ± 3 mS for CVD-10 mice. The results between the two groups were not significant.
Conclusions: Mice expressing excess Dp-71 appeared to have no b-wave abnormality. These animals did not show any other behavioral anomaly. It would be interesting to now compare mice lacking Dp-71 in an identical experimental condition.
Association for Research in Vision and Ophthalmology, May 8, 2013

****PAS Workshop**

GLOBAL HEALTH AND MEDICAL SIMULATION: HOW TO IMPLEMENT A RESIDENT-LED SIMULATION CURRICULUM IN RESOURCE-LIMITED COUNTRIES

Michael B Pitt, Walter Eppich, Sabrina M Butteris, Molly Shane

Maintaining a meaningful relationship with a global health partner institution can be challenging. Providing sustained and impactful projects that visiting clinicians, particularly trainees, can implement promotes these essential relationships. We have found that healthcare simulation, a modality that is becoming increasing present in residency program education, can be adapted to fill these needs. Using simple to follow one-sheet guides and an inflatable mannequin to deliver a targeted curriculum, we developed a model for an inexpensive yet effective use of simulation in resource-limited countries. Since 2010, we have trained residents to lead these sessions for Tanzanian medical students while abroad, doing so for over 300 learners. We provide an overview of our curriculum development and implementation, with an emphasis on how to overcome common obstacles when utilizing simulation in low-resource settings.
PAS DATE/TIME LOCATION May 5, 2013; 8:00-11:00 AM; Room 209C

****PAS Oral Presentation**

LASTING EFFECTS OF A BI-DIRECTIONAL INTERNATIONAL RESIDENT EXCHANGE – TANZANIAN RESIDENT FEEDBACK OVER FIVE YEARS

Michael Pitt, Sabrina Butteris, Sophia Gladding

Background: In 2007, a bi-directional pediatric resident exchange program was established between Ann & Robert H. Lurie Children's Hospital of Chicago and Bugando Medical Centre (BMC) in Mwanza, Tanzania. From 2007-2012, 59 third-year residents from Lurie Children's and 13 second-year residents from BMC participated in the exchange.
Objective: Determine the impact exchange on the BMC residents who participated in terms of their practice of medicine or teaching, their view of local system change, and their relationships with visiting (US-based) residents.
Methods: With IRB approval from both institutions, an online survey with 24 open-ended and 5 Likert scale questions was sent to the BMC residents who participated in the exchange. Participation was voluntary and anonymous. We conducted a content analysis of the written responses quantifying the number of responses and selected representative quotes from each of the survey's main categories.
Results: The survey response rate was 77% (10/13). Every respondent reported the experience positively impacted their ability to answer clinical questions. Many residents (77%) cited specific patient examples including improvements in knowledge (e.g. management of croup, newborn resuscitation) as well as broader concepts like "widening my differential diagnosis, "open[ing] up for different ideas from different people," and "attitude change." The majority, 85%, gave examples of improved teaching including "using simulation," "using positive reinforcement" and being "more accommodating to . . . slow learners." Most residents noted systems changes at BMC resulting from the exchange, with 77% citing specific changes including initiating "morning report and sign-out" and improved "resident communication." Many residents (75%) indicated the exchange changed their views of US residents noting, "I see them as colleagues" and "I am more aware of what they have in mind and the shock they go through."
Conclusions: The majority of BMC residents who participated in the exchange at Lurie Children's cited lasting positive impacts on their clinical decision-making, teaching, systems at BMC, and view of visiting residents. Trainee exposure to different systems appears to be an effective mechanism for generating change. This type of bi-directional exchange, rather than the more typical unilateral visits by US trainees, should be encouraged as pediatricians attempt to improve the health of children worldwide.
PAS DATE/TIME/LOCATION May 6, 2013; 2:00pm; 146C

****PAS Poster Symposium Session – Obesity II: Clinical and Pathologic Correlations**

QUANTITATIVE MRI-NOT ALT-ALLOWS FOR EARLY DIAGNOSIS OF HEPATIC STEATOSIS

Jennifer Rehm, Peter Wolfgram, Ellen Connor, Vanessa Curtis, Wei Zha, Scott Reeder, David Allen, MD

Background: The prevalence of non-alcoholic fatty liver disease (NAFLD) ranges from 28% to 38% in overweight children. NAFLD is anticipated to be the leading cause of liver cirrhosis, failure, and transplant in the future. Early identification of NAFLD, currently based on ALT, is important for prevention and intervention.
Objective: To compare quantitative MRI to ALT for early diagnosis of NAFLD and associated metabolic disease.
Methods: Cross-sectional study of 131 females aged 11 to 21 years (mean 13.30±2.01), 64% Caucasian, 31% African American & 5% Asian (27% Hispanic, 73% Non-Hispanic). Fifty-five percent of subjects were overweight or obese (BMI >85%). Fasting glucose, insulin, ALT, BMI, & waist circumference (WC) were measured. Hepatic fat was quantified using MRI proton density hepatic fat fraction (HFF). Hepatic steatosis (HS) was defined as HFF >5.6%.
Results: Tables show metabolic markers in all subjects and in overweight subjects with/without HS. Overall mean ALT was 24±13 and was normal (≤40U/L) in 93% of all subjects and 70% of HS (see Figure 1). HS was found in 25% of overweight subjects and 1 subject with a BMI <85%. [figure1]
Discussion: Quantitative MRI allows early identification of HS and correlates with insulin resistance. In contrast, elevated BMI and ALT were not predictive of HS in the overweight girls. The strong correlation of ALT with HFF in HS subjects suggests hepatocellular injury. However, 14 HS subjects had an ALT ≤40U/L and would be missed by current ALT based screening. Using an ALT of ≤16U/L rules out most HS but decreases specificity. An algorithmic approach incorporating HFF would greatly enhance early diagnosis of NAFLD, allowing for early prevention and intervention.
Acknowledgements: NIH (RC1 EB010384, R01 DK083380, R01 DK088925, R01 DK096169, & T32 DK077586-01), Wisconsin Alumni Research Foundation Accelerator Program, Genentech Center for Clinical Research, Endocrine Fellows Foundation, and Pediatric Endocrine Society. We thank GE Healthcare for their support.
PAS DATE/TIME/LOCATION May 5, 2013; 10:30 am− 12:30 pm; ROOM: 146A (Walter E. Washington Convention Center); BOARD NUMBER: 4

PROTON DENSITY FAT FRACTION IS A HIGHLY ACCURATE BIOMARKER OF HEPATIC STEATOSIS IN ADOLESCENT GIRLS AND YOUNG WOMEN

Jennifer L Rehm, Peter Wolfgram, Ellen L Connor, Wei Zha, David Allen, Diego Hernando, Scott Reeder

Target audience: Clinical radiologists and physicians who provide care to children, including specialists in pediatric endocrinology, gastroenterology and hepatology, and primary care providers in pediatrics and family medicine.

Purpose: The prevalence of non-alcoholic fatty liver disease (NAFLD) in children ranges from 1-10% worldwide and 28% to 38% in overweight children.1 In fact, NAFLD is anticipated to be the leading cause of liver cirrhosis, failure, and transplant in the future - surpassing alcoholic liver disease, viral hepatitis and liver cancer.2 Therefore, early identification of NAFLD is important for intervention and prevention of progression. Traditional methods of detecting fatty liver, such as ultrasound or serum aminotransferases, miss early changes. A rapid, clinically relevant, non-invasive method for early detection and staging of NAFLD is urgently needed.3 The purpose of this work was to evaluate the accuracy of a novel quantitative MRI technique to quantify hepatic steatosis in adolescents.

Subjects: This is a cross-sectional study involving 132 females with BMI Z-scores ranging from -2.20 to 2.71 (mean 1.07 ± 1.12), aged 11 to 21 years (mean 13.30 ± 2.01), 27% Hispanic, 73% Non-Hispanic; 64% Caucasian, 31% African American and 5% Asian. Fifty-five percent of subjects were overweight or obese (BMI > 85%). Subjects were recruited through a local middle school and pediatric clinics.

Anthropometric and Laboratory Measures: Blood samples were collected within 1 month of imaging for assays including glucose, insulin, total and HDL cholesterol, and ALT after an overnight fast. All labs were performed in the same laboratory. Anthropometric measurements included height, weight, and waist circumference (WC). Homeostasis model of assessment-insulin resistance (HOMA-IR) was calculated as [fasting glucose (mg/dL) × fasting insulin (μU/ml)/405].

Imaging: Imaging was performed on a clinical 3T scanner (MR750, GE Healthcare, Waukesha, WI) using an investigational version of a chemical shift encoded water-fat separation method (IDEAL IQ) and a 32-channel phased array body coil. Single voxel STEAM spectroscopy and fat-water separation over the liver were acquired4. First, single voxel STEAM without water suppression was acquired in the posterior right lobe using the following parameters: TE = 10, 15, 20, 25, 30 ms acquired in a single TR of 3800ms, 2x2x2cm voxel, 1 signal average, 2048 points, and a spectral width of 5000, all acquired in a breath-hold of 23 seconds. Next, IDEAL IQ images were acquired over the entire liver using the following parameters: FOV = 44x40cm, first TE/TR = 1.2/8.6ms, echo spacing = 2.0ms, echo train length = 6 (2 shots of 3 echoes), BW = ±111kHz, flip = 3o to minimize T1 bias, 8mm slices, 28 slices, and 256x160 matrix. 2D parallel imaging (ARC) with R=2.86 was used to reduce imaging time to a 23 second breath-hold. An on-line reconstruction algorithm was used to perform T2* correction, spectral modeling and eddy current correction to create quantitative proton density fat-fraction (PDFF) maps over the entire liver. Fat-fraction measurements were made from PDFF maps determined by averaging PDFF value from regions of interested placed in the 9 Couinaud segments of the liver5. Hepatic Steatosis (HS) was defined as MRS-PDFF > 5.6%6.

Statistics: Associations between fat fraction and other outcomes were examined using Spearman rank correlation analysis. Correlations were adjusted by BMI Z-score and age using nonparametric Spearman's analysis. Hepatic steatosis was identified by MRI-PDFF and MRS-PDFF and compared using a Kappa Index. A two-sided p-value of <0.05 was regarded as significant.

Results: Figure 1 demonstrates excellent agreement between PDFF measured with MRS and MRI and a high degree of reliability between MRI and MRS for determining hepatic steatosis (PDFF > 5.6%). In overweight and obese subjects 21% had HS by MRS and 25% by MRI. Tables 1-3 show correlations of PDFF with metabolic makers. Mean ALT was 25.91± 23.39. 129 (98%) of subjects had ALTs within the normal range (≤60 U/L). When serum and anthropomorphic biomarkers were adjusted for age and BMI Z-score they did not correlate significantly with MRS-PDFF or MRI-PDFF.

Discussion: Quantitative MRI is a feasible and accurate measure of hepatic triglyceride content in a diverse group of adolescents and young women. It is highly reliable for identifying early hepatic steatosis and correlates with metabolic risk factors (insulin resistance, low HDL). In contrast, BMI was not predictive of HS in the overweight girls. The strong correlation of ALT with PDFF in HS subjects is evidence of hepatocellular injury3; however 18 of these subjects had an ALT within the accepted normal range and would be missed by current pediatric HS screening guidelines. Thus, ALT is not a sensitive screening tool for early HS. The ability to use PDFF as an accurate biomarker for hepatic steatosis offers a strong advantage over traditional measures in identifying NAFLD risk and following the effectiveness of interventions for NAFLD in obese adolescents. Future work will include the use of MR elastography to measure liver stiffness and identify progression of fatty liver disease in children and adolescents.

Conclusion: Liver PDFF measured with quantitative MRI is a rapid, clinically relevant, non-invasive method for early detection and quantitative staging of hepatic steatosis in adolescent girls and young women. This novel quantitative MRI technique holds promise as a method for early identification of NAFLD, thus allowing intervention prior to development of irreversible hepatic injury and progression of metabolic disease.

Acknowledgements: We acknowledge support from the NIH (RC1 EB010384, R01 DK083380, R01 DK088925, R01 DK096169, and T32 DK077586-01) the Wisconsin Alumni Research Foundation (WARF) Accelerator Program and Genentech Center for Clinical Research. We thank GE Healthcare for their support.

The International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting Salt Lake City, UT, USA April 24, 2013

TRACKING NATURAL KILLER CELLS AFTER HAPLOIDENTICAL HEMATOPOIETIC STEM CELL TRANSPLANTS USING 19F

Lauren Reil, Michael Martinez, Erbay Salievski, Myriam N Bouchlaka, Christian M Capitini

The University of Wisconsin Carbone Cancer Center (UWCCC) is one of the few FDA-approved centers allowed to administer natural killer (NK) cells after haploidentical hematopoietic stem cell transplant (haploHSCT) to children with progressive or refractory, metastatic solid tumors. The anti-tumor effects of this however have not been sufficient to cure these patients. Some patients develop graft versus host disease (GVHD), which is when donor cells attack the host's tissues. The development of GVHD impedes conclusive results on the efficacy of NK cell infusions. In addition, it is not known if NK cells traffic directly to tumors and mediate cytotxicity, or if they traffic to other tissues and stimulate other effector cells, thus indirectly eliminating the tumor. Therefore, investigators in my lab propose to optimize the non-toxic tracer agent 19F using magnetic resonance imaging (MRI) to track NK cells in vivo. Previous studies have shown the use of 19F as a noninvasive method of tracing murine and human dendritic cells. It not only successfully tracks but also quantifies the number of apparent cells in a region of interest. This proposal would allow us to monitor the fate of NK cells post their infusion.

*University of Wisconsin Undergraduate Research Symposium Pediatrics Research Wee*k

COLLEGE STUDENT ALCOHOL USE AND THE MEDIA: RECALLING COUNTER ALCOHOL ADVERTISEMENTS

Shari Schoohs, Megan Moreno

Purpose: College students have the highest rates of alcohol use and the greatest percentage of problem drinkers of any age group. Previous research has illustrated links between alcohol advertisements and alcohol attitudes and behaviors. Counter alcohol advertisements have the potential to help reduce problem alcohol use. However little is known regarding whether these advertisements are memorable or perceived as influential by college students perceive them to be.
Methods: Focus groups were conducted with undergraduate college students from two universities in the Midwest, one public and one private. Focus groups were age and gender specific to identify whether themes were different by age or gender. For this study, the focus of the focus groups was two main questions about counter alcohol advertisements. The first question was "Do you remember seeing any advertisements that show the negative consequences of drinking?" and the second was "Did any of these advertisements influence the whether or not you drink alcohol?" The data was qualitatively analyzed by two trained research assistants through an iterative process.
Results: A total of 70 students participated in 15 focus groups, and 70% were females. 11 groups were freshmen, 2 groups were students under 21, and 2 were students over 21. Results showed that several counter advertisements were mentioned or referenced by participants in response to questions. Some of the most popular counter advertisements referenced were drinking and driving advertisements including the anti-drinking and driving overflowing car commercials produced for the National Highway Traffic Safety Administration, and the "Drink Responsibly" tags at the end of alcohol advertisements. Although participants could recall counter advertisements, they said these messages did not influence their decision to drink alcohol. Students suggested that counter advertisements do not focus on issues college students face, as most counter alcohol advertisements focus on drinking and driving, and many college campuses are largely pedestrian populations. There were no significant differences between groups for themes, regardless of age or gender.
Conclusions: College students remembered several counter alcohol advertisements, although they felt that the advertisements didn't influence their decision to drink alcohol. This calls to attention that memory of the counter advertisements may be less important than the relevance or influence of the advertisement.
Learning Objective: Consider which counter alcohol advertisements college students can recall and what makes these advertisements memorable. Keywords: college student, alcohol, counter, advertisements.

Society for Adolescent Health and Medicine; March 14, 2013

CHANGES IN ATTITUDES, INTENTIONS, AND BEHAVIORS TOWARD TOBACCO AND MARIJUANA DURING STUDENTS' FIRST YEAR OF COLLEGE

Mara Stewart, Megan Moreno

Purpose: Tobacco and marijuana are both commonly used by college students and have negative health effects. Predictors and timing of initiation of these substances in college is not completely understood. The purpose of this study was to understand how students' attitudes, intentions, and behaviors toward tobacco and marijuana change during their freshman year of college.

Methods: College students from two large state universities completed phone interviews prior to their freshman year (Time 1) and again one year later (Time 2). The identical interviews assessed students' attitudes, intentions, and behaviors toward both substances. Attitude was measured on a 0 to 6 scale with 6=most positive and intention was measured on a 0 to 5 scale with 5=very likely to use. Behavior was measured by lifetime use (yes or no) and current use (past 28 days). Results were analyzed using paired t-tests and logistic regression.

Results: 275 participants completed both interviews (82% response rate); participants were 57% female and 75% Caucasian. Tobacco attitudes changed from 0.9 to 1.2 (p=0.01); marijuana attitudes changed from 1.9 to 2.3 (p=0.00). Intention to use tobacco changed from 0.4 to 0.8 (p=0.00); intention to use marijuana increased from 0.7 to 1.1 (p=0.00). By Time 2, 12.2% of participants initiated tobacco use, 44.2% reported lifetime use, and 19.5% were current users. By Time 2, 13.5% of participants initiated marijuana use, 46.2% reported lifetime use, and 21.7% were current users. Initiation of tobacco use by Time 2 was positively associated with intention to use tobacco at baseline (OR=1.9, 95% CI; 0.99-3.9, p=0.05). Among those who had used tobacco at Time 1, positive intention was associated with current use at Time 2 (OR=1.8, 95% CI; 1.1-2.8, p=0.02). In contrast, initiation of marijuana at Time 2 was associated with both positive attitude at Time 1 (OR=1.7, 95% CI; 1.1-2.5, p=0.01) and intention (OR=1.8, 95% CI; 1.1-2.9, p=0.02). Neither attitude nor intention predicted current marijuana use among students who were users at Time 1.

Conclusions: Attitudes, intentions, and behaviors toward tobacco and marijuana all changed significantly towards favored use during students' freshman year of college. However, predictors of initiation or continuation of use differed by substance, suggesting that different prevention approaches may be beneficial for these two substances. Given the broad initiation of tobacco and marijuana use among college freshmen, there is compelling evidence that this population comprises an ideal target group for such intervention.

Sources of Support: This study was supported by the National Institutes of Health grant 1R01DA031580-01.

Society for Adolescent Health and Medicine; March 2013; Atlanta GA

UW Undergraduate Research Symposium; April 2013

****PAS Poster Presentation**

USE OF WHOLE EXOME SEQUENCE ANALYSIS TO IDENTIFY CAUSAL VARIENTS IN CONGENITAL VERTEBRAL MALFORMATIONS

Alex Stoddard, Mark Stephan, Kristen Rasmussen, Cathy Raggio, Linlea Armstrong, Blank, Janet Livingston, Ulrich Broeckel

Background: Congenital vertebral malformations (CVM) represent defects in formation and segmention of somites occurring with an estimated incidence of between 0.13-0.50 per 1000 live births. Extreme genetic heterogeneity has made it difficult to identify mutations in patterning genes associated with CVM.

Objective: The objective was to identify causal variants for CVM using a whole exome sequencing (WES) methodology.

Design/Methods: Two families with different phenotypic congenital vertebral malformation phenotypes, each with an autosomal dominant inheritance pattern were sequenced utilizing Agilent SureSelect hybridization-based exome capture methodology. A filtering strategy using CASAVA, samtools and GATK to prioritize sequence coding variants included requirements for heterozygosity in affected individuals, absence of variant in unaffected individual, filtering by high impact variants such as stop/gain-loss and nonsynonymous coding change and filtering by population frequency as observed in the NHBLI exome variant server data set in which a given variant must have a minor allele frequency of <1%.

Results: A filtered list of approximately 20 genes with corresponding possible causal variants was identified for each patient. Among the candidate genes, a nonsynonymous mutation in TLE4 (NM_007005:exon14:c.A1318G:p.T440A) was identified in an affected father and both daughters with L1 hypoplasia, congenital kyphosis and prolonged patency of the anterior fontanelle. A nonsynonymous mutation in PPIB (NM_000942:exon4:c.C404T:p.P135L) was identified in an affected father and both daughters with cervical, thoracic and sacral CVM, hearing loss, cleft palate and the Sprengel deformity.

Conclusions: Based on the known biologic functions of TLE4 and PPIB it is reasonable to speculate that heterozygous mutations in either can be associated with CVM phenotypes . TLE4 is a transcription factor which has an important role in cell fate and boundary specification and interacts with Notch signaling mutations. Ppib-/- mice have a severe osteogenesis imperfecta phenotype and develop an enhanced curvature of the spine. WES has promise to discover causal variants associated with CVM. Functional studies in model systems are required to confirm proof of pathogenicity.

PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM – 2:00 PM; Hall D/E 4503 Poster 107

****PAS Poster Presentation**

HYPEROXIA INDUCES ALTERATION OF INFLAMMATORY PATHWAY GENE EXPRESSION IN HUMAN LUNG EPITHELIAL CELLS (A549)

Sara A Tokarz, Wenxiang Luo, Ryan M Spott, Bikash R Pattnaik, De-Ann M Pillers

Background: Progress in neonatal respiratory care of the preterm infant has led to substantial reduction in the classical form of Bronchopulmonary Displasia (BPD) first described 40 years ago. Due to the improved survival rate among extremely premature infants, a "new BPD" has emerged in which the development of the very premature lung is disrupted. Thus, BPD continues to be a major chronic respiratory disorder that causes morbidity and mortality in preterm neonates.
Hyperoxic toxicity impacts neonatal lung development, in part by activating inflammatory pathways in epithelial cells, which give rise to alveoli. However, the exact effect that hyperoxia has on the developing neonatal lung and consequently, the development of BPD, has not been well defined.
Objective: Expose a human type II lung epithelial cell line (A549) to hyperoxic conditions to elucidate changes in the expression of inflammatory genes.
Design/Methods: A549 cells were grown in normoxic (21% O2) or hyperoxic (95% O2) conditions for 24 hrs and then RNA was isolated. A Human Common Cytokine PCR Array (SABiosciences) was used to measure the changes in gene expression between normoxic and hyperoxic conditions. Experiments were performed in triplicate. Data analysis was performed on StepOnePlus Software v2.2. The Student's t-test was applied. Changes greater than 1.5-fold with a p-value ≤.05 were considered significant.
Results: Hyperoxic treatment resulted in at least a 1.5-fold change in the expression of 23 genes that belong to different functional categories. Interleukins (IL)1B, IL6, IL8, and IL12A were up-regulated whereas IL2, IL9, IL12B, and IL16 were down-regulated. Within the TNF superfamily, hyperoxic treatment increased expression of LTB, TNF, TNFSF8, TNFSF10, and TNFSF12. In the TGF family, the expression of INHA, INHBA, and TGFA was increased, but LEFTY2 and GDF10 were reduced. In addition, hyperoxic treatment also increased CSF1, CSF2, and PDGFA, but decreased IFNB1.
Conclusions: Our findings suggest that lung epithelial cells may play an important role in hyperoxia-related BPD via the production of inflammatory mediators. These genes may play a role in regulating critical aspects of lung development that may contribute to BPD, including leukocyte infiltration, disruption of alveolar epithelial and capillary cell function, proliferation of fibroblasts contributing to lung fibrosis, and smooth muscle proliferation leading to hyperplasia. /
PAS DATE/TIME/LOCATION May 5, 2013; 4:15-7:30pm; Hall D/E (Walter E. Washington Convention Center) Board Number 264

A FAILURE TO COMMUNICATE? OLDER ADOLESCENT FEMALES' VIEWS IN RESPONSE TO MALES' SEXPECTATIONS

Leah Wachowski, Megan Moreno

Adolescent body image has implications for overall health. Body image is influenced by peers and media. However, there is little research examining the effects of Facebook, a new form of media, on adolescents' body image. The purpose of this study was to investigate female college student's perceptions of how Facebook affects body image.
Female undergraduate students participated in focus groups at a state university. Focus groups discussed perceptions about the associations between body image and Facebook including questions relating to the impact of age, gender, and Facebook advertisements on body image.
26 female undergraduate students participated in four focus groups. Three main themes were identified: Facebook provides an ideal medium for comparison, gender expectations are upheld on Facebook, and actions of peers are influential.
Findings suggested that Facebook may influence body image negatively or positively depending on the individual's own body image ideals rather than the characteristics of Facebook itself.
Pediatrics Research Week