American Academy of Pediatrics

Section on Uniformed Services

2014 Scientific Awards Competition
The Ogden C. Bruton Award

The Ogden C. Bruton Award, given by the Uniformed Services Section of the American Academy of Pediatrics, is an annual citation and purse for the best paper by a Uniformed Services pediatrician on either basic research or applied research on the development, evaluation, or application of an emerging technology in pediatrics.

This award was originally sponsored by the Med-Johnson Nutritional Division and was first presented at West Point, New York in 1969. In 1989 the Uniformed Services Section of the American Academy of Pediatrics provided additional recognition and awards for individuals placing second and third place in this competition.

The award is named in honor of Dr. Ogden C. Bruton, discoverer of the immunodeficiency disease bearing his name and organizer of the first pediatric residency program at Walter Reed Army Medical Center.
Ogden C Bruton
Colonel, Medical Corps, US Army (Ret)

Ogden Carr Bruton was born on June 14, 1908, in Mount Gilead, North Carolina. At the age of 16 he entered Trinity College, which was to become Duke University, and graduated in 1929. He then attended Vanderbilt University School of Medicine where he received his MD degree in 1933, remaining for his pediatric residency until 1936 when he became a member of faculty. Recipient of the Commonwealth Fund Fellowship, he spent time at the Child Guidance Clinic of Los Angeles and the Pediatric Psychiatry Clinic of Babies Hospital in New York in 1938-1939. After returning to Vanderbilt, he was conscripted as a reserve officer to serve one year in the peacetime army in 1940 and began an illustrious 21-year military career with assignments at Walter Reed; the 210th General Hospital, Ft. Gulick, Panama; Army Regional Hospital, Ft. Knox, Kentucky; and Tripler General Hospital, Hawaii. In 1946 after a single month of private practice in Winston-Salem, North Carolina, he was recalled as a consultant by the Army Surgeon General to improve health conditions and care for “war brides” and their babies prior to and during their passage to the United States. His recommendation for a training course for physicians staffing returning troop ships was instrumental in improving the case for infants and children. During this time he received a Regular Army commission. Upon returning to the United States, he was assigned to Walter Reed General Hospital to develop the Army’s first pediatric training program. He became a Clinical Professor of Pediatrics at Georgetown University School of Medicine and a consultant at the Children’s Hospital, Washington, D.C. The remainder of his military career was spent at Walter Reed except for a period from 1955-1958 while he was at Tripler General Hospital, Hawaii, directing the pediatric service and gaining residency training approval.

On May 28, 1944, he married Melda Kathryn (Kay) Dove of Winchester, Virginia. They have a daughter, Kathryn Jo and a son, Odgen Carr, Jr.

The discovery and treatment of agammaglobulinemia in a male child with repeated pneumococcal infections, published in 1952, was an epoch-making contribution to medicine. This basic investigation led to later studies that have broadened our current understanding of not only the immunological deficiencies, but other immunological phenomena. As a clinician and educator, Dr. Bruton has influenced the lives of untold numbers of medical students, residents and colleagues. Many of his former pediatric residents became leaders in military and academic medicine. For all those who know him, “The patient is first, and last, always.”

At the 1992 Uniformed Services Pediatric Seminar in Washington DC, Dr. Bruton was awarded the Department of Defense Distinguished Civilian Service Award. This prestigious award, the highest that the Department of Defense can give to a civilian, requires approval by the Secretary of the Army. It recognized his significant lifetime achievements and contributions to pediatric care, education of pediatricians, and support of pediatric research within the Department of Defense.

Ogden C Bruton has fostered the highest ideals of the American Academy of Pediatrics, The American Pediatric Society, and the United States Army Medical Corps. Many deserved honors: military, medical, and humanitarian have come to him. However, the significance of the Bruton Award and the Bruton Lectureship of the Military Section of the American Academy of Pediatrics are sources of personal enjoyment and pride to him. By competing for each annual Ogden C Bruton Award, young pediatricians in the military services will continue to advance the health care of infants and children and to add the noble legacy and tradition established by Ogden C Bruton for military pediatrics.

Billy F. Andrews, MD, FAAP
(Revision by John R Pierce, MD 12/93)
The Ogden C. Bruton Award: Past Recipients

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<th>Year</th>
<th>Recipient</th>
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<td>1969</td>
<td>MAJ Alva Strickland, MC, USA</td>
<td>Growth Retardation in Cushing’s Syndrome</td>
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<td>1970</td>
<td>CPT Charles Hyman, MC, USA</td>
<td>Parental Hyperalimentation</td>
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<td>1971</td>
<td>CPT David Kerns, MC, USA</td>
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<td>1972</td>
<td>CPT Richard Bland, MC, USA</td>
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<td>1974</td>
<td>CPT Gerald Fischer, MC, USA</td>
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<td>1975</td>
<td>MAJ William Oetgen, MC, USA</td>
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<td>1976</td>
<td>LTC Russell Steele, MC, USA</td>
<td>Cellular Immune Responses to Herpes During Treatment of ARA-A</td>
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<td>1977</td>
<td>MAJ Jerry D Reeves, USAF, MC</td>
<td>Host Defense in Infantile Malignant Osteoporosis</td>
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<td>1978</td>
<td>MAJ Alan Mease, MC, USA</td>
<td>Newborn Neutrophil Membrane Abnormalities</td>
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<td>1979</td>
<td>CDR Harold Koenig, MC, USA</td>
<td>Immune Suppression of Erythropoiesis in Transient Erythroblastopenia of Childhood</td>
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<td>1980</td>
<td>LTC Gerald Fischer, MC, USA</td>
<td>Direct Effect of Type Specific Antibod on Surface Morphology and Viability of Type III Group B Streptococcus</td>
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<td>1981</td>
<td>LTC William Allen, MC, USA</td>
<td>Effects of Diazoxide on Proximal Tubular Sodium Reabsorption</td>
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<td>1982</td>
<td>LCDR Douglas Sobel, MC, USN</td>
<td>Angiotensin Mediated Secretion of ACTH from Adenohypophyseal Cells in Monolayer Culture</td>
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<td>1983</td>
<td>COL Richard Lampe, MC, USA</td>
<td>Measles Reimmunization in Children Immunized Before on Year of Age</td>
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<td>1984</td>
<td>CDR Stephen Golden, MC, USN</td>
<td>Prostaglandin Release and Pulmonary Artery Hypertension Induced by Group B Streptococcal Extract infusions in Neonatal Lambs</td>
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<td>1985</td>
<td>COL Val Hemming, USAF, MC</td>
<td>Investigations into Mechanisms of Adverse Reactions to Formalin Inactivated Respiratory Syncytial Virus (RSV) Vaccine</td>
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<td>1986</td>
<td>CAPT Victor Pineiro, USAF, MC</td>
<td>Alteration of Intestinal Motility After Destruction of Enteric Serotonergic Neurons</td>
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<td>1987</td>
<td>LCDR Julian F Keith, MC, USN</td>
<td>Maternal Protein Deprivation During Late Gestation: impact on the Mother, Fetus, and Neonate</td>
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<td>MAJ Howard Heiman, MC, USA</td>
<td>Pre- and Postnatal Exposure to Immunization-Induced Antibody Prevents Group B Streptococcal Infections</td>
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<td>The Effect of Different High Frequency Ventilator Strategies on the Propagation of Tracheobronchial Histopathologic Changes</td>
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<td>MAJ Melin Robb, MC, USA</td>
<td>Virologic Characterization of HIV Infection in Infants and Children</td>
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<td>LCDR Steve Savarino, MC, USN</td>
<td>Identification of a Plasmid Locus Required for Adherence of Enteroaggressive E. Coli to HEP-2 Cells</td>
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<td>MAJ Edward Stevens, MC, USA</td>
<td>Furosemide Differentially Relaxes Airway and Vascular Smooth Muscle in Fetal, Newborn and Adult Guinea Pigs</td>
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<td>LCDR John A McQueston, MC, USN</td>
<td>Changes in Endothelial-Dependent and Independent Vasodilation During Chronic Intrauterine Pulmonary Hypertension</td>
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<td>LCDR Michael J Nowicki, MC, USNR</td>
<td>Glucocorticoids Up-Regulate Taurocholate Transport by the Ileal Brush Border Membrane</td>
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<td>MAJ Jeffrey S Shenberger, USAF, MC</td>
<td>Role of Interleukin-4 (IL-4) in H. polygyrus-induced Changes in Epithelial Transport</td>
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<td>1999</td>
<td>COL Bradley A Yoder, USAF, MC</td>
<td>The Immature Baboon: A New Model for Neonatal Chronic Lung Disease</td>
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<td>MAJ Arthur de Lorimier, MC, USA</td>
<td>Murine Antibody Response to a Vaccine for Entertoxigenic Escherichia coli</td>
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<td>2001</td>
<td>MAJ Margret E Merino, MC, USA</td>
<td>Immunomagnetic Purging of Ewing’s Sarcoma from Peripheral Blood and Bone Marrow: Quantitation by Real-Time PCR</td>
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<td>2002</td>
<td>MAJ Jay Kerecman, USAF, MC</td>
<td>Pulmonary Surfactants Decrease Alveolar Macrophage Cytokine and Nitric Oxide Production</td>
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<td>2004</td>
<td>MAJ Susan Dotzer, USAF, MC</td>
<td>The Distribution of Corticotropin Releasing Hormone in the Fetus, Newborn, Juvenile and Adult Baboon</td>
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<td>2005</td>
<td>LCDR Brett Siegfried, MD, MC, USNR</td>
<td>ENU Mutagenized Mice with Omphalocele, Ploydactyly, Hydrops and Congestive Heart Failure Caused by a Mutation on Chromosome 17</td>
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<td>2006</td>
<td>Andrew J. Bauer, MD, FAAP LTC, MC, USA</td>
<td>PMA Induces Epithelial to Mesenchymal Transition in Thyroid Cancer</td>
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<td>2007</td>
<td>Kirk E. Jensen, MD</td>
<td>Targeting of epigenetic regulators in thyroid cancer results in inhibition of cell growth and induction of differentiation</td>
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<td>Maj Thomas C. Newton, MD</td>
<td>Cancer Stem Cells in Neuroblastoma- A Comparison of Pre-Treatment and Relapsed Models</td>
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<td>2009</td>
<td>Capt Matthew Eberly, USAF, MC</td>
<td>Massive infection of memory CD4 T cells is associated with significant increase in IL-15 production during acute Simian Immunodeficiency Virus infection</td>
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<td>2010</td>
<td>MAJ Justin DeVito, DO</td>
<td>Is IL-13 Important in a Murine Model of Ulcerative Colitis?</td>
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<td>2011</td>
<td>MAJ Thornton S. Mu, MD</td>
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<td>MAJ Nicole R. Dobson, MD, FAAP</td>
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<td>2013</td>
<td>Susan Whiteway, MD, FAAP</td>
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Ogden Bruton Award

2014 Top 6 Abstract

(1st Place) Bone Marrow Stromal Cells from Acute Myeloid Leukemia Patients Release Exosomes that Rescue Leukemia Cells from Kinase COX4 Overexpression in Metastatic Medullary Thyroid Cancers

Fetal brain damage resulting from minimal maternal alcohol exposure and antioxidant modulation in vivo

Recurrent mutations in TWIST2 alter epithelial-mesenchymal transition and cause ablepharon macrostomia syndrome

The Role of HIV-1 V2-specific Antibodies in Mother to Child Transmission

Use of a novel neuroimaging technique in the diagnosis of a rare pediatric disorder

All Abstracts for 2014

Hypoxia, Hydrocortisone and Indomethacin alter prostaglandin receptor subtypes, intestinal epithelial barrier function, and cell survivability
Abstract: Perinatal HIV transmission accounts for the majority of pediatric HIV infections. Little is known about the HIV-1 immune characteristics governing maternal to child transmission. V2-specific antibodies have been associated with protection against perinatal transmission and recently were identified as a potential correlate of protection in the RV144 vaccine trial. We sought to evaluate the role of these antibodies in perinatal transmission utilizing a bank of stored maternal and infant samples from a previous perinatal HIV study. Methodology: 181 HIV-infected pregnant women from Thailand were enrolled between 1996 and 1998. 102 did not receive antiretroviral drugs and their samples were included in our study. 18 transmitting mothers (TM) were paired with 18 non-transmitting mothers (NTM) based on viral load and CD4 percentage at time of delivery. Infants of these mothers had samples collected at 6 months of life which were also analyzed. IgG binding antibodies specific to cyclic V2 peptides 92THO23 and MN, and gp70V1V2 Case A2 and A/E protein, were measured in the serum samples by ELISA. Endpoint titers of TM were compared with those of NTM using the Wilcoxon signed-rank test. Results: There were no significant differences in the maternal binding titers of V2-specific IgG to both cyclic V2 peptide (92THO23, MN) and gp70V1V2 protein (Case A2 and A/E) between TM and NTM. Compared to HIV uninfected infants, HIV positive infants of TM were found to have significantly higher levels of V2-specific IgG antibodies to the cyclic V2 peptides 92THO23 (p<.001) and MN (p<.001), as well as to gp70V1V2 Case A2 protein (p<.001) and Case A/E protein (p=.0015). Conclusions: We found no differences in the IgG antibody binding titers specific to cyclic V2 peptides or to gp70V1V2 proteins between TM and NTM. HIV positive infants of TM did have significantly higher IgG binding titers to both cyclic V2 peptides, and gp70V1V2 proteins. However, at 6 months of life, this is likely indicative of the child’s developing immune response to HIV-1 infection, and a waning of maternal antibody in uninfected infants. Although we only tested a small number of HIV-1 transmitting pairs, our data suggest that V2-specific IgG antibodies may not play a role in mother to child transmission.
Sponsoring Member Statement:

Abstract Author Statement: During time period Jan 2013 - Oct 2013 while on active duty at WRNMMC - Bethesda

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:

Abstract Author Statement: During time period 2012-2014 while on active duty at San Antonio Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
BACKGROUND: Concomitant use of hydrocortisone and the nonspecific cyclooxygenase (COX)-inhibitor indomethacin increases the risk for spontaneous intestinal perforation (SIP) in extremely low birth weight preterm infants. OBJECTIVE: Test the hypothesis that the dysregulation of the PGE2/EP pathway and alteration of barrier function leads to impaired cell survival and risk of perforation. DESIGN/METHODS: A Caco-2 cell line was utilized in the setting of normoxia (160 torr) and hypoxia (20 torr) under varying conditions of pro-inflammatory agents (TNF-alpha (10ug/mL), IFN-gamma (10ug/mL)) and anti-inflammatory agents of indomethacin (50uM) and hydrocortisone (50ng/mL). PGE2 and EP receptor expression were analyzed with RTPCR and protein expression assays. Barrier function was assessed using transepithelial electrical resistance (TER) measurements and solute flux assays. Cell survivability and morphology was evaluated with direct confocal microscopy as well as indirect LDH quantification, cytotoxicity assays.

RESULTS: Epithelial barrier integrity was impaired under exposure of hypoxia alone; these effects compounded with exposure to pro-inflammatory agents leading to increased cytotoxicity. Addition of anti-inflammatory agents demonstrated improved cell survivability without improvement in barrier function as demonstrated by solute flux, confocal imaging, and cytotoxicity assays. The concomitant exposure of the Caco-2 cell monolayer to hypoxia, pro-inflammatory and anti-inflammatory agents demonstrated abnormalities of barrier integrity, cell morphology, and impairment of tight junction formation on confocal microscopy, not seen in normoxia conditions. Hypoxia, pro-inflammatory and anti-inflammatory agents modulated specific EP receptor subtype expression/quantification. CONCLUSIONS: The data suggests that the concomitant exposure of hypoxia, inflammation and use of hydrocortisone/indomethacin alters localized eicosanoid pathway regulation, impairs epithelial barrier function and negatively affects cell survivability/architecture; possibly by inhibiting cell mediated apoptosis mechanisms potentially leading to increased risk of intestinal perforation.
Abstract Author Statement: During time period 2012-2014 while on active duty at San Antonio Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Juvenile onset Parkinson disease (PD) is an extremely rare condition. Defined as onset <20 years of age, it is characterized by a slowly progressive, yet typically debilitating course. Clinical characteristics include rigidity, bradykinesia, dystonia, resting tremor, postural instability, and hyperreflexia. Lower-limb dystonia is often a presenting sign in juvenile-onset cases. In children, dopa-responsive dystonia (DRD) is a far more common clinical condition with many of the same clinical features. However, the prognosis of the two conditions differs vastly, with DRD generally following a more benign clinical course. The two entities may be clinically indistinguishable, and advanced neuroimaging may be useful. Dopamine transporter (DAT) imaging with 123I-ioflupane is a neuroimaging technique that can reliably differentiate parkinsonian syndromes from other disorders that mimic PD. It is indicated for detecting loss of functional nigrostriatal dopaminergic neurons by single photon emission computed tomography (SPECT) imaging in patients presenting with symptoms or signs suggestive of dopaminergic neurodegeneration. By binding to presynaptic striatal dopaminergic neurons, it enables visualization of dopamine distribution in the striata and is a sensitive marker for neuronal loss in the basal ganglia. Visual loss of radiotracer within the putamen is indicative of dopaminergic neurodegeneration associated with PD, and aids in distinguishing between disorders associated with parkinsonism such as DRD and PD. This imaging modality is not widely used in pediatrics, however, its utility has been well established in the adult literature. We recently employed DAT scanning to differentiate between DRD and juvenile onset PD in a pediatric patient with unclear clinical diagnosis. DAT scan results were consistent with juvenile onset PD, leading to confirmatory genetic testing. A thirteen year old boy was referred for evaluation of gait disturbance, right leg spasms, and frequent falls. He reported worsening and progressive symptoms over the course of one year and stated that he often felt slow and off balance. No diurnal predilection for these symptoms was noted. His past medical history was notable for mild anxiety. There was no history of trauma. Family neurological history was negative. Review of systems to include changes in other aspects of neurologic functioning such as bowel and bladder control, sleep, and cognitive function was negative. Initial neurologic exam was notable for diffuse hyperreflexia, asymmetric increase in tone in the lower extremities, and postural instability. Preliminary investigations included extensive screening for inflammatory and metabolic diseases, as well as neuroimaging of the brain and spinal cord via magnetic resonance imaging (MRI). Brain MRI was initially viewed as normal, and laboratory investigations were notable only for elevated TSH and TPO antibodies, later felt to be unrelated to his clinical course. He was placed on dopamine for suspected dopa-responsive dystonia, and his symptoms and physical exam improved dramatically within a few weeks. However, genetic testing for variations in the GTP cyclohydrolase 1 (GTPCH1) and tyrosine hydroxylase (TH) genes most commonly implicated in DRD was negative. Thus, a DAT scan was performed which noted asymmetric radioisotope tracer uptake in the region of the right basal ganglia, a finding indicative of dopaminergic neurodegeneration associated with PD rather than DRD. Retrospective review of the brain MRI confirmed mild atrophy of the pars compacta region of the right substantia nigra, also consistent with a neurodegenerative process such as PD. Subsequent genetic testing yielded two disease-associated mutations on the PARK2 gene, providing genetic confirmation of a diagnosis of autosomal recessive juvenile onset PD. Early use of DAT scanning in pediatric patients presenting with symptoms suggestive of DRD should be considered as it may provide a means of early and appropriate diagnosis, and thus guide genetic testing, therapy, and prognosis.
Sponsoring Section Member Name:

Abstract Sponsor: Dalila Lewis, MD Major/USAF

Sponsoring Member Statement: Made by Dalila Lewis, MD on 2/14/2014

Abstract Author Statement: During time period 2012-2013 while on active duty at Naval Medical Center Portsmouth

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract Title: Recurrent mutations in TWIST2 alter epithelial-mesenchymal transition and cause ablepharon macrostomia syndrome.

Abstract:

Ablepharon macrostomia syndrome (AMS) is a rare autosomal dominant disease characterized by absent eyelids, dysmorphic facies, and lax redundant skin. TWIST2 is a key regulator of mesenchymal cell fate during embryonic development and is expressed in craniofacial mesenchyme, chondrogenic cell precursors and the dermis of the skin. Established functions of TWIST2 in early development include the induction of cell migration in epithelial-mesenchymal transition (EMT) and maintenance of mesenchymal stem cell pluripotency. We identify a novel and recurrent mutation by exome sequencing (ES) in the highly conserved basic Helix-Loop-Helix (bHLH) domain of TWIST2 on Chromosome 2 as the cause of ablepharon macrostomia in two unrelated pedigrees. We demonstrate mosaicism of the TWIST2 missense mutation c.223G>A (p.E75K) in the father of the first pedigree, with complete germline transmission to his affected daughter, and recurrence of the identical mutation in an unrelated proband by Sanger sequencing. We expand the clinical phenotype of AMS to include disrupted arrangement of collagen, microfibrillar proliferation and abnormal elastic fibers by transmission electron microscopy ultrastructural exam. We perform RNA transcriptome sequencing on cultured patient and control dermal fibroblast lines and complete differential expression analysis of these data, as well as pathway enrichment analysis, to reveal significant enrichment of several pathways known to be involved in epithelial-mesenchymal transition. Additionally, we demonstrate stable overexpression of wild type TWIST2 in HeLa cells causes cells to adopt a mesenchymal-like phenotype consistent with epithelial-mesenchymal transition, while cells with stable overexpression of mutant E75K TWIST2 fail to adopt this phenotype. The recurrent TWIST2 c.223G>A (p.E75K) mutation is the first identified genetic cause of ablepharon macrostomia syndrome and we further propose that altered epithelial-mesenchymal transition is integral to the pathogenesis of this disease.
Abstract Author Statement: During time period October 2010-February 2014 while on active duty at Walter Reed National Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Introduction Medullary thyroid carcinoma (MTC) arises from parafollicular C cells and presents in both hereditary and sporadic forms. Hereditary MTC is an aggressive cancer for which there is no standard effective systemic therapy. In pediatric cases, the hereditary form is the most common presentation, and is associated with multiple endocrine neoplasia type 2 (MEN2A or MEN2B) and familial MTC. Germ line activating mutations in RET are the cause of inherited forms of MTC, and somatic mutations in RET can be found in 30-50% of sporadic cases. MTCs harboring mutant RET are characterized by early metastatic spread. However, the molecular mechanisms underlying metastatic progression of MTCs are not well understood. Recent studies have highlighted how reprogramming of tumor cell metabolism contributes to disease progression. Aberrant expression of mitochondrial genes was also demonstrated in metastatic cancers. Objective The objective of this study was to examine expression of mitochondrial respiratory chain molecules in MTC-derived cell lines and in human MTC tissue. Material and Methods Two human MTC cell lines, TT and MZ-CRC-1, which harbor endogenous C634W or M918T RET mutations respectively, were examined in this study. The mRNA level of 86 genes coding for the mitochondrial electron transport chain was evaluated using “mitochondrial energy” PCR arrays. RNA from normal thyroid was used as a control. Western blot analysis was performed to determine the protein expression of mitochondrial molecules in MTC cell lines. MTC samples from 62 patients were used for immunostaining. Statistical analysis was carried out to correlate results of staining with clinicopathological characteristics. Results Both MTC-derived cell lines demonstrated increased expression of genes coding for mitochondrial complex I (NADH dehydrogenases: NDUFA5, NDUFA10, NDUFB2 and NDUFA8), complex II (Succinate dehydrogenase: SDHB), and complex V (ATP synthase: ATP5C1 and ATP5I) when compared to the normal thyroid. Increased expression of mitochondrial carrier (SLC25A25) was specific for the RET634 positive TT cells. RET918 positive MZ-CRC-1 cells were characterized by overexpression of genes coding for complex IV (COX4, COX6 and COX7) when compared to the normal thyroid and to TT cells. Western blot with anti-NDUFA5, anti-SDHB, anti-COX4 and anti-ATP5B showed expression of mitochondrial proteins in MTC-derived cells. In human MTC samples, staining with anti-NDUFA5, anti-COX4 and anti-ATP5B was detected in 8/62 (12.9%), 36/62 (58%) and 56/62 (90%) examined tumors respectively. Normal C cells were negative with anti-NDUFA5 and anti-COX4, but demonstrated cytoplasmic staining with anti-ATP5B. There were no associations between the level of expression of mitochondrial molecules and patient age or gender or tumor size. The level of NDUFA5 and ATP5B was not significantly different between MTCs presenting with and without metastases. In contrast, expression of COX4 was significantly associated with the presence of metastases at the time of surgery. Positive immunostaining with anti-COX4 was detected in 22/28 (78.5%) MTCs presenting with lymph node metastases, versus 14/34 (41.1%) tumors without metastases (p=0.004). Conclusion Increased expression of mitochondrial molecules in MTC-derived cell lines and human MTC suggests a role of enhanced mitochondrial respiration in development of MTC. Over-expression of COX4 may be involved in the metastatic progression of MTCs, perhaps representing a biomarker for tumor aggressiveness.
BACKGROUND: Fetal alcohol syndrome comprises a pattern of anatomic and developmental abnormalities of the fetus and newborn associated with maternal alcohol intake. One proposed mechanism for this injury is enhanced neuroapoptosis in the fetal brain caused by oxidative stress. Previous in vitro studies using fetal rat cortical neurons demonstrate that vulnerability to oxidative stress damage is affected by intracellular glutathione levels. For example, cells with high glutathione content are spared cell death when exposed to EtOH. Intracellular glutathione concentration can be modulated by administering N-acetylcysteine (NAC), which increases intracellular glutathione levels, or buthionine sulfoximide (BSO), which decreases glutathione levels. While this has been shown in vitro and in some adult rodent models, this is the first study demonstrating glutathione content, modulated by NAC and BSO, as a mediator of apoptosis in a live animal dam/fetus model. Of particular interest, this study also reveals evidence of fetal brain damage from a minimal amount of maternal alcohol exposure (equivalent to a one-time dose of approximately three drinks in an average human female). HYPOTHESIS/OBJECTIVE: A decrease in intracellular glutathione increases fetal brain damage when premature fetal mice are exposed to maternal alcohol intake in vivo. DESIGN/METHODS: EtOH (2.5 g/kg) was administered to pregnant mice at day 16-17 gestational age. The mice dams were divided into 6 groups: control, EtOH, NAC, NAC+EtOH, BSO, and BSO+EtOH. One hour prior to EtOH administration, BSO and NAC were administered to the respective dam groups. Twenty-four hours after EtOH administration, the fetal mice were harvested. Fetal brain tissues were analyzed by western blotting for procaspase 3 (a marker of apoptosis), cytochrome c (a marker of the mitochondrial pathway of apoptosis), GP91 and GP47 (components of the NADPH oxidase system-a source of Reactive Oxygen Species (ROS) formation), MnSOD and CuZnSOD (mitochondrial antioxidants), and doublecortin (a marker of neuronal migration). RESULTS: Two hundred and seventy-one mice brains from forty-six pregnant mice were harvested. The mean blood alcohol concentration of the mice dams one hour after EtOH exposure was 101 mg/dL (equivalent to three drinks for an average human female). Procaspase 3 was decreased by 16% in the EtOH group (p=0.001) and by 19% in the BSO+EtOH group (p=0.002). Doublecortin expression was decreased by 9% in the BSO+EtOH group (p=0.02). Cytochrome c was increased by 11% in the BSO group (p=0.02). CuZnSOD was increased by 19% in the NAC+EtOH group (p=0.006) and by 14% in the BSO+EtOH group (p=0.01). MnSOD was increased by 8% in the EtOH group (p=0.048), by 14% in the NAC+EtOH group (p=0.02), and by 12% in the BSO+EtOH group (p=0.026). CONCLUSIONS: A single episode of oxidative stress and antioxidant depletion elicits immune cell modulation, a triggered cascade of oxidant and antioxidant protein expression, and apoptosis in vivo. The repertoire of these events likely causes immature neurons to undergo cell death, thus resulting in fetal brain damage. Of particular interest, a minimal amount of maternal alcohol intake, equivalent to a one time dose of three drinks in an average human female, results in signs of fetal brain damage.
Military Hospital Affiliation (if any): U.S. Naval Hospital Okinawa

Sponsoring Section Member Name:

Abstract Sponsor: Christopher A. Rouse Maj/USAF

Sponsoring Member Statement: Made by Christopher A. Rouse on 30Jan2014

Abstract Author Statement: During time period Jun2009 to Jan2014 while on active duty at Brooke Army Medical Center and U.S. Naval Hospital Okinawa

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Despite dramatic advancements in therapy, relapse in pediatric Acute Myeloid Leukemia (AML) remains unacceptably high. Resistance to chemotherapy plays a large role in relapse, whether it is intrinsic to the leukemia cell or is provided to the leukemia cell by an extrinsic source. The leukemic bone marrow microenvironment has emerged as a setting where altered stromal cell function provides a sanctuary for leukemia cells through extrinsic drug resistance. The mechanism by which altered stromal cell function provides that protection is unclear. The release of cell membrane derived vesicles, including exosomes, is a constitutive cellular function that is involved in cell-cell communication. Exosomes contain micro-RNA, mRNA, and protein, all of which can have specific influences on the behavior of recipient cells. We recently reported that leukemia-derived exosomes transfer protein and RNA between cells in the AML niche (1). Stromal cell-derived exosomes and their trafficking as a mechanism for extrinsic chemo-resistance has not yet been studied. We therefore hypothesized that AML patient bone marrow stromal cell exosomes (AML-BMSC’s) differ from those of healthy individuals (N-BMSC’s), and that the differences constitute a mechanism of extrinsic drug resistance in AML. We obtained bone marrow stromal cells from AML patients and from healthy individuals. Stromal cells were selected by adherence, fibroblastic morphology, stromal transcript expression, CD90 positivity and CD45/CD34 negativity. Exosomes were purified by differential ultra-centrifugation and analyzed for miRNA-155, due to its known relation to onco-genesis, and for mRNA of CXCL-1 and CXCL-12, due to their involvement in immune surveillance and in support of hematopoietic stem cells, respectively. Viability of the AML cell line MOLM-14 AML (Flt3-ITD+), exposed to the selective Flt3 tyrosine kinase inhibitor Quizartinib, +/- exosomes from AML-BMSC’s or N-BMSC’s was measured using MTS assay. Of the AML patient stromal cell exosome preparations assessed thus far (N=9), 88% (8/9) have shown a protective effect on the viability of MOLM-14 cells in the presence of Quizartinib, while normal controls (N=3) showed no protective effect, relative to exosome-free media. In examining the content of patient stromal exosomes (N=5 to date), all samples showed a significant increase in miR-155 content, as well as significant decreases in CXCL-1 and CXCL-12, relative to controls. This is the first report of bone marrow stromal cell exosomes from AML patients and our results show consistent chemo- protection of AML cells by patient, but not control, exosome preparations. Ongoing analysis of exosome content demonstrates differences between patient and control exosomes in factors relevant to maintenance of residual hematopoietic function (CXCL-12, CXCL-1) and onco-genesis (miR-155). We conclude that bone marrow stromal cell exosomes constitute a mechanism for extrinsic drug resistance in AML, and that the stromal component of the leukemic microenvironment is a potential therapeutic target. 1Huan et al; Cancer Research 2013
Sponsoring Section Member Name:

Abstract Sponsor: Christine Johnson CAPT/USN

Sponsoring Member Statement:

Abstract Author Statement: During time period 7/2013-12/2013 while on active duty at Oregon Health And Science University

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
The Howard H. Johnson, Jr. Award

The Howard H. Johnson, Jr. Award, given by the Uniformed Services Section of the American Academy of Pediatrics, is an annual citation and purse for the best research paper on a pediatric topic by a Uniformed Services house officer.

Recognizing that the competitive nature of the other Uniformed Services Section research awards limited participation by house officers, the Executive Committee of the Uniformed Services Section established this award. Originally sponsored by Gerber Products, it was designed to foster house officer research and was first given in San Francisco in March 1983. In 1989, the Uniformed Services Section of the American Academy of Pediatrics provided additional recognition and awards for individuals placing second and third in this competition.

The award is named in honor of Howard H. Johnson, Jr., whose devotion to house officer education as Chairman of Pediatrics at Wilford Hall USAF Medical Center is legendary.
Howard H. Johnson, Jr.
Colonel, USAF (Ret), Medical Corps

Howard H. Johnson, Jr. was born in Richmond, Virginia on 4 October 1925. He graduated from George Washington University with a BA degree in 1948, and from George Washington Medical School with a Doctor of Medicine degree in 1951.

Dr. Johnson completed a rotating internship at Baltimore City Hospital in 1952. Following completion of a pediatric residency at Baltimore City Hospital, he joined the Air Force medical Corps and was assigned as Chief of Pediatrics at Nouasseur Air Force Base, Morocco from 1954 to 1956. After serving as Chief of Pediatrics at FE Warren Air Force Base, Wyoming between 1956 and 1958, he moved to San Antonio, Texas to become Assistant Chairman of the Department of Pediatrics at Wilford Hall USAF Medical Center.

Beginning in 1958, he helped establish the first Air Force Pediatric Residency Program at Wilford Hall USAF Medical Center. After an interruption from 1965 to 1968 to serve as Chief of Pediatric at Wiesbaden Air Force Base, Germany, he returned to Wilford Hall USAF Medical Center as Chairman of Pediatrics.

Dr. Johnson has held many important positions during his 30 years as an Air Force pediatrician. As Consultant to the Surgeon General in Pediatrics and Chairman of the Division of Maternal and Child Health at Wilford USAF Medical Center for many years, Dr. Johnson has been extremely influential in improving quality of child health among Air Force Dependents. He was active in the military section of the AAP in its formative years, serving as a charter member, secretary-treasurer and member of the Executive Committee. He served as the first Air Force host of the Uniformed Services Pediatric Seminar in 1971, and subsequently in 1978 and 1981. A practicing pediatric cardiologist for more than 20 years, he is the Clinical Professor of Pediatrics at the University of Texas Health Science Center, San Antonio, Texas, and at the Uniformed Services University of the Health Sciences.

One of Dr Johnson’s most significant accomplishments was his active participation in the training of pediatric residents in the Air Force since 1958, when the first Air Force Pediatric Residency Program begun at Wilford Hall USAF Medical Center. Many of his former residents currently serve on the teaching faculty of military and civilian training programs or as senior Air Force physician administrators. They remember Dr Johnson as a well-rounded and knowledgeable physician who was always willing and available to discuss distressing and difficult cases. He set an example to follow, much like a father. Indeed, one of the patients he cared for while a Lieutenant in the Air Force Medical Corps returned as one of his fellows when he was a Colonel and Chairman of Pediatrics at Wilford Hall. His quiet leadership and example have
provided stability that has markedly improved the quality of pediatric health care and teaching in the Air Force.

Dr. Johnson retired from the Air Force in 1983 after 30 years of service.

In honor of this very special pediatrician, clinician, and scholar, the Howard J. Johnson Jr. Award is given to the Uniformed Services resident submitting the best house staff presentation on a pediatric topic.

COL Jerry D Reeves, USAF (Ret), MC
(revised November 1992)
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<tr>
<th>Year</th>
<th>Recipient</th>
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<td>1983</td>
<td>CPT Kevin J. Kelly, MC, USA</td>
<td>The Clinical Importance of Serum Aminoglycoside Levels</td>
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<td>1984</td>
<td>CPT Gail Murphy, MC, USA</td>
<td>Application of a Bayesian Drug Dosing Program in Neonates</td>
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<td>1985</td>
<td>LT Joseph Torkildson, MC, USN</td>
<td>Use of Neonatal Mean Corpuscular Volume (MCV) as a Screening Test for Alpha Thalassemia</td>
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<td>CPT Brian Carter, MC, USA</td>
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<td>LCDR Gordon Naylor, MC, USN</td>
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<td>CPT Michael C. Slack, MC, USA</td>
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<td>2LTC Seeburger, USAF, MSC</td>
<td>Ontogeny of the Mononuclear Phagocytic System: A Study of Membrane Characteristics, Chemotaxis and Microbicidal</td>
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<td>LT Jeffrey W. Brifton, MC, USN</td>
<td>Comparison of Mupirocin and Erythromycin in the treatment of the Impetigo</td>
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<td>CPT Jeffrey A. Becker, MC, USA</td>
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<td>CPT David Greenberg, USAF, MC</td>
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<td>CAPT Erica A. Kirsch, USAF, MC</td>
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<td>Are Segmented and Band Neutrophils Reliably Distinguished for Clinical Use in Neonatal Sepsis Evaluations?</td>
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<td>Efficacy of Albuterol Administered by Web Nebulizer Vs. Metered Dose Inhaler in Hospitalized Children with Acute Asthma</td>
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<td>CPT Ann Marie Straight, MC, USA</td>
<td>Thyroid Cancers Which Express Telomerase Have an Increased Recurrence Risk for Children and Adolescents</td>
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<td>Prevalence of <em>Chlamydia trachomatis</em> Infection in Male ROTC Cadets</td>
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<td>CAPT Deena Sutter, USAF, MC</td>
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<td>Capt Matt Eberly, MD, USAF, MC</td>
<td>The Effect of Universal Maternal Screening on the Incidence of Neonatal Group B Streptococcus (GBS) Disease</td>
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<td>CAPT Jennifer Keck-Wherley, MC, USA</td>
<td>Incidence of Intracranial Hemorrhage in Asymptomatic Term Newborns</td>
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<td>CAPT Anjali Kunz, MC, USA</td>
<td>Characteristics of Human Metapneumovirus Infection Compared to Other Common Respiratory Viruses in a Community Cohort of Healthy Infants</td>
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<td>CPT Ashley M. Maranich, MC, USA</td>
<td>The Panton Valentine Leucocidin Virulence Factor in Staphylococcus aureus Disease</td>
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<td>2008</td>
<td>CPT Devon Kuehn, MD</td>
<td>Prevalence of Iron Deficiency among toddlers in a uniformed service population</td>
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<td>2009</td>
<td>LT Melissa A Buryk, MC, USN</td>
<td>Efficacy of Neonatal Release of Ankyloglossia</td>
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Howard H. Johnson Award

2014 Top 6 Abstract

Decreased Prematurity Rates in an Open-Access Universal Health Care System

Do Prenatal Vitamins and Sun Exposure Protect Hawai'i Newborns from Vitamin D Deficiency?

Impact of Cost of Living and Food Costs on Food Insecurity

Impact of Using a Bilirubin Nomogram for Identification of Infants at Risk for Severe Hyperbilirubinemia on Length of Hospital Stay, Hospital Readmission, and Breastfeeding

(1st Place) Late-Preterm Infants Have Higher Risk for Respiratory Syncytial Virus Hospitalization

Parental Intimate Partner Violence Impacts Children's Well-Child Care and Immunizations

All Abstracts for 2014

A Comparison of Child Maltreatment Rates in Military and Civilian Children in Hawaii

Retrospective evaluation of 13-valent pneumococcal conjugate vaccine catch-up administration before and after vaccination advocacy among providers
BACKGROUND: In February 2010, the FDA approved the 13-valent pneumococcal conjugate vaccine (PCV-13) to replace the previous 7-valent pneumococcal conjugate vaccine (PCV-7). Children aged 14-59 months were to receive a single dose of PCV-13. Nationally, compliance with this catch-up dose has been reported at less than 40%. The San Antonio Military Medical Center (SAMMC) and Wilford Hall Ambulatory Surgical Center (WHASC) have similar patient populations and providers, but differ in their Immunization Information Systems (IIS). At WHASC, patients were referred to an Immunization Clinic where a medical technician reviews and administers vaccines based on the electronic Immunization Information System (ASIMS). SAMMC clinic uses the AHLTA immunizations module as an IIS, which was considered to be unreliable, and required provider order prior to vaccination. This study assessed the rates of supplemental PCV-13 vaccination at two military pediatric clinics in San Antonio before and after a vaccination advocacy intervention. We conducted a retrospective review of data derived from well-child encounters at the two clinics. The purpose of the study was to evaluate rates of compliance with recommended PCV-13 catch-up doses longitudinally from the time of ACIP recommendation and to compare compliance rates between the two clinics. Additionally, the study included a quasi-experimental pre-post design to assess the effects of an educational intervention to increase awareness of the recommended catch-up dose of PCV-13. METHODS: Records from children aged 18-59 months at the time of a well-child encounter between 1 June 2010 and 31 December 2012 were included. Compliance was defined as documentation of vaccination in the same month or within one month following the encounter, unless the catch-up dose had already been received at a previous time during the study period. Encounters were excluded if the child was outside of the 18-59 month age range at the time of the study, for any subject with interruption in TRICARE eligibility or change in enrollment during the study period, or in children who received immunizations or healthcare at other non-study facilities during the study period. Statistical analysis was performed using chi-squared, paired t-tests and multivariate logistic regression methods. RESULTS: Over the entire study period supplemental PCV-13 vaccine compliance at WHASC was 18% compared to 10.5% at SAMMC (p<0.01). In the three months following the vaccine advocacy intervention, vaccine rates at WHASC improved to 75% at WHASC and 43% at SAMMC. WHASC compliance was higher than SAMMC when comparing equivalent levels of providers (staff pediatricians, nurse practitioners, interns, and residents). Additionally, residents who saw patients at both locations had a significantly higher compliance rate when seeing patients at WHASC (24 versus 8%, p<0.01). Site of well child visit remained statistically significant on logistic regression analysis. Compliance, initially <5% in the first months of after vaccine recommendation, increased at both sites over time (see Figure 1). CONCLUSIONS: Our results suggest direct education to pediatric providers (verbally, via e-mail, handouts, etc.) is crucially important to improving compliance with vaccine recommendation changes. Additionally, vaccine delivery systems that bypass the primary care provider and deliver vaccines based on accurate and updates Immunization Information Systems result in higher compliance rates than systems where the provider is directly responsible for ordering the vaccine.
Military Hospital Affiliation (if any): San Antonio Uniformed Services Health Education Consortium

Sponsoring Section Member Name: Deena Sutter

Abstract Sponsor: Deena Sutter, LCol?USAF

Sponsoring Member Statement: Made by Deena Sutter, on 15Feb2014

Abstract Author Statement: During time period Feb2012-Feb2014 while on active duty at SAMPC

House Staff Author Statement: Made by Joshua Anchan

Program Director Statement: Made by Faux

Medical Student Statement:
Award applied for: **Howard Johnson Award**

**Abstract Title:** Decreased Prematurity Rates in an Open-Access Universal Health Care System

**Abstract:**

Background: Inadequate prenatal care increases the risk of preterm birth. The US Military Health System (MHS) provides universal access to medical care for all active duty (AD) service members and their dependents. Observational data from individual military medical facilities suggests a lower preterm birth rate in the MHS as compared to national averages. These studies also suggest that demographic factors, such as race and socioeconomic status (SES), may impact prematurity even within a system of universal access to care. Objective: To determine the rate of preterm birth in the MHS as compared to national average and determine the impact of race and SES on preterm birth. Design/Methods: A retrospective cohort was designed with infants born between 2006-2009 enrolled in the MHS. Inpatient records for birth hospitalizations were extracted from the Military Health System database as were family demographic data for children born in 2008-2009. International Classification of Disease Ninth Revision (ICD-9) codes were used to define prematurity. Pearson Chi-Square test and logistic regression analyses were used to determine the impact of demographic factors on prematurity. SES was assessed by AD sponsor rank, with junior enlisted rank considered lower SES. Results: In 2006-2009, 415,882 infants were born in the MHS; of these 33,976 (8.17%) were born preterm. The preterm birth rates by year were 7.9% (2006), 8.29% (2007), 8.34% (2008) and 8.17% (2009). In the 2008-2009 cohort the odds of preterm birth were increased in African-American (AA) families (10.9% compared to 7.9%; OR 1.42; 95% CI 1.36, 1.49) and in families where the mother was not married to the AD sponsor and thus not eligible for care in MHS (OR 1.07; 95% CI 1.02, 1.14). Odds of preterm birth was decreased in families with married parents (OR 0.92; 95% CI 0.88, 0.97). SES did not impact preterm birth rate. Preterm birth was increased in AA families of junior enlisted (OR 1.33, 95% CI 1.24, 1.43) and senior enlisted/officer rank (1.49; 95% CI 1.41, 1.57). Conclusions: The preterm birth rate of 8.17% observed in the MHS from 2006-2009 is lower than the corresponding US preterm birth rate of 12.5%. AA families had higher odds of preterm birth regardless of SES, but the overall rate of 10.9% is lower than the national average of 18% for AA families from 2006-2009. Universal access to medical care may decrease preterm birth rates.

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**Sponsoring Section Member Name:**
Background: Respiratory syncytial virus (RSV) is a leading cause of hospitalization for children <1 year old and is more severe in early preterm infants. Objective: To assess if late preterm (LPT) birth is an independent risk factor for RSV hospitalization in children less than 3 years old, and to assess severity of disease. Methods: We conducted a retrospective cohort study of children enrolled in the military health system database. LPT birth was defined as 33+0 through 36+6 weeks gestation. Patients who received palivizumab or had known risk factors for RSV were excluded. Adjusted hazard ratios (HR) for LPT birth were calculated using a Cox proportional hazard model, while controlling for gender and RSV season. Severity of illness was assessed by comparing the need for respiratory support, length of stay (LOS), and age at the time of RSV hospitalization. Results: A total of 605,615 children and 1,211,940 person-years were studied, of which 8,434 children were admitted for RSV infection. LPT children accounted for 705 (8.4%) of these RSV hospitalizations. The incidence density for RSV hospitalization of LPT children was more than double that of term children (13.6 vs. 6.7 per 1000 person-years). LPT children had an increased adjusted risk for RSV hospitalization; specifically, those born 33+0 through 34+6 weeks (HR, 1.90; 95%CI, 1.64-2.20), and 35+0 through 36+6 weeks (HR, 1.93; 95%CI, 1.68-2.00). [Figure1] Conclusions: LPT birth in an otherwise healthy child is an independent risk factor for RSV hospitalization. LPT children have a more severe RSV hospitalization, requiring longer stays and more respiratory support than term children.

Attached table: J62_Figure_1.gif

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Military Hospital Affiliation (if any): WRNMMC-B

Sponsoring Section Member Name:
Abstract Sponsor: David R. Stagliano, MD MAJ/USA
Sponsoring Member Statement: Made by David R. Stagliano, MD on 28JAN2014
Background: Exposure to parental intimate partner violence (IPV) has been associated with adverse health outcomes in children. Small studies indicate IPV-exposed children are at increased risk for incomplete childhood immunizations and insufficient health maintenance. Objective: To compare the adequacy of immunization and rate of well-child visits of IPV-exposed and IPV-unexposed children in a large open-access health system. Design/Methods: A retrospective cohort study was created from all children born in the Military Health System (MHS) in fiscal year 2006-2007. Children were classified as IPV-exposed based on a confirmed incident of IPV, as determined by a military-wide agency. International Classification of Disease Ninth Edition (ICD-9) data from outpatient visits were used to determine the rate of well-child visits over the first year of life. Current Procedural Terminology (CPT) data were used to determine the proportion of children who met the 2008 Healthcare Effectiveness Data and Information Set (HEDIS) criteria for complete immunization by their 2nd birthday. Results: Of the 204,546 children born in the MHS during FY 2006-2007, 134,902 (66%) received care in the MHS through the first year of life; of these, 6,061 (4.49%) were exposed to parental IPV. Using a Wilcoxon rank-sum test, children exposed to IPV did not differ from unexposed children on total healthcare encounters in the first year of life (p=0.15), however IPV-exposed children had a significantly lower rate of well child-visits per year (p<0.0001), 3.94 (SD±1.87), compared to unexposed children 4.27 (SD±1.85). The 70,214 children who received care through the first two years of life at military facilities where immunization records were available included 1,720 (4.2%) exposed to parental IPV. Odds of IPV-exposed children meeting HEDIS criteria for complete immunizations were 11% lower than that of unexposed children (OR 0.89 [95% CI 0.82-0.95]). This effect remained significant after controlling for demographic variables including parental age, parent rank, child gender, and parental marital status. Conclusions: Even within a universal open-access healthcare system, children exposed to parental IPV are at increased risk for inadequate routine health maintenance, which may impact childhood health beyond the first years of life. Additional research is needed to explore effective screening and intervention methods to increase routine health care use of this at-risk population.

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Military Hospital Affiliation (if any): Walter Reed National Military Medical Center

Sponsoring Section Member Name:

Abstract Sponsor: Sebastian Lara LT, USN
Award applied for: **Howard Johnson Award**

Abstract Code: **J-68**

**Abstract Title:** Impact of Using a Bilirubin Nomogram for Identification of Infants at Risk for Severe Hyperbilirubinemia on Length of Hospital Stay, Hospital Readmission, and Breastfeeding

**Abstract:**

Purpose: Infants with hyperbilirubinemia are treated with phototherapy to prevent bilirubin encephalopathy. In 2004 the American Academy of Pediatrics (AAP) published updated guidelines, including a nomogram, recommending more aggressive management of hyperbilirubinemia to reduce the occurrence of bilirubin encephalopathy. Another aim of this guideline was to prevent unintended harm such as excessive cost and decreased breastfeeding while treating hyperbilirubinemia. The impact of phototherapy on breast feeding has not been studied. The objective was to determine if the percentage of healthy infants > 35 weeks estimated gestational age requiring treatment for neonatal hyperbilirubinemia at Madigan Army Medical Center (MAMC) has increased after publication of the 2004 AAP Management of Hyperbilirubinemia Guideline. Also determine the impact on the diagnosis of kernicterus, peak levels of total serum bilirubin (TSB), timing and duration of phototherapy, and breast feeding. Methods: A retrospective analysis of computerized medical records compared infants diagnosed with hyperbilirubinemia requiring phototherapy born prior to implementation of the 2004 AAP guideline (2000-2003) and afterwards (2006-2009). Breastfeeding impact was determined by comparing feeding method documented at birth and 2-months for treated infants to randomly selected, age matched untreated infants. Results from the two time periods were compared using Chi-square test except for length of stay (simple T test) and incidence of TSB > 25 mg/dL (Fisher exact test). Cost analysis was conducted utilizing Diagnosis Related Groups and Current Procedural Terminology codes associated with neonatal jaundice and phototherapy. Results: Infants born during 2000-2003 and 2006-2009 were 7,214 and 8,818, respectively. No infants were diagnosed with kernicterus during either study period. The diagnosis of severe hyperbilirubinemia was unchanged (4vs1 infants, p=0.181). Phototherapy administration during the birth hospital stay increased (0.8%, p=0.013) as did readmission for phototherapy (1%, p<0.001). Average length of stay was shorter for the birth (3.5vs2.96 days, p=<0.001) and readmission (1.32vs1.15 days, p=0.073) hospital stays among treated infants. The TSB of infants treated with phototherapy during readmission (20.29vs19.59 mg/dL, p=0.033) was lower. The average number of TSB tests obtained per infant born during these two time periods was unchanged (2.1vs2.09) but the number of infants requiring multiple TSB studies decreased (55.2%vs38.5%, p=<0.001). Deliveries increased 22% while total hyperbilirubinemia treatment cost increased 101% ($269,362vs$541,720). Infants who received phototherapy during the birth hospitalization (27.5%vs37.2%, p=0.004) and during readmission (25.0%vs36.6%, p=0.059) were more likely to breastfeed at 2 months. Conclusion: Implementation of the 2004 AAP Management of Hyperbilirubinemia Guideline resulted in more frequent diagnosis of hyperbilirubinemia, lower TSB levels upon treatment, shorter length of stay, but a doubling of cost. No kernicterus cases were diagnosed at MAMC during the periods studied and the incidence of severe hyperbilirubinemia is unchanged. Infants who received hyperbilirubinemia therapy, that included lactation consultation, were more likely to breastfeed at 2 months.

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**Rank/Service**

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Introduction: Recently, there has been increased media attention on rising rates of child maltreatment in military families over the last several years, particularly in comparison to declining child maltreatment reported by state child protective services (CPS) since the late 1990s. These accounts have relied on the comparison between CPS data and data collected by the Department of Defense (DOD) Family Advocacy Programs (FAP). However, there is little information to support the validity of direct comparison of these two social services systems. This study compares the rate of child maltreatment reported to and substantiated by the State of Hawaii, and contrasts those with rates reported by FAP. Methods: Child maltreatment data was obtained from reports published by the State of Hawaii’s Department of Human Services (DHS) from 2000 to 2010. Child maltreatment rates were also obtained from the Defense Manpower Data Center (DMDC) for child maltreatment reports to the Department of Defense (DOD) Family Advocacy Programs (FAP) for the 4 military services in Hawaii. Rates of reported and confirmed child maltreatment were compared for children in military and non-military families evaluated by DHS. These rates were then compared to rates of reported and substantiated maltreatment by FAP. Age and gender of children with substantiated reports were analyzed as well. Results: The rate of child maltreatment confirmed by DHS was 2.5-4.5 times higher for children in non-military families compared with those in military families and rates declined steadily in both groups. In contrast, FAP rates declined through 2007, and then increased significantly after that. The ratio of FAP substantiation to DHS confirmation in military families ranged from a low of 1:1 in 2003 to 4.7:1 in 2010. There were also significant differences between DHS and FAP in the distribution of ages of children with substantiated reports. Discussion: Our results show wide variation between FAP and DHS-reported child maltreatment rates. From 2000 to 2010, the State of Hawaii Department of Human Services substantiated significantly more cases of maltreatment to non-military children. In both populations, the rate of child maltreatment substantiated by DHS shows an overall decline over our study period. This contrasts the upsurge of child maltreatment substantiated by FAP from 2008 to 2010. Based on these findings, future comparisons between FAP and CPS rates of child maltreatment should be made with care as such comparisons may not be valid.
Abstract Sponsor: Sarah M Frioux MAJ/Army

Sponsoring Member Statement: Made by Sarah M Frioux on 13Feb2014

Abstract Author Statement: During time period Nov 2012-Feb 2014 while on active duty at TAMC

House Staff Author Statement: Made by CPT Amisha B Patel

Program Director Statement: Made by COL Richard Kynion

Medical Student Statement: Made by n/a
Background: Food insecurity is associated with negative health outcomes and 14.9% of US Households report food insecurity. This study sought to determine the impact of environmental factors, locational income, cost of living, and food prices on food insecurity rates. Methods: A secondary analysis was completed of household level data from National Health and Nutrition Examination Surveys (NHANES) obtained from 2003-2010 and community level data reflecting the surrounding living environment through the 2010 Map the Meal Gap Study by Feeding America, the Council for the Community and Economic Research ACCRA Cost of Living Index, Annual Average 2010, and the 2009 American Community Survey that was linked together based on 2000 US Census Tracts. This study examined the association of these environmental variables with the household data from 29,413 families. Bivariate analyses were conducted to examine the relationship between food insecurity and these household and community variables. Significant predictor variables were then included in a multivariate logistic regression to determine the independent relationship of each of these variables to household food insecurity. All estimates were weighted to represent the US civilian, non-institutionalized population and to account for oversampling and non-response to the interview.

Results: In the bivariate analysis, food insecurity was associated with the following family demographics: younger heads of household (40.5 years [95%CI 39.7-41.3] vs. 46.9 [46.3-47.6], P<0.0001), female heads of household (17.0% vs. 10.4% male, p<0.0001), renting their home residence (27.6% vs 7.3% own home, p<0.0001), Mexican-American and non-Hispanic Black heads of household (28.3% and 22.6% respectively vs. 13.4% other and 8.5% white, p<0.0001), and lower total family income (133% of Federal Poverty Line [95%CI 123-142] vs. 312% [304-320], p<0.0001). Food insecurity also associated with the following measures of community affluence: living in a census tract with a lower median family income ($42,721 [95%CI 40831-44611] vs. $54,991 [52274-57707], p<0.0001), living in census tract with a median income that is a lower percentage of the median income of the surrounding area (83% [95%CI 80-86] vs 107% [104-111], p<0.0001), and living in a census tract with a higher percentage of families with total family incomes below the federal poverty line (17.1% [95%CI 15.4-18.7] vs. 11.0% [9.9-12.0], p<0.0001). Food insecurity was also associated with lower community costs per meal ($2.51 [95%CI 2.46-2.56] vs. $2.54 [2.49-2.59], p=0.027). In the multivariate logistic regression adjusting for household demographic variables only, food insecurity was shown to be associated with lower total family income relative to Federal Poverty Index (OR:2.18 [95%CI 1.96-2.42]), being female (OR:1.22 [95%CI 1.04-1.42]), renting (OR:1.69 [95%CI 1.36-2.10]), children living in the home (OR:1.34 [95%CI 1.07-1.68]), and having a Mexican-American (OR:1.55 [95%CI 1.28-1.87]) and non-Hispanic Black (OR:1.41 [95%CI 1.16-1.72]) head of household. Controlling for household variables, food insecurity was also independently associated with living in a census tract with a median family income that was a less affluent relative to the surrounding community (OR:1.60 [95%CI 1.10-2.33]). Conclusion: Community food costs and cost of living were not associated with food insecurity. The most important factors determining food insecurity were lack of family income, a lack of affluence compared to surrounding community, and proximity to federal poverty line based on these earnings. Programs in place to support those who suffer from food insecurity need to be focused on family income on a national level.
Military Hospital Affiliation (if any): NMCSD

Sponsoring Section Member Name: Timothy Roberts

Abstract Sponsor: Timothy Roberts CDR/USN

Sponsoring Member Statement: Made by Timothy Roberts on 2/14/14

Abstract Author Statement:

House Staff Author Statement: Made by Amy Sweigart

Program Director Statement: Made by Lynelle Boamah

Medical Student Statement:
The Andrew M. Margileth Award

The Andrew M. Margileth Award, given by the Uniformed Services Section of the American Academy of Pediatrics, is an annual citation and purse for the best paper by a Uniformed Services pediatrician for research in a clinical area.

This award was originally sponsored by Ross Laboratories and was first presented in El Paso, Texas in March 1977. In 1988, the Uniformed Services Section of the American Academy of Pediatrics provided additional recognition and awards for individuals placing second and third place in this competition.

The award is named in honor of Dr. Andrew M. Margileth for his many outstanding contributions to military pediatrics, both during his active military career and as a faculty member of the Uniformed Services University of the Health Sciences School of Medicine.
Andrew M. Margileth  
Captain, Medical Corps, US Navy (Ret)

Andrew Menges Margileth was born on 17 July 1920 in Cincinnati, Ohio. He graduated from Washington and Jefferson College, Washington, Pennsylvania in 1942, and from Massachusetts Institute of Technology in 1944 with a BA in Biophysics. He was awarded his Doctor in Medicine degree from the University of Cincinnati College of Medicine, Cincinnati, Ohio in 1947.

Andrew Margileth was a member of the Navy Medical Corps for 24 years, retiring with the rank of Captain. He began his service in 1947 as an intern at the National Naval Medical Center, Bethesda, Maryland including his first year of pediatric residency training. His second year was completed at the Johns Hopkins Hospital in Baltimore. Dr. Margileth served as Chief of Pediatrics at COMSERVPAC Dispensary, Honolulu, Hawaii, Corona Navy Hospital, California Chelsea Naval Hospital, Massachusetts, and at the National Naval Medical Center, Bethesda from 1963 thru 1967.

Dr. Margileth held positions at many medical schools and hospitals, including Howard University Medical School, and Children’s Hospital National Medical Center. From 1967 to 1980, he was Professor of Pediatrics and Associate Chairman at George Washington University Medical School. Dr. Margileth was a Clinical Professor of Pediatrics at the University of Virginia and was Professor and Vice Chairman of the Pediatric Department of the Uniformed Services University Medical School at Bethesda from 1979 to 1990.

He is a member of the Alpha Omega Alpha Honorary Society; a fellow of the American Academy of Pediatrics, a fellow of the American College of Physicians, a member of the American Pediatric Society, the Society of Pediatric Dermatology and Infectious Diseases, and AMSUS. He has been a member of the Uniformed Services Section of the American Academy of Pediatrics since 1962.

He has participated actively as a consultant and lecturer in pediatrics, both nationally and internationally. He has served on local and national committees on child health, and has held many prestigious committee assignments with the American Academy of Pediatrics. He also served as consultant in pediatrics to the Surgeon General of the US Navy.

He has published extensively with over 160 articles in leading pediatric journals and textbooks. His areas of interest are pediatric infectious disease and pediatric dermatology.

He has received many honors and awards over his long and distinguished career, but perhaps the highlight occurred in 1977, when the “Best Clinical Paper Award,” now presented annually at the Uniformed Services Pediatric Seminar,
was given his name – “The Andrew Margileth Award.” Dr. Margileth was so honored, not only because of his total dedication to the care and well being of children, but because he devoted his early career to military medicine, having taught literally thousands of students and residents the art and sciences of pediatrics.

He served his national and the Navy well. Dr. Margileth currently practices in the Shands Hospital Pediatric Clinic University of Florida in Jacksonville, FL. He directs the Pediatric Dermatology Clinic at the Backus Children’s Hospital, Memorial Medical Center, Savannah, Georgia. Since 1999, he has been a volunteer at Volunteers in Medicine Clinic, Stuart, Florida.

RADM Melvin Museles, MC, USN (Ret)

(revised March 2003)
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<td>MAJ Gerald Fischer, MC, USA</td>
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<td>1978</td>
<td>CPT Alva Atkinson, MC, USA</td>
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<td>1980</td>
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<td>LTC John K Podgore, MC, USA</td>
<td>Effectiveness of Maternal Third Trimester Erythromycin in the prevention of Infant Chlamydia</td>
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<td>1982</td>
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<td>1983</td>
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<td>Pulmonary Function Tests in Neonates with Chronic Lung Disease During Steroid Treatment</td>
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<td>1997</td>
<td>CDR Jack A Yanovski, MC, USPHS</td>
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<td>CPT William Adelman, MC, UNAR</td>
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<td>COL Donald McCurnin, USAF, MC</td>
<td>Effect of Ductal Closure on Cardiac and Pulmonary Function and on the Development of Chronic Lung Disease in Surfactant Treated Premature Baboons</td>
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<td>2011</td>
<td>LtCol Wanda Salzer, USAF, MC</td>
<td>Administration of Erwinia Asparaginase Following Allergy to PEG-Asparaginase in Children and Young Adults with Acute Lymphoblastic Leukemia Achieves Therapeutic Nadir Serum Asparaginase Activity</td>
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<td>2013</td>
<td>David R. Stagliano, MD</td>
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2014 Top 6 Abstract

2-year stability of T and B cell autoimmunity in new-onset Type 1 Diabetes (T1D)

Changes in Near Infrared Spectroscopy During Blood Transfusions in Neonates with Critical Congenital Heart Defects

(1st Place) Comparison of Esophageal Clearance Times of Oral Budesonide Preparations

Influence of Neonatal Surgical Repair of Tetralogy of Fallot on Electrocardiographic changes, Arrhythmias, and Sudden Cardiac Death

Swallowed Glucocorticoid Therapy for Eosinophilic Esophagitis in Children Does Not Suppress Adrenal Function

The Knowledge, Confidence, Competency Method Validating Pediatric Critical Care Training Efficacy

All Abstracts for 2014

A Multicenter Study of Inferior Vena Cava Filters in the Pediatric Population

Association of Food Deserts with Food Insecurity

Chronic Lung Disease In VLBW infants in a Universal Health Care System

Prevalence of Hypertension, Cardiac Complications and Anti-hypertensive Medication Use in Children

Rising Vancomycin-Resistant Enterococcus Infections in Hospitalized Children in the United States

Sleep Disorders in Children with Autism Spectrum Disorder Diagnoses: A Retrospective Cohort Study Using the Military Healthcare Database

Validation of non-invasive measures of body composition in infants born preterm: Waist circumference/length ratio and ponderal index
Objectives: Vancomycin-resistant enterococcus (VRE) is an emerging drug-resistant organism responsible for increasing numbers of nosocomial infections in adults. Few data are available on the epidemiology of VRE infections in children. We sought to evaluate the trend in VRE infections among hospitalized children in the United States as well as the impact of and risk factors associated with these cases. Methods: A retrospective cohort study and trend analysis was performed utilizing data on hospitalizations for VRE infection from the 1997, 2000, 2003, 2006 and 2009 Healthcare Cost and Utilization Project Kids’ Inpatient Database. To establish which associated conditions are risk factors for VRE, the top 456 co-morbid ICD9-CM diagnosis and procedural codes among patients with a diagnosis of VRE were evaluated in a multivariable logistic regression model. A high-dimensional propensity score 1:5 case-control match was used to evaluate severity outcomes associated with VRE infection such as death, sepsis, length of stay, and hospitalization costs and charges. Results: Hospitalizations for VRE infection showed an increasing trend, from 365 hospitalizations in 1997 to 1123 in 2009 (P<0.001), an average annual increase of 17.3%. Comorbid conditions associated with VRE infection included Clostridium difficile infection (CDI) (adjusted odds ratio [AOR], 1.94; 95% confidence interval [CI], 1.35-2.81), as well as other diagnoses associated with immunosuppression and antibiotic exposure. After adjusting for severity, patients with VRE infection had a significantly longer length of hospital stay (Attributable Difference [AD], 2.1 days, P<0.001), higher hospitalization charges (AD, $18,548, P<0.001), higher hospitalization costs (AD, $4,855, P<0.001), and were more likely to have sepsis (Hazard Ratio [HR], 2.05; 95% CI, 1.60-2.63). VRE infection however was not associated with an increased risk of death (HR, 1.00; 95% CI, 0.71-1.43). Conclusions: VRE infections among hospitalized children are increasing at a substantial rate. VRE infection was associated with conditions that cause immunosuppression, and involve invasive procedures and antibiotic administration. This is the first report of an association between VRE and CDI in children. VRE has a significant impact on the health of hospitalized pediatric patients, including a higher risk of sepsis, and longer hospital stays. This study highlights an alarming trend in VRE infections in children, which should prompt an evaluation of existing infection control policies and surveillance in high-risk pediatric populations.
Sponsoring Member Statement:

Abstract Author Statement: During time period July 2012 - Oct 2013 while on active duty at WRNMMC - Bethesda

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Objective: To describe the electrocardiographic characteristics and their relation to clinical arrhythmia and sudden death following neonatal tetralogy of Fallot (TOF) repair. Background: Arrhythmias are widely recognized as a major factor contributing to morbidity and mortality after repair of TOF. QRS duration =180 milliseconds (msec) on the resting ECG has been previously reported to be the most sensitive predictor of life-threatening ventricular arrhythmias after TOF repair. The significance of QRS duration in predicting malignant ventricular arrhythmias and sudden death after early surgical repair is unknown. Methods: A retrospective observational study of neonates undergoing TOF repair in the first 30 days of life at a single pediatric tertiary care hospital between 1991 and 2010 and had at least 12 months of follow-up was undertaken. Results: One hundred and seventy patients with TOF were identified between 1991-2010, of which 111 (65%) met inclusion criteria, accounting for 968 person years of follow-up time. Genetic testing was performed in 60 (54%) patients and 11 subjects had 22Q11 microdeletion. Median QRS duration was 118 msec (IQR: 90-140) at 89 months median follow-up (IQR 43-166). QRS duration in the 43(38%) patients in whom mechanoelectrical interaction was sought ranged between 58 and 182 msec with indexed right ventricular end-diastolic volumes of 117 ± 42 ml/sq. m. on cardiac magnetic resonance imaging. QRS duration increased significantly with follow-up time (p<0.001). Sudden death occurred in 4 subjects (3.6%), and high-risk events occurred in 10 (9%). The QRS duration in subjects who died suddenly (92 ± 39.4 msec 95% CI: 29.3-154.7) was not significantly different from those who did not (116.9+/−29.5 msec 95% CI: 111.2-122.5 p=0.104). Conclusion: Arrhythmia and sudden death are important late sequelae for patients after repair of TOF. Prolonged QRS duration did not predict sudden death or malignant ventricular arrhythmias in subjects who underwent neonatal repair of tetralogy of Fallot. Investigation of other risk factors is warranted in the current era of surgical repair of TOF.
Abstract Author Statement: During time period 2010-2014 while on active duty at NADDS at Children's Hospital of Philadelphia

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract:

Background- Inferior Vena Cava (IVC) filter use in adults has increased dramatically over the past three decades with concerns regarding the indication for placement, timely retrieval, and long-term complications. Contrary to current recommendations, IVC filters are frequently used for primary prophylaxis in adults without DVT. It is unknown if these changes in IVC filter use are similar in the pediatric population due to sparse data that consists of only single center case reports or case series. Objective- To describe IVC filter use in pediatric patients admitted to U.S. children’s hospitals. Design/Methods- This retrospective multicenter cohort study utilized data from the Pediatric Health Information Systems (PHIS) administrative database, with 44 participating children’s hospitals. Subjects were included for analysis if they were less than 21 years of age, admitted to a PHIS hospital between 1-1-2004 to 12-31-2012 and had a procedure code for IVC filter placement. ICD-9-CM discharge codes were used to determine if a deep venous thrombotic (DVT) event occurred during the admission. Results- During the 9 year study period 276 subjects met the inclusion criteria. The median age of subjects was 15 years. 54.7% (151) were male. 74.3% (205) had an ICD-9 code for DVT. 4% (11) had both a PE and DVT. 2.2% (6) had an isolated PE. The mean number of IVC filters placed per year was 6 per 100,000 admissions (min 4.9- max 7.1), which was constant throughout the study period (p-value- 0.17). The median number of filters placed by center was 4.5 (min 0- max 32). 27.3% (12) hospitals did not place filters during the study period. 37.3% (103) of subjects had an admission diagnosis of DVT and 2.2% (6) died during their admission. Conclusions- IVC filter placement in pediatric patients remains a rare event and is most common in adolescents. Unlike in adults, the placement of an IVF filter in pediatric patients does not appear to be increasing over time, although there was a wide variation in IVC filter use by hospital. There appear to be fewer filters placed for primary prophylaxis because the majority of patients had a concurrent diagnosis of DVT during their admission.

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Sponsoring Section Member Name: Erin M Blevins LCDR/USN

Abstract Sponsor: Erin M Blevins LCDR/USN

Sponsoring Member Statement: Made by Erin M Blevins on 02/14/2014
Abstract Author Statement: During time period 07/01/2011 to 06/30/2014 while on active duty at The Children's Hospital of Philadelphia

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
**Abstract:**

**Background:** First-year pediatric residents and those deployed to natural disasters, humanitarian crises, and counter insurgency battlefields must have the training to treat children with critical care needs. Purpose: Validate the two day Society of Critical Care Medicine's (SCCM's) Pediatric Fundamentals of Critical Care Support (PFCCS) course as an effective pediatric critical care training platform using my Knowledge, Confidence, Competency (KCC) education research evaluation methodology. Hypothesis: Teaching the Society of Critical Care Medicine’s Pediatric Fundamentals of Critical Care Support course will improve the fund of knowledge, self-confidence, and pediatric critical care performance capability of first-year residents relative to non-PFCCS trained third year pediatric residents. Methods: A multi-institutional study in which all the pediatric residents at St. Louis University and the University of Missouri were enrolled in my SCCM PFCCS Course. Each student completed an SCCM standardized and validated pre-test and post-test to assess fund of knowledge. A survey of ten five-point Likert scale questions on managing critically ill children was taken before and after the course to assess their confidence in caring for critically ill children. Furthermore, two pediatric critical care high-fidelity simulations of comparable physiology were given the students to assess their clinical competency. These were videotaped, and a pediatric intensivist debriefed them prior to repeating a different but physiologically similar simulation. Time to perform key life saving diagnoses and procedures were recorded. In addition, third year pediatric residents, who had never taken the PFCCS course, were given the same high-fidelity simulations and videotape intensivist-led debriefings. Results: \(N = 42\). Fund of knowledge assessment increased 26%: 1. Pre-test mean 57.9% \( \pm \) 14.2 versus Post-test 83.9 \( \pm \) 12.4. 2. Pediatric Critical Care Self-Confidence improved in: Overall pediatric critical care – \( p < 0.001 \) Choose ventilator modes – \( p < 0.002 \) Rapid Sequence Intubation medication usage – \( p < 0.016 \) Lead a medical code – \( p < 0.017 \) Correct electrolytes – \( p < 0.0001 \) Provide sedation/analgesia – \( p < 0.012 \) Manage pediatric shock – \( p < 0.001 \) 3. Pediatric Critical Care Competency: 1st year Residents Simulation 1 Total time: 10min. 22 seconds 6 min. 59 seconds \( p < 0.001 \) Time to disconnect From ventilator: 70.5 seconds 52.25 seconds \( p < 0.042 \) Time to pull ET tube 3 min. 26 seconds 1 min. 40 seconds \( p < 0.004 \) 3rd year Residents 12 min 27 seconds 9 min 2 seconds \( p < 0.034 \). PFCCS Course Effect: 1st year Residents' 2nd simulation average time: 419 sec. 3rd year residents' best 2nd simulation time: 510 sec. Mann-Whitney non-parametric test \( p = 0.06 \) Discussion: Knowledge improved 26% as measured by pre-test (57.9%) to post test (83.9%) scores. Self-Confidence improved significantly overall and in key pediatric critical care areas. Competency, 33% improvement in 1st year resident overall time to complete their 2nd simulation. Third year residents noted a 26% improvement in time to complete their second simulation. This delineates out the simulation and instructor effect. However, if one compares the best third year pediatric resident time of 510 seconds to the average time of all the 1st year residents of 419 seconds, this 18% difference denotes a PFCCS course effect superior to the customary three months of Pediatric residency ICU experience. In conclusion, the Society of Critical Care Medicine Pediatric Fundamentals of Critical Care Support course does improve the knowledge, confidence, and competency of its students. My KCC methodology is the first to have been applied to a two day certification card granting training course. The KCC methodology is a way of ensuring competent training is being accomplished so that competent care can be delivered anywhere.
Military Hospital Affiliation (if any): Wright-Patterson AFB, Ohio

Sponsoring Section Member Name: Col Michael Stevens

Abstract Sponsor: Michael Stevens M.D. Col/USAF

Sponsoring Member Statement: Made by Daniel B. Bruzzini M.D. on 14 Feb 2014

Abstract Author Statement: During time period 2010-2012 while on active duty at Center for Sustainment of Trauma and Readiness Skills, St. Louis

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
**Award applied for:** Andrew Margileth Award

**Abstract Code:** M-85

**Abstract Title:** 2-year stability of T and B cell autoimmunity in new-onset Type 1 Diabetes (T1D)

**Abstract:**

Introduction: We previously reported that >99% of newly diagnosed children with insulin-dependent T1D were positive for at least one measure of T1D-related autoimmunity: 89% autoantibodies (Ab), 93% T-cell autoreactivities compared to 2% and 11% in asp/asp+ controls. Subjects/Methods: We report the course of autoimmunity in 150 new onset T1D children over 2 yrs, measuring T-cell autoreactivity to 10 T1D related antigens, Ab(GAD, IA-2, IAA, ICA) and c-peptide (CP) at 3,6,12,18 & 24 mo. We hypothesized that the Ab neg, T-cell+ subjects would become Ab+, with stable or declining T-cell autoreactivity. T-cell autoreactivity was grouped as abnormal autoreactivities to >=4 antigens at onset and retained (T+/T+), lost by 2 years (T+/T-) or normal becoming abnormal(T-/T+). Results: While 12% acquired T-cell abnormalities, only 2% developed new Ab of whom 3 patients were initially Ab-/T+. In contrast, 26% lost > 1 Ab 14% GAD, 4% IA2, 10% ICA. T-cell autoreactivity loss / gain was an almost all-or-none phenomenon, with maintained responses to control antigens. The majority of T and B cell autoreactivities were stable. Other than older age in those T-/T+, T-cell changes were unrelated to Ab type, #, BMIz, CP, HbA1c. Contrary to our hypothesis, few initially Ab-/T+ subjects acquired Ab. (Table) Conclusions: These findings confirm that T-cell responses are not a spurious part of the inflammatory milieu, but as we have previously suggested, are a component of continued T1D autoimmunity over time.

Attached table: M85_USPStable.docx

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**Sponsoring Section Member Name:**

**Abstract Sponsor:** Melissa Buryk LCDR/USN

**Sponsoring Member Statement:** Made by Melissa A. Buryk on 13Feb2014

**Abstract Author Statement:** During time period 01Sept13-01Jan14 while on active duty at Children's Hospital of Pittsburgh of UPMC
House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Background: Essential hypertension is reportedly increasing in pediatric practice; however, large population studies are lacking. Major shifts in guidelines have occurred with few assessments of compliance with the recommendations or effects on treatment. Methods and Results: This study determines the prevalence in children of hypertension diagnosis, echocardiography evaluation, cardiac complications, and anti-hypertensive prescriptions in the post-2004 guideline era using billing data from military health insurance (Tricare) enrollees. Hypertension cases were defined as two or more visits with a primary or unspecified hypertension diagnosis during any calendar year or one visit if with a cardiologist or nephrologist. During 2006-2011, the database contained an average 1.3 million subjects/year aged 2-18 years. Overall, 16,322 met the definition of hypertension (2.6/1000). Hypertension increased 17% during 2006 (2.3/1000) to 2011 (2.7/1000, p<0.001). Among hypertension patients, 5,585 (34%) had an echocardiogram. The rate of echocardiograms per year increased from 22.7% to 27.7% (p<0.001). In patients with echocardiography, 8.0% had cardiac complications. Of hypertension patients, 4574 (28.0%) received anti-hypertensive medications. Conclusions: The rate of hypertension in children has increased. Compliance with national guidelines is poor. Of pediatric hypertension patients who receive an echocardiogram, 1 in 12 had identified cardiac complications, supporting the current guidelines recommending echocardiography for hypertensive children. Less than 1/3 of hypertensive children are treated with medication. Long term data to link adult mortality to pediatric hypertension is not easily attainable and likely will not be available for decades; however, the high short-term complication rate in our study justifies hypertension screening and treatment in children.

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Sponsoring Section Member Name: Cade Nylund, MD
Abstract Sponsor: Cade Nylund, MD, MAJ, USAF
Sponsoring Member Statement: Made by Cade Nylund, MD on 13Feb2014
Abstract Author Statement: During time period 2012-2014 while on active duty at Walter Reed Nat Mil Med Center
House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract: Sleep disorders are common and important co-morbidities in children with autism spectrum disorder (ASD). Associations have been shown between sleep problems and intensified symptoms of autism or problems with day-time cognitive and adaptive functioning. Parent-reported sleep problem rates are found to range from 50 to 80% in children with an ASD as compared to 9 to 50% for comparison groups. Researchers have been unable to reproduce these numbers, however, in either the typically developing population or the autistic population using chart review methods. Retrospective studies report rates of sleep disorder diagnoses in 3.7% of children in a primary care setting, and only 1.1% of children with ASD in a large database review. Objective: To determine the prevalence of diagnosed sleep disorders in children with ASD using the Military Health System (MHS) database in relation to those children without an ASD diagnosis, and to determine the relationship between diagnoses of sleep disorders and ASD. Methods: This retrospective cohort study included subjects enrolled in the MHS database, which is comprised of data on outpatient visits, inpatient admissions, and prescriptions of all military members and dependents treated in both military and civilian medical facilities. Subjects were defined as children aged 2 to 18 years given International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes for an ASD diagnosis as recorded in the MHS database from October 1, 2000 to September 30, 2013 at two separate clinical encounters, who were enrolled in the MHS database 6 months prior to receiving the first ASD diagnosis code and 6 months following receipt of the diagnosis. Five controls were matched without replacement to each case by age, gender, and enrollment timeframe. Each control’s enrollment period was then truncated to match the case’s enrollment period. The database was queried for sleep disorder ICD-9-CM codes for each subject and control during the specified period. Conditional logistic regression was performed with odds ratios (OR) with 95% confidence intervals (95% CI) calculated for having received a sleep disorder diagnosis with respect to the presence of an ASD diagnosis. Results: The MHS dataset yielded 48,809 individuals with ASD. The percentage of children receiving any sleep disorder ICD-9-CM code during enrollment within the study timeframe was 30.7% for the ASD group and 11.6% of controls. The odds of receiving any sleep disorder diagnosis were increased in the group of children with autism as compared to controls. The most commonly received sleep disorder diagnosis was Sleep Disorder Not Otherwise Specified (NOS). Among the sleep disorder categories, children with ASD diagnoses had the most elevated odds of a diagnosis of insomnia as compared to controls. Children with ASD were also found to be more likely to have received a diagnosis of the other sleep disorders (Table). Conclusion: Children with diagnoses of ASD are more likely to receive a diagnosis of any sleep disorder. This database review is the first to show diagnosis rates that resemble the epidemiologic estimates of prevalence in both the ASD and control populations.

Attached table: [M92_USPS Table.docx](M92_USPS Table.docx)

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Rank/Service: CDR MC USN

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Maj Cade M. Nylund MC USAF, CDR Gregory H. Gorman MC USN, Elizabeth Hisle-Gorman, Col Christine Erdie-Lalena MC USAF

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Background: Neonates with critical congenital heart disease (CCHD) represent a unique population with variable and changing hemodynamics (1,5,7,10). These alterations in blood flow may lead to continuous or episodic systemic hypoperfusion making this population more prone to regional ischemia and potential sequelae such as ischemic brain injury and necrotizing enterocolitis (NEC). As blood transfusions have been potentially linked to changes in mesenteric perfusion, blood transfusions in babies with CCHD potentially increase the risk of NEC further (3,7,16-18). In recent years near infrared spectroscopy (NIRS) has been used to provide a noninvasive continuous estimate of tissue bed oxygen content as well as detection of changes in organ perfusion. It is utilized in the peri- and postoperative pediatric cardiac patient to aid in the clinical estimation of brain oxygen delivery and consumption and has been well correlated with SV02 (12). There have been no studies to date that have studied NIRS values pre-operatively in infants with CHD during blood transfusions. The aim of this study was to observe NIRS readings for both brain (rS02-C) and splanchnic (rS02-S) flow in term infants with CCHD before, during, and after blood transfusions to look for time specific changes in regional oxygenation and the effects on the cerebrospinalic oxygen ration.

Design/Methods: This prospective observational cohort study included neonates born at >35 weeks with CCHD requiring protogandin infusion and/or early corrective surgery. Infants were placed on NIRS monitoring while awaiting cardiac surgery. Blood transfusions were administered at the discretion of the attending neonatologist and continuous brain and splanchnic NIRS values were recorded. Results: Over a one year period 37 patients were recruited. Three patients were determined to not meet entry criteria and were excluded. Data from a total of 35 patients involving were analyzed. Average gestational age was 38+3/7 and average weight was 3030 g. The most common diagnoses were hypoplastic left heart syndrome (n=9) and transposition of the great arteries (n=6). The average SNAPPE-II score was 15.5. Only six infants were fed enterally feeds during the pre-operative period and all infant were NPO during blood transfusion. The average RS02-C was 60.3 +/-7 and the average RS02-S was 51.9 +/-13. Repeated measures ANOVA showed a difference in NIRS values during the blood transfusion period (p= 0.001) with a difference found between both intestinal and cerebral NIRS values just before and just after transfusions (P=0.001 and p=0.00002 respectively). Discussion: NIRS values for infants with CHD in the pre-operative time period are lower than the reported values for term infants. The apparent increase in intestinal perfusion immediately after blood transfusions may indicate a benefit from keeping hematocrit relatively high in this fragile population. Conclusion: Near infrared spectroscopy is becoming increasingly prevalent and having a clear understanding of the normal values and trends, especially during blood transfusions, may help providers make choices about the care and interventions in this highly critical patient population.

Attached table: M90_graphs.docx

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Abstract Sponsor: Gayle D. Haischer-Rollo, MD, FAAP Capt, USAF

Sponsoring Member Statement: Made by Gayle D. Haischer-Rollo on 2/14/14

Abstract Author Statement: During time period 6/2012-6/2013 while on active duty at San Antonio Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
OBJECTIVE Eosinophilic Esophagitis (EoE) is a chronic allergic inflammatory condition characterized by esophageal mucosal infiltration of eosinophils. The pathogenesis of EoE is not completely understood, but dietary allergens have been strongly implicated. Treatment ranges from dietary modification (elimination of trigger foods, if identified) to topical corticosteroids, namely fluticasone and budesonide. Current medical therapy most commonly attempts to treat this inflammation topically through swallowing fluticasone via metered dose inhaler or by ingesting a budesonide “slurry,” traditionally created by mixing the drug with an artificial sweetener (sucralose) to create a palatable viscous solution. Growing safety concerns over long term use of artificial sweeteners have led patients and providers to seek alternative slurry options. Furthermore, previous studies have demonstrated improved response rates with longer mucosal contact time of budesonide. The purpose of this study was to compare two alternative budesonide slurry preparations (honey based and xanthan gum based) that do not contain artificial sweetener against the current standard slurry in regards to mucosal contact time. This understanding may lend evidence to broaden current clinical treatment options available for EoE. METHODS Twenty-four healthy adult subjects were recruited for the study. Esophageal clearance of 3 separate viscous budesonide slurries was evaluated using nuclear scintography. Subjects were randomized into two treatment groups. One treatment group of 12 subjects ingested the standard sucralose-budesonide slurry and honey-budesonide slurry. This group of 12 was further randomized to which slurry was administered first so 6 subjects ingested sucralose first (honey second) and 6 subjects ingested honey first (sucralose second). The other treatment group of 12 subjects compared the sucralose-based slurry to xanthan gum based slurry. They were similarly randomized with 6 subjects ingesting the sucralose first (xanthan gum second) and 6 subjects ingesting the xanthan gum first (sucralose second). In both groups, after the first slurry was ingested a period of one hour elapsed prior to ingestion of the second slurry. One millicurie of technetium-99 sulfur colloid (Tc-99m) was mixed with each slurry to evaluate esophageal clearance and mucosal contact time. Total esophageal mucosal contact time as an area under the curve (AUC) was calculated for each slurry in each subject. The difference in AUC in each subject was calculated and analyzed using the Wilcoxon signed rank test. RESULTS All 24 subjects completed the study. 11/24 subjects were female, and median age was 35 years (range 21-59). Of the 12 subjects assigned to the honey based slurry versus budesonide based slurry group, honey had an increased AUC compared to sucralose in 7/12 subjects at 1 and 2 minutes, and 8/12 at 3 minutes (P=0.15). Median percent increase in honey AUC over sucralose based slurry AUC at 1, 2 and 3 minutes was 18%, 15% and 13%, respectively. In the xanthan gum based slurry compared to sucralose slurry group, xanthan gum had a higher AUC in 10/12 subjects at 1 and 2 minutes, and 12/12 subjects at 3 minutes (P<0.001). Median percent increase AUC of xanthan gum over sucralose slurry at 1, 2 and 3 minutes was 24%, 39% and 42%, respectively. CONCLUSION Honey based budesonide slurry did not have a statistically significant benefit in AUC over sucralose based slurry, but may still be considered as an alternative for those averse to sucralose. Xanthan gum based slurry had statistically significant increased AUC over sucralose-based slurry, and offers an evidenced-based artificial sweetener free alternative to sucralose. This increase in mucosal contact time, which in previous studies has been shown to correlate with improved eosinophil counts, may also indicate that xanthan gum slurry may lead to improved response to treatment versus sucralose-based slurry.
Sponsoring Section Member Name:

Abstract Sponsor: Matthew Goldman, MD MAJ, USAF

Sponsoring Member Statement: Made by Jody Hefner on 13 FEB 2014

Abstract Author Statement: During time period 01JUL2011 - current while on active duty at Walter Reed National Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract: Height and weight alone are inadequate measures of body composition. Excess visceral adiposity increases risk for later cardiometabolic disorders. Waist circumference (WC) correlates well with magnetic resonance imaging (MRI) measures of visceral fat in children and adults, but there are no data in infants. Preterm infants of lower gestational age at birth have disproportionate increases in WC/length ratio (WLR) and ponderal index at NICU discharge, suggesting that WLR and ponderal index may be useful to monitor postnatal body composition. Objective: To correlate WC, WLR, and ponderal index with MRI measures of total body fat and visceral fat in infants born preterm. Design/Methods: Brain MRIs were performed at NICU discharge in infants born at <32 weeks gestation. Additional sequences were obtained to quantify total body and visceral fat. Infants underwent whole body MRI on a 1.5 Tesla MRI scanner (Signa HDx; GE Healthcare, Milwaukee, WI) with standard gradients (120 mT/m/sec) using a neurovascular array surface coil (MedRad, Warrendale, PA). Fast Recovery Fast Spin Echo, Proton Density IDEAL images with tailored radio frequency were acquired in the axial plane. Fat quantification was performed by a blinded observer using a commercially available segmentation software program (SliceOMatic, Version 5.0, Tomovision, Montreal, Canada). Weight, length, and WC were measured the same day as the MRI. WLR, ponderal index (kg/M3), and body mass index (BMI, kg/M2) were calculated. The Pearson correlation coefficient was used to describe the strength of association among these measures. Results: In 11 infants analyzed, WLR was strongly correlated with body fat volume (cm3) (r=0.834; p=0.001) and total fat mass as % of weight (%body fat; r=0.717; p=0.01). Ponderal index correlated with body fat volume (r=0.870, p<0.001), visceral fat volume (r=0.890, p=0.001) and % visceral fat (r=0.657, p=0.028). Conclusions: WLR and ponderal index correlate with MRI quantification of total body fat and visceral fat. WLR and ponderal index hold promise as inexpensive and noninvasive measures to monitor body composition in infants born preterm and provide readily available and simple indicators that will be useful in future studies seeking to optimize neonatal nutrition and growth.

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Sponsoring Section Member Name: LCDR Theophil Stokes

Abstract Sponsor: LCDR Theophil Stokes LCDR/USN
Sponsoring Member Statement: Made by Ashleigh Pavey on 15Feb2014

Abstract Author Statement: During time period Jan 2012-Jan 2014 while on active duty at Walter Reed National Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Context: Chronic lung disease of prematurity (CLD) is a major morbidity of very low birth weight (VLBW) infants, with lasting impact on the health of infants and disease burden into adulthood. Non-Hispanic white infants have increased rate of CLD, but non-Hispanic black infants and children with CLD have increased systemic steroid and rescue medication use. Disparities in neonatal outcomes may be multifactorial. Access to care issues create complex interactions that make it difficult to identify contributing effects to neonatal outcomes. Objective: Our study sought to evaluate the incidence of CLD among VLBW infants in the Military Health System (MHS) and to determine if demographic factors are associated with differential outcomes in a system of universal care. Methods: A retrospective cohort was designed with infants born in FY 2008 enrolled in the MHS. Inpatient records for birth hospitalizations were extracted from the MHS database (M2). International Classification of Disease Ninth Revision (ICD-9) codes were used to define CLD and birth weight. Pearson Chi-Square test and logistic regression analyses were used to determine the impact of demographic factors on CLD. Demographic factors analyzed were race, active duty and marital status of mother, lack of in-system prenatal care, and SES. SES was assessed by Active Duty sponsor rank with junior enlisted rank considered lower SES. VLBW infants were also stratified as <750g and 750-1500g to evaluate effects in the highest risk group. Results: Within the MHS, 211,164 infants were born in FY 2008. VLBW infants accounted for 2,106 (1%) of the total births, 32.8% (691) had a diagnosis of CLD. Odds of developing CLD were decreased in infants of mothers who had access to in-system prenatal care (OR 0.74 [95% CI 0.56-0.98]). In infants with BW <750g (n=425), odds were decreased for infants of an active duty mother (OR 0.43 [95% CI 0.24-0.77]), and non-White infants (African American: OR 0.50 [95% CI 0.30-0.84], Asian: OR 0.06 [95% CI 0.01-0.44], and Hispanic: OR 0.27 [95% CI 0.09-0.83]). In infants 750-1500g, demographic factors did not impact odds of CLD. Conclusions: Of infants who receive care in the MHS, odds of CLD were decreased if the mother had access to in-system prenatal care. In the smallest of the VLBW, non-White infants had decreased odds of developing CLD at hospital discharge. Further analysis of long term health usage and CLD disease burden among VLBW infants is planned.
Sponsoring Member Statement: Made by Lisa Peterson on 2/2/2014

Abstract Author Statement: During time period September 2013/January 2014 while on active duty at Walter Reed National Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract:

Background: Eosinophilic esophagitis (EoE) is a chronic inflammatory condition characterized by eosinophilia of the esophageal mucosa. Diagnosis requires esophageal biopsy and current treatment regimens often include daily swallowed glucocorticoid therapy. Treatment courses with swallowed glucocorticoid therapy are often prolonged, which may pose a risk to the hypothalamic-adrenal-axis. There is a paucity of studies examining this effect in children specifically and current treatment may pose a potential risk that has yet to be identified. Objective: The purpose of this study was to examine the effect of chronic swallowed glucocorticoids on adrenal function during the treatment of EoE in children. Methods: Serum cortisol levels were obtained in children with EoE pre and post-treatment with swallowed glucocorticoids. Exclusion criteria included those on any additional steroid therapy. Once diagnosed with EoE by esophageal biopsy, subjects were treated based on current standard of care with either swallowed fluticasone or budesonide. At the time of follow up EGD, blood sampling was repeated. Both pre- and post-treatment serum cortisol samples were collected fasting, between 0700-1000 and determined using a competitive binding method assay. The distribution of differences in cortisol levels between the pre- and post-treatment samples satisfied the assumption for normality and were subsequently analyzed using the paired t-test. Results were confirmed with the nonparametric Wilcoxon signed rank test. Results: Pre and post-treatment serum cortisol levels were examined in 14 children who met clinical and histological diagnostic criteria for EoE. Mean age was 10.1 years (range 2 to 17 years) with 71% male and 29% female subjects. Swallowed glucocorticoid treatment included fluticasone in 79% and budesonide in 21% of subjects. Mean dosage of fluticasone was 792mcg daily (range 220mcg-880mcg daily) and budesonide 0.875mg daily (range 0.5mg-1mg daily) along with a mean treatment length of 17 weeks (range 8-43 weeks). No significant difference in serum cortisol was found following treatment with swallowed fluticasone or budesonide (mean change -1.89 mcg/dL, p-value = 0.75, SD of the change = 21.2). Conclusions: Swallowed glucocorticoid therapy does not appear to significantly affect the adrenal axis in children and therefore may represent a safe therapy for EoE.
Abstract Author Statement: During time period Nov 2012 - Jan 2014 while on active duty at Walter Reed National Military Medical Center

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract:

Background: 14.9% of households reported food insecurity, not being able to get enough food to eat. Food insecurity is associated with multiple negative health outcomes. Living in an area without adequate access to food stores, a "food desert", is associated with increased prices and time required to obtain food. Methods: This study examined the association between living in a food desert census tract (>33% of families living >1 mile [urban/suburban] or > 10 miles [rural] from a supermarket/supercenter) and food insecurity, among a nationally representative sample of 11476 families living in impoverished census tracts (poverty rate >20%), controlling for demographic factors, using PROC SURVEYMEANS, PROC SURVEYFREQ, PROC SURVEYREG, and PROC SURVEYLOGISTIC from SAS version 9.2 to account for the complex survey design of the NHANES. Rural and urban/suburban census tracts were analyzed separately because of different food desert definitions. Results: 15.8% of census tracts examined were rural. 5.8% of rural census tracts and 26.4% of urban/suburban qualified as food deserts. The average census tract had a 24.2% poverty rate and a median family income of $33025 which was 64% of the median income of the surrounding communities. For the families living in the poor rural census tracts, food insecurity was associated with having a head of household who was: younger (40.3 years old [95% CI 38.7-41.9] vs. 47.2 [45.9-48.6], p<0.0001), female (23% of households led by a female were food insecure vs. 14% of households led by a male, p<0.0001), single (25% vs. 15%, p<0.0001), Mexican-American (30% vs. 19% non-Hispanic Black vs. 7% other vs. 14% White, p<0.0001), renting (34% vs. 12%, p<0.0001), and living with children (22% vs. 12%, p<0.0001). Food insecurity for families living in poor rural census tracts was also associated with lower total family income (113% of the Federal Poverty Line (FPL) [87-139] vs. 255% [225-284], p<0.0001). For the families living in the poor urban/suburban census tracts, food insecurity was associated with having a head of household who was: younger (40.3 years old [95% CI vs. 43.8 [42.7-44.9], p<0.0001), female (31% of households led by a female were food insecure vs. 24% of households led by a male, p<0.0001), single (30% vs. 26%, p<0.0001), Mexican-American or non-Hispanic Black (37% Mexican-American vs. 28% non-Hispanic Black vs. 21% other vs. 20% White, p<0.0001), renting (34% vs. 19%, p<0.0001), living with children (35% vs. 17%, p<0.0001), and not living in a food desert (23% of families living in a food desert vs. 29% of families not living in a food desert, p<0.0001). Food insecurity for families living in poor urban/suburban census tracts was also associated with lower total family income (112% FPL [103-120] vs. 219% [208-229], p<0.0001), living in a census tract with a lower median total yearly family income ($31910 [30412-33407] vs. $33616 [32146-35086], p<0.005), and living in a census tract median income that was a lower percentage of the median income of the surrounding area (61% [58-64] vs. 63% [61-66], p<0.01) In multivariate logistic regression adjusting for demographic variables, food insecurity among families living in poor rural census tracts was associated with: lower total family income [OR 0.51 (95%CI 0.42-0.61)], and renting [OR 1.91 (95%CI 1.18-3.09)]. In urban/suburban census tracts, food insecurity was associated with: lower total family income [OR 0.51 (95%CI 0.45-0.57)], renting [OR 1.27 (95%CI 1.01-1.16)], living with children [OR 1.76 (95%CI 1.31-2.37)], and not living in a food desert [OR 0.74 (95%CI 0.58-0.93)]. Conclusion: Living in a food desert was not associated with food insecurity. Lack of family income and family assets were the most important factors in determining food insecurity. Programs to address food insecurity need to focus on family income, not community food access.
Military Hospital Affiliation (if any): NMCSD

Sponsoring Section Member Name:

Abstract Sponsor: Timothy Roberts CDR/USN

Sponsoring Member Statement: Made by Timothy Roberts on 2/13/14

Abstract Author Statement: During time period 05/01/13-02/13/14 while on active duty at NMCSD

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
The Leo J. Geppert Award

The Leo J. Geppert Award, given by the Uniformed Services Section of the American Academy of Pediatric, is an annual citation and pursue for the best paper by a Uniformed Services pediatrician for research in primary pediatric care.

This award was first presented in San Antonio, Texas in March 1997.

The award is named in honor of Dr. Leo J. Geppert for his many contributions to military pediatrics, as the first Chief of Pediatrics at Brooke Army Medical Center, and Chief of the first Department of Defense Pediatrics Residency Program.
Leo J. Geppert was born on 26 January 1915 in Vermillion, South Dakota. After completing his BA in chemistry at University of South Dakota Medical School, receiving a Masters Degree in Biochemistry in 1937. In 1939, he completed medical school on a full scholarship at Washington University in St. Louis, Missouri, and entered his pediatric internship at St. Louis Children’s Hospital, St. Louis, Missouri. His residency training, completed in 1941, was at St. Louis Children’s Hospital and Johns Hopkins Children’s Hospital in Baltimore, Maryland.

Dr. Geppert was commissioned as a 2LT in the US Army through the ROTC in 1941. His initial assignment was at the Medical Replacement Center, Barkley, Texas as a training officer. During World War II, he was assigned as the Executive Officer and Commander of the 309th Medical Battalion attached to the 84th Infantry Division. This included service during the infamous “Battle of the Bulge.”

As the first Chief of Pediatrics at Brooke Army Hospital from 1946 to 1952, he established the first pediatric service in an Army hospital. From 1953 to 1955 he was Commander to the Tokyo General Dispensary in Tokyo, Japan, and as Theatre Consultants in Pediatrics, Armed Forces of the Far East. In 1955 to 1958, he served as Chief of Pediatrics at Walter Reed Army Hospital.

While there he was involved in the diagnosis and treatment of such dignitaries as President Eisenhower’s grandchildren, Vice President Nixon’s children and the King of Saudi Arabia’s children. Colonel Geppert returned to Brooke Army Medical Center as Chief of Pediatrics in 1958.

He was an unpaid consultant to Santa Rosa Children’s Hospital for a number of years prior to his leaving the Army. In 1964, he retired from the Army and accepted a position as Medical Director of the Santa Rosa Children’s Hospital. He served as an unpaid consultant to Santa Rosa for a number of years prior to his leaving the Army.

In 1968, he went into private practice for one year. He then became a staff physician for the State of Texas in San Antonio, Texas, continuing in this capacity until he was diagnosed with lung cancer in 1979.

During his military career he received many awards and decorations, such as; Combat Medic Badge, Army A commendation Medical (with clusters), Bronze Star for Valor, Legion of Merit, and a Special Award from the Association of Uniformed Pediatricians in 1978.
After a long illness COL Geppert died in San Antonio, Texas, on 8 November 1980. He is buried at Fort Sam Houston National Cemetery.
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<tr>
<th>Year</th>
<th>Name and Rank</th>
<th>Title</th>
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<td>CPT Delores M Gries, MC, USA</td>
<td>Evaluation of an Early Discharge Program of Mothers and Infants Following Childbirth in a Military Population</td>
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<td>1998</td>
<td>LT COL Kent Hymel, USAF, MC</td>
<td>Missed Abusive Head Trauma</td>
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<td>1999</td>
<td>CPT Bonnie Hartstein, MC, USA</td>
<td>Introduction of a Procedures Laboratory for New Pediatric Interns</td>
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<td>MAJ Woodson Jones, USAF, MC</td>
<td>Pediatric Residents’ Skills in the Evaluation of Middle Ear</td>
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<td>2001</td>
<td>MAJ Woodson Jones, USAF, MC</td>
<td>How Helpful is Pneumatic Otoscopy in Improving Diagnostic Accuracy?</td>
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<td>2002</td>
<td>LTC Mark W Thompson, MC, USA</td>
<td>The Simulated Delivery Room: Teaching Crisis Resource Management Skills to Pediatric Residents</td>
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<td>2003</td>
<td>MAJ William Adelman, MC, USA</td>
<td>Who Sees the Young Women? Providing Comprehensive Teen Women’s Health Through Shared Resources at a Large Military Community Hospital</td>
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<td>2004</td>
<td>CPT Vinaya Garde, MC, USA</td>
<td>Tertiary Vaccinia in a Breastfeeding Infant</td>
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<td>2005</td>
<td>Capt Cassandra Burns, MD, USAF, MC</td>
<td>Phytoestrogens as an Exogenous Etiology of Premature Thelarche</td>
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<td>2006</td>
<td>Case: CAPT Jay Dintaman, MC, USA</td>
<td>Case of Adolescent with Paget-Schroetter Syndrome and Underlying Thrombophilia Due to an Elevated Lipoprotein (A)</td>
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<td>2007</td>
<td>Case: Capt Matthew Eberly, USAF, MC</td>
<td>A Case of Intracardiac Cysticercosis</td>
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<td>2007</td>
<td>Research: MAJ(P) Victoria Cartwright, MC, USA</td>
<td>Infant lumbar puncture simulation is valuable for pediatric resident training</td>
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| 2008 | **Case:** MAJ Taylor Sawyer, MD  
A Unique Case of Pierson syndrome  
**Research:** LT Corrie E Stofcho, MD  
A Partnership with Partnership for Smokefree Families: NMCSD collaborates with the community for successful smoking cessation intervention | 2013 | **Case:** John Nevin, MD  
Haemophilus Influenzae Type B in an Immunocompetent, Fully Vaccinated ALL Survivor  
**Research:** Melissa Buryk, MD  
Use of Preoperative Cytology with Molecular Mutation Analysis to Help Direct Management of Pediatric Thyroid Nodules |
| 2009 | **Case:** LtCol Lee Williams, USAF, MC  
Deletion of one allele of Chromosome 14q13-14q24 associated with a unique presentation of Brain-Thyroid-Lung Syndrome  
**Research:** LCDR Timothy Wilks, MC, USN  
Experience with Comparative Genomic Hybridization: Pediatricians Peering into Pandora’s Box | | |
| 2010 | **Case:** CPT Kara-Marie Hack, MC, USA  
Propanolol: Not just for Cardiovascular Disease Anymore  
**Research:** CPT Kellie Haworth, MC, USA  
Incidence and Severity of Postpartum Depression Among Military Beneficiaries: A Performance Improvement Project | 2011 | **Case:** LCDR Lisa Peterson, MC, USN  
Indolent Osteomyelitis Following a Plantar Puncture Wound in a Immunocompetent Host  
**Research:** Capt Jonathan A. Stering, USAF, MC  
Does the Site of the Vaccination Clinic Effect Infant Vaccination Rates? |
| 2012 | **Case:** CPT Jade Garee, MD  
A rare cause of hypoxemia and stridor in a neonate  
**Research:** CPT Milissa Carter, MD  
Lights, Camera, Action: Increasing the Use and Documentation of Asthma Action Plans in a Pediatric Outpatient Setting | | |
Leo J. Geppert Award - Case

2014 Top 7 Abstract

(1st Place) A Case of Guillan-Barre with Improved Strength and Sensation in Response to Cooling Therapy

Diagnostic Dilemma: Dopa Responsive Dystonia vs Juvenile Parkinson Disease

Disseminated T. gondii infection in the setting of distant Hematopoietic Stem Cell Transplant

Eradication of Mycobacterium abscessus pulmonary infection in a child with idiopathic bronchiectasis

Late-onset Hypercalcemia in Williams Syndrome: Importance of Early Screening and Intervention

Pyloric Stenosis in Premature Infants

What's in a PHACE: A unique cardiac anomaly in the context of PHACE syndrome in a neonate

All Abstracts for 2014

A 7 year-old boy with McCune-Albright Syndrome initially presenting with a pathological spiral fracture

A Delayed-Interval Delivery of Extremely Premature Twins with Interval Neonatal Transport in Okinawa, Japan

A NEW CASE AND REVIEW OF ALL REPORTED CASES OF CONGENITAL DYSERYTHROPOEITIC ANEMIA CAUSED BY A MUTATION

A Rare Case of Congenital Diaphragmatic Hernia Presenting in an Outpatient Setting

ACUTE MYELOID LEUKEMIA IN AN ADOLESCENT WITH EMANUEL SYNDROME

Addition of Allopurinol to Leukemia Therapy Avoids Mercaptopurine relate Hepatotoxicity
B-Lymphoid/Myeloid Mixed Phenotype Acute Leukemia with RUNX1 Amplification and Hypereosinophilia

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MORE THAN JUST A HEADACHE: AN UNCOMMON CAUSE FOR A COMMON COMPLAINT

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Oral Noninvasive Positive Pressure Respiratory Support in Neonates: Report of Two Cases

PARENCHYMAL CALCIFICATION SECONDARY TO NEONATAL FULMINANT PERTUSSIS

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Reevaluation of the globally delayed child

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Shellfish Consumption Causing Transient Hypothyroidism in a Child

Streptococcus gallolyticus ssp. pasteurianus as a cause of neonatal bacteremia

Successful Transition from Insulin to Sulfonylurea Therapy in a Patient with Monogenic Neonatal Diabetes due to s KCNJ11F333L Mutation

US Military multi-center care and coordination of devastating abdominal wall defect in a critically ill neonate born in developing country
Whole exome sequencing identifies a novel COL4A1 mutation as a cause of Walker-Warburg Syndrome
Abstract: Once considered an uncommon cause of infection, M. abscessus is now an emerging pathogen in pediatric pulmonary infectious disease. Although commonly seen in patients with cystic fibrosis (CF), M. abscessus infection also causes significant morbidity in children with non-CF bronchiectasis. Current American Thoracic Society (ATS) treatment guidelines require prolonged therapy with multi-drug antibiotic regimens that are poorly tolerated and often fail to eradicate respiratory tract infection. Here we present a patient with idiopathic bronchiectasis and pulmonary M. abscessus infection which was effectively treated in five months. Case: An 8 year old female presents with failure to thrive, idiopathic short stature, allergic rhinitis, and mild persistent asthma. Physical examination revealed a small for age child with coarse inspiratory crackles and wheeze throughout lung fields. Spirometry was normal. Chest radiography and sinus CT were normal, but chest CT demonstrated multifocal tree-in-bud opacities with associated diffuse bronchiectasis and ground glass opacities suggestive of atypical infection. Subsequent work up for cystic fibrosis revealed normal sweat chloride test and normal cystic fibrosis transmembrane regulator gene sequence. Primary ciliary dyskinesia evaluation identified normal ciliary ultrastructure and a normal genetic screen. Immunologic evaluation supported normal immune status. Bronchoalveolar lavage (BAL) cultures grew Streptococcus pneumoniae and M. abscessus. Over several months, symptoms progressed and she acutely developed new daily productive cough and decline in spirometry. She was admitted and completed a 14-day course of intravenous (IV) clindamycin and piperacillin-tazobactam for pneumococcal infection. However, one month later, she was re-admitted for a bronchiectasis exacerbation consisting of fever, emesis, increased cough, new onset sputum production and a forced expiratory volume in 1 second (FEV1) of 65.8% predicted, compared to baseline of 111.6% predicted. At this point, treatment for M. abscessus was initiated with tigecycline 50mg IV daily, azithromycin 250mg orally daily, and tobramycin 300mg inhaled twice daily. At her two month follow up, patient had significant improvement in lung exam with resolution of adventitial breath sounds, decreased sputum production, and improved spirometry with an FEV1 of 125% predicted. Repeat bronchoscopy was preformed and all cultures were negative. After five months of treatment, antibiotics were discontinued and the patient remained asymptomatic. Monthly surveillance spirometry has remained above 100% predicted, and respiratory cultures remained negative for M. abscessus for over six months. Discussion: M. abscessus is a significant cause of non-tuberculous mycobacterium infection in patients with bronchiectasis. Transmission occurs from water or soil in the environment. Most M. abscessus infections are seen in the setting of underlying lung pathology, such as bronchiectasis in this patient. ATS guidelines, based on expert opinion (level of evidence is C – poor), recommend treatment with a macrolide plus and additional parenteral agent (amikacin, cefoxitin, or imipenem). The treatment regimen for this patient included the ATS-recommended macrolide, but deviated from the recommended parenteral agents, and included an additional inhaled antibiotic. Our patient exhibited rapid improvement after only two months of treatment and tolerated treatment without complaints of medication side effects. In addition, she had normal BAL after only two months of antibiotics with no recurrence of symptoms after completion of treatment. Conclusion: This case highlights successful treatment of M. abscessus infection in a pediatric patient with non-CF bronchiectasis using a five month course of IV tigecycline, PO azithromycin, and inhaled tobramycin. In children with underlying lung pathology presenting with pulmonary exacerbations, a high index of suspicion should be maintained for atypical infections, including M. abscessus. Early identification of this pathogen allows for expeditious treatment and improved outcomes for the patient.
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Angelman syndrome (AS) is a neurogenetic imprinting disorder with an incidence of approximately 1 in 15,000. The core clinical features include severe cognitive impairments, movement, behavioral uniqueness, and frequently early-onset epilepsy in the first few years of life. These patients have a characteristic physical examination to include microcephaly, widely spaced teeth, and prognathism among other more subtle abnormalities. Here we present the case of a child from Saudi Arabia previously diagnosed with severe global developmental delay presenting with a first-time afebrile seizure and characteristic features of Angelman syndrome. Our patient is a 34-month-old boy with known global developmental delay who is visiting with family from Saudi Arabia and is evaluated after a first afebrile seizure. The seizure was described as a generalized tonic-clonic type lasting 30 seconds with full recovery following a brief post-ictal period. The patient’s medical history is significant for onset of global developmental delay at 6 months of life with hypotonia and delayed milestones. Following an overseas work-up, the patient was diagnosed with presumed perinatal hypoxic-ischemic injury as the likely etiology for his neonatal encephalopathy and developmental delays. His family is especially distressed by the fact that he sleeps very little and awakens several times a night. His physical examination is pertinent for mild prognathism, head circumference in the 10th percentile, axial hypotonia, a wide-based gait, and the patient responsively smiles and laughs frequently throughout the exam. The work-up for his first afebrile seizure included an MRI of the brain that was normal as well as EEG that recorded runs of posterior high voltage slowing with admixed sharp waves. With the clinical suspicion and EEG findings, additional genetic testing was completed and confirmed the diagnosis. The reevaluation of a patient’s underlying diagnosis is a continuous process, and as symptoms evolve, the clinician should consider whether there are alternative or additional diagnostic possibilities. Angelman syndrome is a neurogenetic syndrome that should be considered in children with a new onset of epilepsy at a young age, especially in the setting of additional symptoms such as cognitive and speech delays, movement disorders, sleep abnormalities, microcephaly, a happy disposition, or characteristic electroencephalographic abnormalities.

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INTRODUCTION: Hyperbilirubinemia in infants ≥35 weeks gestation is defined as a total bilirubin level >95th percentile on the hour-specific Bhutani nomogram. The differential for hyperbilirubinemia within the first 24 hours of life includes hemolytic disease, such as ABO incompatibility or Rh isoimmunization, G6PD deficiency, congenital infections, sepsis, occult hemorrhage and polycythemia. Of note, approximately 80% of bilirubin is produced during the breakdown of hemoglobin from red blood cells. We describe a case of neonatal hyperbilirubinemia within the first 24 hours of life as a result of an acute hemolytic process thought to be triggered by maternal cautopyreiophagia, the ingestion of burnt matchstick heads. CASE PRESENTATION: A full term African American infant female was born at 39+3 weeks to a 29 year old G6P2032 mother. Maternal history was significant for pica, which manifested as cautopyreiophagia. Labor was induced due to concern for toxicity resulting from cautopyreiophagia, as the mother was consuming greater than 300 burnt match stick heads per week. Maternal gestational labs were all negative except she was GBS positive, for which she received adequate antibiotic coverage with penicillin. She was A+, antibody negative. Ultimately, the infant was born via caesarian section for non-reassuring fetal heart tones and failure to progress. Meconium was noted in the amniotic fluid. Routine resuscitation was performed and APGARs were 8 and 9. The infant was well appearing, appropriate for gestational age and with a normal physical exam upon delivery. Her birth weight was 3060g. At 22 hours of life, upon a routine nightly examination, the infant’s transcutaneous bilirubin level was found to be 17. Serum bilirubin at 23HOL was 16.7mg/dl, well above the 11.4 level to start phototherapy and close to the 20mg/dl level for an exchange transfusion. Other labs of significance included an elevated reticulocyte count, 19% and LDH1381, which indicated a hemolytic process. The infant received triple phototherapy for 3 days with down trending bilirubin levels. The Texas Teratogen Information Services was contacted in regards to the in-utero exposure of burnt matchstick heads and although no cases were reported, observation for methemoglobinemia and acute kidney injury was recommended, neither of which the infant developed. Given that matches contain sulfur and the infant experienced hyperbilirubinemia most likely secondary to a hemolytic process, initially it was thought the infant had G6PD deficiency that was exacerbated by sulfur exposure. Hematology/Oncology was consulted and G6PD testing was sent on her first newborn screen, which was negative. Ultimately, the infant had normal levels of the G6PD enzyme 2 months after her hemolytic event, when the reticulocytosis following an acute hemolysis should resolve. In addition to sulfur, matches are also composed of potassium chlorate (KClO3), diatomite Ca(OH)2, silica (SiO2.nH2O), glue, starch, and either of these: zinc oxide (ZnO) or calcium carbonate (CaCO3). These chemicals within the matches could have caused oxidative stress triggering a hemolytic reaction in the infant. DISCUSSION: Upon review of the literature, cautopyreiophagia is extremely rare with only two cases reported, one in a dialysis patient with life-threatening hyperkalemia and another in a housewife with pica after whom the term cautopyreiophagia (Greek cauto = combining form of kaiein, to burn, neo-Greek pyreia, matches, Greek phagein, to eat) was created. This is the first reported case of hemolytic disease and subsequent hyperbilirubinemia within the first 24HOL resulting from maternal cautopyreiophagia. Given the amount of matchsticks the mother consumed, this infant was likely exposed to the toxins in the matchstick heads in utero. In addition, the mother consumed burnt matchsticks heads during her previous pregnancy and that older sibling suffered from hyperbilirubinemia within the first 24 hours of life as well.
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A 15 years-old male with a history of intractable epilepsy managed with lacosamide presented to the emergency department following two episodes of syncope, atypical of his usual seizure activity. His parents report that he had been in his normal state of health until one week prior to admission when he began to develop pallor and malaise. Two days prior to admission he developed nausea and abdominal pain. In the emergency department physical examination revealed a pallid, responsive, slightly distressed 15 years-old male. His heart rate was noted to be irregular at 25 beats per minute, with a blood pressure of 90/50 mmHg, respirations of 20, and normal oxygen saturation. He felt reasonable when supine, but presyncopal with sitting upright. The remainder of his physical examination was not suggestive of congestive heart failure. An electrocardiogram was obtained demonstrating complete heart block with a wide complex ventricular escape rhythm. A limited echocardiogram demonstrated qualitatively normal biventricular function, no wall motion abnormalities, and no evidence of effusion. Preparation for temporary transvenous pacing was begun concomitant with starting an infusion of isoproterenol. With initiation of the isoproterenol the heart rate increased to 40 beats per minute and the escape rhythm became narrow complex. Further history revealed that three weeks prior he had attended camp in Maryland, and while he does not recall any insect bites had a few days of “flu-like” illness, mainly manifesting as arthralgia. The family could not recall a recent rash, but reported a peculiar bruise on his leg about one week after returning from camp that they attributed to falling out of his bunk during a seizure. Two-tier testing with ELISA and Western blot subsequently supported the clinical diagnosis of Lyme carditis. Lyme carditis, is uncommon as the initial presentation of Lyme disease in children, occurring as only about 0.5% of initial presentations. The most common manifestation of Lyme carditis is atrioventricular conduction block, but myopericarditis may also occur. Overall, cardiac manifestations occur in about 3% of patients with Lyme disease, depending on the strictness of the definition, and cardiitis occurs more commonly in males. The atrioventricular block of Lyme carditis can be of variable severity, and may rapidly progress from first degree to complete atrioventricular block. Electrophysiology studies in patients with Lyme cardiitis have shown that the conduction abnormality usually occurs at the level of the atrioventricular node, though reports suggesting lower levels of conduction abnormality exist. This patient had profound impairment of his cardiac output. Abdominal complaints are common in children with low cardiac output syndromes, and his episodes of syncope were almost certainly due to impaired cerebral blood flow. This patient had no additional evidence for a diagnosis of myopericarditis. His degree of bradycardia and the wide complex ventricular escape rhythm are atypical of Lyme carditis. His escape rhythm did not have typical bundle branch block morphology, suggesting it was arising from the ventricular myocardium, and therefore unreliable. He was being treated with lacosamide for intractable epilepsy, with mitigation, but not elimination of his symptoms. Lacosamide has been reported to cause PR prolongation, and second-degree atrioventricular block as an uncommon side effect. The mechanism of action of lacosamide is incompletely understood, but in vitro studies show inactivation of voltage-gated sodium channels. The dose dependent cardiac conduction effects may be due to action on cardiac voltage-gated sodium channels. Cardiac toxicity of sodium channel blocking agents is manifested as an increased QRS duration, and when severe, heart block and wide complex bradycardia. We hypothesize that this patient’s exaggerated bradycardia and wide complex rhythm was due to conduction system effects of lacosamide with concurrent Lyme carditis. Antibiotic therapy for Lyme cardiitis was initiated, but he had a protracted return of normal conduction until the lacosamide dose had been weaned.
Background: Toxoplasma gondii infection in the setting of immunosuppression associated with Hematopoietic Stem Cell Transplant (HSCT) is not an unknown complication in the transplant community. There are a number of published reports describing this opportunistic infection in patients who have undergone HSCT, presenting as a reactivation of a previous, asymptomatic infection usually within the first year post-transplant. Objective: To present a case report and discussion of disseminated T. gondii infection in the setting of distant HSCT and repetitive use of monoclonal antibody medication for chronic graft versus host disease. Case Description: Our patient is a 19 year old male with pre-B ALL, with a history of multiple relapses ultimately requiring matched unrelated donor bone marrow transplant. His post transplant course was complicated by acute and then chronic graft versus host disease (GVHD) with multiple colonic flares, which were treated with infliximab, tacrolimus, and sirolimus therapy, and ultimately requiring alternate day prednisone. He subsequently developed Zoster and approximately one month after resolution of lesions he developed severe transfusion refractory thrombocytopenia with radiographic evidence of splenic sequestration. He was admitted to the Pediatric Service with malaise, thrombocytopenia, and fever after receiving the 23-valent pneumococcal polysaccharide and hemophilus influenza type b vaccines in anticipation of a splenectomy. At admission, he was empirically started on ceftriaxone. Initial laboratory evaluation included blood, urine, and viral respiratory cultures. Despite expanded antibiotic coverage our patient remained persistently febrile. During this time, an extensive laboratory investigation failed to reveal an infectious etiology. Therapeutic splenectomy did not improve his thrombocytopenia. Antibiotic coverage was expanded to include vancomycin, meropenem, and caspofungin, without improvement in symptoms. Computed tomography (CT) of his head, chest, abdomen and pelvis demonstrated no clear etiology and biopsies of his stomach and duodenum showed quiescent GVHD. At three weeks, our patient became acutely hypotensive requiring pressor support and transfer to the pediatric intensive care unit. This further progressed to respiratory failure necessitating intubation. At this time doxycycline was added to the antibiotic regimen and fungal coverage was expanded. A bronchoalveolar lavage (BAL) and bone marrow (BM) aspirate were obtained. Universal polymerase chain reaction (PCR) testing for bacteria, fungal, and AFB at the University of Washington on the BAL, BM aspirate, and splenic tissue, revealed the presence of T. gondii, thus, suggesting a diagnosis of disseminated toxoplasmosis. Brain magnetic resonance imaging revealed meningeal enhancement. His cerebral spinal fluid had normal cell counts but was positive for T. gondii by PCR. Subsequently, the patient was started on pyrimethamine, sulfadiazine, clindamycin, and leucovorin. Conclusion: Although infection, and reactivation, with T. gondii is a known complication of HSCT and its associated immunosuppression, there are no reported cases of disseminated T. gondii infection 4-5 years post-transplant. The addition of immunosuppressant therapy in the form of infliximab, tacrolimus, and sirolimus, for chronic graft versus host disease after HSCT may have increased the risk and delayed presentation of this opportunistic infection in our patient. Further research is warranted to determine the infectious risks associated with continued and repetitive use of monoclonal antibody medications in this patient population. The views expressed are those of the author(s) and do not reflect the official policy of the Department of the Army, the Department of Defense or the U.S. Government.

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Abstract: Pulmonary calcification is a rare sequelae of either dysplastic or metastatic tissue injury in infants. This is a case of neonatal fulminant pertussis with severe diffuse pulmonary parenchymal calcification following Bordatella pertussis pneumonia, acute cardiorespiratory failure and diffuse alveolar hemorrhage. Case Description: The patient was a former term infant female with admission at 28 days of life, featuring a 2-day history of coughing episodes and poor feeding, with subsequent respiratory distress, and severe leukocytosis on admission. She rapidly worsened with respiratory failure, severe hypoxemia, pulmonary hypertension, hepatic and renal dysfunction, requiring veno- arterial extracorporeal membrane oxygenation (VA ECMO) support. She failed to improve with high frequency ventilation, aggressive inotropes and numerous anti-pulmonary hypertension therapies. The infant never required chest compressions, her lowest pre-ECMO pH was 6.97 by ABG, and her lowest mean arterial blood pressure was 25mmHg. Pertussis was the suspected etiology secondary to leukocytosis (white blood cell count 95,000/mm3), history of ill contacts, concurrent outbreak of pertussis in the community, and lack of maternal immunization. Along with symptoms on admission, nasopharyngeal sample PCR and culture confirmed pertussis. The infant received a course of azithromycin with clearance of pertussis organisms by post- antibiotic PCR and culture. The infant’s immediate pre-ECMO clinical course featured severe multi-organ failure including respiratory failure, pulmonary hemorrhage, right heart dysfunction, renal insufficiency (required continuous veno-veno hemodialysis briefly the first week of ECMO), focal hepatic infarct, coagulopathy, and massive anasarca including pleural effusions, pericardial effusions and ascites. Renal and hepatic injury resolved during the first week of ECMO. Aggressive diuresis with normalization of total body water was accomplished. The patient remained on VA ECMO for duration of 33 total days (799 hours). She failed to recover any pulmonary function, nor to resolve her pulmonary hypertension during those 33 days on ECMO. Due to evidence of irreversible pulmonary damage, she was withdrawn from ECMO and expired rapidly.

Discussion: We report a case of fatal diffuse parenchymal calcification, not previously reported as a prominent feature of neonatal fulminant pertussis. Dystrophic calcifications occur in a damaged lung following severe inflammatory processes, hemorrhage, or pulmonary infarction. Review of existing literature on pulmonary calcifications also shows association with infections including tuberculosis, histoplasmosis, coccidioidomycosis, or other fungal infections. Infectious calcifications are typically nodular, regional and arise as complications to primary granulomatous lesions. No prior reports suggest an association of pulmonary calcifications as sequelae to B. pertussis pulmonary infection. This case represents a potential rare but fatal sequelae to a disease that remains at the center of pediatric vaccination discussion.

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Abstract Title: **Neonatal sepsis and coagulopathy secondary to congenital transmission of Proteus mirabilis**

Abstract:

1. Introduction/Objective: Proteus mirabilis is a gram-negative bacteria and well-established etiological agent in the transmission of urinary tract infections. This case describes a 27-week infant female delivered for maternal chorioamnionitis with a hospital course notable for disseminated intravascular coagulopathy and sepsis secondary to suspected congenital transmission of Proteus mirabilis based on amniocentesis and placental tissue culture positivity. 2. Case Report: A 25 year-old G2P1 mother presented to labor & delivery with increased pelvic pressure at 27 weeks gestational age. Maternal labs were unremarkable but upon admission, infant was noted to have non-reassuring fetal heart tones and the mother began having increased contractions. Cervical change was present and the mother developed a fever to 100.5° Fahrenheit. Amniocentesis was performed and showed a low glucose (<2 mg/dL) and gram-negative rods on gram stain. The decision was made to proceed to delivery given the diagnosis of chorioamnionitis and preterm labor. At delivery, the infant was noted to have poor color and minimal respiratory effort. Initial heart rate (HR) was between 60-80 beats per minute and failed to improve with positive pressure ventilation (PPV), prompting the team to intubate. Despite intubation and increased PPV, bradycardia and hypoxia persisted. Surfactant was given with subsequent increase in HR to 130s and SpO2 to 100%. The patient’s initial chest radiograph revealed bilateral patchy alveolar opacities with decreased lung volumes. Upon transfer to the Neonatal Intensive Care Unit, the infant received more surfactant, while blood cultures were obtained, umbilical lines placed and empiric antibiotics initiated. Initial labs revealed a white blood cell count of 400/µL, hemoglobin of 9.9 g/dL, hematocrit of 29.9%, and platelets of 81,000/µL in addition to increased prothrombin time and partial thromboplastin time to suggest DIC and pancytopenia secondary to sepsis. The infant received two packed red blood cell transfusions, a platelet transfusion, fresh frozen plasma and a second dose of vitamin K within the first 48 hours of life. Maternal amniotic fluid and placenta were culture positive for gram negative rods identified as Proteus mirabilis with evidence of an abscess on placental pathology. The infant was subsequently placed on Ampicillin monotherapy for 14 days and improved clinically. 3. Discussion: The degree of coagulopathy and pancytopenia secondary to maternal transmission of Proteus mirabilis was striking in this case. Proteus species is well-associated with urinary tract infections, chronic suppurative otitis media and mastoiditis in childhood, in addition to meningitis in infants; however case reports describing congenital transmission of Proteus mirabilis with sepsis, pancytopenia and disseminated intravascular coagulopathy do not exist in the literature.

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Background: Approximately 5-10% of diagnosed diabetes mellitus in the United States is Type 1. As it is typically diagnosed in patients less than 30 years old, this disease affects many American women of childbearing age. Each year, anywhere between 0.2-0.5% of American pregnancies are complicated by Type 1 diabetes. Of all pregnant pre-gestational diabetics, 1-3% will experience diabetic ketoacidosis; an insulin deficient state characterized by a triad of hyperglycemia, ketone body formation, and acidosis. Maternal diabetic ketoacidosis can be devastating for a pregnancy, with fetal demise reported in 35% of cases. This case report will discuss the intracranial pathology found in an infant following a maternal episode of diabetic ketoacidosis at 25 weeks gestation. Clinical Case: This is a male infant born at 37+3 weeks gestational age to a 27 year old G3P1 White Classification type C mother. Prenatal course was complicated by poorly controlled Type 1 diabetes, as evidenced by first trimester A1c 7.3%. Most notability, there was one episode of insulin pump failure at roughly 25 weeks gestation, resulting in maternal diabetic ketoacidosis with a pH of 7.1. Prior to this insult, there had been a generally unremarkable routine 20 week gestation ultrasound, notable only for thickened nuchal fold. Following the episode of diabetic ketoacidosis, a repeat prenatal ultrasound at 28 weeks gestational age revealed bilateral ventriculomegaly. Fetal MRI preformed at 33 weeks gestational age then revealed diffuse white matter atrophy with cystic encephalomalacia. Notably, the mother was rubella non-immune, however TORCH titers were unremarkable and amniocentesis for viral etiology of intracranial pathology was negative. The infant was born at term via scheduled cesarean section and transferred to the Neonatal Intensive Care Unit (NICU) due to known intracranial pathology. Despite extensive cerebral anomalies, he had a relatively uneventful NICU course. He required non-invasive respiratory support for five days, and intubation was not required. The NICU course was also significant for low tone, poor feeding (necessitating G-tube placement), temperature instability, and one episode of seizure-like activity, stopped with Ativan. Brain MRI preformed on day of life five confirmed the extent of cerebral involvement. The MRI was notable for global atrophy to include the basal ganglia, brainstem, pons, and upper cervical spinal cord. There was diffuse white matter loss with periventricular cystic dilation and hydrocephalus ex vacuo. Conclusion: This case report details the history and imaging of a term male infant with severe porencephaly, diffuse white matter loss, and ventriculomegaly due to hydrocephalus ex vacuo. This intracranial pathology is strongly suspected to be a result of severe prenatal cerebral injury sustained during an episode of maternal diabetic ketoacidosis at 25 weeks gestation.

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Introduction: PHACE (Posterior fossa, Hemangioma, Arterial lesions, Cardiac abnormalities/Coarctation, Eye abnormalities) syndrome is the association of segmental infantile hemangiomas of the head and neck with brain, cerebrovascular, cardiac, ocular, and ventral or midline defects. The diagnosis of PHACE syndrome requires the presence of a characteristic segmental hemangioma in association with previously defined major and minor criteria. We report the unique clinical course of a female infant born with segmental facial and limb hemangiomas with a complex anomaly of the aortic arch. Case description: A term infant female was born via SVD to a healthy mother following an uncomplicated prenatal course. Respiratory distress was present shortly after birth and the infant was noted to become hypoxic and cyanotic with poor distal perfusion. Physical exam was significant for left upper sternal border systolic ejection murmur and segmental hemangiomas of the chest, left upper extremity, and face. Initial work-up revealed cardiomegaly on chest x-ray, poor femoral and brachial pulses, but no significant arm to leg BP gradient. Echocardiogram revealed premature closure of the ductus arteriosus with associated severe RVH, PFO with right to left shunting, and severe coarctation of the aorta located in the midtransverse arch. The infant was intubated, started on prostaglandin and transferred to a cardiac surgical center. Subsequent CTA confirmed the complex vascular anomalies described above, left aortic arch crossing midthorax to join a distal right descending aorta, as well as a small left carotid and aberrant right subclavian artery from the descending aorta, and left subclavian artery from the vertebral artery. The infant underwent repair of the coarctation utilizing a pulmonary homograft patch, with an uncomplicated postoperative course. Two weeks postoperatively, she was noted to have a significant echo peak gradient at the repair site of 50-70mmHg. Her ventricular function remained normal and, clinically stable, she was scheduled for catheterization and aortic angioplasty six weeks postoperatively. One week prior to the planned procedure, she presented with worsening biphasic stridor initially thought to be secondary to a respiratory illness. Symptoms improved with racemic epinephrine and steroids but returned shortly after these medications were discontinued. An otolaryngology consult was sought and the presumptive diagnosis of PHACE was made. Subglottic hemangioma was discovered on office flexible laryngoscopy and confirmed on direct laryngoscopy and bronchoscopy. High dose oral steroids were initiated for treatment of the subglottic and ulcerating facial hemangiomas. Subsequent MRI/MRA evaluations revealed an enlarged ascending aorta and right internal carotid and a diminutive left internal carotid artery, and extensive discontiguous hemangioma involving the left cheek, parotid gland, carotid sheath, subglottic trachea and left chest wall. There was no posterior fossa or cerebrovascular involvement. Cardiac catheterization was performed with balloon angioplasty of the transverse arch, decreasing the gradient from 40mmHg to 10mmHg. Cineangiography revealed a corkscrew-like appearance of the descending aorta with areas of narrowing and aneurysmal dilatation, having a 25mmHg gradient along this stretch of aorta that was not amenable to angioplasty. Propranolol therapy for her hemangiomas was initiated and she was weaned off oral steroid therapy. Discussion: This is the first case report of critical coarctation of the aorta, long segment descending aortic narrowing with adjacent segments of aneurysmal dilatation, aberrant subclavian arteries, with in utero closure of the ductus arteriosus, and details the unique clinical course of a female infant with PHACE syndrome and large, segmental hemangiomas and complex congenital heart disease.
BACKGROUND: Pyloric stenosis (PS) usually presents in the first 3-8 weeks of life with feeding intolerance in the form of projectile, non-bilious emesis and weight loss. Pyloric stenosis has not classically been a diagnosis of premature infants. This case series illustrates the variability in the general presentation of PS in the premature infant, and the challenges involved in diagnosis. CASES: Three Caucasian male premature infants cared for at a large tertiary medical center were eventually diagnosed with PS. All infants manifested feeding intolerance, as evidenced by postprandial non-bilious emesis, intermittent abdominal distention, and brown-flecked emesis. None of the infants developed the classic triad of projectile vomiting, a palpable olive-like mass on exam, and visible peristalsis. Two of the infants, born at gestational ages of 333/7 and 293/7 weeks, were diagnosed by ultrasonographic criteria after a few days of feeding intolerance and weight loss at 4 and 7 weeks of life (371/7 and 364/7 weeks' postmenstrual age), respectively. Both infants had a diagnosis of gastroesophageal reflux earlier in their NICU courses. The third infant, born at 294/7 weeks' gestation, presented with feeding intolerance at 4 weeks of life diagnosed as medical necrotizing enterocolitis (NEC). Intermittent coffee-ground emesis and feeding intolerance persisted after treatment for medical NEC. An abdominal ultrasound was normal. An upper GI series with small bowel follow-through revealed normal anatomy and intestinal motility, but gastric emptying was delayed. The infant was started on erythromycin and reglan to facilitate gastric emptying, but feeding intolerance continued. The diagnosis of PS was eventually made at 6-weeks-of-life (361/7 weeks' postmenstrual age) by upper endoscopy. A repeat abdominal ultrasound after endoscopy confirmed the diagnosis of PS. DISCUSSION: These cases illustrate the challenges surrounding the diagnosis of pyloric stenosis in premature infants, especially before term-equivalent age. Feeding intolerance and emesis in premature infants may result from a variety of conditions, including immaturity of the gastrointestinal tract, gastroesophageal reflux, NEC, anatomic lesions, and sepsis. This overlapping symptomatology may contribute to a delayed diagnosis of PS in premature infants. A review of the current literature reveals that 10-20% of all PS cases occur in infants born prematurely, but the constellation of symptoms and timing of presentation have not been well defined. Pyloric stenosis may be more common in the preterm infant than initially appreciated. Providers caring for neonates in the Neonatal Intensive Care Unit need to maintain a high index of suspicion for pyloric stenosis in premature infants with persistent feeding intolerance.
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6-Mercaptopurine (6-MP) is an integral part of treatment for acute lymphoblastic leukemia (ALL) and lymphoblastic lymphoma. 6-MP is a prodrug that is metabolized by various enzymes such as xanthine oxidase (XO) and thiopurine methyltransferase (TPMT) into the pharmacologically active metabolite, 6-thioguanine nucleotide (6-TGN) as well as 6-methylated metabolite (6-MMPN) which is associated with hepatotoxicity. While simple adjustments in 6-MP dosing will result in adequate 6-TGN levels with acceptable 6-MMPN levels in most patients, some patients develop severe hepatotoxicity resulting in delays in therapy with inadequate 6-TGN levels. Based on recent unexpected effect of allopurinol on 6MP metabolism, we hypothesized we could successfully treat the hepatotoxicity by combining allopurinol with 6-MP. Although allopurinol which inhibits the enzyme XO was originally developed as an attempt to make 6-MP more effective, it is currently used to prevent complications from tumor lysis syndrome or to treat gout. It has long been known that allopurinol eliminates the first pass clearance of 6-MP but it was recently discovered that combination therapy with allopurinol and 6-MP alters the metabolism of 6-MP towards not only increasing 6-TGN levels but also decreasing 6-MMPN levels through an indirect mechanism which is still not completely understood. We discuss two patients on acute lymphoblastic leukemia (ALL) protocols with wild type TPMT genes who experienced significant hepatotoxicity while on daily 6-MP during standard maintenance therapy. Our first patient is a six year old male with lymphoblastic lymphoma who experienced recurrent grade 4 hepatotoxicity in maintenance therapy per Children’s Oncology Group (COG) protocol, AALL0932. Analysis of thiopurine metabolites showed that this patient had inappropriate levels of 6-MMPN causing severe transaminitis. We, therefore, utilized combination therapy with allopurinol to shunt 6-MP metabolism away from 6-MMPN towards 6-TGN. In fact, his 6-TGN levels have remained significantly above the levels which were shown to be correlated with improved outcomes. This patient has tolerated this combination therapy for over one year now with adequate 6-TGN levels with normal transaminase levels. (see figure 1) Our second patient who was also in the maintenance phase of ALL therapy per COG protocol AALL0232 experienced grade 3 hepatotoxicity including liver steatosis, thrombocytopenia and splenomegaly causing a two month hold of oral 6-MP and methotrexate. We were again able to use combination therapy with allopurinol to alter the metabolism of 6-MP. This patient’s 6-TGN levels have also remained in the desired range. He has tolerated this therapy for over five months with resolution of his grade 3 hepatotoxicity and liver steatosis and improvement in his thrombocytopenia and splenomegaly. There have been several studies now which have correlated 6-TGN levels to event free survival in ALL patients, and it is now accepted that there is prognostic importance to delivering maximum tolerated doses of 6-MP during maintenance therapy. Moreover, pharmacogenetic variation in 6-MP metabolism results in some patients who have adverse reactions on standard doses. Although guidance for dose reduction in patients with TPMT deficiency exists to regulate 6-TGN levels, the current guidance for patients with wild type TPMT who develop excessive 6-MMPN levels resulting in hepatotoxicity is to hold 6-MP and restart once transaminitis has improved. We employed the novel combination therapy of allopurinol and 6-MP to avoid hepatotoxicity resulting in adequate 6-TGN levels in two patients who were being treated on ALL protocols. We suggest that combination therapy with allopurinol and 6-MP can be safely delivered and provide potential benefits to other leukemia and lymphoma patients whose pharmacogenetic profile shunts 6-MP metabolism towards lower 6-TGN levels and high 6-MMPN levels.
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Introduction: Li-Fraumeni syndrome is an inherited cancer predisposition syndrome associated with the development of a cluster of early onset cancers. Leiomyosarcoma is a high grade malignancy characterized by smooth muscle differentiation that has rarely been reported in childhood. Here we present the case of a 16-year-old male with Li-Fraumeni syndrome who presented with symptoms of intermittent intussusception and was found have a colonic leiomyosarcoma. Case: The patient is a 16-year-old male with Li-Fraumeni syndrome, initially diagnosed with adrenocortical carcinoma at 2 years of age. He underwent treatment with surgical resection of the adrenal primary and was ultimately cured after further resection of recurrent disease and radiation therapy to a dose of 24 Gy to the left upper quadrant. Recently he was evaluated for a two month history of worsening left-sided abdominal pain and hematochezia. Colonoscopy revealed a large, intraluminal, pedunculated mass in the left descending colon that measured 4.6cm in diameter, and 4 smaller polyps, each measuring less than 0.5cm. These masses were each resected using an endoscopic snare technique. Histology of the larger mass showed a grade 3 leiomyosarcoma, with tumor extending to within 2mm of the inked margin. Immunohistochemistry was positive for smooth muscle actin and desmin and negative for CD117 and DOG-1. The 4 smaller masses were consistent with benign juvenile polyps. Further imaging with PETCT was negative for metastatic disease. Discussion: Li-Fraumeni syndrome is an autosomal dominant cancer predisposition syndrome resulting from a germline mutation in the TP53 gene. The product of this gene, tumor protein p53, plays an important role in delaying the cell cycle to allow for repair of damaged DNA or initiating apoptosis if the repair cannot be made. With one abnormal TP53 allele, the cell becomes vulnerable to a second somatic mutation affecting TP53, resulting in an increased risk of cancer. Indeed, 50% of patients with Li-Fraumeni syndrome will develop some form of cancer before age 30, and 90% before age 70. Radiation exposure likely increases the risk of malignant transformation. Heightened surveillance targeting known cancers is recommended to include annual skin exams, colon cancer screening starting at age 25 years, and early diagnostic breast imaging. In review of the Li-Fraumeni registry, sarcomas are the most common cancer in children with rhabdomyosarcoma and osteosarcoma having the highest incidence; however there are no prior reports of leiomyosarcoma in this population. Leiomyosarcoma is a malignant cancer of mesenchymal origin that can be found throughout the body, although colon primaries have rarely been reported. In one small series of 28 children, 10 patients were diagnosed with colonic leiomyosarcoma. These patients had an average age of 12 months and presented with symptoms of intestinal obstruction. Given the rarity of this tumor in pediatrics, the best clinical approach has yet to be defined. A recent retrospective review for all soft tissue sarcomas found that maximal diameter of tumor of less than 5cm, presence of metastatic disease, and ability to attain a complete resection have prognostic significance. Our patient's tumor was 4.6cm in diameter yet came within 2mm of the resection margin. With concern for residual disease, he will undergo further surgical resection to ensure complete resection. He will then start surveillance with whole body MRI to monitor for recurrence or new primary disease. Additionally, given the presence of juvenile polyps and risk for colon cancer, we will recommend screening colonoscopy every 6 months. Conclusion: This case demonstrates a novel presentation of colonic leiomyosarcoma in an adolescent patient with Li-Fraumeni syndrome. His presentation highlights the need for aggressive surveillance and early evaluation of new symptoms in Li-Fraumeni patients, especially those with prior radiation exposure.

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Introduction: Aeromedical evacuation has changed dramatically since its introduction a century ago. On the modern battlefield, patients with complex injuries move rapidly from point of injury back to the continental United States (US), stopping en route for stabilizing resuscitation and/or surgical intervention. The evacuation mission has also been successfully applied to military dependents including the capability to transport critically ill infants and children. We present the case of a military dependent born with an abdominal wall defect in a developing country, her transfer to the US and subsequent care. Case Description: A female infant with gastroschisis was born in a developing country to a service member and a foreign national. Her initial surgical care included bowel resection and silo placement. Her initial vascular access was a left internal jugular vein (IJV) central venous catheter (CVC). This was subsequently removed and the vein ligated. Sepsis ensued and transfer to Madigan Army Medical Center (MAMC), Ft. Lewis, WA was arranged. Prior to transport a right subclavian vein CVC was inserted and complicated by pneumothorax requiring tube thoracostomy. En route, an acute hemothorax developed with instability requiring advanced cardiac life support measures. The flight was diverted to San Antonio Military Medical Center (SAMMC), Ft. Sam Houston, TX. Upon arrival, she was septic, hemodynamically unstable, and required ongoing ventilator support. After stabilization she underwent surgery to remove the silo. Exploration revealed dehiscence of the intestinal anastomosis and inflamed, adherent viscera with loss of abdominal domain. Biologic mesh was secured for abdominal coverage and the bowel ends were brought through the mesh as enterostomies. A negative pressure dressing was applied. Postoperatively her respiratory status deteriorated and venous-arterial extracorporeal membrane oxygenation (ECMO) was instituted. An additional cannula was placed cephalad in the right IJV for cerebral drainage in light of previous left IJV ligation. Her sepsis and respiratory failure were due to multi-drug resistant Klebsiella and Acinetobacter, which were treated with colistin and tigecycline. After 190 hours of ECMO, her respiratory status improved allowing for decannulation. Over the next 42 days she weaned from support and transferred to MAMC. At MAMC she received ongoing wound care and enteral nutrition was started including distal stoma refeeding. A low citrulline level (8 micromol/L) raised concerns for short gut. She transferred to Seattle Children’s Hospital where bowel continuity was reestablished and the abdomen was definitely closed. She had 85cm of small bowel with a competent ileocecal valve and all of her colon. Today she eats normally and has no respiratory sequelae. Conclusion: This multifaceted case presented many challenges. The patient was born in a developing country with very limited resources. To this day, the exact nature of her abdominal wall defect remains unclear as do some aspects of her original treatment. Her transport to the US was diverted midflight to an alternative military treatment facility. This demonstrates the flexibility and readiness of our medical corps. The complexity of her abdominal wall defect and need for ECMO were challenging to the neonatal intensive care unit and surgical teams requiring close collaboration and creative solutions including the use of biologic mesh and negative pressure dressing with enterostomies for coverage of a hostile abdomen. The prior ligation of left IJV presented a unique indication for cephalad cannulation during ECMO. The treatment of multi-drug resistant bacteria required unusual choices in antibiotic therapy and utilized lessons learned from treatment of our soldiers in the battlefield. The patient’s care was carried out in three different medical centers by Army, Air Force and civilian medical staff, reflecting a unique continuum of care meeting the needs of the patient, her family and the military. Today, the patient’s smiling, healthy face belies the global coordination of an extraordinary medical effort.

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Introduction: Williams-Beuren Syndrome (WBS) is a genetic disorder secondary to a micro-deletion on chromosome 7q11.23, including the elastin gene, which affects multiple systems. Endocrine abnormalities include hypercalcemia, subclinical hypothyroidism, and diabetes mellitus. Incidence of infantile hypercalcemia in WBS is reported anywhere from 5-50% and is typically mild and transient. The exact mechanism remains unknown. Symptomatic hypercalcemia, including irritability and poor feeding, can negatively affect growth; these may be the presenting symptoms prior to diagnosis of WBS. Case Presentation: We report a 12-month-old female who presented with FTT, as evidenced by no weight gain since her 9-month visit as well as plateau of her height and head circumference. She was born at 39-weeks gestation and small for gestational age. At 2-months of age, a murmur was identified and an echocardiogram confirmed the presence of mild pulmonary artery stenosis and hypoplasia of the aortic arch. These findings, along with mild dysmorphic facial features and delayed developmental milestones, prompted genetics evaluation which confirmed the diagnosis of WBS by microarray. Prior to FTT, the patient developed significant constipation at 7-months of age with subsequent feeding intolerance. At this time she had a serum calcium (sCa) of 11.0 mg/dL (2.75 mmol/L) and a renal ultrasound showed mild nephrocalcinosis. No further laboratory data was obtained. Following failure of outpatient management of feeding intolerance and poor weight gain, she was admitted at 12-months of age for FTT. At admission, World Health Organization (WHO) female growth curves placed her at <3rd percentile for all measurements; American Academy of Pediatrics (AAP) WBS growth curves placed her around (-)2 standard deviations for height and weight and above (-)2 STD for head circumference, with no significant change from 9-months to 12-months of age. Initial lab evaluation revealed a total sCa 19.0mg/dL, corrected to 18.1mg/dL, and ionized calcium 2.33mmol/L, both elevated for age. Urine calcium/creatinine ratio 0.84 was elevated. Other laboratory values included normal phosphorus, parathyroid hormone and Vitamin D. She was started on intravenous fluid (IVF) therapy with a subsequent decrease in sCa to 13.2mg/dL over 24 hours. After one dose of intravenous furosemide, sCa further decreased to 11.9mg/L. Her irritability, feeding difficulties and constipation improved as her calcium normalized. She was transitioned to a low calcium/minimum Vitamin D formula (Calcilo XD) for dietary restriction. At discharge, she had evidence of mild hypercalcemia with a sCa12.6 mg/dL, which was serially followed. Five weeks after discharge, sCa increased to 14.7mg/dL and symptoms of irritability and feeding intolerance returned. She was readmitted and treated with IVF and received one dose of IV Pamidronate 0.5mg/kg. Post-treatment sCa was 11.9mg/dL, which further normalized to 10.9mg/dL four weeks post-bisphosphonate treatment. At 15-months of age, she remained eucalcemic with dietary restrictions and no clinical signs of hypercalcemia. Discussion: To our knowledge, this case is among the highest sCa levels reported in an infant; the highest reported sCa in an infant with WBS is 20mg/dL at 10-months of age. The AAP Health Maintenance for WBS recommends a low calcium diet and no supplemental Vitamin D. Recommended evaluation includes sCa, urine Ca/Cr ratio and renal ultrasound in the neonatal period, or upon diagnosis and again at 12-months of age. Because WBS is routinely screened, it may not be detected until later in life. Even when diagnosis is made, hypercalcemia may not be present initially. Currently, there are no published large-scale studies that support a specific treatment for WBS-associated hypercalcemia, but it typically resolves by age 4. This case illustrates the importance of recognizing the features of hypercalcemia, the obligation to follow up abnormal lab results and serial follow up in a condition with variable presentations and penetrance.

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Emanuel syndrome (ES) is a rare genetic condition caused by an extra derivative chromosome \([+\text{der}(22)t(11;22)(q23;q11)]\) that yields partial trisomy of chromosome 11 and chromosome 22. It is typically characterized by craniofacial abnormalities, universal global developmental delay, cardiac and renal abnormalities, and frequent infections. We report the case of an 18 year old female with known ES who was diagnosed with acute myeloid leukemia (AML). She presented with several days of fever, fatigue, and emesis. An initial CBC showed leukocytosis, thrombocytopenia, and macrocytic anemia. Due to suspicion for a leukemic process, subsequent bone marrow testing confirmed AML with an abnormal blast cell population with the karyotype \(47,XX,\text{del}(7)(q21),+\text{der}(22)t(11;22)(q23;q11.2)\). The expected derivative chromosome of ES was present in addition to a deletion of the long arm of chromosome 7. Chemotherapy was instituted on protocol with daunorubicin, cytarabine, and etoposide. During therapy, blood counts followed the expected pattern and timing as far as time to nadir, length of nadir, and time to recovery. There were no delays in chemotherapy and there was no minimal residual disease present after the first induction phase. Complications of treatment included severe glossal edema that eventually required tracheostomy and acute lung injury requiring periods of mechanical ventilation. During her third round of chemotherapy, the patient developed rapidly progressive respiratory failure, and despite aggressive resuscitation, died from cardiorespiratory collapse. This case, as the first report of leukemia in a patient with ES, is significant for several audiences. It serves to alert primary care providers of patients with ES to the possibility of hematologic malignancy when encountering infectious symptoms and abnormal cell counts. To the oncologist, it demonstrates the response to treatment, the high risk of treatment-related mortality in these patients, and the need for further clinical reports regarding this special population. For researchers of the genetics of AML, the possible role of the ES derivative chromosome in leukemogenesis requires further investigation.

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Abstract:

Juvenile onset Parkinson disease (PD) is an extremely rare condition. Defined as onset <20 years of age, it is characterized by a slowly progressive, yet typically debilitating course. Clinical characteristics include rigidity, bradykinesia, dystonia, resting tremor, postural instability, and hyperreflexia. Lower-limb dystonia is often a presenting sign in juvenile-onset cases. In children, dopa-responsive dystonia (DRD) is a far more common clinical condition with many of the same clinical features. However, the prognosis of the two conditions differs vastly, with DRD generally following a more benign clinical course. The two entities may be clinically indistinguishable, and advanced neuroimaging and/or genetic testing may be needed for clear diagnosis. Dopamine transporter (DAT) imaging with 123I-ioflupane is a neuroimaging technique that can reliably differentiate parkinsonian syndromes from other disorders that mimic PD. It is indicated for detecting loss of functional nigrostriatal dopaminergic neurons by single photon emission computed tomography (SPECT) imaging in patients presenting with symptoms or signs suggestive of dopaminergic neurodegeneration. By binding to presynaptic striatal dopaminergic neurons, it enables visualization of dopamine distribution in the striata and is a sensitive marker for neuronal loss in the basal ganglia. Visual loss of radiotracer within the putamen is indicative of dopaminergic neurodegeneration associated with PD, and provides a useful tool in distinguishing between disorders associated with parkinsonism such as DRD and PD. We present the case of a thirteen year old boy who presented with dystonia, gait disturbance, and postural instability, initially presumed to have dopa-responsive dystonia, yet later confirmed to have juvenile-onset PD based on DAT scan and genetic testing. A thirteen year old boy was referred for evaluation of gait disturbance, right leg spasms, and frequent falls. He reported worsening and progressive symptoms over the course of one year and stated that he often felt slow and off balance. No diurnal predilection for these symptoms was noted. His past medical history was notable for mild anxiety. There was no history of trauma. Family neurological history was negative. Review of systems to include changes in other aspects of neurologic functioning such as bowel and bladder control, sleep, and cognitive function was negative. Initial neurologic exam was notable for diffuse hyperreflexia, asymmetric increase in tone in the lower extremities, and postural instability. Preliminary investigations included extensive screening for inflammatory and metabolic diseases, as well as neuroimaging of the brain and spinal cord via magnetic resonance imaging (MRI). Brain MRI was initially viewed as normal, and laboratory investigations were notable only for elevated TSH and TPO antibodies, later felt to be unrelated to his clinical course. He was placed on dopamine for suspected dopa-responsive dystonia, and his symptoms and physical exam improved dramatically within a few weeks. However, genetic testing for variations in the GTP cyclohydrolase 1 (GTPCH1) and tyrosine hydroxylase (TH) genes most commonly implicated in DRD was negative. Thus, a DAT scan was performed which noted asymmetric radioisotope tracer uptake in the region of the right basal ganglia, a finding indicative of dopaminergic neurodegeneration associated with PD rather than DRD. Retrospective review of the brain MRI confirmed mild atrophy of the pars compacta region of the right substantia nigra, also consistent with a neurodegenerative process such as PD. Subsequent genetic testing yielded two disease-associated mutations on the PARK2 gene, providing genetic confirmation of a diagnosis of autosomal recessive juvenile onset PD. Early use of DAT scanning in pediatric patients presenting with symptoms suggestive of DRD should be considered as it may provide valuable diagnostic information, and subsequently guide genetic testing, therapy, and prognostication.

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Headache is a common chief complaint of teens seen by the general pediatrician. Common etiologies include a multitude of biopsychosocial factors including stress, head injury, substance abuse, migraines, medication overuse, sleep disturbances, and mood disorders. Poor academic performance is also not uncommon in this population, often attributed to the same biopsychosocial contributors. Rarely is Moyamoya disease considered in the differential diagnosis. Moyamoya disease is a condition characterized by progressive stenosis of the intracranial internal carotid arteries as well as their proximal branches, predisposing patients to stroke. While uncommon in the United States, it represents the most common pediatric cerebrovascular condition in Japan. Moyamoya syndrome is a related condition exhibiting the common cerebrovascular features of Moyamoya disease but is due to an underlying systemic condition. The most common presenting symptoms are ischemic in nature, such as transient ischemic attacks or stroke, and in the adult population intracranial hemorrhage is common. However, clinical presentations vary based on individual variations in degree and location of arterial involvement as well as the progression of stenosis and response to reduction in blood supply. We present a case of Moyamoya Disease in a 16 year old female resulting in complex symptomatology infrequently seen in the pediatric population to include an inferior quadrantanopsia and alexia without agraphia. K.B. presented acutely to the emergency department with a complaint of worsening headache over 6 days accompanied by progressive visual disturbance, speech dysfunction, and inability to read. Comorbid conditions included erythema nodosum and polycystic ovarian syndrome for which she was prescribed an oral contraceptive. History was notable for chronic headaches since 8 years of age, as well as recently worsening academic performance. Previously a high-achieving student, she reported significant problems with reading and progressive decline in grades over the past school year. Physical examination in the emergency room was notable for left inferior quadrantanopsia, mild aphasia, and alexia. Urgent head CT revealed multiple areas of hypodensity suggestive of infarct in the left parieto-occipital region and the right parietal region. Subsequent brain MRI confirmed the presence of both acute and subacute/chronic infarcts in these regions as well as punctate areas of involvement in the anterior circulation. In addition, marked attenuation of the posterior cerebral arteries and narrowing of the internal carotid arteries bilaterally with evidence of collateralization was observed raising suspicion of Moyamoya disease. Conventional angionogram confirmed the presence of bilateral findings of internal carotid artery steno-occlusive disease, consistent with Moyamoya disease. Later, SPECT scan demonstrated abnormal perfusion with bihemispheric involvement, greatest in the right hemisphere within the parieto-occipital lobe. Extensive evaluation to assess for comorbid infectious, inflammatory, autoimmune, and coagulopathic etiologies was negative. Medical versus surgical management of Moyamoya disease is controversial as there are currently no reliable data to support indications for timing or specific intervention. Revascularization is often offered to children depending on age of onset, severity of symptoms, extent of vascular involvement, and lack of contraindications to surgery. Our patient was initially managed medically with daily aspirin therapy as well as discontinuance of her estrogen-containing OCP. However, her neurologic impairments did not improve significantly and given the degree of clinical impairment and extent of cerebral involvement, surgical management was recommended. The patient ultimately underwent bilateral pial encephalodurasynangiosis, a procedure performed to augment collateral vessel formation and prevent subsequent ischemia. This case illustrates an uncommon cause for a common pediatric complaint and demonstrates the importance of entertaining a broad differential diagnosis even for seemingly mundane presenting complaints.
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Abstract:

Noninvasive respiratory support (NIRS) with nasal continuous positive airway pressure (CPAP) or with heated and humidified high-flow nasal cannula (HHHNC) is common in the neonatal ICU. These devices require patent nasal passages for positive pressure delivery. There is a paucity of literature on noninvasive options for neonates without patent nasal passages who require respiratory support, and no devices are currently tested and approved for use. We present the cases of two infants in respiratory distress for whom typical nasal NIRS failed secondary to nasal anatomical abnormalities and who were successfully managed with oral NIRS. A 29-weeks' gestation female twin with piriform stenosis and a full-term male with hydranencephaly and no clear nasal passages were admitted to the NICU. They required respiratory support, but had repeated hypoxic and bradycardic events on nasal NIRS (CPAP and HHHNC). As an alternative to intubation, CPAP prongs were placed in their mouths and positive pressure was delivered with subsequent normalization of their vital signs. Oral CPAP and HHHNC were used interchangeably in these neonates. The infants' lips established an adequate seal around the nasal prongs or mask with no additional fixative required to secure the device in place; gas transmission was verified via auscultation. Both infants were maintained with oral NIRS for several days. As appropriate, pressure and flow settings were gradually weaned and were similar to the levels typically used for nasally delivered NIRS (CPAP: 4-6 cm H2O, HHHNC: 4-8 lpm). This treatment did not interfere with orogastric tube feedings, nor was there pulmonary air leak or an increase in gastric air. Both infants appeared comfortable during treatment and maintained normal vital signs as well as age appropriate sleep-wake cycles. The female infant underwent corrective surgery for piriform stenosis, transitioned off of oral NIRS, and was eventually discharged to home. The male infant died of complications related to his severe congenital abnormalities. In neonates, respiratory failure requiring intubation and subsequent mechanical ventilation increases the likelihood of significant complications, including oropharyngeal trauma, infection, and chronic lung disease. Several NIRS devices exist as an alternative to intubation but all are designed to deliver positive pressure via patent nasal passages. Our experience suggests that oral NIRS using the typical nasal devices may be safe and could be considered in neonates who cannot tolerate nasal modalities and would otherwise require intubation. Disclaimer: The views expressed are those of the author(s) and do not reflect the official policy of the Department of the Army, the Department of Defense or the U.S. Government.

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Degradation, corrosion and routine wear and tear of orthopedic prostheses is expected with long-term use. However, in some cases, such routine use can release polymers and metals that compose the prostheses. Delayed-type hypersensitivity reaction can occur when metallic ions induce the immune system to react. Among the most common orthopedic metal sensitizers is cobalt. Given the high number of orthopedic implants in children, analysis of delayed-type hypersensitivity resulting from metallic prosthesis is warranted. We present a case of chronic urticaria in a patient who received a hip transplant and had a positive patch test to cobalt. Our patient, a 64 year-old female, underwent a right total hip arthroplasty in September 2010 after the diagnosis of osteoarthritis. Post operatively, the patient denied any difficulty with her hip other than occasional soreness after extended periods in a seated position. However, she reported having a pruritic rash that started 5 months after her operation. The 1-2 cm macular-papular erythematous lesions were noted to extend on all extremities, trunk and her face. In July of 2012, the patient underwent a True patch test and tested positive for cobalt- a known metal ion in hip prosthesis. She was also treated with omalizumab 300 mg monthly injections without success. Eventually, her chronic urticaria resolved while taking tacrolimus. Recent data suggests that approximately 5% of cases studied developed metal-related cutaneous complications post-implantation. Given such a high prevalence of cobalt allergy identified through patch testing, analysis of metallic implant induced hypersensitivity is warranted. Despite the possibility of delayed-type hypersensitivity and implant failure, the decision to patch test every patient preoperatively for cobalt allergy is generally not favored unless a known metal hypersensitivity is proven. Patch testing patients with a known metal hypersensitivity resulting from watches, jewelry or belt buckles prior to surgery may alleviate potential implant failure requiring surgical revision. The management options for those patients with positive patch tests largely depend on whether clinical demonstration of hypersensitivity exists. A detailed history regarding whether a metal allergy existed prior to implantation and close evaluation of patient progress post-implantation is necessary. While it is known that by removing the offending agent, allergic symptoms should be alleviated; the management of patients with symptoms post-implantation should reflect whether removal is a viable option, replacement of the implant with a non-allergenic alloy is possible or whether the use of a non-allergenic coating is preferable.
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Program Director Statement:

Medical Student Statement:
A 17-year-old male presented to clinic with 2 days of ascending muscular weakness and paresthesias. After extensive work up, including MRI head/neck/spine, lumbar puncture, electromyography, and toxicology screen the patient was ultimately diagnosed with an acute inflammatory demyelinating polyneuropathy (Guillain-Barre Syndrome). The patient’s clinical condition deteriorated, and the patient was transferred to the PICU after onset of diaphragmatic paralysis and respiratory failure requiring intubation and mechanical ventilation. Treatment with intravenous immunoglobulin was initiated and the patient’s strength subsequently began to improve. Though the patient initially remained intubated, he continued to communicate with his family and care team with the assistance of augmented speech devices. Nursing subsequently noted that the patient was making an unusual request: he was asking to have his legs, torso, and arms covered with ice packs or cool rags, reporting improved strength and sensation with cooling. The patient’s strength continued to improve and he was later extubated to CPAP and subsequently weaned to RA, at which time the PICU team initiated a trial of controlled cooling of the patient’s lower limbs with a Gaymar Meditherm cooling system, for 30 minutes prior to out of bed physical therapy sessions, with the goal of improving strength and stability. A complete neurologic exam was performed before and after initial cooling, and the consulting pediatric neurologist noted significant improvements in lower extremity strength and reflexes after the patient was cooled. The patient continued to note subjective improvement in his strength and postural stability with cooling prior to physical therapy sessions throughout his hospital course. Cooling is a widely accepted intervention to relieve the symptoms of central demyelinating syndromes such as multiple sclerosis and myasthenia gravis, but it is not commonly used for peripheral demyelinating neuropathies. A review of the literature shows several animal model trials that associated cooling with increased nerve conduction velocity in demyelinated peripheral nerves, as well as one case report of cooling associated with increased muscle recruitment and strength in a case of chronic inflammatory demyelinating polyneuropathy. This appears to be the first documented case of cooling as an intervention to relieve the symptoms of Guillain-Barre syndrome.
Abstract Author Statement: During time period December 2013 while on active duty at Navy Medical Center San Diego

House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Abstract:

Congenital dyserythropoietic anemias (CDAs) represent a heterogeneous group of inherited red blood cell disorders resulting in ineffective erythropoiesis. There are three major types of CDAs, however, several CDA variants have been identified. KLF1 is a transcription factor required for cell division in erythroid differentiation and maturation. A recently described mutation in KLF1 results in a dominant negative effect on the transcriptional activity of KLF1. We report a case of this mutation resulting in congenital dyserythropoetic anemia, hemolysis, and persistence of fetal hemoglobin. Our patient is a term female whose newborn course was complicated by pulmonary hypertension, hepatosplenomegaly, and anemia. She required a red blood cell transfusion on day of life one. She recovered from her initial complications but continued to require red cell transfusions every 2-4 weeks for the first year of life. Hemoglobin electrophoresis at 6 months revealed 40% hemoglobin F, 58% hemoglobin A, and a small fast band of unknown significance. Her initial peripheral blood and multiple repeats revealed many nucleated red cells and elevated reticulocyte counts. Her smears were otherwise normocytic and normochromic. Her bone marrow biopsy revealed hypercellularity with marked erythroid hyperplasia without classic feature of CDA types 1-3. Myeloid maturation and megakaryocytes were unremarkable and the aspirate was without increased blasts. Now, at 2 years of life, she has not required a transfusion in over 8 months and has demonstrated no evidence of hemosiderosis. We both report a new case and review the four previously reported cases of CDA due to KLF1 mutation to highlight the common features of this atypical CDA.
Program Director Statement: Made by n/a

Medical Student Statement: Made by n/a
Abstract: Salmonella infection is a common cause of colitis and bacteremia in children worldwide. We report a case of colitis and urinary tract infection in a child with Salmonella enterica serotype saintpaul. The patient is an otherwise healthy, toilet trained, 3 year old male who initially presented with bloody diarrhea and colicky abdominal pain. Stool culture obtained at presentation grew Salmonella enterica serotype saintpaul. The patient was afebrile prior to presentation and for the duration of his course. Additionally, he had a normal white blood cell count of 9.9 (x100(9)/L), urine and blood cultures demonstrated no growth. Given the absence of systemic symptoms, antibiotics were not administered at the time of diagnosis. He demonstrated progressive improvement in his symptoms, but continued to intermittently complain of abdominal pain. Two weeks after initial presentation the patient presented with the complaint of dysuria, frequency, and suprapubic pain. His urinalysis was notable for gross hematuria and urine culture grew Salmonella enterica serotype saintpaul. He was treated with cefdinir for 10 days, and had complete resolution of symptoms. Again, repeat blood cultures demonstrated no growth. He remained afebrile and nontoxic appearing for the duration of his course. Previously healthy children with uncomplicated gastroenteritis do not require antimicrobial therapy because the disease is usually self-limiting. This is the first reported pediatric case of a urinary tract infection secondary to Salmonella enterica serotype saintpaul gastroenteritis. In addition, this case highlights a unique complication to a common pathogen that can be seen in the general pediatric population.
Program Director Statement: Made by n/a

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Abstract:

Congenital dyserythropoietic anemias (CDAs) represent a heterogeneous group of inherited red blood cell disorders resulting in ineffective erythropoiesis. There are three major types of CDAs, however, several CDA variants have been identified. KLF1 is a transcription factor required for cell division in erythroid differentiation and maturation. A recently described mutation in KLF1 results in a dominant negative effect on the transcriptional activity of KLF1. We report a case of this mutation resulting in congenital dyserythropoietic anemia, hemolysis, and persistence of fetal hemoglobin. Our patient is a term female whose newborn course was complicated by pulmonary hypertension, hepatosplenomegaly, and anemia. She required a red blood cell transfusion on day of life one. She recovered from her initial complications but continued to require red cell transfusions every 2-4 weeks for the first year of life. Hemoglobin electrophoresis at 6 months revealed 40% hemoglobin F, 58% hemoglobin A, and a small fast band of unknown significance. Her initial peripheral blood and multiple repeats revealed many nucleated red cells and elevated reticulocyte counts. Her smears were otherwise normocytic and normochromic. Her bone marrow biopsy revealed hypercellularity with marked erythroid hyperplasia without classic feature of CDA types 1-3. Myeloid maturation and megakaryocytes were unremarkable and the aspirate was without increased blasts. Now, at 2 years of life, she has not required a transfusion in over 8 months and has demonstrated no evidence of hemosiderosis. We both report a new case and review the four previously reported cases of CDA due to KLF1 mutation to highlight the common features of this atypical CDA.

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Background: The most common causes of neonatal bacteremia and meningitis include group B streptococcus, E. coli, and listeria. With the advancement of new molecular techniques, scientists have been able to perform more specific sequencing of bacteria cultured in these patients. These results are beginning to reveal rare causes of neonatal bacteremia and meningitis that have not been extensively studied in the past. Objective: To present a case report and discussion of neonatal bacteremia and meningitis due to Streptococcus gallolyticus ssp. pasteurianus, a cause of neonatal bacteremia and meningitis, which warrants further investigation. Case Description: A term male infant was born via vaginal delivery complicated by prolonged rupture of membranes for twenty nine hours and the presence of meconium. Prenatal course and maternal labs were unremarkable and there was no evidence of maternal chorioamnionitis or infection. At six hours of life, the patient presented with tachypnea, increased work of breathing and retractions. The patient was admitted to the Neonatal Intensive Care Unit (NICU) and required Continuous Positive Airway Pressure (CPAP) for four days. Initial chest x-ray showed bilateral diffuse lung opacities suggestive of pneumonia with no other abnormalities. A laboratory evaluation revealed severe leukopenia, mild neutropenia and an elevated C-reactive protein. Cerebral spinal fluid (CSF), obtained after initiation of antibiotics, revealed a mild pleocytosis with a negative gram stain and culture remained negative. After approximately eighteen hours, his aerobic and anaerobic blood cultures were noted to be positive and identification of the isolate by molecular sequencing of the 16S ribosomal DNA revealed Streptococcus gallolyticus ssp. pasteurianus. The patient completed 14 days of ampicillin 100mg/kg/dose every twelve hours, in addition to ten days of gentamicin 4mg/kg/day every twenty four hours for synergy, for treatment of bacteremia and suspected meningitis. After completion of therapy the patient was discharged home without complications, and subsequent hearing exam was noted normal. Conclusion: There are a limited number of reported cases of neonates with Streptococcus gallolyticus ssp. pasteurianus bacteremia and/or meningitis. This case, in particular, is the first reported case of an infant developing bacteremia with this specific organism at less than twenty four hours of life. Prior to the advancement of new molecular sequencing techniques, this bacteria may have been underreported as a significant cause of neonatal sepsis and meningitis. Further studies and research are warranted to determine the true occurrence of neonatal infections, colonization rates in mother, preventive measures, treatment regimens, and prognosis in infants infected with Streptococcus gallolyticus ssp pasteurianus.

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Program Director Statement:

Medical Student Statement:
Abstract:

Introduction: Although monogenic neonatal diabetes may be caused by mutations in over 20 different genes, the most common are activating heterozygous mutations in KCNJ11, encoding the Kir6.2 subunit of the ATP-sensitive potassium (KATP) channel, which is highly expressed in pancreatic beta-cells and brain. Mutated KATP channels typically have decreased sensitivity to ATP inhibition, hampering insulin secretion even during hyperglycemia. Oral sulfonylureas (SU) have been demonstrated as an effective treatment in the majority of cases, given they close the KATP channels by an ATP-independent mechanism. However, the likelihood of success is largely predicted by the particular mutation. Previous reports of the F333L mutation were insensitive to SU therapy. We report a case representing a novel response to SU therapy in this same mutation. Case Presentation: A 13-month old Hispanic male presented to our facility for continued management of diabetes mellitus. His diabetes was diagnosed at 3 months of age after presenting in severe diabetic ketoacidosis. He was treated with insulin and subsequently placed on an insulin pump. His insulin dosage at the time of presentation to our facility was 0.4 units/kg/day and his hemoglobin A1c was 9.6% (81 mmol/mol). He was otherwise healthy and growing and developing normally. However, his parents remained challenged with the care of diabetes in a young toddler. Given his young age of diabetes onset, genetic testing for monogenic diabetes was sent and revealed a dominant heterozygous KCNJ11 mutation of F333L. Review of the literature revealed an unsuccessful transition of a previous patient with the same F333L mutation. After discussion with the family, an established SU protocol was modified and inpatient transition from insulin to SU therapy was attempted. Glyburide (glibenclamide) was titrated from a starting dose of 0.2 mg/kg/day to 1mg/kg/day/kg/day which resulted in a complete discontinuation of insulin after 6 days. Pre-SU fasting c-peptide was <0.1 mg/mL, increased to 0.47 ng/mL after 3 days of therapy, and normalized at 1.86 ng/mL by 3-months of outpatient follow up. Hemoglobin A1c decreased to 6.7% (50 mmol/mol) at the 7-month follow up. There were no adverse events observed, to include no hypoglycemia, diarrhea or feeding intolerance and complete blood count and complete metabolic panel remained normal for age throughout treatment. The patient is now 27-months old and has sustained improved glycemic control on a Glyburide dose of 0.4mg/kg/day. He continues to achieve normal, age-appropriate neurodevelopmental milestones. The family regularly voices satisfaction with the decreased intensity of care required on the new, oral regimen. Discussion: This case demonstrates a novel response to oral sulfonylurea therapy in a patient with a KCNJ11 mutation that has been previously been reported as resistant to transition from insulin therapy. Further study of these important rare cases will help to clarify the factors that influence the likelihood of successful SU treatment and neurodevelopmental outcome. Finally, the case highlights the variability of predicted response based exclusively on genotype and reemphasizes the importance, and potential life-altering impact, of genetic screening for patients suspected of having monogenic forms of diabetes mellitus. References: 1. Flanagan SE, Edghill EL, Gloyn AL, Ellard S, Hattersley AT. Mutations in KCNJ11, which encodes Kir6.2, are a common cause of diabetes diagnosed in the first 6 months of life, with the phenotype determined by genotype. Diabetologia 2006;49:1190-7. 2. Zung A, Glaser B, Nimri R, Zadik Z. Glibenclamide treatment in permanent neonatal diabetes mellitus due to an activating mutation in Kir6.2. J Clin EndocrinolMetab 2004;89:5504-7. 3. Pearson ER, Flechtner MD, Njolstad MD, et al. Switching from Insulin to Oral Sulfonylureas in Patients with Diabetes Due to Kir6.2 Mutations. N Engl J Med. 2006; 355:467-477.

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Cow's milk protein allergy (CMPA) is the most common food allergy in infants and children under two years of age, affecting an estimated 2-7.5% of this population. The spectrum of presentation of CMPA is vast and includes atopic dermatitis, wheezing, vomiting, and nonspecific gastrointestinal manifestations. More commonly reported GI symptoms include infantile colic, esophagitis, proctocolitis, and constipation. While alarming to parents, this condition typically follows a benign course upon elimination of cow’s milk protein and many infants tolerate reintroduction during childhood. Although a confirmed history of cow’s milk intake and supportive history and physical exam frequently identify the etiology of symptoms, more severe pathology must be considered when a clinician is presented with an atypical manifestation of disease. Here we present an infant with an uncommon case of cow’s milk protein allergy that general pediatricians may encounter in clinic or emergency practice. Our patient was a former term 37+2 week EGA, 3180 gram AGA breastfed infant. His birth history was complicated by initial respiratory distress, tachypnea, and CXR infiltrate, resulting in an intensive care nursery admission and treatment for congenital pneumonia, which resolved with seven days of ampicillin and gentamicin. The patient was discharged to home with parents on day of life 8 tolerating full enteral feeds with breast milk, as well as voiding and stooling appropriately. At home on day of life 12, parents noted two episodes of bloody stools and increased fussiness, and the family reported to the emergency department for evaluation. An abdominal film was obtained in the ED which revealed cystic and linear pneumatosis of the right ileocecal region. The patient was subsequently readmitted to the NICU for evaluation and treatment of suspected necrotizing enterocolitis (NEC). Upon admission, the infant appeared well and his laboratory studies revealed no abnormalities. Repeat KUBs failed to demonstrate continued pneumatosis. Pediatric surgery and pediatric gastroenterology were consulted, and initial management included nothing by mouth, parenteral nutrition, and a full 14 days of antibiotic therapy for NEC. Further history revealed that the patient’s mother had recently supplemented his breastfeeding with small amounts of cow’s milk formula. Additional imaging including abdominal ultrasound and upper GI studies were normal and the infant recovered well following a full 14 day course of medical treatment for NEC. Reintroduction of enteral feeds with hydrolyzed amino acid-based formula was well-tolerated without recurrence of bloody stools, fussiness, or radiographic findings. Term necrotizing enterocolitis is a rare entity, largely seen in infants with predisposing risk factors such as congenital heart disease. Cow’s milk protein allergy, however, is very common in the term, otherwise well infant. A diagnosis of cow’s milk protein allergy should be included in the differential of an otherwise well-appearing term infant presenting with bloody stools and radiographic findings of pneumatosis intestinalis. A broad differential is particularly important for patients with low risk factors and absent clinical or laboratory findings of NEC who present with pneumatosis. However, even when there is strong suspicion that cow’s milk protein allergy is the etiology of radiographic findings, the potentially devastating consequences of NEC make a full course of treatment with parenteral antibiotics and a pediatric surgery consult an important part of management.

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Abstract: Congenital diaphragmatic hernia (CDH) has an incidence of 1 in 2000 to 1 in 5000 live births. Rarely, it is diagnosed after the mother-infant dyad has been discharged from the birthing hospital. At U.S. Naval Hospital Okinawa, we report a case of CDH in a term seven day-old infant male who presented to an outpatient clinic in respiratory distress. Chest XRAY demonstrated a left-sided diaphragmatic defect with bowel herniation. Interestingly, the infant had previously been admitted to the NICU for 48 hours of antibiotics following a maternal diagnosis of chorioamnionitis. The infant was discharged home after 48 hours with a normal exam and vitals. Upon diagnosis at one week of age, the infant was transferred to a facility with pediatric surgery support for subsequent repair. Prior to repair, the infant did not require intubation and did not demonstrate evidence of pulmonary hypoplasia. This history is consistent with case reports of late-presenting congenital diaphragmatic hernias in children and adults where symptoms begin only after delayed herniation. Congenital diaphragmatic hernia remains a leading cause of pediatric morbidity and mortality throughout the world. The majority of these infants are diagnosed prenatally or immediately after birth. Only a small minority present as outpatients. In these settings, the practitioner must maintain a high index of suspicion for CDH outside of the immediate newborn period.
Award applied for: **Leo Geppert Award - Case Reports**

Abstract Code: **GC-240**

Abstract Title: **A Delayed-Interval Delivery of Extremely Premature Twins with Interval Neonatal Transport in Okinawa, Japan**

Abstract:

Background: Delayed-interval delivery is a rare procedure that is sometimes offered when a female with a multiple gestation pregnancy is at risk for preterm delivery. The literature on the subject consists only of case reports, series, and summaries. There are no reports of inter-hospital transfer of both the surviving firstborn infant and the mother during the interval period prior to the delivery of a second infant. Objective: The question we hope to help answer is whether the benefits outweigh the risks of transporting a surviving firstborn infant and mother to another hospital, possibly with a higher level of care, prior to delivery of the subsequent fetus(es). Design/Methods: This case describes a female with a twin gestation pregnancy who presented to our hospital in 2013 with preterm labor and premature rupture of membranes. She elected to undergo a delayed-interval delivery. Her management was complicated by a scheduled hospital move. This report details the challenges to care and outcomes of the mother and infants. Results: A 30 year old female with a d/di twin pregnancy delivered twin A via SVD at 23+3 weeks. Ultrasound following the delivery demonstrated reconstitution of the cervix and a long cervical length. Twenty-two days later, twin B was delivered via SVD at 26+4 weeks. During the 22 day interval between deliveries, the hospital at Camp Lester, Okinawa, Japan, was scheduled to move to a new facility at Camp Foster, Okinawa, Japan. In order to reduce twin A’s risk of neonatal morbidity, particularly intraventricular hemorrhage, the neonatal ICU at Camp Lester was kept open one extra week while the rest of hospital moved. Laboratory, radiology, and pharmacy services were also maintained for another week at the original hospital. At 11 days of life, twin A was transported to the new facility. Both infants survived without any major neonatal morbidities. The mother had a benign course and did not suffer any perinatal morbidities. Twin B was discharged 19 days prior to twin A. Both have normal development to date. Conclusions: This is one of the very few cases of delayed-interval delivery where not only both twins survived, but neither suffered any major neonatal morbidity. This is the only case we know of where the first infant and mother survived without morbidity after being transported to another hospital. Additionally, this case represents the possibility of transporting both the mother and the surviving infant to another center, with a possible higher level of care, prior to delivery of subsequent fetuses.

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CASE REPORT KR is a 7-year-old male who presented to the Emergency Department with the chief complaint of right arm pain after being struck in the arm while playing football. He described localized pain that worsened with movement. An x-ray of the right humerus revealed a spiral fracture of the mid diaphysis of the humerus, with a secondary finding of an expansive lesion of the proximal radius of nonspecific osseous abnormalities. Follow-up imaging revealed widespread patchy sclerosis as well as shepherd crook deformities of the bilateral proximal femurs, consistent with polyostotic fibrous dysplasia. One week later, nuclear medicine revealed severely increased osteoblastic activity, further suggesting polyostotic fibrous dysplasia. Twelve days after his original presentation to the ED, KR was admitted for surgical stabilization of a spiral fracture of the right proximal femur, which occurred while jumping on the bed. A subsequent biopsy of the right proximal femur confirmed the diagnosis of fibrous dysplasia. This finding, combined with the presence of unilateral café au lait macules with irregular borders, indicated McCune-Albright Syndrome.

DISCUSSION McCune-Albright Syndrome is caused by somatic mutations in the GNAS gene. The diagnosis can be made with at least 2 of the following 3 features: polyostotic fibrous dysplasia, irregular café au lait macules, and hyperfunctioning endocrinopathies. In reviewing the patient’s medical record, the only relevant medical history for the otherwise healthy child was an outpatient clinic visit for bilateral knee pain 8 months prior to his initial fracture. At that time he was noted to have genu valgum, pes planus, mild tibial bowing, inversion of both feet, and proptosis. A pediatric orthopedic consult was placed, but no follow-up appointments were scheduled and no radiographs or other diagnostic tests were obtained. None of his documented well-child checks acknowledged any sort of skin lesion. Present at birth or shortly thereafter, the café au lait macules associated with McCune-Albright Syndrome are unique for their irregular “coast of Maine” configurations, and the tendency for the lesions to both respect the midline and follow the developmental lines of Blaschko. In this case, failure to recognize the peculiar skin lesions led to a delay in diagnosis. A contributing factor toward the patient’s two major pathological fractures within a two-week period of time may have been a result of the undiagnosed underlying polyostotic fibrous dysplasia. If the diagnosis had been made earlier due to the unique skin and bone findings, anticipatory guidance to avoid contact activities could have been provided. Given the extensive nature of involvement of his proximal femurs, his femur fracture may have been prevented by prophylactic fixation. Most often, these patients will come to the attention of a provider due to precocious puberty or fibrous dysplasia. Overall, treatment is aimed at managing endocrinopathies and diminishing risk of pathologic fractures. CONCLUSION McCune-Albright syndrome is a rare condition (prevalence of 1 in 100,000 to 1,000,000). In comparison, café au lait macules are a relatively common skin finding, as up to 10% of the population have an isolated café au lait macule. It is important for primary care providers to recognize the unique characteristic café au lait macules which should trigger further investigation. The unrecognized skin findings in this child, which, according to the mother, were present at time of birth, are a reminder that careful consideration of all abnormal physical exam findings is essential. Recall, this patient had presented to his pediatrician for evaluation for knee pain at which time radiographs of the affected extremities would likely have demonstrated osseous abnormalities prompting more urgent evaluation by Orthopedics, which may have potentially prevented the pathologic fractures experienced in this case.
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Program Director Statement:

Medical Student Statement:
Abstract: Walker-Warburg syndrome (WWS) is the most severe of the cerebral, ocular and muscular dystrophy syndromes and is characterized by congenital muscular dystrophy, hydrocephalus, ocular malformations, and pathognomonic cobblestone lissencephaly. Considered a disorder of neuronal migration, several mutations affecting the dystrophin-glycoprotein complex, which is responsible for linking the intracellular cytoskeleton to the extracellular matrix, have been shown to cause WWS. However mutations in the dystroglycanopathy associated genes, namely POMT1, POMT2, POMGNT1, FKTN, FKRP, LARGE, ISPD and GTDC2, are present in only 50-60% of patients with Walker-Warburg syndrome and demonstrate variable expressivity and penetrance. Recently, mutations in COL4A1, the Type IV collagen alpha 1 gene, have also been identified in two unrelated patients with WWS and suggest an alternative underlying mechanism for this heterogeneous disease. COL4A1 codes for the most ubiquitous basement membrane protein and the COL4A1 mutations identified in these patients disrupts the triple helix structure of the collagen protein. Whole exome sequencing enables the study of rare Mendelian diseases previously limited by traditional linkage methods and is now available in clinical practice. We describe the first use of whole exome sequencing in our institution as a method to evaluate a patient with clinical findings of Walker-Warburg Syndrome and identify a novel COL4A1 mutation. Case report: We present the case of a full-term female neonate born by Cesarean section to non-consanguineous parents of Asian-Pacific Island descent. The pregnancy was complicated by advanced maternal age, polyhydramnios and a family history of three prior fetal losses. Prenatal MRI identified cleft lip and palate, ventriculomegaly, lissencephaly, a hypoplastic pons and cerebellum with a shallow Z-shaped brainstem, and shortening of the right femur. Amniocentesis was performed and revealed a normal 46 XX karyotype. The patient weighed 3,330 grams at birth with an initial exam notable for macrocephaly, microophthalmia, right forearm shortening with overlapping digits, malposition of the right lower extremity, hip dislocation, severe knee rotation, and an imperforate anus. Evaluation by pediatric ophthalmology revealed an absent lens and optic nerve on the right and disorganized ocular contents with colobomas on the left. MRI of the brain at two days of life confirmed cobblestone lissencephaly, gross ventriculomegaly, and absent corpus callosum. Clinical, laboratory and radiographic findings supported the diagnosis of WWS however, a microarray failed to identify mutations in the most commonly associated genes. Whole exome sequencing revealed a mutation in COL4A1 [Pro1286His (C< modalities. treatment new and understanding clinical improved to leading practice, of evolution the contribute may technology this disorders, genetic rare For diagnosis. evaluation for sequencing exome whole utility illustrates it Furthermore, disease. mechanism alternative an supporting thus WWS, cause a as mutation COL4A1 novel implicates phenotype expansion represents case This Conclusions: WWS. surgery, abdominal time at identified mal-rotation intestinal with together which literature, in reported anus imperforate patient WWS second is Additionally, protein. collagen IV Type structure disrupt also domain helix triple present described been previously not had>
Military Hospital Affiliation (if any): WRNMMC

Sponsoring Member Name:

Abstract Sponsor: Kari L Wagner LT/USN

Sponsoring Member Statement: Made by Kari L Wagner on 2/7/2014

Abstract Author Statement: During time period 2012-2014 while on active duty at WRNMMC

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Medical Student Statement:
Abstract: Hypereosinophilia is commonly seen as the result of a reactive process but can also rarely be associated with clonal processes. Mixed phenotype acute leukemias (MPAL) are a rare leukemia subtype comprising 2-5% of all acute leukemia. While specific prognostic lesions have been identified such as BCR-ABL1 and MLL rearrangements, MPAL cases demonstrate a variety of genetic lesions, with no one single phenotype described. Here we present a case of B-lymphoid/myeloid MPAL with previously unreported RUNX1 amplification and hypereosinophilia. Case: A 14 year old female presented with a two month history of migratory myalgia, arthralgia, and fatigue. Initial laboratory evaluation showed normal hemoglobin and platelet count. The white blood cell count was 73 x 10^3/mm^3 with an absolute eosinophil count of 54,750/mm^3. She had a normal physical exam. Molecular studies were negative for PDGFRA/B or FGFR1 rearrangements in the peripheral blood and bone marrow. Bone marrow morphology showed 75% blasts with a B/myeloid mixed phenotype on flow cytometry (positive for CD19 (bright), CD22, CD20, and myeloperoxidase (MPO)). FISH was negative for the common leukemia rearrangements, to include BCR-ABL1 and MLL, but demonstrated four copies of an intact RUNX1. She received a four-drug induction according to a high risk acute lymphoblastic leukemia (ALL) protocol and had a good response with a decreased peripheral total eosinophil count of 600/mm^3 by day 8. A bone marrow aspirate on day 15 showed <1% blasts and FISH was negative for cells with RUNX1 amplification. Discussion: Hypereosinophilia, defined as an absolute eosinophil count greater than 1500/mm^3, can have a varied clinical presentation. Reactive eosinophilia can be seen in parasitic infections, allergic conditions, collagen vascular disease, and non-myeloid malignancies. This rise in eosinophils is the result of overproduction of cytokines, such as IL-3, IL-5, and GM-CSF, which increase eosinophil differentiation and prolong survival. Once secondary causes of eosinophilia have been excluded, evaluation for a primary bone marrow disorder should be undertaken. The 2008 World Health Organization (WHO) revised the scheme of eosinophilic disorders to include myeloid and lymphoid neoplasms with recurring genetic abnormalities of PDGFRA/B and FGFR1; chronic eosinophilic leukemia, not otherwise specified (NOS); lymphocyte-variant hypereosinophilia; and idiopathic hypereosinophilia. Hypereosinophilia has also been described within patients with acute myelogenous leukemia (AML) with t(8;21), inv16, and t(16;16), as well as ALL with t(5;14). Our patient's evaluation revealed acute leukemia with a unique molecular finding of RUNX1 amplification with 4 intact signals. RUNX1, also known an AML1, is constitutively expressed in all lineages except for mature erythroid cells. RUNX1 is located on chromosome 21 and acts as a regulator of hematopoiesis by playing an important role in myeloid differentiation. RUNX1 is frequently deregulated in acute leukemia with chromosomal translocations resulting in the formation of chimeric oncogenes or with point mutations of RUNX1. Amplification of RUNX1 has been detected almost exclusively in childhood ALL and is associated with an increased risk of relapse and overall worse outcome. However, RUNX1 amplification has never before been described in a case of MPAL. MPAL represents a rare form of poorly differentiated leukemias that possess both lymphoid and myeloid immunophenotype. The best clinical approach to treatment is unknown. Recent studies have shown that ALL regimens appear to be more effective than AML type therapy for achieving a complete remission and that stem cell transplantation is likely not needed in first remission. Conclusion: This case demonstrates a novel finding of RUNX1 amplification in a patient with B-lymphoid/Myeloid MPAL and hypereosinophilia. Better understanding of the clinical course and optimal treatment regimen for these rare leukemias may be discerned from characterization of molecular abnormalities, such as, the one manifested in this patient.
The Wolff Chaikoff Effect (WCE) is a phenomenon of hypothyroidism from exposure to excess iodine. It is well described in a number of iodine exposures such as potassium iodide, amiodarone, and iodine containing radiologic contrast. We describe a case in which a child was unnecessarily prescribed levothyroxine for an elevated thyroid stimulating hormone (TSH) and a very low free thyroxine (FT4). Further history determined the elevation was likely transient and due to the WCE. To our knowledge, there are no case reports of ingestion of shellfish causing the WCE in children. A 12 year old female presented to clinic with a goiter. Her symptoms included fatigue and constipation. The goiter was smooth and symmetric with no lymphadenopathy. The provider ordered TSH, FT4 and thyroid uptake and scan. Her initial TSH was 69.61mIU/mL (range 0.35-5.5) and FT4 was 0.57ng/dL (range 0.89-1.76). Four days later, repeat TSH was 88, FT4 was 0.59, and thyroglobulin and thyroperoxidase antibodies were positive. The presence of antibodies and goiter suggested she had hypothyroidism due to Hashimoto's thyroiditis. She was prescribed levothyroxine 75mcg daily. Later, further history revealed that in an effort to treat the goiter, she consumed approximately one pound of mussels over two days prior to presentation. Eleven days after presentation a thyroid scan was performed and associated TSH was 19.99 and FT4 was 1.1. However, patient reported she had taken only two doses of levothyroxine prior to the scan. We believe her severe hypothyroidism was evidence of the WCE after excessive iodine intake from shellfish. Hashimoto's thyroiditis could have caused an elevated TSH, but would not explain her entire clinical picture. Although she was given a prescription of levothyroxine, two to three doses would not likely cause such a dramatic improvement in her TSH. Further supporting the WCE, her TSH continued to normalize rapidly without further treatment. This case highlights the importance of a thorough history when patients present with abnormal thyroid function. Dietary history, specifically seafood consumption, as well as other possible iodine exposures should be fully explored. Due to the transient nature of the WCE, treatment with supplemental thyroid hormone may not be necessary despite initial laboratory values consistent with profound hypothyroidism.

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Sponsoring Member Statement: Made by Amy Zucharo on LT/USN
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House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
The Leo J. Geppert Award

The Leo J. Geppert Award, given by the Uniformed Services Section of the American Academy of Pediatric, is an annual citation and pursue for the best paper by a Uniformed Services pediatrician for research in primary pediatric care.

This award was first presented in San Antonio, Texas in March 1997.

The award is named in honor of Dr. Leo J. Geppert for his many contributions to military pediatrics, as the first Chief of Pediatrics at Brooke Army Medical Center, and Chief of the first Department of Defense Pediatrics Residency Program.
Leo J. Geppert was born on 26 January 1915 in Vermillion, South Dakota. After completing his BA in chemistry at University of South Dakota Medical School, receiving a Masters Degree in Biochemistry in 1937. In 1939, he completed medical school on a full scholarship at Washington University in St. Louis, Missouri, and entered his pediatric internship at St. Louis Children’s Hospital, St. Louis, Missouri. His residency training, completed in 1941, was at St. Louis Children’s Hospital and Johns Hopkins Children’s Hospital in Baltimore, Maryland.

Dr. Geppert was commissioned as a 2LT in the US Army through the ROTC in 1941. His initial assignment was at the Medical Replacement Center, Barkley, Texas as a training officer. During World War II, he was assigned as the Executive Officer and Commander of the 309th Medical Battalion attached to the 84th Infantry Division. This included service during the infamous “Battle of the Bulge.”

As the first Chief of Pediatrics at Brooke Army Hospital from 1946 to 1952, he established the first pediatric service in an Army hospital. From 1953 to 1955 he was Commander to the Tokyo General Dispensary in Tokyo, Japan, and as Theatre Consultants in Pediatrics, Armed Forces of the Far East. In 1955 to 1958, he served as Chief of Pediatrics at Walter Reed Army Hospital.

While there he was involved in the diagnosis and treatment of such dignitaries as President Eisenhower’s grandchildren, Vice President Nixon’s children and the King of Saudi Arabia’s children. Colonel Geppert returned to Brooke Army Medical Center as Chief of Pediatrics in 1958.

He was an unpaid consultant to Santa Rosa Children’s Hospital for a number of years prior to his leaving the Army. In 1964, he retired from the Army and accepted a position as Medical Director of the Santa Rosa Children’s Hospital. He served as an unpaid consultant to Santa Rosa for a number of years prior to his leaving the Army.

In 1968, he went into private practice for one year. He then became a staff physician for the State of Texas in San Antonio, Texas, continuing in this capacity until he was diagnosed with lung cancer in 1979.

During his military career he received many awards and decorations, such as; Combat Medic Badge, Army A commendation Medical (with clusters), Bronze Star for Valor, Legion of Merit, and a Special Award from the Association of Uniformed Pediatricians in 1978.
After a long illness COL Geppert died in San Antonio, Texas, on 8 November 1980. He is buried at Fort Sam Houston National Cemetery.
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<td>2002</td>
<td>LTC Mark W Thompson, MC, USA</td>
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<td>2003</td>
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Leo J. Geppert Award - Research

2014 Top 3 Abstract

A Targeted Educational Curriculum Intervention Improves Physician Nutrition Knowledge

Implementation of a bronchiolitis treatment pathway at a military treatment facility significantly reduces the use of ineffective therapies in the inpatient setting

(1st Place) Postpartum Depression: Improving Education and Screening in the Pediatric Primary Care Setting

All Abstracts for 2014

Does the timing of elective neonatal circumcision affect rates of breastfeeding initiation and maintenance in male infants?

EXPOSURE TO INTIMATE PARTNER VIOLENCE IS NOT ASSOCIATED WITH DEVELOPMENTAL DELAY IN MILITARY CHILDREN
Award applied for: **Leo Geppert Award - Research Studies**

Abstract Code: **GR-50**

Abstract Title: **A Targeted Educational Curriculum Intervention Improves Physician Nutrition Knowledge**

Abstract:

Background: The vital importance of nutrition in preventing and managing illness is increasingly recognized. Nutrition training has been reported to be suboptimal at all levels of education from medical school to residency to fellowship. Practitioners, including pediatric gastroenterologists perceive gaps in their nutrition knowledge limiting their comfort in managing the nutritional aspects of disease. As part of our pediatric gastroenterology fellowship curriculum improvement plan in 2009, we reviewed fellow performance on the nutrition questions on the American Board of Pediatrics (ABP) subspecialty in-training examination (SITE) and noted suboptimal mean scores and inadequate improvement as fellows progressed. Having identified this deficiency, we developed and implemented an educational intervention directed towards improving our trainee nutritional core knowledge base. Methods: Beginning in academic year 2009-2010 we made an educational intervention, implementing a targeted curriculum consisting of 2 hours of nutrition education monthly for 10 months per year (60 hours total). Sessions consisted of evidence-based and case-based presentations by faculty and trainees. The curriculum was developed by pediatric gastroenterology faculty in conjunction with two pediatric dieticians. Topics included an annual core discussion and a three year rotation of advanced topics with specific objectives selected from the ABP Pediatric Gastroenterology Content Specifications and the North American Society for Pediatric Gastroenterology, Hepatology & Nutrition Guidelines for Training in Pediatric Gastroenterology. Sample topics included obesity, growth issues & malnutrition, complementary & alternative medicine, pharmaco-nutrition, food allergies & intolerances, and use of formulas. Results: SITE nutrition scores were reviewed from 2004-2013, noting the difference in scores from year to year. Twenty-one score changes in 12 fellows were reviewed: 13 from first year to second year and 8 from second year to third year. Trainee score changes were considered in 2 groups: those who took their first SITE before the nutritional curriculum was introduced (2009 or earlier), and those who took it in 2010 or later. Before the curriculum change, mean annual score improvement was only 3.92% correct (p=.82 test of improvement). Following the intervention, mean score significantly improved by 25.16% (p=0.03 test of improvement). Conclusions: A novel educational curriculum substantially improved nutrition knowledge in pediatric gastroenterology fellows. This clinically relevant targeted approach may be useful in nutrition education in general to enhance practitioner preparation for the challenges of nutrition medicine. In patient-centered clinical settings, an improved nutrition knowledge base should also give practitioners greater confidence in providing essential patient education on nutritional issues.

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Medical Student Statement:
Background: Research shows that infants born into families with intimate partner violence (IPV) have increased risk for preterm birth and low birth weight (LBW), birth outcomes that are known to be associated with developmental delay in childhood. Preliminary research studies suggest exposure to parental IPV increases odds of developmental delay in young children. Objective: To explore an association between exposure to parental IPV and diagnosis of developmental delay in the first three years of life. Methods: A retrospective cohort of children born in FY 2006-2007 and enrolled in the Military Health System (MHS) was designed. Inpatient birth records and outpatient records for the first three years of life for included children were linked to substantiated cases of IPV among active duty military parents. Diagnoses of preterm birth, LBW, and developmental delay were identified using International Classification of Disease Ninth Revision (ICD-9) codes. Logistic regression modeling was used to calculate the odds ratio of children diagnosed with developmental delay. Results: Of the 94,151 children born into the MHS in fiscal year 2006-2007 who continued to receive military healthcare for the first three years of their life, 7,331 infants (7.8%) were born preterm, and 1,559 (1.7%) were born LBW. There were 3,685 children (3.8%) exposed to parental IPV and 6,709 children (7.1%) diagnosed with one or more developmental delay. A diagnosis of developmental delay was more likely in infants born preterm (OR 2.01 [95% CI: 1.87-2.16] p<0.0001) and LBW (OR 1.69 [95% CI: 1.44-1.98] p<0.0001). There was no significant association between exposure to parental IPV and diagnosis of a developmental delay (OR 0.93 [95% CI: 0.82-1.07] p =0.309). Subtypes of developmental delay were also not significantly associated with exposure to IPV, including communication delay (OR 0.97 [95% CI: 0.72-1.30] p=0.842), motor delay (OR 1.27 [95% CI: 0.82-1.97] p=0.284), pervasive developmental disorder (OR 0.92 [95% CI: 0.62-1.36] p=0.670), intellectual disability (OR 1.31 [95% CI: 0.41-4.21] p=0.648), learning disability (OR 1.03 [95% CI: 0.74-1.44] p =0.869) and elimination disorders (OR 0.36 [95% CI: 0.088-1.44] p =0.148). Conclusion: Military infants born preterm and LBW are more likely to be diagnosed with developmental delay. However, a diagnosis of developmental delay is not associated with exposure to parental IPV. Further research is needed to explore this relationship.

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House Staff Author Statement:

Program Director Statement:

Medical Student Statement:
Award applied for: **Leo Geppert Award - Research Studies**

Abstract Code: **GR-51**

Abstract Title: **Does the timing of elective neonatal circumcision affect rates of breastfeeding initiation and maintenance in male infants?**

Abstract:

BACKGROUND: There is a growing body of recent literature to suggest that the population health benefits of male circumcision may outweigh the risks of the procedure. Similarly, it is well accepted that breastfeeding yields multiple public health benefits. The question of whether breastfeeding initiation and maintenance is adversely affected by the timing of newborn circumcision is still widely debated, and studies which examine this relationship are few in numbers. PURPOSE: 1. To determine at what age male neonates are being circumcised (measured as hours of life) in the Newborn Nursery at the Naval Medical Center San Diego. 2. To assess breastfeeding patterns in this cohort of circumcised male neonates in the first 2 months of life. 3. To determine if there is a significant relationship between the timing of elective neonatal circumcision and breastfeeding initiation and maintenance in the first 2 months of life. METHODS: We are conducting a retrospective chart review of greater than 800 circumcised male infants, who were born at the Naval Medical Center San Diego from 01JAN2008 to 31DEC2009. Data collection includes: gestational age, maternal demographics and pregnancy history, sponsor rank, degree of family support present, infant birth weight, time of birth, time of circumcision, breastfeeding status during hospital stay and at time of discharge (exclusively breastfed versus formula supplement), as well as reported feeding method at the newborn, 2-week and 2-month well baby visits. Exclusion criteria include: gestational age <38 weeks, twin/multiple gestation, NICU admission, and absence of maternal intention to breastfeed at time of delivery. Data will be analyzed using logistic regression analysis with continuous covariates, with the independent variable of interest being the timing of elective circumcision, and the dependent variable being exclusive breastfeeding at well clinic visits in the first 2 months of life. Covariate factors that will be addressed include maternal age, ethnicity, parity, method of delivery, socio-economic status of family, and family support markers (ie, single active duty mother, father deployed). RESULTS: Data collection for this research project is ongoing; we do anticipate we will have results at the time of the meeting in October 2014. CONCLUSION: Results will be used to guide physician counseling, and potentially hospital policy, on timing of circumcision to ensure that a breastfeeding friendly environment is fully supported in the newborn nursery.

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House Staff Author Statement:

Medical Student Statement:
Background and Objectives Although the American Academy of Pediatrics published evidence-based clinical practice guidelines for the management of bronchiolitis in 2006, providers continue to use therapies with no proven clinical benefit. Data from academic medical centers that have implemented bronchiolitis treatment pathways demonstrate significant reductions in the use of ineffective therapies, such as short-acting beta-agonists (SABA), systemic steroids, and antibiotics. We developed and implemented an inpatient bronchiolitis treatment pathway at Naval Medical Center Portsmouth with the aim of increasing adherence to evidence-based guidelines, reducing variability in patient care, and decreasing resource utilization without adversely affecting patient outcomes or increasing duration of hospitalization. Methods We developed a customized inpatient bronchiolitis treatment pathway that uses family history of atopy as the key determinate for initial inhalation therapy. All patients were assigned a severity score based on wheeze, air exchange, respiratory rate, and muscle use (WARM score). Pre- and post-treatment WARM scores were calculated to determine therapeutic effectiveness of inhalation therapy and inform subsequent management. We implemented our treatment pathway in October 2013. Retrospective chart review was conducted for bronchiolitis admissions between October and January for three years beginning in 2011. Children older than 24 months of age, those born at less than 28 weeks gestation, and those requiring intensive care were excluded from our review. Prescription of SABA, antibiotics, systemic steroids, and supplemental oxygen for the 2013-2014 season were compared to the two prior seasons using chi-square analysis. The average number of doses per patient of SABA, racemic epinephrine, and hypertonic saline and the duration of hospitalization for the 2013-2014 season were compared to the two prior seasons using analysis of variance (ANOVA). Results We reviewed 127 charts; 38, 52, and 37 from the 2011, 2012, and 2013 seasons, respectively. One hundred thirteen patients met inclusion criteria; 13 were born between 28 and 36 weeks gestation. Of those excluded from the analysis, 7 were older than 24 months of age, 4 were born at less than 28 weeks gestation, and 3 required intensive care. Median age was 6 months. Fifty-four percent of patients were male. Sixty-six percent of patients were infected with respiratory syncytial virus (RSV); 52, 67 and 77 percent from the 2011, 2012 seasons, respectively. We found statistically significant reductions in the prescription of antibiotics (8.8% versus 36.4% and 19.6%, p < 0.03), oral steroids (2.9% versus 33.3% and 30.4%, p < 0.005), and supplemental oxygen (8.8% versus 30.3% and 34.8%, p < 0.03) after bronchiolitis treatment pathway implementation. We found a statistically significant reduction in the number of patients initially prescribed SABA (31% versus 79% and 64%, p < 0.01). There was a trend toward reduction in the average number of SABA doses per patient (p = 0.053). Duration of hospitalization was unchanged (p = 0.35). No adverse patient outcomes were observed. Conclusions Implementation of an inpatient bronchiolitis treatment pathway at Naval Medical Center Portsmouth significantly reduced the use of ineffective therapies without increasing duration of hospitalization or adversely affecting patient outcomes.
Military Hospital Affiliation (if any): Naval Medical Center-Portsmouth

Sponsoring Section Member Name:

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Sponsoring Member Statement: Made by Lori Vanscoy, MD on 2/15/2014

Abstract Author Statement:

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Program Director Statement: Made by CAPT Timothy Porea, MD

Medical Student Statement:
Title: Postpartum Depression: Improving Education and Screening in the Pediatric Primary Care Setting
Lauren M Vasta, MD, Kari L Wagner, MD, Jeannie L Bay, DO, Ashley J Dunn, MD Katherine E Shedlock, MD, Muoy Lim, MD and Laela M Hajiaghamoseni, MD. Pediatrics, Walter Reed National Military Medical Center at Bethesda, Bethesda, Maryland, United States. Background: Post partum depression (PPD) affects up to 15% of new mothers. Visits for newborn and infant health maintenance are opportunities to screen for PPD. Objective: To implement a process improvement program to improve PPD awareness by pediatric providers and improve screening rates Design/Methods: Electronic medical records of all 2 week, 2 month and 4 month well child visits at a single-institution between December 1, 2011 and January 31, 2012 were reviewed for PPD screening. An intervention of educational sessions on PPD, the Edinburg Postnatal Depression Scale (EPDS), interpretation, interventions, and documentation was provided during department-wide conferences. The EPDS tool was provided to families at the 2-week, 2-month and 4-month well visits as a dry erase form bundled with developmental screening forms, and the results reviewed with families. Following a 6 month intervention period, an EMR follow-up review of visits between December 1, 2012 and January 31, 2013 was conducted. Differences in PPD screening compliance was determined with a ?2 test. Results: There were 322 visits during the pre-intervention period and 417 visits in the post-intervention period. Prior to the intervention, 7.4% of all visits documented completion PPD screening. Compliance was highest at the 2 week visit (20%) and lowest at the 4 month visits (6%). Post-intervention, there was an increase in PPD screening compared to the pre-intervention period (27.6 % vs 17.4%; p=0.001). The increase was noted at both the 2 week visit (34.9 % vs 20%; p=0.01) and the 4 month visit (25.2% vs 6%; p=0.004). Three positive screens were detected and two of the three referred for further counseling; one was already receiving treatment. Conclusions: With a low-tech educational program and screening program bundled into existing clinic processes, outpatient screening of PPD increased. Piggy-backing programs onto existing successful processes, like developmental screening, are a useful means of program improvement with minimal additional provider time required.
Abstract Sponsor: Ashley J. Dunn Civilian

Sponsoring Member Statement: Made by Lauren M. Vasta MD on 12/20/2013

Abstract Author Statement: During time period 01/01/2012 - 12/20/2013 while on active duty at WRNMMC

House Staff Author Statement:

Program Director Statement: Made by Gregory G. Gorman

Medical Student Statement:
The Val G. Hemming Award

The Val G. Hemming Award, given by the Uniformed Services Section of the American Academy of Pediatric, is an annual citation for the best paper by a Uniformed Services medical student.

This award was first presented in Washington, DC in 2003.

The award is named in honor of Dr. Val G. Hemming whose devotion to medical education as Chairman of Pediatrics at Uniformed Services University of Health Sciences is legendary.
Dr. Hemming was chosen as Dean at F. Edward Hébert School of Medicine in May 1996. Prior to assuming the position of Interim Dean of the school in the summer of 1995, he had been the University's Chair of Pediatrics, which he held upon retirement from the Air Force in October 1990.

From Rexburg, Idaho, Dr. Hemming attended Idaho State University and Ricks College, ID. He holds a Bachelors Degree in Entomology from the University of Utah, and received his Doctor of Medicine from the University of Utah College of Medicine in 1966. He then completed a mixed medicine-pediatric internship at the University of Utah Affiliated Hospitals in 1967.

Dr. Hemming was accepted into the US Air Force Senior Medical Student Program in 1965, and served on active-duty with the Air Force during the fourth year of medical school and his internship. Subsequently, he completed training as an Air Force flight surgeon at Brooks Air Force Base, TX, during the summer of 1967. His next assignment was to Mather Air Force Base, CA, and then he returned to Wilford Hall Air Force Medical Center, TX, for residency training in pediatrics in 1968.

Following a four-year assignment in Germany, he obtained a Air Force-sponsored infectious diseases fellowship in the departments of Pediatrics and Medicine at the University of Utah. In 1976, Dr. Hemming was assigned to David Grant Medical Center, Travis Air Force Base, CA, where he later became the Chairman of the Department of Pediatrics and Director of Pediatric Residency Program.

He was assigned to the Department of Pediatrics at the Uniformed Services University of the Health Sciences in 1980, and then appointed as Chair of Pediatrics in 1987. From 1983 through 1990, he also served as Specialty Consultant in Pediatrics to the Air Force Surgeon General, and from 1987 through 1990 as the Consultant in Pediatrics to the Assistant Secretary of Defense (Health Affairs).

Academics and research interest have included pathogenesis of Lancefield group B streptococcal infections in neonate, pathogenesis of lower respiratory tract bacterial and viral infections in infants and young children, and pediatric education for undergraduate medical students. Most significant is his research in the Respiratory Syncytial Virus infection. This resulted in the development of two biological products for prevention of RSV infection in children, which have been widespread clinical use since 1996.

During his tenure as Dean, Doctor Hemming has worked tirelessly to maintain the highest levels of academic excellence at the Uniformed Services
University, while encouraging an enthusiastic sense of mission among the members of our community. This has resulted in continuous growth and development of innovative new programs in nearly every department. He played a critical role in the creation of The Uniformed Services University of Health Sciences National Capital Area Medical Simulation Center, one of the most advanced medical training facilities in the world. His vigorous promotion of the University has led to several highly successful new national and international academic relationships. Despite these senior responsibilities, Dean Hemming has always remained highly available to all members of the medical and graduate student classes, and has personally mentored a large number of them in their development as physicians, researchers, and educators. All members of the Uniformed Services University hold him in their highest regard and wish him well in his continued career endeavors.

He and his wife Alice (Bell) are the parents of Heidi (b. 1963), Julie (b. 1967), Jill (b. 1969) and Patrick (b. 1979). They have seven grandchildren, including Colin and Copeland Smith (Heidi); Jeremiah, Lucy, and Ella Savage (Julie); and Graham and Benjamin Austin (Jill).
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<td>Respiratory Syncytial Virus: A Problem At Both Ends of Life?</td>
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<td>Iodide Inhibits Phosphorylation of Protein Kinase B (Akt) and Extracellular Signal Regulated Protein Kinase (ERK) in FRTL-5 Thyroid Cells</td>
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<td>2013</td>
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<td>Increased Risk for Constipation and Encopresis in Children with Attention</td>
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Val G. Hemming Award

2014 Top Abstract

(1st Place) Epidemiology of Biliary Atresia in the United States

All Abstracts for 2014

The Connection between Urinary Retention, Urinary incontinence, and Urinary Tract Infections and children with ADHD
Abstract:

Background: Biliary Atresia (BA) is a devastating disease in infants causing progressive destruction of the intra- and extrahepatic bile ducts leading to cirrhosis, liver failure, and death if left untreated making it the leading cause of liver transplantation in children. Surgical hepatoportoenterostomy or Kasai operation is the gold standard of treatment, and more than 80% of infants referred for surgery within 60 days of life will have successful reestablishment of bile flow compared to less than 20% if Kasai is performed after 90 days of life. The pathogenesis of BA is not well understood, but because of seasonality, BA is thought to be linked to a viral illness, like rotavirus, which stimulates the inflammatory obliteration of the bile ducts. There have been reports of a decreasing trend in BA in Taiwan thought to be due to implementation of a nationwide rotavirus vaccination. This study will seek to evaluate epidemiological factors related to BA, the trend in the rate of BA, and the age at which Kasai operations are being performed in the United States and seasonality.

Methods: A retrospective cohort study and trend analysis was performed utilizing data on hospitalizations from 1997, 2000, 2003, 2006, and 2009, triennial Health Cost and Utilization Project Kids’ Inpatient Database (HCUP-KID). Population denominator data, to calculate rates, was also obtained from HCUP-KID. Case selection was performed by searching the database for children less than 1 year of life for the International Classification of Diseases, Ninth Revision diagnostic code for biliary atresia (751.61) and for the procedure code for the Kasai hepatoportoenterostomy (51.37). Subjects were required to have both the diagnosis of BA and a Kasai hepatoportoenterostomy performed during the hospitalization to be counted. Subjects identified as having undergone a liver transplant (50.5X, 998.1) were excluded. Results: Over the 5 study years there were 839 cases of BA. BA was more common in females with a rate of 5.02 per 100,000 vs. 3.57 per 100,000 in boys (relative risk 1.41; 95% confidence interval, 1.23-1.61; p<0.001). There was a significant increase in the rate of BA over the study time period increasing from 2.85 per 100,000 in 1997 to 5.9 per 100,000 in 2009 (p<0.001; see figure 1A). The overall median (interquartile range) for age in days at the time of Kasai hepatoportoenterostomy was 63 (47-76), and there was no change (increase or decrease) in the age in days at the time of Kasai (p=0.64; see figure 1B). There was insufficient evidence of seasonality to BA (p=0.13; see figure 1C). Conclusions: Females are at an increased risk of BA. The incidence of BA is increasing in the United States and there was not a significant seasonality to BA. The lack of seasonality along with an increasing trend of cases of BA during the same period when rotavirus vaccine implementation took place in the United States suggests that rotavirus vaccination did not affect the rates of BA. The age of Kasai has remained stable from 1997-2009 suggesting that early identification of treatment BA has not improved. Our study is the first nationwide population study of BA in the United States and significantly contributes to the epidemiological understanding of this disease.

Attached table: H29_BA figures final.pdf

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Abstract Author Statement:

House Staff Author Statement:

Program Director Statement:

Medical Student Statement: Made by Perri Hopkins
Abstract:

Background: Disorders of the lower urinary tract represent a significant source for physician visits. This study will look at urinary tract infections, enuresis, and urinary retention, and examine the association to children with ADHD. Urinary tract infections (UTI) led to over 1 million physician visits each year. Enuresis is a common phenomenon, impacting approximately 10% young children. Episodes of urinary retention are relatively rare, and pediatric causes are not well understood, however these episodes represent significant danger to the child. Studies examining this relationship reveal 11-19% of children with ADHD have enuresis. However, these studies use small homogeneous samples. Rates of UTI and urinary retention in children with ADHD have not been reported. We hypothesize there is an association between the diagnosis of ADHD and increased rates of visits for urinary tract infection, enuresis, and pediatric visits for urinary retention.

Methods: A retrospective cohort study of children in the military health care system was performed. The study included dependent children of active-duty personnel, aged 4-12 years, during fiscal years 2006 and 2007. ADHD, enuresis (daytime and nighttime), urinary tract infection and urinary retention were identified by ICD-9 diagnostic codes. Incidence rate ratios (IRR) were calculated using negative binomial regression analysis for the clinic visit rate for enuresis, urinary tract infections, and urinary retention comparing those children with ADHD to children without ADHD, analyses were adjusted for child age and gender. Additionally, a subgroup analysis among children with ADHD was performed to examine the impact of ADHD medication on visit rates. Results: There were 742,939 children identified in the study, 6.9% of children had ADHD. The incidence of night-time enuresis in children with ADHD was 40 per 1000 compared to 11 per 1000 in children without ADHD (p<0.0001). Children with ADHD had increased visits for night-time enuresis (IRR 4.81 [95%CI 4.43-5.23; p<0.0001]; adjusted IRR 4.33 [95%CI 3.97-4.72; p<0.0001]). The incidence of daytime enuresis in children with ADHD was 32 per 1000 compared to 10 per 1000 in children without ADHD (p<0.0001). Children with ADHD had increased visits for daytime enuresis (IRR 3.05 [95%CI 2.78-3.34; p<0.0001]; adjusted IRR 3.00 [95%CI 2.73-3.30; p<0.0001]). The incidence of urinary retention in children with ADHD was 1.7 per 1000 compared to 0.7 per 1000 in children without ADHD (p<0.0001). Children with ADHD had increased visits for urinary retention (IRR 1.14 [95%CI 1.05-1.24; p=0.002]; adjusted IRR 1.86 [95%CI 1.71-2.02; p<0.0001]). The incidence of UTI in children with ADHD was 38 per 1000 compared to 33 per 1000 in children without ADHD (p<0.0001). Children with ADHD had increased visits for UTI (IRR 2.05 [95%CI 1.43-2.94; p<0.0001]; adjusted IRR 2.18 [95%CI 1.49-3.18; p<0.0001])

Conclusion: Children with ADHD sought medical care 4.3 times more for night-time enuresis as compared to children without an ADHD diagnosis, 2.2 times more for urinary retention, 3 times more for daytime enuresis, and had an 86% increase for UTI visits. It has been established that ADHD has a number of psychiatric co-morbidities including voiding dysfunction and constipation. These voiding problems, especially urinary retention, likely lead to urinary stasis and ultimately UTIs. Of note, previous studies analyzing constipation/fecal incontinence in this patient group show no improvement in those symptoms with the treatment of ADHD. Likewise in this study, visits for urinary disorders did not decrease with ADHD treatment. This lack of response to ADHD treatment in these voiding symptoms might indicate a biologic cause. The high prevalence of urinary disorders in this population, and the unclear mechanism, increases the importance of physician’s awareness of the association.

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