ATRIAL FIBRILLATION IN PATIENTS TAKING KNOWN QTC INTERVAL-PROLONGING DRUGS


10.1136/jim-2016-000393.556

Purpose of Study QTc interval prolongation involves delayed repolarization of cardiac myocytes and is a risk factor for supra- and ventricular arrhythmias. Patients with atrial fibrillation may have a significant prolongation in QTc duration compared to controls. Many drugs are known to increase the QTc interval. However, the risk of AF in patients receiving such agents is uncertain. In this study we hypothesized a higher occurrence of QTc interval prolongation with atrial fibrillation in patients taking...
QTc-prolonging drugs when compared to patients in sinus rhythm.

Methods Used A retrospective chart review of 3322 patients at an urban medical center from January 2014 to June 2016 of QTc interval on standard 12-lead ECG was performed. Of these patients, 226 were documented as taking QTc interval-prolonging drugs at the time of their ECG. These drugs included furosemide, fluoroquinolone antibiotics, selective serotonin reuptake inhibitors (SSRI), macrolide antibiotics, as well as patients with a urine drug screen positive for cocaine. The incidence of atrial fibrillation and sinus rhythm for each cohort was then compared.

Summary of Results In patients found to be in sinus rhythm vs. atrial fibrillation, a statistically significant number were found to be taking furosemide (12±5 vs. 50 ±2; p value <0.01) and SSRIs (9±4 vs. 56±2; p value <0.05). There was no significant difference found in AF in patients taking fluoroquinolones (4±2 vs. 23±1; p value 0.12), macrolides (1±0.4 vs. 14±0.5; p value 1.0) or using cocaine (1±0.4 vs. 11±0.4; p value 1.0).

Conclusions Patients taking furosemide and SSRIs were each at a greater risk of having atrial fibrillation compared to controls in sinus rhythm. It is therefore important to be mindful of these risks and to monitor patients taking these agents for QTc interval prolongation with an increased risk of atrial fibrillation.
The adherence to statin guidelines in those patients with diabetes mellitus without history of coronary artery disease

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10.1136/jim-2016-000393.559

Purpose of Study Meta-analyses of randomized trials confirmed the findings that statin use reduced cardiovascular events and mortality, and that MI, and coronary death and cardiovascular events were significantly reduced in the intensive versus moderate statin therapy groups. According to the 2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular (ASCVD) Risk in Adults, a high level of evidence supports the use of moderate-intensity statin therapy in persons 40–75 years old with DM, and the use of high-intensity statin therapy in those with estimated 10-year ASCVD risk ≥7.5%. This study evaluated whether despite the proven CVD risk reduction with statin therapy, patients with DM without a history of coronary artery disease (CAD) are not adequately being treated with statin therapy.

Methods Used We conducted a retrospective chart review by querying the patient admission database of an urban community teaching hospital for those patients aged 40–75 who were admitted with DM, had their lipids measured and did not have a concomitant diagnosis of CAD or documented statin intolerance for the period September 2014 to December 2015. The patients’ ten year ASCVD risk was calculated using the ACC/AHA calculator and it was determined whether the patients should be on a moderate or high intensity statin, and whether or not they were prescribed the appropriate therapy.

Summary of Results 64 patients met our inclusion criteria. 19/64 (30%) patients were on any statin on admission, which improved to 38/64 (59%) on discharge. 20/64 (30%) patients were discharged on moderate intensity statin when only 9/64 (14%) met the recommendation for moderate intensity. 16/64 (25%) patients were discharged on high intensity statin when 55/64 (86%) met the recommendation for high intensity. 2/64 (3%) patients were discharged on low intensity statin despite qualifying for moderate intensity. Only 17/64 (27%) patients received appropriate intensity statin therapy as per the guidelines.

Conclusions Despite the proven clinical benefit of statins in diabetics the results of this study show that based on the guidelines, statins are under-prescribed and used at inadequate intensity in clinical practice in patients with DM without history of CAD.

Adolescent Medicine and Pediatrics
Concurrent Session
1:00 PM
Monday, February 13, 2017

Importance of student-taught reproductive health education
F Khan. LSUHSC School of Medicine in New Orleans, New Orleans, LA.
10.1136/jim-2016-000393.560

The cholineric toxidrome
JM McKee, MN Frascogna, P Caddock. UMMC, Jackson, MS.
10.1136/jim-2016-000393.561

Purpose of Study Emesis and diarrhea are common ailments afflicting pediatric patients. This case illustrates a common symptomatology addressed in the pediatric emergency room (ER) that resulted in an unusual diagnosis.

Methods Used A 19 month old otherwise healthy male presented to the ER with malaise, nasal congestion, non-bloody, non-bilious emesis and watery diarrhea. Symptom onset was 12 hours prior to presentation. Associated symptoms included decreased appetite and ‘funny breathing’. Last wet diaper unknown. No known ingestions. Mother denied fever or sick contacts. The patient’s past medical,
surgical, family and social history were unremarkable. On presentation, the patient was noted to be lethargic, ill appearing and tachycardic. He was afebrile and alert with mild increased work of breathing, coarse breath sounds and normal oxygenation. The remainder of physical exam was unremarkable.

**Summary of Results** The initial biochemical workup and radiographic imaging revealed no evidence of renal, pulmonary or metabolic disturbance. Despite aggressive fluid resuscitation, the patient demonstrated gradual clinical deterioration. Urine and serum drug testing was negative. He was ultimately placed on a non-rebreather face mask due to respiratory distress associated with copious airway secretions and increasing somnolence. Prior to transfer to ICU, another caregiver presented to the ER and informed health care team after further questioning that patient may have been exposed to ‘roach poison’.

He was subsequently intubated and toxicology was consulted due to strong concern for poisoning. After much persuasion, the caretaker informed health care team that a bottle of pesticide solution was left in the home by a pesticide company and was labeled ‘dicrotophos 96.8%’ (Bidrin 8). This is an industrial grade organophosphate pesticide. The patient had a waxing and waning course while in the ICU on mechanical ventilation, 2-pralidoxamine infusion and atropine for the treatment of organophosphate poisoning. The Mississippi Department of Agriculture, Environmental Protection Agency and the Federal Bureau of Investigation participated in this case due to concern for bioterrorism. The patient was ultimately discharged under the care of another family member.

**Conclusions** This case emphasizes the importance of recognizing the ‘classic toxidromes’ that may present to the ER masked by a wide array of symptomatology.

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**A CASE OF LARYNGEAL PAPILLOMATOSIS IN AN 18 MONTH OLD**

A Landry, R Brown, C Knoles. The University of Oklahoma College of Medicine, Oklahoma City, OK.

10.1136/jim-2016-000393.562

**Case Report** The patient is an 18-month old female with chronic stridor, who had increased difficulty breathing, and worsening stridor for 3 days. The patient had been diagnosed with croup at age 6 months but had persistent stridor, and intermittent episodes of difficulty breathing despite treatment.

The patient was born at 35 weeks of gestation and intubated for 7 days. Patient always had a weak raspy cry and had inspiratory stridor since 6 months of age. The patient received several courses of oral and inhaled steroids with mild, temporary relief of stridor.

In ED, she received a dose of racemic epinephrine and oral steroids with minimal improvement. Chest x-ray was normal. Lateral x-ray of the soft tissues of the neck showed a soft tissue mass projects within the proximal trachea, suspicious for papilloma. Otorhinolaryngology was consulted and found papillomatous lesions involving the bilateral vocal folds with supraglottic collapse with inspiration on fiberoptic endoscopy. Mother of the patient revealed that she was infected with HPV. The patient underwent direct laryngoscopy and laryngeal papillomatosis was discovered.

Laryngeal papillomatosis is the most common benign tumor of the larynx in the pediatric population. The disease is caused by Human Papillomavirus (HPV), serotypes 6 and 11. HPV is often vertically transmitted vertical during vaginal delivery. The age of presentation of symptoms is usually between 3–6 years of age. Treatment is surgical, but vaccines developed for HPV can help ease disease burden.
to the best of our knowledge this is the first report describing acute platelet dysfunction leading to anemia and hypolema in a patient receiving the DMPA injection and Tecfidera®. We theorize that the interaction between the two drugs was responsible for the platelet dysfunction seen in this case. Medical providers caring for female patients with multiple sclerosis taking Tecfidera® should keep in mind this potential interaction when prescribing the DMPA injection for contraceptive and medical needs.

**Purpose of Study** This project exposes pediatric and medicine-pediatric residents to a simulated suicidal patient who has presented to clinic for a routine well child visit. It is crucial residents gain knowledge and experience in caring for suicidal teenagers.

**Methods Used** This research study is designed to evaluate a resident’s experience in handling a difficult diagnosis in the primary care setting. Each intern has a simulated encounter with a standardized patient. Sessions occur in the simulation center and are recorded. During history taking, the resident learns the patient is acutely suicidal. The resident then has to determine how to further investigate these symptoms and then appropriate management for the patient. The scenario is scripted and was piloted to ensure standardization in educational intervention. Following the scenario each resident participates in a nonjudgmental debriefing with the attending. An anonymous post-survey is completed assessing the simulation’s effectiveness on a 5 point Likert scale and open ended questions.

**Summary of Results** Simulation sessions started in July 2016. To date 6 interns have completed the simulation. Surveys show 6/6 (100%) learners strongly agreed the simulation was a helpful learning experience and were satisfied with content and quality of simulation. 5/6 (83%) strongly agreed they would be able to apply the concepts, knowledge and skills. 6/6 (100%) strongly agreed they wanted more primary care simulation. Learning themes included: Value of learning with a standardized patient and receiving feedback directly from them, practicing being in an uncomfortable situation, and talking through the protocol of safely getting the child emergent help. Improvement suggestions included: Adding a component of talking to the mother about the suicidal condition and more time to discuss ways to approach difficult conversations.

**Conclusions** A suicidal pediatric patient is a fragile encounter in the outpatient setting. Quickly developing a rapport with the patient so they share details is a skill that comes with practice. This simulation is designed to give residents this exposure and practice feeling more comfortable in future encounters. Feedback has been positive and learners feel more prepared after the simulation. It allows supervisors to observe a difficult patient care scenario assessing intern’s ability to communicate and think on their feet, important ACGME competencies.

**Purpose of Study** Pediatric providers identify limited resources as a barrier to effective management of their overweight/obese patients. The purpose of study was to assess providers’ current resources used in overweight/obesity management and to determine if technological resources could improve current practice.
Methods Used Surveys were distributed to providers in the South Carolina Pediatric Practice Research Network (SCPPRN) who regularly manage pediatric overweight/obesity. Providers were asked about the content and format of provided resources, additional needed resources, the frequency they refer patients to smartphone apps, and whether monitoring patients’ progress via an app would change their management. They were also asked how effective their current management is versus management with an app. Descriptive statistics were calculated using SAS 9.4 (Cary, NC), and the t-test was used for continuous variables.

Summary of Results Fifty-eight out of 99 providers completed the survey. The majority of providers reported only sometimes or less frequently giving take-home resources on physical activity (77%) and healthy eating (72%). Fifty-six percent gave printed material, 40% gave web-based material, and 17% referred to apps at least sometimes or more often. Additionally, 69% providers chose a weight management app for patients as a resource that would most assist in management of overweight/obesity. Thirty-eight percent were not aware of apps with interactive healthy eating games and 24% were not aware of apps with age appropriate exercises. Yet if aware, 95% and 91% respectively would refer patients at least sometimes. If providers had an app to monitor patient progress toward goals, 78% would use it. Of these, 93% would use the app to determine follow-up intervals for weight management. There was a significant difference in providers’ perceived current effectiveness with overweight/obese management (mean score=2.85) compared to potential effectiveness with an app (mean score=3.19), P<.01.

Conclusions Pediatric providers often do not provide take-home resources for their overweight/obese patients; yet, they appear interested in smartphone apps as a resource. Increasing providers’ awareness and use of apps may improve overweight/obesity management.

PHOTOGRAPHY METHODOLOGY DEVELOPMENT TO ASSESS INFANT SLEEP ENVIRONMENT

R Nabaweesi,1,2 R Ekstälin,1,2 ME Attkén,1,2 S Mullins,1,2 B Miller,2 L Whiteside-Mansell1. 1University of Arkansas for Medical Sciences, Little Rock, AR; 2Arkansas Children’s Research Institution, Little Rock, AR.

Purpose of Study Sleep-related deaths contribute substantially to post neonatal infant mortality, prompting recent recommendations to improve safety of the sleep environment. Effectiveness of educational interventions for safe sleep and other injuries in the home are best evaluated using direct observation during a home visit; however, such visits are costly and intrusive for families. To develop a protocol which illustrates a standard approach to evaluate the safety of an infant’s sleep environment using photographs taken with a smartphone.

Methods Used First, we developed an instruction guide for teen mothers to take and submit photographs of their infant’s sleep space. We then compared information collected during home visits with results of a standard observational checklist for the photographs to determine if reliable safety information could be determined from the photographs alone. Finally, we analyzed the inter-rater reliability of photograph content coders and, based on these results, developed a photography coding guide to standardize this evaluation.

Summary of Results Through this iterative process, we identified a set of six photographs that can be used to evaluate seven of the twelve AAP recommendations for safe sleep. Photographs from seven participants were coded for content. Inter-rater reliability (IRR) between coders in the first phase was strong for 17 of the 46 items with a mean Cohen’s Kappa of 0.95. Nineteen of the items on the photography content coding had an IRR less than 0.60 and a mean Kappa of 0.06.

Conclusions Photography has the potential for use in injury prevention evaluation settings as an effective alternative to home visits. Coders need only have basic knowledge of safe sleep practices in order to appropriately evaluate the safety of the sleep space from the photographs with the coding guide. We plan to refine and standardize the methodology using a larger sample size.

PROMOTING EARLY DEVELOPMENTAL SCREENING (PEDS) PROJECT

N Connolly, M Dunlap. University of Oklahoma Health Sciences Center, Oklahoma City, OK.

Purpose of Study Developmental delays affect up to 13% of children in early childhood. Children receiving early intervention services are proven to demonstrate improved developmental outcomes, but many children are not being screened for delays as recommended by the American Academy of Pediatrics. The overall aim is to increase developmental screening using home-based child care providers. This preliminary study identified the feasibility of home-based child care providers administering a developmental screen and communicating to parents the results and recommendations.

Methods Used Child care providers completed two surveys: the first before two educational sessions pertaining to administration of the Ages and Stages Questionnaire (ASQ) and the second after they administered ASQs on children ages 4 months to 5 years in their home child care facility. Parents of the children also completed surveys before and after their children had been given the ASQ.

Summary of Results 47% of child care providers improved on their comfort in assessing a child’s development. 50% improved on their familiarity with developmental screening tools. 65% of providers increased their familiarity of developmental intervention services. On the parent pre survey 6.8% had concerns about their child’s development, and 2% of children were already receiving services. On the post survey 99% of parents reported their child received developmental screening at the child care facility, and 100% reported that the child care provider discussed the results with them. 18.8% of parents reported receiving recommendations based on the screening. The ASQ results for the children were varied: 53.5% passed, 27.7% borderline, and 18.8% failed.
Conclusions Developmental screening using ASQs can be successfully implemented in home child care facilities, and results can be communicated to parents. However, a discrepancy exists between the percentage of children scoring borderline or fail and the percentage of parents receiving recommendations for intervention. This suggests possible barriers to interpretation of results, knowledge of resources, or consistent communication of appropriate recommendations to parents. In addition, only 6.8% of parents had concerns about their child’s development but 46.5% of children scored borderline or fail; this further highlights the importance of developmental screening.

PEDIATRIC UNINTENTIONAL FIREARM INJURIES IN RURAL TRAUMA
R Dimmitt, R Russell, I Maizlin. UAB, Birmingham, AL.
10.1136/jim-2016-000393.569

Purpose of Study Gunshot wounds are the second most common cause of traumatic pediatric deaths in the US, with greater risk than other developed countries. We sought to determine the clinical trends and geographical and age foci associated with unintentional pediatric (UGSWs).

Methods Used We identified pediatric patients (≤18 years old) admitted for UGSWs (2000–2015). Patients were stratified by age: <5 years, 6–9 years, 10–14 years, 15–18 years. Demographics, injury pattern, and outcomes were evaluated. Incidence rates were collated by location to create geographic areas. Summary of Results 194 children (79.4% male, 72.0% African American) sustained UGSWs, mean age of 10.7 ±4.6 years. Most common firearms were handguns, pellet guns, and hunting rifle (54.2%, 24.7% and 5.3%, respectively). UGSWs had a mortality rate of 4.1%, similar to the US rate of 5.0%. Mean hospital stay was 4.7 days, with median Injury Severity Score (ISS) of 5 (Range 1–13) and most common injury site being the extremity. Young teenagers (10–14 years) had rates of UGSW twice that of other age groups. Younger age groups had higher mean ISS (13.8 vs. 10.8 vs. 9.0 vs. 5.7, p=0.011), with no difference in mortality rates (p=0.898) or length of hospitalization (p=0.449). The youngest patients suffered more injuries to head/neck and abdominal cavity, while young teenagers were more commonly shot in the extremities and older teenagers had more thoracic trauma. Geographically, UGSW rates increased in peri-urban areas (Fig).

Conclusions Children 10–14 years old in peri-urban are most likely to experience UGSWs with handguns. Using the resulting heat maps we established the most effective areas and populations for preventative intervention.

NATIONWIDE EVALUATION OF TRENDS IN ATV RELATED INJURIES IN CHILDREN
R Dimmitt, R Russell, I Maizlin. UAB, Birmingham, AL.
10.1136/jim-2016-000393.570

Purpose of Study The inherent risk of all-terrain vehicles (ATV) has been recognized since their introduction in the 1970s. However, ATV operating remains an unregulated activity in many states. We aim to identify the circumstances and clinical outcomes resulting from pediatric ATV accidents.

Methods Used The National Trauma Database (2010–2012) was reviewed for patients <19 years of age admitted following ATV accidents. Patients were stratified into 3 age-groups: 0–6 years, 7–12 years, 13–19 years. Demographics, patterns of injury, and outcomes were evaluated, with chi-square and ANOVA tests used for analysis.

Summary of Results 19,607 children (75.4% male) were involved in ATV-related traumas, with mean age of 13±4.3 years. 9,493 (48.4%) of the injured were drivers, 8,558 (43.6%) were passengers, and 1,556 (8%) were not riding the ATV. Over 14% of the traumas occurred on paved roads. Only 29% of the children were helmeted, and the lowest rate was among the youngest group (<19%). Mean hospital stay was 3.2 days, with 20% of the patients admitted to the ICU, and 6.5% requiring ventilator support. Overall mortality was 0.84%. Compared to younger age groups, patients 13–19 years old had longer mean hospital stay (3.5 days, p=0.05), higher rate of ICU admissions (23%, p=0.05), and greater ventilator requirements (8.3%, p=0.04). The oldest group also had the highest associated mortality (0.95%, p=0.02).

Conclusions ATV use results in a significant number of pediatric injuries and trauma-related admissions, especially in the 13–19 year old age group. Safety guidelines mandating helmet use and prohibiting the operating of ATVs on paved roads must be considered.
Allergy, Immunology, and Rheumatology II Concurrent Session
1:00 PM Monday, February 13, 2017

568 CASEATING GRANULOMAS: IS IT SARCOIDOSIS OR NOT??
S Gonnalagadda,2 T Jackson,1 V Majithia2. 1University of Mississippi Medical Center, Jackson, MS; 2University of Mississippi Medical Center, Jackson, MS.
10.1136/jim-2016-000393.571

Case Report Sarcoïdosis is an inflammatory multisystem granulomatous disease characterized histologically by noncaseating granulomas of involved organs. Necrotizing granuloma is an uncommon pathology of sarcoidosis but has been reported in lungs, eye and central nervous system (CNS). Here, we report a case of neurosarcoïdosis presenting with caseating necrosis initially misdiagnosed and treated as tuberculosis.

A 50-year-old African-American female with past medical history of hydrocephaus and previously treated tuberculous meningitis was readmitted after 10 months with worsening mental status. The previous admission was negative for infectious work up and a neurosurgical appointment for brain and leptomeningeal biopsy was missed by the patient.

Work-up showed an elevated erythrocyte sedimentation rate of 128 mm/hr and C-reactive protein of 9.7 mg/dl, a normal calcium of 9.3 mg/dl and ACE (acetylcholinesterase) of 18 and a negative antinuclear antibody, anti-neutrophil cytoplasmic antibody, quantiferon gold. Fungal assays were negative and sputum stans and cultures were negative for acid fast bacilli. Cerebrospinal fluid (CSF) analysis showed high protein and high ACE. Magnetic resonance imaging showed diffuse leptomeningeal enhancement. Computerized tomography thorax showed hilar adenopathy and bronchoscopic biopsy revealed nonspecific inflammation without granulomas.

A brain biopsy revealed granulomatous leptomeningitis with central necrosis and chronic lymphocytic inflammation of leptomeninges and cerebrum. Final microbiological studies showed a negative PCR for mycobacteria from sputum, bronchoalveolar lavage and CSF. Her neurological status showed significant improvement with pulse dose of methylprednisolone for 5 days followed by prednisone 60 mg daily with a gradual taper.

Necrotizing granulomatous lesions of CNS includes infectious causes like mycobacterial, fungal and noninfectious causes like granulomatosis with polyangiitis, necrotizing sarcoïd granulomatosis, neurosarcoidosis and idiopathic pachymeningitis. A thorough work up is essential in making an accurate diagnosis to determine the treatment strategy. In the present case, an earlier diagnosis and treatment may have improved neurological outcome.

569 A CASE OF PERSISTENT NEUTROPENIA WITHOUT RECURRENT INFECTIONS
VP Devin,1 A Rubinstein2. 1Louisiana State University-Health Sciences Center, New Orleans, LA; 2Albert Einstein College of Medicine, Bronx, NY.
10.1136/jim-2016-000393.572

Case Report Congenital neutropenia is typically discovered shortly after birth. Individuals are marked by a low number of neutrophils and an increased susceptibility to infections. Affected individuals may also have recurrent fevers and mucosal ulcerations. Approximately 20% of these individuals may develop a blood cancer or myelodysplastic syndrome. Patients with recurrent infections may require long-term therapy with antimicrobial prophylaxis or low dose granulocyte-colony stimulating factor (G-CSF).

We present a 51 year-old male who presented for evaluation of his persistent neutropenia. The patient was discovered to be neutopenic when he was hospitalized for pneumonia at age 35 requiring 8 days of IV antibiotics. At that time his absolute neutrophil count (ANC) was 200/ mm³ Since that time he has been followed by a hematologist and treated with intermittent G-CSF for low ANC without recurrent infections. Of note, the G-CSF did not restore his ANC to normal levels, likely providing no additional immunoprotection. In addition, his sister has a diagnosis of cyclic neutropenia but appears to be responsive to G-CSF. Our immunologic evaluation was notable for ANC of 300 and leukopenia of 2.0×10⁹/L but total immunoglobulins, H. flu antibodies, mitogen assay, and RAJI Immune Complex Assay were all normal.

The patient’s unique presentation, lack of recurrent infections, and otherwise normal immunologic workup point toward a genetic etiology. Most cases of severe congenital neutropenia are caused by mutations in the ELANE (neutrophil elastase) gene. In about one-third of people with severe congenital neutropenia, the cause of the disorder is unknown. It has been seen that within one family, one patient may have severe permanent neutropenia and frequent infections, while others have mild intermittent neutropenia or even cyclic neutropenia. This demonstrates that while our patient has been asymptomatic and can continue to be treated conservatively, surveillance should continue should be become symptomatic or develop complications. Furthermore, this case demonstrates the occurrence of asymptomatic persistent severe neutropenia and brings into question the need for prophylaxis in this cohort.

570 THE ROLE OF VITAMIN D AND LEUKOCYTE-ASSOCIATED IMMUNOGLOBULIN-LIKE RECEPTOR-1 ON COLLAGEN INDUCED ARTHRITIS
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10.1136/jim-2016-000393.573

Purpose of Study Rheumatoid Arthritis (RA) is a devastating and chronic inflammatory disease. Leukocyte-associated Immunoglobulin-like Receptor 1 (LAIR-1/CD305) has been suggested to play a role in RA. LAIR-1 is an immune inhibitory receptor that protects against autoimmune dysfunction and 1,25(OH)₂D₃ (vitamin D) has been shown to upregulate LAIR-1 on immune cells. We sought to evaluate the effectiveness of vitamin D supplementation on collagen-induced arthritis (CIA) and T-cell suppression by stimulation of the LAIR-1 receptor.
Methods Used 40 DR1 mice, either LAIR-1 sufficient or deficient were immunized with type II collagen (CII)/ Complete Freund’s Adjuvant (CFA) to induce arthritis. Each mouse was treated with an oral dose of either control (propylene glycol, 0.1 mL/dose) or vitamin D (23 μg/dose). The mice were scored for severity of disease and compared to controls. A second group of 40 DR1 mice, either LAIR-1 sufficient or deficient were immunized with CII/ CFA. On days 3 and 7, each mouse was treated intravenously with either control (propylene glycol, 0.1 mL/dose), porcine α-I(II) collagen (0.33 mg/dose), or bovine α-1(II) collagen (0.33 mg/dose) to stimulate LAIR-1. At 3 weeks, blood samples were analyzed using an IgG ELISA. Murine splenocytes were cultured with either anti-CD3 or peptide A2. After activation with either anti-CD3 or A2, either A2, CD3, Vit D, anti-LAIR or combinations of these were added and analyzed using an IFN-γ ELISA.

Summary of Results Our data shows a trend toward decreased severity of arthritis in LAIR-1 sufficient mice that received vitamin D3 supplementation but not in LAIR-1 deficient mice. Secondly, administration of CII in vivo significantly decrease self-antibody production [subclass IgG-2B was better than subclass IgG-2C (p=0.03)]. We confirmed a decrease in INF-γ production by stimulating LAIR-1 with collagen and noted a slight synergistic effect of stimulating LAIR-1 by LAIR antibody paired with vitamin D.

Conclusions Our data supports the conclusion that stimulation of LAIR-1 may be a promising therapy for the treatment of autoimmune diseases such as RA and that further research is needed to determine the exact role that vitamin D has on the LAIR-1 receptor.

Tissue is the Issue- The Ruse of a Rapidly Developing Eye Mass in an Immunocompromised Patient

TM Crout, V Majithia, F Asher, A Lewis, K Lewis. University of Mississippi Medical Center, Jackson, MS.

10.1136/jim-2016-000393.574

Case Report Immunocompromised rheumatology patients are at constant risk for infection, so when a new symptom develops, the top of our differential diagnosis is not necessarily another connective tissue disease.

A 54-year-old man presented to the hospital for one week of bilateral periorbital edema, proptosis, and worsening ophthalmoplegia. He carried a diagnosis of seropositive rheumatoid arthritis with previous episcleritis, and chronic sinusitis with previous sinus surgery and multiple antibiotics. He was on adalimumab, methotrexate, and sulfasalazine. Physical examination revealed bilateral periorbital edema, left episcleritis, mild proptosis, vertical diplopia, and a right eyelid subcutaneous mass. Erythrocyte sedimentation rate was 70 mm/hr, c-reactive protein was 2.5 mg/dl, comprehensive metabolic panel and complete blood count were unremarkable. Magnetic resonance imaging showed an enhancing infiltrative infectious versus inflammatory process of the left orbit originating from the sinus medially. Computed tomography of the face was highly suspicious for acute, invasive fungal sinusitis with extensive soft tissue strands into the retroantral, postseptal, and extradural fat bilaterally with suspected dehisence of the lateral wall of the left sphenoid sinus. A sphenoid sinusotomy was performed with no growth from all cultures, including fungal. Pathology from the sphenoid sinus biopsy did not reveal invasive fungal organisms and a biopsy of the eyelid mass showed a mixed inflammatory infiltrate with sclerosis and vasculitis. A cytoplasmic anti-neutrophil cytoplasmic antibody and anti-proteinase 3 returned positive and thus, granulomatosis with polyangiitis was diagnosed in a patient with already known seropositive RA. Rituximab was initiated with improvement in the size of the infiltrative mass and control of his RA.

An immunosuppressed patient with known rheumatoid arthritis presenting with an infiltrative sino-orbital process would usually raise primary concern for infection; however, other infiltrative processes still need to be excluded.

Unusual Presentation of Combined Immunodeficiency in a Child with Homozygous Dock8 Mutation

B Brunet, R Rodriguez. University of Mississippi Medical Center, Jackson, MS.

10.1136/jim-2016-000393.575

Purpose of Study Typical presentation of DOCK8 deficiency includes low ALC, with low B and NK cells. NK cell function, CD8 T-cell survival and function, peripheral B-cell tolerance, and regulatory Th17 cell function are impaired. Patients have eosinophilia and elevated IgE, low IgM and normal to high IgG levels. Clinical features include recurrent respiratory infections, cutaneous viral and Staph aureus infections, candidiasis, atopic disease, and hepatic disorders. This case illustrates an atypical presentation of the disease with prolonged fever, lymphadenopathy, eosinophilia, and cough with hypoxemia.

Methods A 2-year-old twin male, originally from Yemen, presented with fevers, cachexia, and cough for one month with lymphadenopathy, severe eosinophilia, elevated IgE and inflammatory markers. With absence of atopy, lymphopenia, or recurrent infections, infectious and malignant etiologies were investigated with a higher likelihood than hyperimmunoglobulin E syndrome (HIES). We also evaluated lymphocyte subsets, T and B-cell function, and genetic tests for HIES.

Summary of Results Eosinophil count peaked at 63,250, with neutrophil and lymphocyte counts remaining normal to elevated. Lymphocyte subsets, antigen and mitogen profile were normal. B-cell function was impaired with low titers to diphtheria, tetanus, Hib, and S pneumonia. IgE was elevated initially at 1118 IU/ml but decreased to 688 IU/ml. IgM and IgG were normal. Infectious work-up was negative (PPD, HIV parasites, blood, urine and respiratory cultures). Abdominal u/s and cardiac echo were normal. Chest CT showed extensive parenchymal abnormality, adenopathy, and bronchiectasis.

BAL showed 94% eosinophils with positive PPJ PCR. Vitamin B12 was normal, tryptase elevated, T-cell receptor gene rearrangement suggested clonality. Leukemia/lymphoma panel was negative. DOCK8 Gene Sequencing was positive for homozygous mutation.
Conclusions DOCK8 deficiency was discovered in 2009 and can present with atypical clinical features, making the diagnosis confusing. Our patient presented with signs and symptoms mimicking infectious or malignant etiology, with atypical serology for HIES. The patient was started on 2 mg/kg prednisolone and weaned to 0.5 mg/kg to control symptoms. We are currently preparing him for treatment with HCT.

**573** RECURRENT WET COUGH IN CHILDREN MAY INDICATE LOW PNEUMOCOCCAL PROTECTION, NOT ATOPY

S Sussman, LE Leiva, LA Wall. LSUHSC-New Orleans, New Orleans, LA.

10.1136/jim-2016-000393.576

**Purpose of Study** Cough is among the most common of pediatric complaints and is often attributed to allergy or asthma. However, recurrent wet cough may be a warning sign of an underlying disorder. While there is much controversy surrounding the significance of antibiotic-responsive wet cough, there has been limited investigation into the immunologic phenotype of such children.

**Methods Used** Chart review in the allergy immunology clinic identifying fully immunized pediatric patients (age 24–72 months) with >2 weeks of wet cough. All subjects demonstrated recurrent episodes and a clear pattern of requiring antibiotics for resolution. Clinical and laboratory characteristics were compared between those with elevated serum IgE levels and those with IgE within the normal range. Statistical analysis comparing pneumococcal titers was conducted using t-test.

**Summary of Results** Of the 23 subjects meeting criteria, 10 had elevated IgE and 13 had normal IgE. Recurrent otitis media was present in nearly all (20 of the 23) subjects in both groups. Aeroallergen-specific IgE testing demonstrated sensitization in only 5 patients (3 with elevated IgE and 2 with normal IgE). Clinical diagnosis of asthma was rare in both groups. Tobacco smoke exposure was present in 39% of subjects. Pneumococcal antibody titers using a 14-antigen ELISA panel demonstrated protection (>1.3 MCG/ML) to a mean of 2.5 serotypes in the elevated IgE group, compared to 6.3 serotypes in the normal IgE group (P <0.01).

**Conclusions** Analysis of children with recurrent antibiotic-responsive wet cough revealed that allergic sensitization and asthma were very rare even in subjects with elevated IgE. The elevated IgE cohort unexpectedly demonstrated very low pneumococcal protection, suggesting that children presenting with wet cough may have a degree of immune dysregulation and susceptibility to infection.

**575** UNIQUE CHARACTERISTICS OF SCLERODERMA IN THE LOWCOUNTRY OF SOUTH CAROLINA

S Compton, RS Silver, D Kamen. Medical University of South Carolina, Charleston, SC.

10.1136/jim-2016-000393.577

**Purpose of Study** Scleroderma (SSc) is a rare autoimmune disease categorized on the basis of skin involvement as either limited or diffuse, the latter of which manifests in more severe skin and internal organ involvement. SSc disproportionally affects women and literature suggests African American (AA) patients experience autoimmune diseases differently than other ethnic groups. We sought to determine if there was a difference in AA patients and non-AA patients among the Lowcountry AA Gullah population.

**Methods Used** Data was collected as part of an ongoing IRB-approved longitudinal registry of SSc at MUSC, including demographics, clinical disease manifestations, and other medical history. Patients were seen over a 12-year period at the MUSC Division of Rheumatology outpatient clinics. Descriptive chart review was performed to confirm age of onset, SSc disease type, and selected criteria for SSc to assess severity of disease.

**Summary of Results** A total of 189 patients with SSc (79.4% female, 32.3% black) were identified. AA patients developed SSc at a significantly younger age compared to the non-AA patient subset (41.3 ±12.9 yrs., 48.8 ±13.1 yrs., respectively, p=0.0003). Females developed SSc at a younger age than males (45.1 ±13.7 yrs. versus 51.4 ±11.6 yrs. (p=0.0087). Diffuse SSc was significantly more common in AA patients (p=0.002). Females in both population groups were more likely to have diffuse SSc than limited SSc (69.4%, p=0.001). A higher percentage of non-AA patients experienced dysphagia (31.6% p=0.279), as well as digital ulcers (60.0% p=0.072), although not statistically significant. Non-AA patients had a significantly higher prevalence of restrictive lung disease based on forced vital capacity predicted <70% (59.3% versus 40.7% p=0.026). Overall mortality was 10% in AA patients compared to only 4% in non-AA patients (p=0.097).

**Conclusions** In conclusion, we found that AA SSc patients are younger and more often have diffuse disease than non-AA SSc patients, consistent with findings among other AA populations. Non-AA patients had a higher prevalence of restrictive pattern, however we found a higher (albeit not statistically significant) mortality rate among AA patients. These data support the conclusion that AAs have a more unfavorable SSc prognosis, but further investigation of the multifactorial causes for this disparity is needed.

**574** RECURRENT WET COUGH IN CHILDREN MAY INDICATE LOW PNEUMOCOCCAL PROTECTION, NOT ATOPY

S Sussman, LE Leiva, LA Wall. LSUHSC-New Orleans, New Orleans, LA.

10.1136/jim-2016-000393.576

**Purpose of Study** Cough is among the most common of pediatric complaints and is often attributed to allergy or asthma. However, recurrent wet cough may be a warning sign of an underlying disorder. While there is much controversy surrounding the significance of antibiotic-responsive wet cough, there has been limited investigation into the immunologic phenotype of such children.

**Methods Used** Chart review in the allergy immunology clinic identifying fully immunized pediatric patients (age 24–72 months) with >2 weeks of wet cough. All subjects demonstrated recurrent episodes and a clear pattern of requiring antibiotics for resolution. Clinical and laboratory characteristics were compared between those with elevated serum IgE levels and those with IgE within the normal range. Statistical analysis comparing pneumococcal titers was conducted using t-test.

**Summary of Results** Of the 23 subjects meeting criteria, 10 had elevated IgE and 13 had normal IgE. Recurrent otitis media was present in nearly all (20 of the 23) subjects in both groups. Aeroallergen-specific IgE testing demonstrated sensitization in only 5 patients (3 with elevated IgE and 2 with normal IgE). Clinical diagnosis of asthma was rare in both groups. Tobacco smoke exposure was present in 39% of subjects. Pneumococcal antibody titers using a 14-antigen ELISA panel demonstrated protection (>1.3 MCG/ML) to a mean of 2.5 serotypes in the elevated IgE group, compared to 6.3 serotypes in the normal IgE group (P <0.01).

**Conclusions** Analysis of children with recurrent antibiotic-responsive wet cough revealed that allergic sensitization and asthma were very rare even in subjects with elevated IgE. The elevated IgE cohort unexpectedly demonstrated very low pneumococcal protection, suggesting that children presenting with wet cough may have a degree of immune dysregulation and susceptibility to infection.

**575** SUBCUTANEOUS IMMUNOGLOBULIN THERAPY DURING PREGNANCY IN A WOMAN WITH HYPER-IGM SYNDROME

B Olmsted, SF Kemp. University of Mississippi Medical Center, Jackson, MS.

10.1136/jim-2016-000393.578

**Purpose of Study** Hyper-IgM (HIGM) syndromes are rare disorders distinguished by quantitative deficiencies of IgG and IgA with normal or elevated IgM resulting from defective antibody class-switching. Patients with immunodeficiency require special consideration of immunoglobulin replacement strategies during pregnancy, and IgG trough levels decrease during pregnancy due to such physiologic factors as plasma volume expansion and increased
catabolism. Subcutaneous Immunoglobulin (SCIG) product
inserts recommend periodic monitoring of total IgG levels
during maintenance therapy; although high-quality evi-
dence is lacking. We present an empirically successful man-
gement strategy for SCIG maintenance therapy during
two consecutive pregnancies in a patient with HIGM.

Methods Used Beginning at the end of the first trimester,
trough total serum IgG levels were monitored monthly and
weekly SCIG doses (Hizentra, CSL Behring) adjusted as
clinically indicated or to approximate 700 mg/dL.

Summary of Results Incremental dosage increases of 1 to
3 grams of SCIG were required beginning in the second tri-
ster of both pregnancies. A UTI during the first trimester of
the second pregnancy resolved with oral nitrofurantoin.
She had two spontaneous, term deliveries at ages 29 years
and 33 years, respectively.

She continued the final SCIG dose for 4 weeks post-
partum and then resumed the ante-partum dose.

The first child has Down syndrome, which we do not
attribute to immunoglobulin replacement; the second child
has no discernible development defects.

Conclusions We believe this is the first report of a specific
SCIG strategy during pregnancy for a patient with HIGM.
Further pregnancy registry data are needed.

Summary of Results Both cTfh and cTh17 cells were sig-
nificantly increased in RA patients, especially in active
patients comparing to healthy donors (p<0.05). The fre-
quency of cTfh cells correlated with the percentage of plas-
mablasts and the level of pathogenic anti-CCP antibody as
well as DAS-28, whereas the frequency of cTh17 cells cor-
sulted with serum level of CRP.

Conclusions Circulating Th17 cells may be involved in RA
pathogenesis by inducing generation of autoantibody pro-
ducing plasma cells, while cTh17 cells largely related to
inflammation. Thus, disrupting the signals provided by
both of Th17 and Th17 cells may provide effective ther-
peutic strategies for active RA patients.

Endocrinology and Metabolism Concurrent Session
1:00 PM
Monday, February 13, 2017

577 EARLY TEENAGE FEMALES WITH TYPE 1 DIABETES
REPORT PARENTAL STRESS

A Lewis, K Lewis, R Paulo, M Hutchison, D Bovilby. Medical University
of South Carolina, Charleston, SC.

Purpose of Study Chronic illness can cause significant
stress on adolescents that can become a barrier to optimal
management of Type 1 diabetes (T1D). The objective of
this study is to identify the primary diabetes related stres-
sors in adolescent patients with T1D.

Methods Used This study analyzed the results of the
‘Response to Stress Questionnaire’ developed by the Stress
and Coping Research Lab at Vanderbilt. The study was
completed by 87 consecutive adolescents with T1D in our
clinic. A retrospective chart review collected demographics,
diabetes information, and other medical information.

Summary of Results The average age was 15.1±1.8 years,
with 55% females, and 54% Caucasian. The average dur-
ation of diabetes was 5.56±4.29 years and the average A1c
was 8.7±1.81%. 25% of the patients had significant con-
comitant chronic illnesses with the most prevalent being
asthma (10%), microalbuminuria (4.5%), and celiac disease
(3.5%). 25% of the patients had psychiatric diagnoses.
11.5% had ADHD, 8% anxiety disorder, and 7% depres-
sion. 30% lived in single parent households, and 6% had
Department of Social Services involvement. The top stres-
sors for the overall cohort were: ‘Parents bugging me about
taking care of myself’, ‘Dealing with diabetes care (diet,
供s, etc)’, and ‘Seeing my family worry about me’. The
least source of stress identified was ‘Going to clinic so
often and missing school’. The more stressed patients were
female, African American, younger (age 11–13), with a
short duration of diabetes (< 3 yr) and A1c values at goal
(< 7.5 %).

Conclusions Teaching parenting skills for adolescents with
chronic illness to parents of T1D patients, increasing pro-
vider recognition of patient’s specific diabetes stress, and
implementing strategies to reduce patient stress (ie Tenion
Tamer Application) may improve this aspect of diabetes
management.
Purpose of Study The purpose of this study was to study the heterogeneity of gene expression in islets from pancreas donors with or without type 1 diabetes by comparing gene expression profiles of laser-captured pancreatic islets of different histologic phenotypes.

Methods Used Using the nPOD tissue bank we obtained pancreatic tissue from 23 male and female diabetic and non-diabetic (control) donors diagnosed at the varying times before their death. The samples were stained for presence and/or absence of insulin and CD3 (T lymphocytes). Staining for both insulin and CD3+ T cells resulted in the following histologic subtypes of islets: Ins+CD3- (control/T1D), Ins+CD3+ (T1D), Ins-CD3+ (T1D), and Ins-CD3- (T1D). Following staining, 120 individual islets were collected and subjected to RNA extraction followed by gene expression profiling. Hierarchical clustering was then performed on these 120 individual islets.

Summary of Results Hierarchical clustering revealed inter-mixing and separation of phenotypes. Analysis of the data focused on identifying genes and pathways that distinguished different islets. Of particular interest based on hierarchical clustering results, were differences between normal control islets (Ins+CD3-) vs. similar Ins+CD3- islets from T1D donors, as well as control islets vs. Ins+CD3+ T1D (insulitic) islets. Analysis of control vs. Ins+CD3- T1D islets revealed primarily the expression of genes that fit under metabolic abnormality categories. It also showed the differences in genes regulated by glucose abnormalities as well as insulin secretion related genes. Data mining also revealed changes in genes involved in beta cell development. Comparison of control islets vs. Ins+CD3+ T1D islets revealed changed expression of antigen presentation pathway genes as well as in a large number of interferon-regulated genes, suggesting a prevalence of their role in the pathogenesis of the disease. Finally, data analysis of these groups also revealed differential expression of beta cell development related genes similar to what was seen in our first groups of comparison.

Conclusions Variability in gene expression shown establishes the heterogeneous nature of Type 1 diabetes in regards to its progression.

Purpose of Study This multicenter randomized clinical trial was designed to compare the safety and efficacy of a DPP4-inhibitor (sitagliptin) plus basal insulin vs. basal bolus insulin regimen in the management of general medicine and surgery patients with type 2 diabetes (T2D).

Methods Used A total of 280 patients with blood glucose (BG) between 140–400 mg/dl and treated with diet, oral antidiabetic agents or total daily insulin dose ≤0.6 unit/kg were randomly allocated (1:1) to receive sitagliptin plus glargine once daily or to basal bolus regimen with glargine once daily and lispro before meals. Major outcomes included differences in mean daily BG and frequency of hypoglycemia between treatment groups.

Summary of Results There were no differences in the mean daily BG (170±49 mg/dl vs. 169±48 mg/dl, p=0.96), proportion of BG readings 70–180 mg/dl (57% vs. 60%, p=0.58), hospital length of stay (median [interquartile range]: 4 [3–8] vs. 4 [3–8] days, p=0.54) or in a composite of hospital complications including acute kidney injury, wound infection, stroke, acute myocardial infarction, respiratory failure, reoperation, and pneumonia (10% vs. 8%, p=0.66) between sitagliptin-basal and basal-bolus groups. The total daily insulin dose (0.24±0.14 U/kg vs. 0.33±0.16 U/kg) and number of daily insulin injections (2.2±1.1 vs. 2.9±0.9) were less in the sitagliptin-basal vs. basal-bolus, both p<0.001. There were no differences in the number of patients with hypoglycemia (9% vs. 12%, p=0.45) between groups.

Conclusions Treatment with sitagliptin plus basal insulin is safe, effective and more convenient than basal bolus regimen for the management of general medicine and surgery patients with T2D.
7.32%±1.68% at 6 months (both, p<0.001). Mean daily glucose decreased from 211.6±53.8 mg/dl at enrollment to 134.3±32.5 mg/dl and 133.4±39.8 mg/dl at 3 and 6 months, respectively (both p<0.001). Patients with HbA1c<7% had a change from 6.27±0.48% to 6.28±0.80% and 6.22±0.99% at 3 and 6 months. Patients with HbA1c 7–9% had a reduction from 8.04±0.65% to 7.29±1.1% and 7.34±1.27% (both p>0.001), and those with HbA1c>9% had a reduction from 11.35±1.71 to 7.98±1.75% and 8.02±2.01% at 3 and 6 months (both p<0.001). Hypoglycemia (<70 mg/dl) was 23.5% in HbA1c<7%, 23.2% in HbA1c 7–9%, and 26.4% in HbA1c>9% groups. BG<40 mg/dl was reported in <2% of patients.

Conclusions In summary, our HbA1c-based discharge algorithm with oral agents with or without basal insulin was found to be safe and effective to manage general medicine and surgical patients with T2DM.

**581 METFORMIN AND ITS EFFECT ON THYROID AND GI MALIGNANCY IN PATIENTS WITH T2DM**

P Branch,4 B Brannick,1 D Henderson,1 J Zuber,2 S Solomon1,3. 1University of Tennessee, Memphis, TN; 2VAMC Memphis/UTHSC Memphis, Memphis, TN; 3VAMC Memphis, Memphis, TN; 4 Meharry Medical College, Nashville, TN.

10.1136/jim-2016-000393.584

**Purpose of Study** Metformin (MET), an antidiabetic drug, has anti-neoplastic activity when used as adjuvant therapy in the treatment of breast, prostate and colon cancer. MET works via inhibition of mTOR, activation of tumor suppressor genes p53 and LKB1 via AMPK. In a retrospective chart review in VAMC Memphis we investigated survival, recurrences, and the prevalence of metastases in T2DM patients with either thyroid, gastric or esophageal cancer taking MET.

**Methods Used** Thyroid, gastric, and esophageal cancer patients with T2DM on MET were compared to controls taking any diabetic medication other than MET. We investigated recurrences, metastases, secondary malignancies, and survival. Specific biomarkers were examined for each malignancy: Thyroid, thyroglobulin; Esophageal, CEA; and for Gastric cancer, Vitamin B12. HbA1c and creatinine were measured in MET patients compared to healthy controls. Statistical analysis was performed using unpaired t-tests and chi square and by calculating Cohen’s d and Cramer’s V effect sizes. Total number for each cancer was: thyroid 46; esophageal 145; and gastric 149. However, the number of cases in the Non MET group far exceeded the N in the Met group for each cancer.

**Summary of Results** MET patients had better survival rates than Non MET patients: 76.9% vs 45.5% (V=0.28, p=0.054) for thyroid; 44.4% vs 9.9% (V=0.32, p=0.001) for gastric; and 37.5% vs 5.1% (V=0.29, p=0.011) for esophageal. Greater recurrence rates were observed for MET Esophageal patients compared to Non-MET (37.5% vs 8.8%, V=0.22, p=0.037), and a similar result and size (V) for Thyroid patients (38.5% vs 15.2%, V=0.25, p=0.117).

**Conclusions** Adjuvant use of MET leads to significantly better survival rates for thyroid, gastric, and esophageal cancer. Paradoxically, although they lived longer, we observed an increase in recurrence rates of cancer in esophageal and thyroid patients. The smaller N for patients on MET for both gastric and esophageal cancer may have been because of the well-known side-effect of MET as a gastrointestinal irritant. Despite low enrollment in the MET group and an increase in recurrence rates, overall survival rates for all patients on MET was significantly increased.

**582 THE ROLE OF FLAVIN-CONTAINING MONOOXYGENASE GENE FAMILY IN DIABETIC NEPHROPATHY**

MA Al-Obaide, R Singh, P Datta, MV Salguero Berrmonth, T Vasylyeva. Texas Tech University HSC, Amarillo, TX.

10.1136/jim-2016-000393.585

**Purpose of Study** Increasing evidence links the flavin-containing monooxygenases (FMOs) with diabetic nephropathy (DN), which is one of the leading causes of chronic kidney disease (CKD) in the United States. DN complications are characterized by increased expression of inflammatory response genes triggered by high glucose concentrations. Trimethylamine N-Oxide (TMAO) promotes vascular inflammation through signaling of nuclear factor-kB (NF-kB), is formed inside liver from trimethylamine (TMA) by two main FMOs encoded by two of five FMO gene family members. The objective of this study was to: evaluate the level of TMAO in patients with advanced DN and characterize the regulation of expression of unexplored cell-specific FMO1 and FMO3 alternative promoters in kidney cells: renal endothelial and mesangial cells, under high glucose concentrations.

**Methods** TMAO concentrations were quantified in serum samples of 20 T2DM CKD 4–5 (not on dialysis) patients and 20 healthy subjects. Bioinformatics databases were systematically used to search for FMO gene family alternative promoters and the associated regulatory sequences. Renal endothelial and mesangial cells were grown under normal (5.5 mM) and high ambient glucose conditions (25 mM). The extracted RNA was used to measure the expression of FMO1 and FMO3 alternative promoters by reverse transcriptase (RT) real time q-PCR. The inflammatory markers: IL6 and TNFα, were assessed by ELISA and western blot (WB) in the cell lysates.

**Summary of Results** TMAO levels in T2DM patients were significantly higher as compared to healthy subjects (p<0.01). One of four FMO1 alternative promoters was highly expressed in renal endothelial and mesangial cells compared with FMO3 expression. Preliminary results suggested the potential role of high ambient glucose in regulation of FMO1 expression. Presence of unexplored two antisense ncRNA loci and IncRNA long non-coding RNA (IncRNA), LOC105371611, located in the divergent configuration close to FMO1 suggested a potential role in regulation of the gene.

**Conclusions** The level of TMAO is elevated in T2DM CKD patients, FMO1 is highly expressed in kidney cells and may link to the local overexpression of inflammatory cytokines through the NF-kB signaling pathway stimulated by high ambient glucose conditions.
Abstracts

583 TEMPORAL TRENDS AND CLINICAL OUTCOMES IN PATIENTS WITH UNCONTROLLED DIABETES AND RELATED COMPLICATIONS

N Jain,1 N Jain,2 L Garg,3 M Agarwal,1 D Kadaria1. 1University of Tennessee, Memphis, Memphis, TN; 2Memorial University Medical College, Nashville, TN; 3Lehigh Valley Medical Center, Allentown, PA.

Purpose of Study Patients with uncontrolled diabetes are frequently hospitalized with life-threatening complications such as ketoacidosis, hyper-osmolality, and diabetic coma. There is paucity of data with respect to contemporary trends in management and outcomes of uncontrolled complicated diabetes mellitus related hospitalizations.

Methods Used We analyzed the 2003 to 2011 Nationwide Inpatient Sample databases to examine the temporal trends and in-hospital mortality in patients presenting with uncontrolled complicated diabetes mellitus aged ≥18 years in the United States. All patients with primary diagnosis of uncontrolled complicated diabetes mellitus were identified using ICD-9 CM codes- 250.02–250.03, 250.10–250.13, 250.20–250.23 and 250.3.

Summary of Results From 2003 to 2011, the number of patients admitted with the primary diagnosis of uncontrolled complicated diabetes mellitus increased from 171,408 to 216,965 (p-trend <0.001). During the study period, in-hospital mortality decreased from 0.8% to 0.4% (adjusted odds ratio [per year] 0.90; 95% confidence interval 0.89 to 0.91; p-trend <0.001). The average hospital charges increased from $14,370 to $22,897 (p-trend <0.001), whereas the average length of stay decreased 3.9 to 3.4 days (p-trend <0.001).

Conclusions Although the number of hospitalizations with primary diagnosis of uncontrolled diabetes mellitus increased by approximately 26.5% between 2003 and 2011, there have been favorable trends in the clinical outcomes of these patients, with a decrease in risk-adjusted in-hospital mortality.

584 CLINICAL CHARACTERISTICS AND OUTCOMES IN PATIENTS WITH COMBINED DIABETIC KETOACIDOSIS AND HYPEROSMOLAR HYPERGLYCEMIC CRISSES

K Tsegka,1 SD Cardona,1 S Nair,1 P Vellanki,1 KV Narayan,1 GE Umpierrez,1 F Pasquel1. Emory University, Atlanta, GA; 2Rollins School of Public Health, Atlanta, GA.

Purpose of Study To determine the distribution of hyperglycemic crises (isolated hyperosmolar hyperglycemic state (HHS), isolated diabetic ketoacidosis (DKA) and combined DKA-HHS) in patients admitted to Emory University Hospitals between 2005 and 2015.

Methods Used The Clinical Data Warehouse program at Emory was used to collect electronic health data including:

Patient demographics, anthropometrics.

Laboratory values: HbA1c, plasma glucose, arterial/venous pH, ketones, total serum osmolality, effective serum osmolality, anion gap, total and corrected serum sodium, creatinine, estimated glomerular filtration rate, lactic acid, CPK.

ICD-9 codes for hospital comorbidities/complications (hypokalemia, acute kidney injury, cardiac complications, deep vein thrombosis/venous thromboembolism, cerebral edema, rhabdomyolysis, length of hospital stay, and mortality within 30 days of hospitalization).

Summary of Results Among 1211 patients, 465 (38%) had DKA (ICD-code and bicarbonate ≤ 18 mEq/L on presentation), 421 (33%) patients had HHS (ICD-code, effective osmolality ≥ 300 mOsm/kg, and bicarbonate > 18 mEq/L) and 325 (27%) had combined features of DKA-HHS (DKA+osmolality≥300 mOsm/kg). HHS patients were older, more likely to be African American, and had higher BMI. Cerebral edema and rhabdomyolysis were uncommon. Age was independently associated with increased mortality [adjusted OR (aOR): 1.05, 95% confidence interval (CI): 1.03–1.07]. After adjusting for age, gender, BMI, and race, subjects with combined DKA-HHS had higher 30-day mortality compared to subjects with isolated hyperglycemic crises (aOR: 2.5, CI: 1.4–4.6). Hypokalemia (<3 mEq/L) was common (N: 326, 27.37%) but did not differ among groups. Severe hypokalemia (<2.5 mEq/L) occurred in 75 subjects (6.3%) and was associated with increased mortality (OR 3.17, 95% CI: 1.49, 6.76). This association remained significant after adjusting for hyperglycemic crises categories, demographic variables, and metabolic parameters on admission (aOR 4.49, 95% CI: 1.82, 11.09).

Conclusions The combination of HHS and DKA increased the odds of mortality among patients presenting with hyperglycemic crises. Hypokalemia was common and was independently associated with increased mortality.

585 CAVEATS IN ADOLESCENTS WITH POLYCYSTIC OVARIAN SYNDROME AND DEMOGRAPHICS IN A TERTIARY CENTER

LE Shenep,1 H Al-Zubeidi1,2. University of Tennessee Health Science Center, Memphis, TN; 2Le Bonheur Children’s Hospital, Memphis, TN.

Purpose of Study Polycystic ovarian syndrome (PCOS) is a common heterogeneous condition with features overlapping some characteristic of normal pubertal development. The cause of PCOS is thought to be related to a combination of ovarian hyperandrogenism and insulin-resistant hyperinsulinism. Our aims were to: 1. Determine the prevalence of PCOS in our adolescent population 2. Evaluate baseline demographics and laboratory parameters 3. Investigate the presence of ethnic variations in patients with PCOS 4. Investigate the utility of ICD codes in research methods 5. Assess the adequacy of diagnostic evaluation and screening for co-morbidities in patients with suspected PCOS.

Methods Used We performed an IRB approved retrospective chart review of 250 subjects referred to the endocrine clinic, general pediatric clinic and healthy lifestyle clinic with an ICD code of polycystic ovarian syndrome or a related diagnostic code between April 2014 and April 2016. We identified 22 patients with confirmed PCOS based on NIH criteria, and we identified 70 patients with
possible PCOS. We combined the groups for analysis.

**Summary of Results**
The prevalence of PCOS was 1%. The average age was 15 +/- 1 years. 65% were Non-Hispanic Black, and 26% were Non-Hispanic White. There were no ethnic differences for baseline demographics or androgens. Black race compared to white race was associated with a greater prevalence of obesity (92% vs. 87%) and insulin resistance (26% vs. 0%), but a lower prevalence of dyslipidemia (11% vs. 55%). Black patients compared to white patients with PCOS had a higher mean HDL (43 vs. 36 mg/dL, p=0.04) and lower mean triglyceride level (92 vs. 180 mg/dL, p=0.00). Of patients with NIH confirmed PCOS, only 38% received an ICD code for polycystic ovarian syndrome.

**Conclusions**
Our study demonstrates that while black patients with PCOS had a greater prevalence of insulin resistance and obesity, they had less dyslipidemia when compared to white patients with PCOS. Further studies are needed to confirm this finding. To improve diagnostic evaluation of PCOS, we created a tool to assist in screening for comorbidities and accurately diagnosing PCOS.

**Abstract 586**

**PERIOPERATIVE STRESS HYPERGLYCEMIA AND RISK OF COMPLICATIONS AND MORTALITY IN NON-DIABETIC PATIENTS UNDERGOING GENERAL SURGERY**

G Davis, M Fayfman, D Reyes, F Pasquel, P Vellanki, J Haw, L Peng, GE Umpierrez. Emory University, Atlanta, GA.

10.1136/jim-2016-000393.589

**Purpose of Study**
The prevalence and clinical outcome of perioperative hyperglycemia defined as a blood glucose (BG)>140 and 180 mg/dl in patients without diabetes is not known.

**Methods Used** Accordingly, we reviewed glycemic control and hospital outcomes data in 2002 consecutive patients with preoperative normoglycemia (BG<140 mg/dl) at 4 university-affiliated hospitals.

**Summary of Results** A total of 424 patients (21.2%) developed≥1 episode of BG 140–180 mg/dl and 220 patients (11%) had a BG>180 mg/dl within 48 hours after surgery. Compared to patients with normoglycemia, patients with stress hyperglycemia (BG >140 and >180 mg/dl) had a longer length of hospital stay (LOS) and significantly higher rates of complications and mortality (all, p<0.001) (Table).

After adjusting for age, gender, BMI and race, compared to patients with normoglycemia, those with postoperative BG 140–180 mg/dl had higher odds ratios (OR) for both complications [1.98 (95% CI: 1.51–2.61)] and mortality [2.82 (0.93–8.56)]. The OR for complications and mortality in patients with postoperative BG >180 mg/dl were 3.36 (2.39–4.71) and 8.05 (2.92–22.17), respectively.

**Conclusions**
Development of stress hyperglycemia in non-diabetic patients undergoing general surgery is common and is associated with longer LOS, and increased rates of hospital complications and mortality. Randomized clinical trials are needed to determine if treatment of stress hyperglycemia can improve outcomes in surgery patients.

**Health Care Research and Quality Improvement**
Concurrent Session
1:00 PM
Monday, February 13, 2017

**Abstract 587**

ARE DATA EXTRACTED FROM THE ELECTRONIC MEDICAL RECORD VALID FOR RESEARCH PURPOSES?

L Scheid,2 LS Brown,1 C Clark,1 C Rosenfeld2. 1Parkland Health & Hospital Systems, Dallas, TX; 2UT Southwestern Medical Center, Dallas, TX.

10.1136/jim-2016-000393.590

**Purpose of Study**
The Electronic Medical Record (EMR) was designed to improve patient management and administrative billing. However, researchers have begun using the EMR for easy electronic extraction of patient data and the ICD-9 code for diagnoses. While most databases are manually entered and carefully validated, the EMR is rarely validated for accuracy. Thus, we assessed the validation of electronically extracted EMR data as part of a retrospective hypoglycemia study and examined sources of error.

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**Abstract 586 Table 1**

<table>
<thead>
<tr>
<th></th>
<th>Normoglycemia</th>
<th>Stress Hyperglycemia</th>
<th>Stress Hyperglycemia</th>
<th>p-value</th>
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<tr>
<td></td>
<td>&lt;140 mg/dL</td>
<td>140–180 mg/dL</td>
<td>&gt;180 mg/dL</td>
<td></td>
</tr>
<tr>
<td># patients</td>
<td>1358</td>
<td>424</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>Age, years</td>
<td>56.2±18.5</td>
<td>59.5±17.2</td>
<td>59.3±17.4</td>
<td></td>
</tr>
<tr>
<td>Male gender, n (%)</td>
<td>643 (47)</td>
<td>212 (50)</td>
<td>110 (50)</td>
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<tr>
<td>Race, n (%)</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Caucasian</td>
<td>716 (53)</td>
<td>282 (67)</td>
<td>144 (65)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>642 (47)</td>
<td>142 (33)</td>
<td>76 (35)</td>
<td></td>
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<tr>
<td>LOS, median, days</td>
<td>6</td>
<td>9</td>
<td>11.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mortality, n (%)</td>
<td>12 (1)</td>
<td>7 (2)</td>
<td>10 (5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Complications, n (%)</td>
<td>301 (22)</td>
<td>135 (32)</td>
<td>104 (47)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OR complications (95% CI)</td>
<td>1.00 (Ref)</td>
<td>1.98 (1.51–2.61)</td>
<td>3.36 (2.39–4.71)</td>
<td></td>
</tr>
<tr>
<td>OR mortality (95% CI)</td>
<td>1.00 (Ref)</td>
<td>2.82 (0.93–8.55)</td>
<td>8.05 (2.92–22.17)</td>
<td></td>
</tr>
</tbody>
</table>
Abstracts

Methods Used EMR data were electronically extracted (clarity report [CR]) from 100 of 3479 neonates with a blood glucose <40 mg/dL within 72 h of birth between 2010–2014. Data included demographics, diagnoses, maternal factors, laboratory results and medications. Thirty-one continuous and categorical variables were assessed by blinded manual chart review and compared to the CR using K inter-user agreement score or percent validity score. Variables with a K≤0.4 or percent validity ≤70 were then investigated to determine sources of error in the CR. Errors were corrected and the data reanalyzed.

Summary of Results Overall, 20/31 (63%) variables had a K>0.6 for categorical variables or >70% validity for continuous variables. When factors specific to neonatal hypoglycemia were examined, maternal gestational diabetes and obesity had a K=0.80 and 0.85, respectively, whereas overt diabetes and neonatal hypoglycemia had a K=0.24 and 0.16, respectively. Although 100% of neonates had a blood glucose <40 mg/dL, only 67% had EMR documentation of ‘hypoglycemia’; 36/100 had ‘hypoglycemia’ in the problem list and 29/100 were assigned an ICD-9 code for hypoglycemia. CR errors included wrong ICD-9 code, absence of diagnostic documentation and coding within the EMR, and assignment of imprecise ICD-9 codes, e.g., ‘gestational diabetes’ and ‘abnormal glucose tolerance,’ which are diagnostically different, have the same ICD-9 code, 648.8

Conclusions The EMR has a wealth of patient data, but valid identification is often affected by human error, e.g., data entry and coding errors, that can result in incorrect identification, analyses and conclusions. Data electronically extracted from the EMR for research require validation.

588 CHANGES IN OPIOID PRESCRIBING FREQUENCIES AMONG CHILDREN 0–5 YEARS OLD FROM 2000–2015

W Basco,1 D Bundy,1 S Garner,2 M Ebeling,1 K Simpson1. 1Medical University of South Carolina, Charleston, SC; 2South Carolina College of Pharmacy, Charleston, SC.

Purpose of Study Federal and professional organization policies have advocated reducing opioid use for all patients, including children. We tested the hypothesis that opioid use among young children has decreased over the past 16 years.

Methods Used Using 2010–2015 paid South Carolina (SC) Medicaid claims data, we identified dispensed prescriptions for opioids to children 0–5 years old. We evaluated whether the frequency of opioid prescriptions per 1000 enrollees per year decreased over the 16-year study period. Logistic regression assessed whether year was predictive of opioid frequency, controlling for age, gender, and race/ethnicity. The SC Revenue and Fiscal Affairs Office and the Institutional Review Board of MUSC approved this study.

Summary of Results There were 753,672 unique children ages 0–5 in the data. 231,193 subjects received an opioid prescription during 2,487,535 person-years, for an overall opioid use frequency of 92.9/1000 children/year. Opioid prescribing overall declined from a rate of 133.6/1000 in 2000 to 36.3/1000 in 2015 (Cochran-Armitage test for trend p=<.0001). This trend was present for all one-year age groups but really began in earnest around 2007 after relatively static levels 2000–2006. In logistic regression, year was significantly inversely related to the frequency of opioid prescription (adjusted Odds Ratio 0.899, 95% CI 0.898–0.900), even after adjusting for age, gender, and race/ethnicity. Race/ethnicity was also inversely associated with receipt of opioid, with adjusted OR 0.65 among black subjects. Increasing age (aOR 1.31) and being male gender (aOR 1.24) were positively associated with receipt of opioid.

Conclusions Opioid prescriptions to children 0–5 years old in SC have decreased over the past 16 years, plateauing from 2000–2006, then steadily decreasing to a level below 2000 use frequency. This trend held for all one-year age groups. While the decrease in overall prescribing is encouraging, further inquiry is needed to evaluate the appropriateness of current prescribing.

589 NEONATAL ABSTINENCE SYNDROME: REDUCTION IN LENGTH OF STAY USING A STATEWIDE QUALITY IMPROVEMENT PROGRAM

S Duncan. Univ Louisville, Louisville, KY.

Purpose of Study Kentucky (KY) is at the epicenter of the opioid epidemic. Annual cases of Neonatal Abstinence Syndrome (NAS) continue to rise creating a financial burden on limited resources due to the often-excessive length of stay. A collaborative state quality improvement (QI) program was begun, with the objectives to 1) educate providers and stakeholders and 2) standardize the evaluation, pharmacologic and non-pharmacologic treatment for the infant with NAS. The measurable goals were to 1) reduce length of stay (LOS) by 10% and 2) reduce the need for pharmacologic intervention by 5%.

Methods Used Following IRB approval, the program was offered to KY birthing hospitals. Education was provided via statewide and regional conferences and monthly action period calls. The first intervention involved standardization of evaluation and pharmacologic protocols. The second intervention included education on non-pharmacologic management and a trauma informed care approach. Hospitals were asked to collect and enter data into a REDCap data system, which de-identified the data set. Baseline data was collected for infants born prior to April 1, 2015. Babies born after this date were stratified into those born before and after February 1, 2016 as cases in intervention 1 and 2, respectively. Data analysis was performed using SAS v9.4.

Summary of Results A total of 2,033 patients were enrolled. Of those, 1,270 had a LOS >5 days, suggestive of NAS withdrawal. When stratified by gestational age, there was a reduction in LOS for infants 37–38 6/7 weeks from 23.1 d to 14.4 d (p<0.05), and a trend towards reduction for infants ≥39 weeks from 22.4 d to 19.2 d (p=0.06). For those infants with symptoms of withdrawal, there was a trend towards reduction in pharmacologic intervention from 77% to 65.7%. The use of specific non-
pharmacologic interventions increased for those babies whom had data recorded, including swaddling, gentle handling, disturbing only on cue, quiet and dim environment, vertical rocking, non-nutritive sucking and infant massage (all p ≤ 0.01).

**Conclusions** QI efforts can make meaningful impacts on LOS and the need for pharmacologic management in NAS. Continued QI efforts may provide value and improve the care of infants by improving outcome and reducing costs.

### 590 IMPROVEMENT OF RESPIRATORY OUTCOMES BY USE OF NON-INVASIVE VENTILATION IN A LEVEL IV NICU

T Nguyen, A Blood, A Hopper, Y Nicolau. Loma Linda University, Loma Linda, CA.

**Purpose of Study** The use of non-invasive respiratory support with bubble continuous airway pressure (BCPAP) has successfully decreased the incidence of chronic lung disease (CLD) in some centers. The California Perinatal Quality Care Collaborative (CPQCC) data shows that the rates of CLD are higher in our 84-bed level IV NICU than in comparable NICUs. To address this issue, in 2013 we developed a well-defined protocol that utilized BCPAP as the primary mode of ventilatory support in both the delivery room (DR) and in the NICU for babies who weigh < 1,500 grams. The purpose of this study was to evaluate the effectiveness of this intervention on the rate of DR intubation and incidence of CLD.

**Methods Used** All inborn babies < 30 weeks gestation and weighing 250–1500 grams received resuscitation following strict NRP guidelines and were then placed on BCPAP immediately with Hudson prongs as the primary apparatus. Babies who required surfactant therapy were briefly intubated and then extubated back to BCPAP. This process allowed very-low-birth-weight (VLBW) infants to maintain adequate functional residual capacity in order to decrease the risk of reintubation. In addition, all babies in the NICU who showed signs of respiratory failure or required ≥ 35% oxygen underwent a trial of BCPAP as an attempt to avoid intubation and mechanical ventilation. CPQCC outcomes for the rate of DR intubation, BCPAP before intubation and CLD in 2013 were compared to the two years prior (2011 & 2012).

**Summary of Results** Implementation of the BCPAP protocol in 2013 was associated with a 12.5% increase in DR BCPAP usage, a 13% decrease in DR endotracheal intubation, a 6% decrease in post-delivery-room invasive conventional ventilation, and a 9.7% decrease in oxygen supplementation at 36 weeks corrected when compared to 2011–2012.

**Conclusions** The introduction of BCPAP as the primary mode of ventilatory support helped to increase the rate of BCPAP usage and decrease the rate of intubation and mechanical ventilation in both the DR and the NICU. This was associated with an overall decrease in our CLD rate.
our residents followed a standardized process for patient transitions from inpatient to outpatient care. We needed to identify best practices and problems in our existing discharge traditions and develop standardized discharge guidelines across all specialty areas. Could pre-clinical medical students in their summer break help us meet these goals?

**Methods Used** Nine medical students completing their M-1 year (M-1s) participated in an Optimizing Transitions of Care 8-week summer work project. The students completed Institute for Healthcare Improvement basic certification, and reviewed regulatory expectations (CMS, TJC) for discharge processes, literature presenting discharge best practices, and curricula and policies used in other teaching institutions to standardize discharges. Subsequently, M-1s rotated through clinical areas observing discharge processes and interviewed residents, nurses, nurse practitioners, physical therapists, clerks, administrators, schedulers, and patients. They were asked to identify optimal and suboptimal practices, barriers to effective discharge, and opportunities for improvement.

**Summary of Results** M-1s reviewed discharge practices on 12 inpatient services; 16 specific recommendations were made by the students, including consultants placing their own discharge followup (f/u) appointment orders, unit clerks communicating directly with patients re appointment scheduling, and EHR allowing f/u appointment orders prior to day of discharge. M-1s created a comprehensive discharge guideline for residents across our hospital, well received thus far. Administration is actively working on M1 recommendations including better EHR discharge checklists visible to all members of the care team, additional discharge planning guidance for patients, and optimizing use of our patient discharge lounge.

**Conclusions** M-1s can make substantial contributions to quality improvement processes such as discharge optimization. In addition to a positive impact on patient care, these experiences provide students an opportunity to explore future career options, reduce anxiety about their upcoming clinical clerkship experiences, and expose future MDs to the impact of quality improvement work in patient care.

**Summary of Results** Fifty-one patients were included in the study cohort. 42 (82%) were admitted, 14 (33%) of which had no or mild bleeding. In those without active bleeding, admission was associated with a lower platelet count (p<0.01) only and was not associated with other patient characteristics, insurance status, or time of presentation. Among non-bleeders, 10 (71%) patients had repeat CBC’s without documented indication, 12 (86%) received PIT (2 of whom had adverse reactions), and 3 (21%) had BMB performed. No statistically significant difference in rates of revisit to the ED existed based on initial ED disposition.

**Conclusions** A significant proportion of children with new onset ITP are being admitted to the hospital, despite not meeting guideline criteria for PIT. These children are undergoing potentially unnecessary therapies and procedures. An ED protocol for new onset ITP may promote standardization of care and decreased admission and hospital resource utilization for these patients.

**594 IMPROVING PHYSICIAN/PATIENT CONTINUITY IN PRIMARY CARE CLINIC**

DF Speight, TC Wall. University of Alabama at Birmingham, Birmingham, AL.

**Purpose of Study** Pediatric residents are required by the ACGME to follow a panel of patients throughout their three years of residency. Residency programs are evaluated by the ACGME on the continuity of patient care achieved in their primary care component. However, ACGME rules result in significant restrictions on resident availability for their continuity experience. Consequently, our residents have reported concerns regarding continuity with their patient panel. In order to improve continuity between residents and their patients, our program initiated two changes in the scheduling protocols for clinic.

**Methods Used** Our residents are assigned a ‘usual’ clinic day for the year, and they attend clinic morning or afternoon of that assigned day, unless there is a conflict with rotation duties for the month. Prior to this project, the clinic schedule for residents was produced one month in advance and thus did not allow patients much time for scheduling appointments. The first step in our improvement efforts was for the clinic schedules to be released 3 months in advance to allow patients more time and available dates to see their primary doctor. Step two was for the residency program to develop ‘PCC Partners,’ which is a
group comprised of a resident from each PGY year with different clinic days. If the primary doctor is unavailable, the staff will try to schedule the patient to see one of their PCC partners, with the expectation that the group would communicate with each other about their shared patient panel. We conducted chart reviews for all patients who were seen in clinic for a Well Child Check-Up between June and December in order to determine whether the patient was seen by his/her primary resident, a ‘partner’, or another resident in clinic.

Summary of Results Over 2500 charts were reviewed. Prior to changes, 30% of patient visits occurred with the primary doctor. With advanced schedule release, visits with the primary doctor increased to 50%. Additionally, 11% of visits in December were seen by a ‘partner’ reducing the number of visits that occurred with another resident to 39%.

Conclusions Our experience suggests that early scheduling and PCC Partners can be effectively implemented to improve resident continuity for well child check-ups. Further research is needed to evaluate sustainability and other strategies for improving continuity with patients.

### PILOT STUDY: ATTENTION TO WOMEN’S HEALTH ISSUES BY MALE VS FEMALE RESIDENTS

MV Salguero Berrmouth, RD Smalligan, T Vaslyeva, K Cutts. Texas Tech Univ HSC Amarillo, Amarillo, TX.

Purpose of Study Mammography and cervical screening are the most effective methods of early detection of cancer in women. According to the National Health Interview Survey, the percentage of women 45 years of age and older who reported having had a mammogram within the past 2 years was 69% in 2013. The percentage of women with no history of abnormal smears who reported having a Pap smear regularly was 16–53% in 2013. The number of women in the United States who died from cervical and breast cancer in 2013 was 4,217 and 39,620, respectively. These statistics show the need to improve screening rates for these cancers. Internal Medicine physicians are crucial players in management of women’s health issues and recent ACGME data shows that 56% of male students will enter internal medicine. Current literature has identified differences in management of patients based on the physician’s gender in areas such as cardiovascular health and women’s preventive health. This pilot study was designed to study similar concerns among internal medicine residents at one institution.

Methods Used A retrospective chart review of 40 sequential new female patients (50 years or older) first seen between 1/1/2014 and 12/31/2015 by internal medicine (IM) residents in the Texas Panhandle was performed. Demographic characteristics, smoking and alcohol history, gender of the IM resident, recommendation for mammogram and recommendation for cervical cancer screening by the physician were extracted from the clinical records.

Summary of Results Mean age of the population was 62 years. Both mammogram and cervical screening were recommended less frequently by male physicians. The percentage of female and male physicians recommending mammograms was 70% and 20%, respectively. The percentage of female and male physicians recommending cervical screening was 30% and 16.6%, respectively.

Conclusions For the first time, this study shows strong objective evidence for the need for quality improvement projects in the education of IM residents regarding cancer screening for women, especially among male residents. The study adds evidence to the recently published results of a survey of IM Program Directors where they emphasized that this screening is a priority topic but training opportunities are limited.

### IMPROVING COMPETENCY WITH REAL-TIME CPR FEEDBACK USING ROLLING REFRESHERS

RW Steele, J Janisko, S Schexnayder. 1University of Arkansas for Medical Sciences, Little Rock, AR; 2Arkansas Children’s Hospital, Little Rock, AR.

Purpose of Study Rolling refreshers training is a technique to improve staff competency in cardiac arrest management. High quality CPR has been shown to improve survival, but using complex electronic feedback equipment is problematic in low frequency emergencies.

Methods Used The intervention consisted of training sessions in pairs of two staff members in the Arkansas Children’s Hospital Pediatric ICU (PICU). Prior to each training exercise, participants completed a survey regarding their level of knowledge and comfort with different CPR scenarios, as well as using the Zoll defibrillator feedback system. The participants then completed a training session, consisting of two resuscitation simulations. Simulations included an infant and adolescent CPR scenario. Participants were observed, recorded, and provided self-feedback after the session. A post-refresher survey was completed within 90 days of the intervention.

Summary of Results While most staff (>93%) were comfortable in their CPR skills and the application of these skills in various scenarios, over one-third of staff were uncomfortable using automated feedback devices during real-time CPR. Only 72% felt competent in recognizing rhythms requiring defibrillation. Sixty percent of staff completed the follow-up survey. After training, 100% of the staff were comfortable with their CPR skills and using the feedback system during simulated resuscitations. In addition, 94% of the staff were comfortable recognizing a rhythm that would require defibrillation.

Conclusions Rolling refreshers improve staff comfort in providing CPR with technology-based real time feedback. The rolling refresher technique provides an opportunity to improve staff understanding and application of CPR feedback. The training modality allows another mechanism to reinforce lethal rhythm recognition. We speculate such improvement in technical proficiency with feedback technology will improve actual CPR performance and potentially impact resuscitation outcomes.
Purpose of Study It is widely known that patients who present with fever and neutropenia have significantly better outcomes when given antibiotics as quickly as possible. An initiative was launched to increase the percentage of immunocompromised patients who received antibiotics within the target time frame of one hour with an original intervention performed in July 2012 and a second intervention in May 2016.

Methods Used The study was conducted in an Emergency Department of a large, academic Children’s Hospital. During the first intervention, a specific process was designed (prompt placement in room, standardized antibiotic choice, no waiting on labs, order set and prompt port access). The second intervention included a nurse champion for each shift, a notification to the nurses and MD when patient was placed in room and transparent reporting to entire staff including specific feedback in cases where the target was not reached. Data were entered into Excel and were analyzed using Mann Whitney U.

Summary of Results Baseline median time to antibiotics (TTA) for this group of patients was 96.9 minutes and only 35% of neutropenic patients received antibiotics within the recommended 60 mins. Intervention 1 was successful in reducing time from ED triage to antibiotic administration to 64.3 minutes and 51% of patients received antibiotics within 60 mins. The initial improvement did wane over time and just prior to intervention 2, we found the % time antibiotics were given within the target goal had fallen to 64.3 minutes and 51% of patients received antibiotics within one hour. There was a significant improvement in TTA when comparing representative months before (July 2015) and after (July 2016) the second intervention (U=39, p=0.0001. (95%CI 23.5, 46.5)).

Conclusions Quality improvement interventions improved the time to antibiotics for high risk potentially neutropenic pediatric patients with fever. A second intervention was necessary to reach the goal. Further study will evaluate sustainability of the quality improvement project.

Infectious Diseases II
Concurrent Session
1:00 PM
Monday, February 13, 2017

CHEST COMPUTED TOMOGRAPHY CHARACTERISTICS AND TIME TO CULTURE CONVERSION AMONG PATIENTS WITH PULMONARY TUBERCULOSIS
AC Hernandez-Romieu, M Schecter, D Bizune, S Ray, R Kempker. Emory University, Atlanta, GA.

Purpose of Study To assess whether chest computed tomography (CT) characteristics are associated with culture conversion among patients with pulmonary tuberculosis (PTB).

Methods Used Retrospective cohort analysis of patients with culture confirmed PTB at Grady Memorial Hospital in Atlanta, GA from 2008–2015. Cox Proportional Hazards models were fit to test the association between CT characteristics and time from treatment initiation to sputum culture conversion.

Summary of Results Among 247 patients, 178 (72%) had a chest CT. The mean (95% CI) time from admission to CT was 1.9 (1.3–2.6) days. Patients with CT evaluation had similar demographics (age, gender, body mass index), comorbidities (HIV, diabetes, smoking), chest x-ray (CXR) findings, and initial grade of sputum AFB smear compared to those without CT. In contrast, patients with CT were more likely to have an additional extra-pulmonary site of TB. Among 139 patients with non-cavitary CXR, 48 (35%) had a cavitary lesion detected on CT. In total, 84 (47%) patients had a cavity on CT. The percent of patients achieving culture conversion at 28 and 56 days was 64% and 89% for patients with no cavity on CT, and 39% and 77% among those with cavitary CT. Cavity CT was independently associated with a longer time to TB culture conversion after covariate adjustment. Models did not include initial smear grade and CXR findings due to collinearity. The unadjusted and adjusted hazard ratios (HR) with 95% CI and p-value for cavitary compared to non-cavitary CT were 0.58 (0.42–0.80; p=0.01) and 0.56 (0.36–0.87, p=0.02), respectively.

Conclusions In our setting, we found chest CT to be commonly performed among patients with PTB and to have a better ability to detect cavitary disease as compared to CXR. Additionally, chest CT may have important clinical utility in that the presence of a cavitary lesion can identify patients who take longer to convert their cultures and hence may need more intensive management. Our data support the use of CT to determine both severity of disease and prediction of culture conversion. Efforts are currently ongoing to further characterize the specific CT findings that predict prolonged time to culture conversion.

PREDICTORS OF SURGICAL INTERVENTION IN END-STAGE RENAL DISEASE PATIENTS WITH INFECTIVE ENDOCARDITIS
JA Woller, V Walsh, J Jacob. Emory University School of Medicine, Atlanta, GA.

Purpose of Study We previously showed valve replacement surgery for infective endocarditis (IE) in end-stage renal disease (ESRD) patients did not independently predict survival. We assessed guideline-based surgical indications in ESRD patients with IE.

Methods Used ESRD patients with IE from two academic hospitals between 2009 and 2012 were identified using ICD-9 codes and confirmed by chart review. Patients meeting modified Duke criteria for IE and undergoing chronic dialysis were included. Five indications for surgery
with highest evidence (based on the 2015 endocarditis guidelines) were included for analyses on onset congestive heart failure (CHF), abscess/fistula on echocardiogram, new conduction delay, resistant organism, and persistent infection. The primary outcome was valve replacement surgery, comparing early surgery (during index hospitalization and within 6 weeks of diagnosis) with delayed/no surgery. Categorical variables were analyzed using χ² or Fischer’s exact test, and continuous variables with the two-tailed t-test. Logistic regression was used to determine independent predictors of early surgery, controlling for sex, diabetes, previous IE, and valve type.

Summary of Results Of 583 eligible patients, 122 were confirmed with both ESRD and IE. 31 (25%) had early surgery, and 26 (21%) had a relative contraindication or refused valve replacement surgery. Mean age was 57 years. 89% were Black, 63% were diabetic, 43% had pre-existing valvular disease and 47% had an intravenous hemodialysis catheter. Transfer from an outside hospital (OSH) was more frequent in patients undergoing early surgery than delayed/no surgery (65 vs. 23%, p<0.0001). No other demographic or clinical characteristics were statistically different. Among the five surgical indications, new CHF (39 vs. 6%, p<0.0001) and abscess/fistula visualized on echocardiogram (39 vs. 6%, p<0.0001) were associated with early surgery. In multivariate analysis, OSH transfer (OR=5.0, p=0.004), new onset CHF (OR=11.1, p=0.001), and visualization of abscess/fistula (OR=8.1, p=0.004) were associated with early surgery.

Conclusions Two out of five high level indications are associated with early surgery. These data suggest a need for careful discussion of the indications and risks/benefits of surgery with the patient and surgical team.

LOW BACK PAIN: A NEW CAUSE FOR CONCERN
M Yunes, M Farinacci. San Juan City Hospital, San Juan, PR.
10.1136/jim-2016-000393.603

Case Report CDC reports that since Dec. 2015 Zika has affected thousands of Puerto Ricans. Zika is a flavivirus transmitted by the mosquitoes Aedes aegypti and Aedes albopictus, which are also responsible for transmission of Dengue Fever and Chikungunya. Typical symptoms include fever, rash, conjunctivitis, joint pain and general malaise.

This is the case of a 55 yr old female patient that presented to the urgency room with the chief complain of low back pain and generalized malaise over the past week. Patient visited the nearby UR and after her 3rd visit was transferred to our institution. A new onset of perioral numbness, problems with mastication and dysarthria prompted the patient’s last visit to the UR. She complained of generalized malaise, nausea, vomiting, and low back pain that progressed to generalized myalgias and arthralgias for the past days. Patient self-administered analgesics without improvement. Physical exam remarkable for tenderness at temporomandibular joints, dysarthria, facial diplegia, lower extremity areflexia, and tenderness to palpation of the upper and lower extremity musculature. Laboratory work up was relevant for lymphocytosis, dehydration and metabolic alkalosis. Influenza rapid test was negative. Head CT scan was not contributory. Titers for Dengue, Chikungunya and Zika were ordered. Zika titers were positive. Lumbar puncture revealed elevated proteins suggestive of Guillain-Barre Syndrome (GBS). Patient received IV immunoglobulins for 5 days with successful response and no complications.

GBS is characterized by progressive ascending lower extremity weakness and has been associated with Zika virus infection. Our patient did not meet typical criteria for clinical diagnosis of GBS. Instead she presented with perioral numbness and worsening low back pain. These atypical neurological presentations in addition to low back pain, decrease the index of suspicion for GBS and delayed time to diagnosis. This is worrisome since Zika is an emergent disease and the patient was evaluated multiple times at various URs without being able to establish a diagnosis.

This case is one among other confirmed diagnoses of atypical GBS associated with Zika infection in our institution. As Zika infection rates in Puerto Rico continue to increase, awareness should be heightened among medical community regarding symptoms of its possible complications.
days (43.1% vs 17.8%) were more common in patients who died (p<0.0001). In multivariable analysis, ICU stay (OR 3.51, 95% CI 1.79–6.88), a central line (OR 3.26, 95% CI 1.59–6.70), or an invasive infection (OR 2.24, 95% CI 1.14–4.40) predicted mortality.

Conclusions Patients with invasive infection and markers of severe illness were more likely to die. Higher mortality occurred with progression and recurrent infection than with initial invasive infection. Early initiation of appropriate therapy and central line removal in high-risk patients may prevent progression and decrease mortality.

602 GASTROSTOMY TUBE INSERTION IN AIDS PATIENTS: EXPERIENCE IN AN URBAN SOUTHEAST USA HOSPITAL
PN Siebert. Emory University, Atlanta, GA.
10.1136/jim-2016-000393.605

Purpose of Study Percutaneous endoscopic gastrosotomy (PEG) tubes are used to deliver enteral nutrition or medications in patients unable to take either orally. Limited literature exists on use of PEG tube in the management of young adults with advanced AIDS. We present our experience with PEG insertion in our hospital.

Methods Used This is a retrospective descriptive study in a southern urban hospital in Atlanta, Georgia. Electronic medical records were used to identify patients aged 18–40 years with HIV who had PEG tube insertion from 2010–2016. Charts were reviewed to abstract demographic, HIV- and nutrition-related data, opportunistic infections (OI), PEG tube indications, complications, and mortality rate.

Summary of Results Of 56 patients HIV+ patients who had a PEG insertion order from 2010–2016, 16 were under 40 (21–39) years old. 9 were women, 14 African American, and 2 Hispanic. Average CD4 count was 40 (1–166) and OI was common: 6 had disseminated Mycobacterium avium complex (DMAC), 4 had progressive multifocal leukoencephalopathy, 2 had cryptosporidium, and 1 had Kaposi sarcoma.

The reasons for PEG insertion included poor nutrition status in 88%(14/16) with low body mass index (<18.5 kg/m²) or low prealbumin. In addition to poor nutrition status, 5 (31%) individuals had PEG insertion due to inability to take medication without an organic cause and were diagnosed with ‘pill aversion’. Of these 5, average age was 27(22–34), 80% were female, and 80% had DMAC with abdominal CT showing abdominal lymphadenopathy or bowel edema.

PEG tube insertion was well tolerated, though 2 (13%) patients had site leakage and 1 (9%) had gastric bleeding. Mortality was high, with 8/16 (50%) dying or transferring to hospice during a median time of follow up of 110 (7–1130) days; two were lost to follow-up. None of the patients with pill aversion died during follow-up.

Conclusions Our experience with PEG tube insertion in young adults with advanced AIDS showed it is well tolerated and is used for nutrition and medication administration. We identified 5 patients with documented ‘pill aversion’ who benefitted from PEG insertion, allowing medication administration, and who are still alive at the time of this study. Further study is needed to assess the benefits of PEG insertion and determine the optimal time of insertion to improve survival in patients with advanced AIDS.

603 KAPOSI SARCOMA HERPESVIRUS INFLAMMATORY CYTOKINE SYNDROME AS INITIAL PRESENTATION OF AIDS
V Cantos, A Kalapila, C Gunthel, M Nguyen. Division of Infectious Diseases, Emory University, Atlanta, GA.
10.1136/jim-2016-000393.606

Case Report A 28-year-old male presented with intermittent fevers, headache, vomiting, weight loss, and diffuse lymphadenopathy for four months. An HIV screening test came back positive. His CD4 cell count was 92 cells/μL (7%) and his serum HIV RNA was 1044110 (6.02 log10) copies/mL. Laboratory abnormalities are detailed in Table 1. Whole body positron emission tomography–computed tomography (PET-CT) showed diffuse hypermetabolic lymphadenopathy and splenomegaly. A lumbar puncture and a brain magnetic resonance imaging (MRI) were normal. Excisional inguinal and axillary lymph node biopsies were negative for Kaposi Sarcoma (KS) or Kaposi sarcoma herpesvirus- associated Multicentric Castleman’s Disease (KSHV-MCD) based on KSHV immunostain, flow cytometry and histology. Infectious work up for lymphadenopathy was unrevealing. Excisional skin and tonsil biopsies both showed KS. He received four cycles of liposomal doxorubicin and rituximab with good response. Tenofovir, emtricitabine, elvitegravir and cobicistat were started prior to being discharged home.

After five outpatient cycles of liposomal doxorubicin, a multigated acquisition (MUGA) scan showed a decrease in his ejection fraction (from 54 to 49%) which prompted the discontinuation of chemotherapy. To date, he hasn’t had further recurrences of KICS-like symptoms.

Discussion KSHV Inflammatory Cytokine Syndrome (KICS) is characterized by the classical signs and symptoms of KSHV-MCD in the absence of MCD by histopathology. Laboratory abnormalities include anemia, thrombocytopenia, hypoalbuminemia, hyponatremia and elevated C-reactive protein.

<table>
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<th>Abstract 603 Table 1 Laboratory and radiographic abnormalities</th>
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<td>Albumin, g/dL</td>
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Purpose of Study

There is a scarcity of available data to define non-tuberculous mycobacteria epidemiology in the Southeastern USA, especially in regards to Mycobacterium kansasii infection. The goal of our study was to quantify the burden of M. kansasii infection in Atlanta, Georgia, describe patient characteristics, and to determine clinical treatment outcomes of patients infected with M. kansasii.

Methods Used

The medical records of patients from three Atlanta area hospitals with a positive culture for M. kansasii between 2010–2015 were retrospectively reviewed. Characteristics and clinical treatment outcomes were assessed for those patients who received any M. kansasii treatment.

Summary of Results

A total of 73 unique patients had a positive culture for M. kansasii including 43 (59%) who received anti-mycobacterial treatment. Patient demographics including age, gender, symptoms, and comorbidities were similar among both treated and untreated patients. Patients who received treatment were significantly more likely to meet American Thoracic Society (ATS) disease criteria (58% vs. 17%, p<.01) and to have received an infectious diseases consult (54% vs. 12%, p<.01) than patients not receiving treatment. Among the 43 treated patients, the mean age was 46 years and most were male (79%). The most common comorbidities were HIV (65%) and COPD (23%). The majority had pulmonary disease (38%) with the remaining cases consisting of bacteremia (2), lymphatic (1), pericardial (1), and splenic (1) involvement. The median time for diagnostic sputum collection to treatment initiation was 35 days, and median days of drug treatment among those not lost to follow up (n=30) was 278 (IQR 147–487) days. In regards to outcomes, almost half of patients were considered cured (n=21, 49%), 13 were lost to follow up, 1 was still on treatment, and 8 (18%) were considered to have a poor outcome (6 deaths, 2 treatment failure). No significant predictors of mortality were found.

Conclusions

Our results highlight several challenges regarding M. kansasii management including the criteria used to diagnose disease, timely initiation of treatment, and the high rates of poor outcomes and loss to follow up.
one tailed-T test. Average Daily Temperatures (ADT)/year for both periods were calculated. The correlation between the number of S. aureus cultures and ADT per period was calculated utilizing the Pearson’s correlation coefficient.

Summary of Results 643 positive S. aureus cultures from all sites were obtained between April 2011 and March 2016. For S. aureus SSTB, there were 313 positive cultures in the warmer months (period A) compared to 209 in the cooler months (period B) \((p=0.003)\). Similarly, there were more MRSA specific SSTB cultures \((p=0.035)\) and MSSA SSTB \((p=0.028)\) cultures during period A compared to B. A positive correlation between ADT and total S. aureus SSTB cultures was also identified \((r=0.69)\). For blood cultures, there were 67 positive cultures in period A compared to 54 positive cultures in period B \((p=0.106)\). We observed a significant increase only in the number of MSSA positive blood cultures for period A compared to period B \((p=0.022)\). There was no significant difference in MRSA positive blood cultures for period A compared to B \((p=0.155)\). For all cultures, there was a decrease in MRSA positive cultures over the 5-year period while the number of MSSA positive cultures increased.

Conclusions An increase in SSTB cultures positive for S. aureus occurred during warmer seasons among children in our region. This could be associated with a more optimal growth temperature for S. aureus or variations in a child’s indoor vs outdoor activity during the warmer months. While the absolute number of MRSA cultures decreased over the 5 years in the study, the number of MSSA cultures increased.

Abstract 607 INCIDENCE AND RISK FACTORS ASSOCIATED WITH SYPHILIS IN THE END-STAGE RENAL DISEASE POPULATION

E Weathers,1 J Waller,2 R Colombo,3 M Kheda,3 JE Turrentine,3 NS Nahman,2,3 S Baer2,3,1 Medical College of Georgia at Augusta University, Augusta, GA;2 Charlie Norwood VA Medical Center, Augusta, GA;3 Augusta University, Augusta, GA.

Purpose of Study Syphilis is a sexually transmitted infection with an increasing incidence in the United States. Rates of syphilis have not previously been studied in the end stage renal disease (ESRD) population. Examining diagnoses of syphilis and associated risk factors in ESRD patients may identify opportunities to improve screening and risk modification in this population.

Methods Used All ESRD patients with incident dialysis from 2004–2010 from the United States Renal Data System were queried. ICD-9 codes were used to determine syphilis diagnosis after incident dialysis and related comorbidities. Neurosyphilis (NS) was defined as an ICD-9 diagnosis code and a lumbar puncture code temporally associated. A 5% random sample of those without syphilis was used for further analysis. Statistical analysis was performed using SAS 9.4 and a generalized linear model was used to examine the adjusted relative risk (aRR).

Summary of Results Of 773,600 patients, 585,072 had complete data for analysis. 3505 patients had a billing code for syphilis; 3197 coded NS. Patients with NS without a lumbar puncture 90 d before or 30 d after diagnosis, were excluded \((n=3343)\). The final number of syphilis patients was \(n=383\). The incidence of syphilis diagnosis increased yearly from 2004–2011, with a peak incidence in 2011 of 54 diagnoses per 100,000 person years. Clinical diagnoses risk factors: hepatitis B \((aRR=1.75\ 95\%\ confidence\ interval \(CI\) 1.12–2.71)\), hepatitis C \((aRR=3.60\ CI 1.99–6.51)\), herpes simplex virus \((aRR=2.05\ CI 1.46–2.87)\), and HIV \((aRR=7.55\ CI 5.42–10.52)\). Demographic risk factors: Black race \((aRR=4.96\ CI 3.85–6.40)\) and other (non-white) race \((aRR=1.99\ CI 1.14–3.47)\).

Conclusions In the ESRD population, the incidence of syphilis was over 3 fold greater than in the general population in 2011, with the majority coded as unspecifed syphilis followed by NS. The trend of rising incidence from 2004–2011 and associated risk factors reflects that of the population. The increased incidence in relation to the general population indicates more screening for syphilis in the ESRD population may be of benefit.
with 61% eosinophils. MRI of the brain revealed areas of restricted diffusion and many hyperintense flair signals indicating focal lesions. Exhaustive testing for bacterial, viral, autoimmune, and other parasitic causes were all negative.

The boy admitted to eating a whole, live snail ‘on a dare’ two weeks prior to the onset of symptoms. He was diagnosed with *A. cantonensis* eosinophilic meningoencephalitis and steroid therapy was initiated, as is the mainstay of treatment. Within 24 hours, the patient’s symptoms completely resolved. He was discharged home to complete a 14-day course of oral prednisone. On follow-up, the patient made a full recovery without neurologic sequelae.

### Medical Education, Medical Ethics, and Advocacy

**Concurrent Session**

1:00 PM

Monday, February 13, 2017

609 **DOES A STRUCTURED PEDIATRIC RESIDENT PARENTING CURRICULUM IMPROVE RESIDENTS’ CONFIDENCE AND KNOWLEDGE REGARDING DELIVERY OF PARENTING ADVICE?**

H Qasimyar,1 A Caldwell,1 LW Shumate,1 A Bax1,2. 1University of Oklahoma, Oklahoma City, OK; 2University of Oklahoma, Oklahoma City, OK.

10.1136/jim-2016-000393.612

**Purpose of Study**

Pediatric residents receive little formal parenting education despite effective parenting advice potentially resulting in more desirable parenting behavior, greater family satisfaction with physicians, and decreased rates of child maltreatment. This project is a pilot curriculum to improve resident knowledge and confidence in this area.

**Methods Used**

The curriculum includes four 5–10 minute web-based modules over Toddler Parenting and Discipline. Modules consist of a powerpoint with recorded audio didactics, short videos, and a list of resources for parents. Prior to weekly continuity clinic, residents watched a module and briefly discussed the topic with clinic faculty. Residents completed a confidence questionnaire and a knowledge quiz prior to and after completion of the 4-week curriculum. At the end of the pilot, residents and clinic faculty completed a feasibility survey.

**Summary of Results**

Prior to the modules, average resident confidence in giving toddler parenting advice was 5.54/10 (10 being very confident) and average score on board-style questions was 7.59/12 correct (N=41). After the modules, those who completed 0–2 modules showed an increase in confidence and knowledge to 6.57 and 8.14, respectively (N=7) and those who completed 3–4 modules showed an increase to 8.08 (N=26) and 8.40 (N=25), respectively. Faculty (N=9) reported an average feasibility rating of 3.67/4 (4 being excellent), while residents reported an average rating of 3.54 (N=33). 28 of 33 residents reported interest in more modules. 26 residents reported using the information from the modules with their patients.

**Conclusions**

This pilot curriculum led to an increase in confidence for all residents who participated, more so for those who completed more modules. Knowledge increased from pre- to post-pilot testing, but statistical analysis for significance is pending. Faculty and residents gave high rating to the curriculum, showed interest in more modules, and applied information clinically. We suggest that similarly designed parenting modules will be feasible and effective in improving resident guidance on parenting.

610 **INFANT SAFE SLEEP: A MEDICAL STUDENT INTERVENTION**

M Cotti-Rausch, B Lewis, M Udine, C Dye. University of Alabama at Birmingham, Birmingham, AL.

10.1136/jim-2016-000393.613

**Purpose of Study**

Sudden Infant Death Syndrome (SIDS), now better known as Sudden Unexpected Infant Death (SUID), is the leading cause of infant mortality from 1 month to 1 year of life. The 1994 Back to Sleep campaign reduced rates of SIDS by 50%, but rates have recently plateaued. The hypothesis of this project was that a medical student led intervention would both empower medical students to lead bedside education while increasing the number of families who received teaching on current safe sleep recommendations.

**Methods Used**

Medical students on the General Inpatient Pediatrics Service (GIPS) at Children’s of Alabama (CoA) were recruited into the study. They completed a questionnaire to determine baseline knowledge of risk factors for SUID as well as recommendations for safe sleep practices. Students then received formal education on AAP recommendations, including how to address common barriers to caregiver compliance with recommendations. The inpatient educational intervention identified 0–6 month old infants on GIPS teams. Families of these high-risk infants received brief teaching and a safe sleep pamphlet from trained third year medical students. At the end of the rotation, medical students completed a follow-up questionnaire evaluating current knowledge and perceived comfort towards family education. Unpaired t-tests compared students’ pre-intervention and post-intervention safe sleep knowledge.

**Summary of Results**

A total of 44 third year medical students were included between March and August 2016. 100% received education. The mean pre-intervention knowledge score was 4.03, which improved to 5.65 after the intervention (p <0.001). Greater knowledge was associated with increased comfort in leading family-directed educational sessions: 63% vs. 3% with ‘no comfort’ pre and post-intervention. A total of 50 families, 14.6% of admitted infants during the study period, received education.

**Conclusions**

A brief medical student intervention focused on current AAP recommendations to reduce rates of SUID, increased the number of families with infants who received formal safe sleep education during their stay at CoA from 0 to 14.6%. The intervention also enhanced medical student comfort with providing bedside education, a skill necessary for success as future medical practitioners.
Purpose of Study

To evaluate pediatric residents’ competence in performing 8 of the ACGME required procedures. We organized a procedure boot camp with the goal of increasing residents’ competence in performing these procedures prior to advancement to supervisory roles.

Methods Used

Our intervention group was 27 PGY-1 residents who completed a boot camp at the Children’s of Alabama Simulation Center. Residents completed a pre-boot camp survey rating their self-assessed competence using a 5-point Likert scale in performing these procedures: bladder catheterization, foreign body removal, immunizations, IV placement, tracheostomy change, UAC/UVC placement, bag-mask ventilation and neonatal/pediatric intubation. After completion, PGY-1 residents completed a post-boot camp survey. As a control, we surveyed 22 PGY-2 and 14 PGY-3 residents to determine their self-assessed competence without the intervention.

Summary of Results

Comparing the pre- to post-boot camp mean responses, there was an increase in self-assessed competence for each of the 8 skills. The largest increases were in trach changes (1.38 to 3.85), immunizations (2.46 to 4.35), IV placement (1.88 to 3.75) and bladder catheterization (2.29 to 4.15). Skills with the smallest increase were neonatal intubation (2.75 to 3.6) and UAC/UVC placement (2.61 to 3.55). When comparing responses among the classes, interns had the highest reported competence for bladder catheterization, immunizations, IV placement and trach changes. The PGY-3 class had the highest reported competence for foreign body removal, UAC/UVC placement, neonatal and pediatric intubation.

Conclusions

The skills with the most improvement after the boot camp were trach changes, immunizations, IV placement and bladder catheterization. We theorize these are skills interns are not often exposed to in their first year. Even when comparing across the classes, interns report higher competence, which indicates this lack of exposure continues throughout residency. The areas of least improvement were neonatal intubation and UAC/UVC placement, which is likely because residents at our institution spend 2 months of their internal year in the NICU. When comparing the responses among classes, PGY-3 residents had the highest competence in foreign body removal, UAC/UVC placement and intubation, which they likely have more exposure to during residency.

Purpose of Study

The attainment of the highest grade, or honors, in core clerkships is a focus of considerable attention for students and faculty. There is significant variability nationwide in the proportion of students awarded honors. We examined differences in opinions between pediatric and medicine attendings’ values that define honors designation in clerkship students.

Methods Used

In this multi-institutional cross-sectional study, teaching ward attendings in pediatrics and internal medicine clerkships (2013–2016) were surveyed, ‘How much emphasis do you place on each of the following characteristics when designating a student as ‘honors’? The survey (24-items; 10-point Likert scale, 1=less emphasis, 10=more emphasis) was framed around ACGME competencies (patient care, medical knowledge, practice-based learning, communication, professionalism, and systems-based practice (SBP)), followed by cognitive interviews, and pilot tested. Mann-Whitney U and Fisher’s exact tests were used to compare survey responses.

Summary of Results

Response rate was 56% (79/141). The 25 pediatric attendings evaluated a median of 12 students in the past year, and the 54 medicine attendings evaluated a median of 4.

Comparison of median responses determined professionalism the most important characteristic for both pediatricians (9.3) and internists (9.3) (p=0.06). SBP was the least important for pediatricians (6.3) and internists (7.7) (p<0.01). Within SBP, median responses differed in valuation of care coordination in a healthcare system (pediatrics 6, medicine 8, p <0.01) and understanding social determinants for care transitions (pediatrics 6, medicine 7, p=0.03). Priority of patient safety (pediatrics 7, medicine 8, p=0.12) were similar. No significant differences were found in the remaining competencies.

Conclusions

Qualities important in the evaluation of clerkship students for honors were similar among pediatrics and medicine attendings. Professionalism was valued the greatest and SBP the least, though significant difference in valuation of SBP existed. Future studies examining the values of other medical specialties may help standardize the assignment of honors to students.
Facebook accounts. The Twearl accounts were monitored for student responses. Average exam scores were compared between the study and control groups, and between both groups and the classes prior and after the introduction of Twearls, and the national averages for those corresponding years.

**Summary of Results** There was no significant difference in exam scores between students that volunteered to receive the daily Twearls (mean=80.59) compared to the control (mean=80.81) group (p=0.92). Mean scores were significantly different in the control group as compared to mean scores in Pre-Twearls and National Average 2014–15, a year after study conclusion (Table 1). Mean scores were significantly different in the Research group as compared to mean scores in pre-Twearls, Pilot year and national averages in all years (Table 2).

Though hard copy handouts are no longer provided, students have continued access to scheduled Peds Twearls via Twitter/Facebook and a new Pinterest board with added educational content. Average exam OU scores for the 2014–15 year, after study conclusion, was 79.3 (SD 8.38) and National average was 75.7 (SD 8.7), (CI: 2.78, 4.41).

**Conclusions** Educational tools utilizing social media platforms positively affected mean NBME Subject Exam scores in both groups. The interactive learning experience of social media platforms may account for the positive difference, but may also account for the difficulty in controlling for contamination between groups during the intervention year.

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**IDENTIFYING GAPS IN TRANSITION FROM MEDICAL SCHOOL TO INTERN YEAR**

A Salih. The University of Oklahoma Health Sciences Center, Oklahoma City, OK.

10.1136/jim-2016-000393.617

**Purpose of Study** The Academy of American Medical Colleges (AAMC) published 13 core Entrustable Professional Activities (EPAs) that comprise the knowledge and skills medical students should be able to perform unsupervised upon entry to residency training. In this study, needs assessment surveys were distributed to both pediatric teaching faculty and pediatric interns to evaluate the perceived importance of the EPAs for students entering pediatric residency versus their perceived preparedness for each EPA. These results will guide the development Pediatric Boot Camp course curriculum for students entering residency.

**Methods Used** Pediatric teaching faculty (N=72) and current pediatric interns (N=17) were identified. Following IRB approval, anonymous surveys assessing competence and perceived importance of each EPA were sent out to both groups via MedHub. Participants ranked competence and perceived importance using scales of increasing importance, ranked 1–10.

**Summary of Results** Survey results from 45 faculty and 17 interns were assessed by gap analysis and statistically significant differences between perceived importance and competency were identified. EPAs identified by both groups included: (1) EPA 9: Collaborate as a member of an interprofessional team (P=0.02), (2) EPA 11: Obtain informed consent for tests/procedures (P=0.03), (3) EPA 12: Perform general procedures of a pediatrician (P=0.057). Interns rated EPA 2: Prioritizing a differential diagnosis following a clinical encounter, as very important and with a large discrepancy in competence, whereas faculty did not. In contrast, faculty rated EPA 5: Documenting a clinical encounter in the patient record, as very important, whereas interns did not. Topics not specifically listed as EPAs, but determined important for curriculum included professionalism and communication, cultural sensitivity, effectively calling a consult, conflict management and reporting.

**Conclusions** When applying gap analysis to the EPAs, agreement between pediatric faculty and pediatric interns was found for 2 EPAs. These results will inform curriculum development for a Pediatric Boot Camp for transitioning students. Incorporation of the EPAs to a boot camp course represents a novel approach to our knowledge. The course is anticipated to increase medical student preparedness and use of EPAs may allow for generalizability across specialties.

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**RESIDENT WELLNESS AND ADVOCACY**

A Caldwell, M Dunlap. The University of Oklahoma, Edmond, OK.

10.1136/jim-2016-000393.618

**Purpose of Study** Reach Out and Read (ROR) is an evidence based program promoting early literacy. It is unique to study resident wellness as it pertains to resident advocacy projects that allow for interaction with children in a non-clinical sense and connection with peers. Green Eggs and Ham Day (GEHD) benefitting ROR is an annual event at the Children’s Hospital at OU Medical Center which is planned and organized by residents with supervision by faculty. GEHD consists of breakfast followed by activities for children and a silent auction. Community partners and volunteer groups participate. This study evaluates GEHD. Our hypothesis is that residents with high involvement in GEHD will have improvement in wellness compared to residents with minimal to no involvement in this event, and will have higher confidence setting up community events in the future, asking community groups to work on projects, and joining/volunteering for community organizations.

**Methods Used** Current pediatric and internal medicine/pediatric residents at the University of Oklahoma Health Sciences Center will complete a survey prior to planning meetings for this year’s GEHD. After completion of the event, residents will complete the same survey evaluating resident involvement in advocacy and their overall wellness. Pre and post survey data will be analyzed.

**Summary of Results** A study evaluating residents from 2014–2015 who were involved in GEHD revealed that after involvement in GEHD 67% were confident/very confident setting up fundraisers or community events in the future. 58% were confident/very confident asking community groups to work on a project and 83% were likely/very likely to volunteer for a community organization. Comments from residents highlighted how GEHD
impacted their lives: ‘Working with the children...we rarely see them happy and healthy. That’s the best part.’ Positive effects of GEHD on residents led to creation of this study. Data from this study is currently being collected.

**Conclusions** Involvement in GEHD impacts the lives of residents as evident from 2014–15 data, and could have an effect on resident wellness and a resident’s likelihood to work with and volunteer for community groups in the future. Events such as this could be implemented to a greater degree at our institution and others in an effort to improve resident wellness and support resident advocacy education.

**IF YOU BUILD IT, WILL THEY COME? AN ANALYSIS OF CANDIDATE ATTITUDES TOWARDS A NEW RESIDENCY PROGRAM**

MD Banajaz, S Denniston, S Kumar, AD Wolfe. 1 Baylor College of Medicine- Children’s Hospital of San Antonio, San Antonio, TX; 2 Baylor College of Medicine, Houston, TX.

10.1136/jim-2016-000393.619

**Purpose of Study** Recruitment into new programs can be challenging, as many factors cited by participants in the NRMP matching program as important to ranking decisions cannot be assessed. Our aim was to determine the characteristics of new programs which were most influential on ranking decisions.

**Methods Used** An IRB approved, anonymized survey was sent to the 349 applicants who interviewed during the first two recruitment seasons of the Baylor pediatric residency program at The Children’s Hospital of San Antonio. The applicants were asked to rank specific program characteristics and recruitment techniques on a 7 point Likert scale as to the effect they had on the applicant’s ranking decisions for our program, as well as provide qualitative responses to questions regarding the most attractive and most concerning aspects of joining a new residency program. A response rate of 46.1% was received. Somers’D directional coefficients were calculated to determine the correlation between an applicant’s ranking of the program and their ranking of the survey item, and data were stratified to those who ranked the program in their top 2 versus lower. In addition, 3 non-blinded reviewers individually studied the free text responses for emergence of patterns using qualitative analysis of themes, and word cloud generator software was utilized to correlate.

**Summary of Results** Among the strongest correlating items related to being a new program were the opportunity to help shape the program, the newness and size of the program, and the opportunity to be one of the first graduates. Influential recruitment practices included program communications, written information about the program, and website vividness. Candidates were most concerned about a lack of upper level residents, fear of unforeseen difficulties, and no evidence of outcomes.

**Conclusions** New programs have unique features which can strongly influence ranking decisions. Recruitment practices can be crafted to both highlight and reassure about these features, and may affect ranking decisions. New programs should seek to identify candidates who view these features as positives to predict ranking decisions and determine best fit.

**EXAMINING THE EFFECT OF A LANGUAGE POLICY ON THE OUHSC PEDIATRIC RESIDENCY**

N Soulages Arrese, M Dunlap, M Cooper, R blucker. University of Oklahoma Health Sciences Center, Oklahoma City, OK.

10.1136/jim-2016-000393.620

**Purpose of Study** The purpose of this project is to evaluate the use of Spanish for pediatric residents before and after the implementation of a language policy. The policy requires all pediatric residents using a non-English language in clinical encounters to pass a standardized test to provide clinical care in that language.

**Methods Used** Residents completed an anonymous online survey about their perceived language proficiency and current use of Spanish in patient care before the resident language policy was implemented. The survey will be re-administered three months after the policy went into effect. Analyses will involve frequency counts of specific answers, discrepancies between self-reported proficiency and actual practice, and the impact of the language policy based on change in scores from pre- to post-survey.

**Summary of Results** Thirty-six residents completed the pre-policy survey. Forty-two percent of respondents reported that they do not speak Spanish, 36% reported as beginnings, 11% as intermediates, 8% as advanced, and 2.8% as fluent. Seventeen percent of residents self-described that they are/maybe are competent to provide independent care in Spanish. However, only 70% of respondents reported always using language support. Fourteen percent reported that they usually, but not always, recognize the limits of their Spanish ability. Only five percent of residents acknowledged the possibility of having made a medical error related to the use of Spanish.

**Conclusions** Given that poor communication has been shown to impact clinical outcomes and family diagnosis comprehesion, demonstrating objective language proficiency prior to providing services is the standard of care at many of major medical institutions nationally. Our pre-policy implementation data shows that the majority of pediatric residents do not speak Spanish or identify themselves as beginners. A larger than expected proportion of residents report that they do not always recognize the limits of their Spanish ability. In addition, 70% of residents report always using language support while only 10% of residents self-identify themselves as advanced or fluent, highlighting the need for a formal language policy. The results of the post-policy survey will reflect the behavioral changes of the residents and will be compared to the pre-policy survey.
ACTIVE LEARNING: HUMAN EMBRYOLOGY MULTIPLE CHOICE QUESTIONS CONSTRUCTED BY 1ST YEAR MEDICAL STUDENTS

RM Turcu, D Buckley. University of Louisville, Louisville, KY.
10.1136/jim-2016-000393.621

Purpose of Study Active learning is now a prominent part of the medical education curriculum. It requires students to rely less on traditional passive lecture type learning. Our study describes and analyzes a novel active learning activity consisting of multiple choice questions created by the 1st year medical students using Human Embryology material. Student generated question activities have been utilized mostly outside U.S. and have not really been introduced into medical education. At our institution, embryology material was a good fit for this activity because it is clinically oriented and lacked other active learning components

Methods Used The 160 students in the class worked in groups of 4–6 to create an embryology related clinical vignette type multiple-choice question for each unit of the course. An upper level medical student and the course director reviewed submitted questions and provided written feedback for content and style. The revised questions were compiled into a practice exam using the testing software ExamSoft, made available to students prior to the graded exam. ExamSoft allows for question performance analysis. The discrimination index (DI) for the student-generated questions was used to assess the quality of the questions submitted. DI shows the ability of a question to distinguish between high and low performing students. For a question with high DI, better performing students are more likely to get it correct, while poorer performing students are more likely to get it wrong

Summary of Results For the year 2014–15 of the study the DI for submitted questions increased from 0.28 in unit 1 to 0.39 in unit 4 (p value 0.025). For the 2015–16 year, the average DI for questions in unit 1 and 4 were 0.28 and 0.44, respectively (p value 0.004). The data suggests that the quality of the questions improved throughout the course, as students obtained more feedback from the question reviewers

Conclusions This active learning exercise exposed students to critical thinking, in the context of clinical applications and was a reliable formative feedback. The question database created during the study will be used for practice tests in the future years. This type of activity is flexible and can be implemented across all medical education disciplines and levels of training

ASSOCIATION OF FIRST YEAR MEDICAL STUDENTS BEFORE AND AFTER COMMUNITY HEALTH ADVOCATE TRAINING

SB Parker, R deShazo. University of Mississippi Medical Center, Jackson, MS.
10.1136/jim-2016-000393.622

Purpose of Study Most Mississippians with hypertension and diabetes do not know they have these conditions and present late with preventable complications. Our group has developed a program to train lay health screeners capable of measuring blood pressure, blood sugar, body mass index, and basic dietary counseling. This Community Health Advocate, incorporated into the curriculum of the Population Health course for first year medical students, provides opportunities to conduct health screenings in churches/civic groups. They also come to recognize the value of community service as health professionals. We evaluated changes in health literacy among the students as a result of the 16 contact hours in the program (10 hours classroom training, 2 hours skills training, and 4 hours of practical experience). The curriculum comprises a lecture series, skills training/assessment, and small-group sessions in nutrition counseling.

Methods Used Students completed a 30-question examination before/after training (see supplementary material). The statistical significance of the overall mean change in score (post-test - pre-test) was assessed using a paired t-test.

Summary of Results 141/149 students took the pre-test; the mean score was 23.2 (minimum 11, maximum 29). 133/149 students took the post-test; the mean score was 26.4 (minimum 18, maximum 30). 12 of the 132 students who took both tests, the overall mean change in score (post-test – pre-test) was 3.1 (P <.0001). 109 students (82.6%) showed an increase in scores (mean increase 4.0, P <.0001), 12 (9.1%) a decrease (mean decrease 2.4, P=0.004), and 11 (8.3%) no change.

Conclusions The data presented here suggests that the curriculum described provides the skillset to be health screeners. Specifically, we confirmed that they comprehended the material presented in the curriculum and knew how to apply it in a second component, which served as a practical examination. Although this group has more pre-existing health knowledge than most Mississippians, the program produced a measurable increase in health literacy. We now include nursing, dental, and allied health students in this program as well as in community settings with lay individuals. Our group would be pleased to share this curriculum with other medical schools for use in service learning activities for medical students and others.

Perinatal Medicine II Concurrent Session 1:00 PM Monday, February 13, 2017

TOO MUCH OF A GOOD THING: THE EFFECTS OF THIOREDOXIN REDUCTASE-1 INHIBITORS ON CELL VIABILITY IN HYPEROXIA

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10.1136/jim-2016-000393.623

Purpose of Study Bronchopulmonary dysplasia (BPD) is a serious lung condition that causes significant morbidity and mortality in premature infants. Studies have shown that pulmonary oxygen toxicity in the neonatal period is a significant cause of BPD. The thioredoxin reductase-1 Inhibitor (TrxR1) aurothioglucose (ATG) attenuates lung injury in a murine BPD model; however, the effects of
ATG and auranofin (AFN), a similar TrxR1 inhibitor, on murine alveolar epithelial cell viability in hyperoxia are not known. The present studies were designed to test the hypothesis that ATG or AFN treatment will attenuate hyperoxia-induced decreases in alveolar epithelial cell viability.

**Methods Used** Murine lung epithelial cells (MLE-12) were seeded at equal densities (2×10⁵ cells/well) and cultured in room air (RA, 21% O₂, 5% CO₂, 74% N₂) for 24h. Cells were subsequently treated with 5 μM ATG, 0.5 μM AFN, or vehicle control (saline or DMSO, respectively) and exposed to either RA or hyperoxia (85% O₂, 5% CO₂, 10% N₂) for an additional 24h. Viable cell number was determined using Trypan blue exclusion. Data (mean ±SD, n=3) were analyzed using Two-way ANOVA with Tukey’s multiple comparison post-hoc. Significance was accepted at p<0.05.

**Summary of Results** Our data revealed an independent decrease in total cell number in hyperoxia-exposed saline, DMSO, ATG, and AFN-treated cells in nearly all treatment groups when compared to their respective RA-exposed controls (μ=2.10±1.97, p=0.03; μ=2.55±2.09, p=0.02; μ=1.84±1.97, p=0.06; μ=2.82±2.09, p=0.01 respectively). There was no significant effect of ATG or AFN on percent viable cells in hyperoxia when compared to respective hypoxia-exposed control cells.

**Conclusions** Our results are consistent with published data showing that hyperoxia decreases the number of alveolar epithelial cells after 24h. Contrary to our hypothesis, TrxR1 inhibitors did not attenuate the effect of hyperoxia on cell viability. In MLE-15 cells, hyperoxia causes an arrest in cell proliferation, whereas hyperoxic exposure in animal models causes apoptosis. Future studies will evaluate the differences between in vivo and in vitro conditions (apoptosis vs cell cycle arrest); and the effects of time of exposure and drug concentration.

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**620 NOVEL MODEL OF HYPOXIC-ISCHEMIC BRAIN DAMAGE IN INTRA UTERINE GROWTH RESTRICTED NEWBORN RATS**


*University of Mississippi Medical Center, Jackson, MS.*

10.1136/jim-2016-000393.624

**Purpose of Study** There is a critical lack of knowledge of factors that might prevent adequate response to moderate hypothermia (HT) after HI brain injury. We aim to characterize a reproducible, rat model of neonatal HI with intra uterine growth restriction (IUGR) to evaluate IUGR as one such likely factor.

**Methods Used** Rodent model of IUGR induced by placental insufficiency in dams at 14 days of gestation was used. HI was induced at postnatal day (P) 10 by permanent right carotid artery ligation followed by 90 min of hypoxia (8% oxygen).

**Summary of Results** Both IUGR and HI increased caspase-3 activity in right cortex at 24 h after room air and hypoxic exposure respectively (P<0.05, n=3–5 pups). Prior IUGR augmented HI induced right cortex caspase-3 activity (P<0.05, n=3–5). HI in control and IUGR groups decreased the success rate of the contralateral vibrissa-elicited forelimb test, increased the time to initiate movement during movement initiation test and increased the time to finish elevated beam walk test at P40 and P60 (P<.05, n=8–12). Prior IUGR augmented HI induced abnormality in vibrissa-elicited forelimb test at P40 but showed higher success rate when compared to HI only group at P60 (P<.05, n=8–12). Time to explore novel object did not vary significantly amongst the 4 groups.

**Conclusions** Mild to moderate HI in P10 rats showed evidence of early brain injury and abnormalities in motor and behavior outcomes at adolescent and adult ages. As previously reported, prior IUGR increased HI induced early brain injury. However, prior IUGR showed variable effects on HI induced long-term behavior and motor abnormalities. This is a novel, reproducible rat model of IUGR and HI enabling further investigation and generation of useful translational preclinical data.

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**621 INTRAVENOUS ADMINISTRATION OF HUMAN UMBILICAL CORD DERIVED MESENCHYMAL STEM CELLS DECREASES PRESSOR USE AND FLUID REQUIREMENTS IN PRETERM BABOONS OF BORDERLINE VIABILITY**

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10.1136/jim-2016-000393.625

**Purpose of Study** To evaluate therapeutic effects of mesenchymal stem cells (MSCs) derived from human umbilical cords when given intravenously to preterm baboons electively delivered at borderline viability.

**Methods Used** Premature baboons were electively delivered by C-section at 125±2 days gestational age (full term=185 days). Immediately after delivery, animals were intubated and given surfactant. Umbilical artery catheters and PICC lines were placed for fluid management and monitoring of BPs and ABGs. The animals were mechanically ventilated for 14 days with the ventilators adjusted to maintain pCO₂ targets of 45–55 torr and pO₂ targets of 50–70 torr. At 2 hrs of life, 1.5 ml of MSCs were administered over 15 mins in a dose of 10⁶ cells/kg birthwt to treated animals versus vehicle to controls. Daily echos were performed by a board-certified pediatric cardiologist. All results are expressed as group means±SD.
Summary of Results 4 untreated controls (2M,2F) with mean birthweights of 357.1±7 gms and 5 MSC-treated preterm baboons (2M,3F) born at 381±26 gms survived to 14 d in stable condition. Despite receiving increased fluid intake from 0–72 hours of life (245±25 ml/kg/d in controls vs 211±9 ml/kg/d in MSC-treated), 3/4 controls required dopamine vs 0/5 MSC-treated and still had lower mean BPs at 72 h (35.0±7.2 vs 40.0±4.7 mm Hg). Average urine output from 0–72 h was similar in controls vs MSC-treated (5.4±0.4 ml/kg/hr vs 4.6±0.8 ml/kg/hr) but controls increased 11% from birthwts vs 5% for MSC-treated and serum albumin dropped to <65% of birth values over the first 72 h in 3/4 controls vs only 1/5 MSC-treated.

Conclusions Treatment of preterm baboons of borderline viability with IV MSCs appears to decrease capillary leak and increase intravascular volume leading to improved hemodynamic stability and less need for supplemental pressors during the critical first 72 hours of life.

### 622 POSTNATAL CYTOMEGALOVIRUS INFECTION AND SHORT-TERM OUTCOMES IN VERY LOW BIRTH WEIGHT INFANTS

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Purpose of Study To estimate the risk of postnatal cytomegalovirus infection (pCMV) and evaluate the association between pCMV and short-term outcomes in very low birth weight (VLBW) infants.

Methods Used Secondary, multicenter observational study at 3 hospitals in Atlanta, GA. Nucleic acid testing of maternal breast milk and infant serum/urine performed at 5 time points from birth to 90 d with testing within 5 d of birth to evaluate congenital infection. Multivariable generalized linear models or Cox proportional-hazards models with adjustment for birth weight used to evaluate the association between pCMV and mortality or serious morbidity, defined as bronchopulmonary dysplasia (BPD), retinopathy of prematurity stage 2+ (ROP), or necrotizing enterocolitis (NEC). For NEC, pCMV onset determined using midpoint between last negative and first positive test (approach 1) or date from the last negative test (approach 2).

Summary of Results Of 598 VLBW infants, 459 (76.8%) were born to CMV seropositive mothers. After testing 2935 infant samples, 35 (5.9%) infants were diagnosed with CMV infection (2 congenital, 33 postnatal). Among infants born to CMV seropositive breastfeeding mothers, the pCMV incidence was 16.2% (95% CI 11.5–22.8%). pCMV was not associated with the composite outcome of mortality or serious morbidity: adjusted relative risk 1.13 (95% CI 0.74–1.72). Among individual outcome components, pCMV was not associated with mortality, BPD or ROP. However, pCMV was potentially associated with NEC: adjusted hazard ratio 2.57 (95% CI 0.65–10.1) by approach 1 and 5.49 (95% CI 1.22–24.8) by approach 2. Additionally, breast milk CMV viral load in the first 14 d after birth was significantly associated with NEC: hazard ratio per 1 log 10 increase 1.37 (95% CI 1.14–1.64).

Conclusions This study estimates pCMV occurs in 12–23% of breastfed VLBW infants born to CMV seropositive mothers. NEC may be a consequence of pCMV with risk related to breast milk CMV content.

### 623 MODERN NEONATAL TRANSPORT: SOUND AND VIBRATION LEVELS AND THEIR IMPACT ON PHYSIOLOGIC STABILITY

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10.1136/jim-2016-000393.627

Purpose of Study Background: The neonatal transport system is a key component of regionalized neonatal care. During transport, neonates may be exposed to sound and vibration exceeding recommended levels. Studies have shown that sound and vibration were greater in rotary-wing air transport (RWAT) than travel by ground. However, this data has not been updated to reflect technological advances in transport vehicles. Though morbidity and mortality is higher in outborn vs inborn infants, no studies have correlated these stressors with a change in physiologic stability during transport.

Objectives: To evaluate sound and vibration in modern transport vehicles and evaluate their impact on the physiologic stability of neonates comparing RWAT to ground ambulance (GAM).

Methods Used Prospective, cohort observational study. Included all infants ≤7 days transported to the Children’s Hospital between 10/31/2015 and 6/30/2016, excluding infants with neurological conditions. We measured sound and vibration continuously during transport, and logged temperature, respiratory status, blood pressure, and response to stimuli every 15 minutes to assess physiologic stability with the TRIPS score.

Area Under the Curve for all biometrics was computed using the trapezoidal method for all subjects over given time points. These areas were assessed for normality using the Shapiro-Wilk test. Comparisons between air and ground transport vehicles and evaluate their impact on the physiologic stability of neonates comparing RWAT to ground ambulance (GAM).

Summary of Results Of 253 transported newborns during the study period, 118 were included. The table represents the average mean sound and vibration levels of all subjects at the 30 minute time point during transport. Similar findings were found at all time intervals throughout transport. TRIPS scores for individual patients did not significantly vary from beginning to end of transport.

Conclusions Neonates transported via RWAT had exposure to significantly higher levels of sound and vibration than those transported via GAM and both exceed
published recommendations. However, measures of physiology stability did not show significant change between the two groups.

**Purpose of Study** The current growth assessment compares infants’ weight (wt) to growth in utero at similar gestation. Recent attention has been paid to utilizing wt:length ratios, such as body mass index (BMI), instead. We proposed to determine the feasibility of BMI as a growth-monitoring tool and to assess reduction in extrauterine growth restriction (EUGR; ≤10th percentile in BMI) after nutritional interventions implemented in our NICU.

**Methods Used** Perinatal database was used to identify all VLBW babies born between 2006 and 2014. Singleton babies with all required data and no congenital malformations/infections were included. BMI (wt/length2) were calculated at birth and discharge and Olsen’s growth curves were used to identify babies born intrauterine growth restricted (IUGR, wt) and IUGR’ (BMI), along with those discharged EUGR (wt) and EUGR’ (BMI). Changes in z-scores for BMI were trended.

**Summary of Results** Of 10,256 NICU admissions between 2006 and 2014, 1,870 (18.2%) were VLBW and 1,286 met inclusion criteria. The population was 51.1% female, predominantly African-American (84.5%), with median birth weights 2,652 g vs. 1,970 g of non-African-American babies. BMI was comparable to standard curves and no significant difference between race or gender. The yearly percentages of IUGR and IUGR’ babies were comparable. Yearly percentages of IUGR’ and EUGR’ babies are shown (Fig). Median ΔZ-scores improved from -0.4 (2010) to 0.09 (2013).

**Conclusions** BMI can be successfully utilized as a tool to monitor growth restriction in VLBW neonates and to identify babies with disproportionate growth restriction. The improving ΔZ-Scores over the past 3 years may indicate improved nutritional status in our NICU after implementing quality improvement measures.

**Purpose of Study** Donor milk (DM) is frequently offered to preterm infants in lieu of mothers’ own milk (MOM). Studies have favorably compared human milk to preterm formula with respect to growth, infection rates, and microbiome development; no studies have directly compared DM versus MOM for these outcomes.

**Methods Used** 125 eligible infants <1500 g birth weight (BW) were enrolled after parental consent and followed until 36 weeks PMA. Infants whose feeds consisted of more than 50% MOM were grouped into a MOM cohort; infants fed primarily DM were grouped into the DM cohort. Per feeding protocol, MOM and DM were fortified with DM-derived fortified. Stool was collected during the first six weeks of life to analyze gut microbiome development via 16S rRNA sequencing. Daily weights were recorded and a research nurse measured weekly length and head circumference (HC) until 36 weeks PMA. Secondary outcomes included feeding tolerance, length of stay, days of parenteral nutrition, incidence of NEC, spontaneous intestinal perforation, sepsis, BPD, symptomatic PDA, retinopathy, and white matter injury. Outcomes were compared via the Wilcoxon rank sum test and Fisher’s exact test.

**Summary of Results** Among 125 enrolled infants, 93 have completed all data collection to date. The DM cohort (n=34) received on average 15% mothers’ milk compared to 91% for the MOM cohort (n=59). At 36 weeks, MOM infants weighed 2200±336 g vs. 1980±309 g for DM infants (<0.01). Average growth velocities were 2.7 g/day (p<0.01) and 0.7 g/kg/day (p=0.05) higher among MOM infants. Final MOM weight, length, and HC percentiles using Fenton 2013 growth curves were 10% (p<0.01), 7% (p=0.04) and 12% (p=0.03) higher. DM infants averaged 2.6 days NPO after initiating feeds compared to 0.9 for MOM (p=0.03), and 12% required ligation or coiling of PDA compared to 2% for MOM (p=0.04). All other outcomes were similar between groups.

Bacterial DNA extraction from stool specimens is currently in process for microbiome sequencing in October 2016.

**Conclusions** Infants <1500 g BW fed primarily MOM spend fewer days NPO and have better growth compared to peers fed mostly DM. MOM may be protective against symptomatic PDA requiring procedural intervention.
**REAL-TIME, MEDIA-ENHANCED FEEDBACK IMPROVES NEONATAL INTUBATION SKILLS**

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10.1136/jim-2016-000393.630

**Purpose of Study** To determine if the use of real-time, media-enhanced feedback to learn intubation skills compared to traditional teaching and demonstration alone positively affects intubation skills and confidence in performance after an initial teaching session among third-year medical students rotating through their pediatric clerkship.

**Methods Used** Eighty-seven students were prospectively randomized for neonatal manikin intubation instruction by traditional instructor demonstration alone or by the additional use of Google Glass, which added video viewing (Figure 1), life-streaming and feedback capability. Both groups were given a standardized written assessment test and confidence survey. We measured time to successful intubation, total number of attempts, test scores, and confidence scores.

**Summary of Results** Time to intubation for practice attempt 2, test 1 time, and test 2 time were all significantly shorter in the treatment group (Table 2). The proportion of successful attempts (Table 1) and written assessment scores (Table 2), did not differ significantly between the control and treatment groups.

**Conclusions** The addition of Google Glass when teaching neonatal intubation shortens time to successful intubation and increases confidence scores.

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**MATERNAL EXPOSURE TO ADVERSE CHILDHOOD EVENTS ON PRENATAL DEPRESSION AND BREASTFEEDING**

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10.1136/jim-2016-000393.631

**Purpose of Study** Adverse childhood events (ACE) have predicted a range of negative health outcomes across the life course, however their impact on prenatal and postnatal experiences have not been well examined. Stress has been related to prenatal depression (Ritter 2000) and breastfeeding (Grajeda, 2002; Kendall, 2000). According to the CDC, black infants consistently had the lowest rates of breastfeeding during 2000–2008. Racial differences in breastfeeding may be due to multiple reasons, including maternal exposure to stress. To further determine the effects of ACE on mothers, this study will examine the cumulative maternal lifetime exposure to ACE and its effects on prenatal depression and breastfeeding.

**Methods Used** Pregnant women were recruited from Tulane University’s prenatal clinics as part of a larger study investigating the effect of maternal life and prenatal stressors on infant and childhood development. Women were interviewed before and after their infants’ births regarding their exposure to traumatic and stressful life events, prenatal depression, and breastfeeding. Depressive symptoms and ACE exposure were assessed using the Edinburgh Postnatal Scale (EDS) and Adverse Childhood Experiences Scale, respectively.

**Summary of Results** Mothers with greater ACE exposure were significantly more likely to be depressed prenatally (p=0.06) and also significantly less likely to breastfeed during their infant’s first year of life (p=0.02). Prenatal depression did not mediate the relationship between ACE exposure and breastfeeding, although mothers with prenatal depression were less likely to breastfeed.

**Conclusions** Maternal life events and prenatal stresses may not only affect mothers’ well-being during pregnancy, but may also affect breastfeeding, which may have negative consequences for infant development. Practitioners should assess maternal ACE as a potential risk for prenatal depression. Greater research examining ACE and breastfeeding is needed to design interventions to increase breastfeeding rates, especially in high risk populations.

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**TECHNOLOGY ASSISTED MEDICATION ADHERENCE IN PREGNANCY**

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10.1136/jim-2016-000393.632

**Purpose of Study** As health systems evolve to meet the challenges of poor medication adherence, cell phone technology has emerged as an intervention to target compliance. We examined the utility of text messaging to promote medication adherence in a study evaluating the role of vitamin D during pregnancy.

**Methods Used** In an ongoing RCT, women were randomized to receive 400 IU/day (n=184) vs an additional 4000 IU/day (n=189) of vitamin D3. We performed an a priori designed analysis, in the experimental arm of the trial, to compare the difference in those who opted to receive text message medication reminders vs those who did not and the % change in maternal 25(OH)D. Exclusion criteria consisted of women who withdrew from the study and those who did not speak English as a primary language, due to the English-only capabilities of the app at time of enrollment. The association between receiving medication reminders and % change in maternal 25(OH)D concentrations throughout the course of gestation was estimated by the Mann-Whitney U test (SAS v9.4, Cary, NC).

**Summary of Results** We found a statistically significant difference between those who opted to receive medication reminders and % change of maternal 25(OH)D concentrations of the 33 who opted to receive reminders, the median % change was 114 (IQR 51, 143) and for the 74 who opted not to receive reminders, the median % change was 91 (IQR 71, 211), p=0.03. Using a linear regression model and controlling for race, insurance status, and pill count, opting to receive reminders was significantly associated with an increased % change in maternal 25(OH)D concentrations (p=0.02).

**Conclusions** Our findings support a significant association between participants who opted to receive text medication reminders vs those who did not, and improvement in...
maternal 25(OH)D during pregnancy. Our findings are consistent with the emerging evidence that technology assistance may play a critical role in improving maternal, and thus fetal, health. This study additionally highlights the importance of multilingual applications appropriate for the enrolled population to assess the generalizability of findings to a more diverse population.

**Abstracts**

**629 CAN WE REDUCE EMPIRIC ANTIBIOTIC UTILIZATION FOR CLINICAL CHORIOAMNIONITIS IN NEONATES UNDER THE NEW TRIPLE I CRITERIA?**

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10.1136/jim-2016-000393.633

**Purpose of Study** Chorioamnionitis (CAM) increases the risk of early onset neonatal sepsis (EOS). Diagnosis is based on maternal symptoms, most commonly fever. Overdiagnosis can result in administration of unnecessary antibiotics and prolonged hospital stay for the neonate. Recently NICHD consensus statement recommended using the term Triple I (intramniotic infection or inflammation or both) instead of CAM with specific diagnostic criteria. We re-evaluated the mothers diagnosed with clinical CAM with the new Triple I criteria and compared the clinical characteristics of these mothers, their infants and neonatal antibiotic use based on the new criteria.

**Methods Used** This was a retrospective study of infants≥35 wk gestation who received empiric antibiotics for EOS over an 8-month period (08/2014–03/2015). Eligible infants were identified from the NICU database and individual maternal and neonatal charts were reviewed. Clinical, laboratory and antibiotic usage data were recorded. Chi-square test and t-test were used to compare categorical and continuous variables respectively.

**Summary of Results** Ninety-seven infants admitted to the NICU for possible EOS and administered antibiotics were evaluated. There were 24 infants who received antibiotics who did not have history of maternal CAM (Group A), while 73 infants received antibiotics for maternal CAM. Of the 73 mothers diagnosed with CAM, 32 (44%) did not meet the criteria for triple I (Group B) and 41 (66%) met the criteria. There were 24 infants that received antibiotics for maternal CAM. Of the 73 infants diagnosed with clinical CAM, 32 (44%) did not meet the new triple I criteria proposed by the NICHD workshop. Antibiotic administration and prolonged hospital stay can be avoided in a significant number of neonates using the Triple I criteria.

Renal, Electrolyte and Hypertension II

**Concurrent Session**

**1:00 PM**

**Monday, February 13, 2017**

**630 HISTOPLASMOSIS IN PEDIATRIC RENAL TRANSPLANT RECIPIENTS: EXPERIENCE IN AN ENDEMIC REGION**

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10.1136/jim-2016-000393.634

**Purpose of Study** Data about histoplasmosis in pediatric kidney transplants (KTx) patients are scarce. We report a case series of histoplasmosis in KTx patients in an endemic area.

**Methods Used** All KTx cases from Jan 2002 to Aug 2016 in our mid-south children’s hospital were reviewed to identify those with histoplasmosis. Demographic, clinical, and lab data were collected.

**Summary of Results** The incidence of histoplasmosis among our KTx patients was 6.9% (6/87). Mean age at histoplasmosis diagnosis was 13.2 years (range 3–18 years). Patients were from the metropolitan area of Memphis, TN and neighboring counties in Mississippi. Underlying diagnoses were glomerulosclerosis (3), medullary cystic disease (1), and obstructive uropathy (2). One patient also had perinatal HIV infection. Majority (5/6) were deceased donor transplants, and none had a history of rejection prior to histoplasmosis. Mean time from transplant to histoplasmosis was 25.1 months (1.6–82.1 months), and 33% occurred in the first year after transplant. All had induction with Thymoglobulin®. None were on antifungal prophylaxis at the time of diagnosis. Post-transplant immunosuppression included a combination of tacrolimus or cyclosporine, prednisone, and +/- mycophenolate mofetil. Median duration of symptoms prior to diagnosis was 14 days. Common symptoms included fever, malaise, diarrhea, cough, and dyspnea. 50% (3/6) had severe disease requiring ICU admission. Urine and serum Histoplasma antigen were highly positive at diagnosis and trended down throughout therapy. Patients were treated either with amphotericin B and transitioned to an azole or received azole monotherapy for a mean duration of 7 months. Most (83%) received chronic suppression with itraconazole for varying lengths of time. There were no deaths, and only one relapsed after repeat transplant.

**Conclusions** KTx patients in endemic areas are at increased risk for disseminated histoplasmosis. Further research is needed to determine if pediatric KTx patients in a histoplasmosis endemic area would benefit from antifungal prophylaxis.
COPPER-ZINC SUPEROXIDE DISMUTASE IS A NOVEL PROGNOSTIC BIOMARKER OF ACUTE KIDNEY INJURY FOLLOWING CARDIOTHORACIC SURGERY

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Purpose of Study Acute kidney injury (AKI) remains a significant cause of morbidity and mortality, and approximately 20% of patients who undergo cardiothoracic surgery will develop AKI. The identification and prognosis of AKI, as well as the translation of preclinical therapeutic options has been impeded by the lack of a detectable biomarkers during AKI. Copper-Zinc superoxide dismutase (CuZn SOD) is an endogenous antioxidant protein which serves to neutralize superoxide radicals. Previous proteomics studies in our lab detected CuZn SOD in urine from patients who developed AKI after cardiothoracic surgery, as well as mice with ischemia-reperfusion injury and rat glycerol models of AKI. Thus, CuZn SOD offers a promising option as a novel biomarker for AKI.

Methods Used Urine samples were obtained from 243 patients who developed stage 1 AKI within 48 hours of cardiothoracic surgery. Urine samples were diluted with phosphate-buffered saline (PBS), and urinary CuZn SOD was quantified by ELISA. Data were analyzed and a receiver operating characteristic curve (ROC) was constructed using Graphpad Prism 7.0.

Summary of Results We found a significant increase in CuZn SOD concentration in the urine of patients that developed Stage 3 AKI, required renal replacement therapy (RRT), or died within 30 days when compared to patients who had a maximum increase in serum creatinine corresponding to stage 1–2 AKI. Urine CuZn SOD concentration was able to predict the progression to stage 3 AKI or 30 day mortality with an area under the ROC curve of 0.79 (95% C.I.=0.70–0.87, p<0.0001).

Conclusions This study demonstrates the potential for CuZn SOD to serve as a novel prognostic biomarker for AKI.

REDUCED PRORENIN RECEPTOR(PRR) GENE DOSAGE IN NEPHRON PROGENITORS IN MICE PROGRAMS HYPERTENSION LATER IN LIFE

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Purpose of Study Deficient nephrogenesis is the major factor contributing to development of hypertension later in life (developmental programming). Previously, we demonstrated that conditional ablation of the PRR in nephron progenitors in Six2<sup>PRR<sup>-/-</sup></sup> mice results in reduced congenital nephron number and early perinatal death (Song et al., Dev. Biol., 2016). Here, we tested the hypothesis that reduced PRR gene dosage in heterozygous Six2<sup>PRR<sup>+/-</sup></sup> mice is associated with development of hypertension during later life.

Methods Used Conscious mean tail-cuff arterial blood pressure (MAP) was measured in Six2<sup>PRR<sup>+/+</sup></sup> (n=3) and control Six2<sup>PRR<sup>+/+</sup></sup> (n=4) mice at 2 months of age using a Visitec BP2000 system (Visitec Systems, Apex, NC). Kidney weight was determined and glomerular number was counted at 2 months of age from 3 consecutive H&E-stained sections/kidney adjacent to the longitudinal midplane.

Summary of Results Kidney weight (288±14 vs. 408±17, p<0.001) and the number of glomeruli per kidney section (69±4.0 vs. 178±4.9, p<0.001) was reduced in Six2<sup>PRR</sup> <sup>-/-</sup> compared with control mice. In contrast, MAP was increased in Six2<sup>PRR</sup> <sup>-/-</sup> compared with control mice (95.5±2.8 vs. 70.4±3.8, p<0.01).

Conclusions We conclude that reduced PRR gene dosage in Six2<sup>+</sup> nephron progenitors in mice results in reduced kidney weight and glomerular number, but an increased MAP at 2 months of age. These findings strongly support the association between decreased PRR signaling in nephron progenitors during nephrogenesis and developmental programming of hypertension later in life likely due to reduced nephron endowment.

OUTCOMES ASSOCIATED WITH INPATIENT VS. OUTPATIENT HEMODIALYSIS INITIATION IN A LARGE INCIDENT ESRD COHORT

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Purpose of Study The setting (Inpatient vs. Outpatient) of chronic HD initiation could be determined by medical (e.g. comorbidities) or other factors (e.g. no available mature vascular access). It is unclear if the setting of HD initiation is associated with mortality risk in the post-dialysis period.

Methods Used We examined the association of inpatient (vs. outpatient) HD initiation with all-cause and cause-specific mortality in 48,261 US veterans transitioning to HD between 10/2007–09/2011. Associations were examined in Cox (all-cause mortality) and competing risk regression models (cause-specific mortality), adjusted for demographics, comorbidities, vascular access type, predialysis Nephrology care and medication use, and pre-ESRD eGFR and hemoglobin.

Summary of Results 22,338 (46.3%) patients started HD as inpatients. Inpatient HD start was associated with older age, presence of a tunneled catheter, and more comorbidity. Higher hemoglobin, lower eGFR and predialysis use of active vitamin D were associated with outpatient HD start. 32,323 patients died over a median follow up time of 2.1 years (mortality rate, 95%CI: 290/1000 patient-years, 287–293). Inpatient vs. outpatient HD start was associated with significantly higher crude all-cause, CV and infectious mortality. These associations were substantially attenuated, but remained significant after multivariable adjustment (Figure).

Conclusions Veterans who transitioned to HD in a hospital setting experienced significantly higher mortality following dialysis initiation. Better predialysis care may allow more patients to initiate HD as outpatient. Future studies are needed to examine the impact of this on mortality.
RISK FACTORS ASSOCIATED WITH INVASIVE FUNGAL INFECTIONS IN KIDNEY TRANSPLANT PATIENTS

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Purpose of Study Kidney transplant patients are at an increased risk for invasive fungal infections (IFI) due to the requirement for immunosuppressive therapy for prevention of rejection. We recently described mortality associated with IFI in kidney transplant patients (JIM 64:628). The goal of this study was to characterize the risk factors associated with development of IFI in this cohort.

Methods Used All kidney transplant patients in the United States Renal Data System from 2005–08 were queried for a diagnosis of post-transplant IFI and clinical covariates using ICD-9 and CPT-4 codes from Medicare inpatient hospital claims. Logistic regression was used to examine the adjusted relative risk (aRR) of demographic and clinical risk factors for IFI overall and by type.

Summary of Results 57,188 people received a kidney transplant during the specified time period; 1218 (2.1%) were diagnosed with at least one IFI. The total number of IFI by type included: aspergillosis (n=291; 21.7%), cryptococcosis (n=276; 20.6%), candidemia (n=164; 12.2%), histoplasmosis (n=118; 8.8%), and ‘other’ (n=494; 36.8%). Bacterial pneumonia (aRR=2.99) and diabetes mellitus (DM) (aRR=2.07) were the clinical variables most strongly associated with development of any IFI. A diagnosis of bacterial pneumonia was also highly associated with aspergillosis (aRR=3.31), as was prednisone use (aRR=2.19) and candida colonization (aRR=2.18). Total parenteral nutrition (aRR=3.26) and DM (aRR=2.86) significantly increased the risk of cryptococcosis. Bacteremia was associated with a 4-fold increase in candidemia. Leukopenia carried the largest risk for histoplasmosis (aRR=1.91). Receipt of anti-thymocyte globulin (aRR=2.42) and history of bacterial pneumonia (aRR=3.33) were significantly associated with ‘other’ IFI.

Conclusions In the 2% of kidney transplant patients who developed an IFI, multiple factors impacted the overall IFI risk and the type of infection. Clarification of specific IFI risk may allow for earlier detection, treatment, and possibly even prevention of IFI in this vulnerable population.

RENAL RESPONSE TO ACIDOSIS: RNA-SEQ

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10.1136/jim-2016-000393.639

Purpose of Study Metabolic acidosis is a common pathophysiologic condition that can occur either acutely or chronically in a variety of settings and diseases. Acidosis has a number of adverse effects including progression of chronic kidney disease, bone loss, and muscle wasting. The kidneys are the main organs which respond to acid loads to protect against systemic acidosis.

Methods Used C57Bl/6 mice were fed either normal or acid diet (X3d), kidney RNA extracted & integrity validated. RNAseq was performed at Tulane Center for Aging Genomics and Biostatistics Core on Ion Proton platform with 20 M reads/sample. Bioinformatics was completed at the Cancer Crusaders NGS Analysis Core. For qPCR, RNA was isolated from same kidneys & mRNA relative expression was calculated by delta delta Ct.

Summary of Results We identified 1173 transcripts differentially expressed >1.5 fold (each statistically significant), 525 transcripts upregulated and surprisingly 648 down regulated. Among those upregulated, many have been previously reported to be involved in the response to acidosis: PCK1, GLUD1, SNAT1, SNAT3, SLC13A2, SLC26A6. But we also identified many additional genes that indicate a broader cellular metabolic response to acidosis. Of note gene transcripts exponentially upregulated were: FGF18, PCK1, SOX14, BCL6, Fam25c; and down-regulated Mir6239, Mir6236, RNU12 and SNORD13.

Also 36 genes from SLC family were identified and differentially expressed under acidosis. By qPCR SLC genes 13a2, 13a3, 16a9, 26a6 & 38a3 were upregulated & consistent with RNAseq.

Ingenuity Pathway Analysis (Qiagen) revealed many of the genes part of canonical pathways: dTMP de novo biosynthesis, superpathway of cholesterol biosynthesis, glutathione-mediated detoxification, NRF2-mediated oxidative stress response.

Conclusions Acidosis alters (both up and down) many genes and pathways. Apart from the top canonical pathways, many of these genes have been reported in renal fibrosis/damage, tubule injury, hypertrophy & glomerular injury. Since acidosis activates a variety of critical pathways in addition to the known pathways, this information may be useful in designing approaches to a variety of renal and systemic disorders.
Purpose of Study Percutaneous kidney biopsy (PKB) is routinely performed by a nephrologist with ultrasound (US) guidance from a radiologist, or solely by interventional radiology (IR). There is paucity of data regarding safety and feasibility of PKBs performed by a nephrology (NEPH) team without participation of a radiologist. We hypothesized that PKBs independently performed by a NEPH team are as safe and optimal in yield of kidney tissue as those performed by IR.

Methods Used We established a NEPH clinical service to independently perform bedside real-time US-guided PKBs. Records were reviewed to compare complication rate (minor: hematoma, gross hematuria; major: blood transfusion (ordered at the discretion of the hospitalist) invasive procedure, intensive care or death) and biopsy adequacy (successful retrieval of glomeruli-containing tissue fully available for light, immunofluorescence and electron microscopy) of PKBs performed by the NEPH team vs. those performed by IR under computer tomography (CT) guidance.

Summary of Results We identified 109 PKBs performed by NEPH (16 g needle) and 103 by IR (68% 16 g, 32% 18 g) over the last 3 years. Groups were comparable regarding age (46.0 vs. 50.2 yrs) and baseline hemoglobin (10.6 vs. 10.2 g/dL) and platelet count (229 vs. 232 x10^3/mm^3), whereas mean body mass index (BMI) (28.5 vs. 31.8 kg/m^2; p=0.012) and estimated glomerular filtration rate (eGFR) (57.1±47 vs. 32.3±37 ml/min/1.73 m^2; p<0.008) were different for NEPH and IR, respectively. Complication rates were similar between groups (major: 6.4% vs. 4.9%; minor: 2.7% vs. 6.8%, for NEPH and IR, respectively), even among those with BMI>30 kg/m^2 or eGFR<45 ml/min. Two IR cases but no NEPH cases required arterial embolization. One death occurred with IR, none with NEPH. Adequate tissue specimens were obtained in 104 cases (95.4%) of the NEPH cohort vs. 84 (81.6%) of the IR cohort (p=0.002).

Conclusions Real-time US-guided PKBs performed by a NEPH service are as safe as CT-guided PKBs performed by IR in a high risk population at an academic medical center, and may provide superior tissue retrieval.

Case Report Introduction: The inferior vena cava (IVC) is a dynamic vessel that may expand and contract based on extracellular fluid volume (ECFV) status. Hemodialysis (HD) patients may exhibit wide swings in volume status and may serve as good models for assessing the relationship between IVC diameter (IVCD) and ECFV. On this basis, we assessed the utility of measuring IVCD before and after sequential HD sessions in a volume expanded HD patient.

Case report: A 52-year-old male with ESRD was admitted with volume overload and hypertension. Over 3 HD sessions, mean fluid removal was 3.9 L per session for a total removed of 11.7 L. IVCD was determined non-invasively using a GE Sonosite device, and measured at the entry to the right atrium before and after each HD session. Pre and post systolic BP (SBP) and IVCD, and the change in IVCD and UF removed were determined and are indicated in the table. With volume removal the IVCD was reduced, but recovered within 24 hours between dialysis sessions 1 and 2. A sustained decline in IVCD was demonstrated by HD session 3, suggesting that euvolemia was approaching. A similar favorable effect in blood pressure was noted, further supporting the contention of euvolemia. Of note, persistent volume expansion from session 1 to 2 caused the IVCD to re-expand within 24 hours.

Conclusion: IVCD correlated with volume removal and reduction of BP in this volume expanded HD patient. In the face of persistent volume overload, re-expansion of the IVC occurred within 24 hours. Determination of IVCD may be a useful non-invasive test for assessing volume status and determining ultrafiltration goals in HD patients.

<table>
<thead>
<tr>
<th>Hospital Day</th>
<th>Pre-SBP (mmHg)</th>
<th>Pre-IVCD (cm)</th>
<th>Post-SBP (mmHg)</th>
<th>Post-IVCD (cm)</th>
<th>Change in IVCD (cm)</th>
<th>UF removed (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>196</td>
<td>2.7</td>
<td>160</td>
<td>2.3</td>
<td>0.4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>172</td>
<td>2.7</td>
<td>148</td>
<td>2.3</td>
<td>0.4</td>
<td>3.7</td>
</tr>
<tr>
<td>3</td>
<td>142</td>
<td>2.4</td>
<td>128</td>
<td>1.9</td>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>170±27</td>
<td>2.6±0.17</td>
<td>145.3±16.16</td>
<td>2.16±0.23</td>
<td>0.43±0.05</td>
<td>3.9±0.17</td>
</tr>
</tbody>
</table>
Purpose of Study Age is a risk factor for cardiovascular diseases, including hypertension. The prorenin receptor (PRR) is a new member of the renin-angiotensin system that enhances renin activity and fully activates prorenin and is upregulated in the heart, vasculature and kidney of various hypertensive animal models. The soluble form of the PRR (sPRR) has been found augmented in the plasma of patients with essential hypertension and preeclampsia. This study evaluated whether age changes plasma soluble prorenin receptor levels and if this is correlated with systolic blood pressure in aged mice.

Methods Used For this purpose, we used BL6/J male mice (n=25) divided in 3 groups according with age (in months): Group 1: 4–6 m (n=10); Group 2: 8–10 m (n=10); and Group 3: 15 m and older (n=5). In these mice, blood samples were collected from the submandibular sinus to measure plasma levels of sPRR by ELISA (IBL, Inc), and systolic blood pressures (SBP) were measured by the tail cuff method after a period of two weeks of training.

Summary of Results Fifteen months and older mouse group had significantly higher SBP (117.9±1.9 mmHg) compared to 4–6 months old (103.0±1.8 mmHg) and 8–10 months old groups (105.0±1.6 mmHg; p<.0001). Similarly, plasma sPRR levels were significantly higher on the 15 months old mice (3,834±194 pg/ml) compared to 4–6 months old (1,552±141 pg/ml) and 8–10 months old group (1,738±87 pg/ml; p<.0001). Furthermore, plasma sPRR levels were 2.5 fold higher in the oldest group as compared to the younger mice. Plasma sPRR levels were positively correlated with age (r=0.8726; p<.0001). However, SBP and age did not correlate. Interestingly, plasma sPRR levels exhibited a significant positive correlation with SBP (r=0.6029, p=0.0174).

Conclusions This study indicates that plasma sPRR levels increase with age and that these levels are correlated with SBP. Augmentation of plasma sPRR levels may increase susceptibility to hypertension and cardiovascular disease in the elderly subjects. However, further studies to define whether the relationship between plasma sPRR and SBP is independent of age will need to include higher number of mice.
inhabitants living in an area of Nicaragua endemic for MeN, we used urinary specific gravity (USG) as a surrogate marker for renal perfusion, and compared USG between the two groups.

**Methods Used** A de-identified database was obtained from a health fair occurring in Chinandega, Nicaragua. Parameters included age, sex, degree of labor, BMI, capillary blood glucose (CBG), blood pressure (BP), USG, and urine pH (UPH). Data was analyzed using JMP software using a two-sample t-test.

**Summary of Results** Seventy-one patients were studied. Demographics showed: age 32±8.8 years, 65% males and 70% natives. 31% of NIC were hard laborers. When compared to FOR, NIC had significantly higher BMI (26.4 ±3.5 vs. 24.1±4.0, p=0.0195) and systolic BP (117.1 ±11.6 vs. 108.8±11.6, p=0.0078). CBG trended higher in NIC compared to FOR (84.8±19.1 vs. 78.1±9.5, p=0.0516). NIC had significantly higher USG than FOR (1.018±0.0069 vs. 1.014±0.007, p=0.023) and a trend toward higher UPH (6.43±0.715 vs. 6.24±0.436, p=0.1894).

**Conclusions** NIC exhibited higher USG than FOR, suggesting a component of volume depletion regardless if their occupation involved hard labor or not. It is unclear if the associated increase in urinary pH represents a physiologic response to chronic secondary hyperaldosteronism, dietary causes, intrinsic tubular dysfunction, or other causes. Further assessment of urinary parameters may provide clues to the etiology and development of MeN in Nicaraguans.