



2009 PAS Annual Meeting

As you plan your meeting itinerary, be sure to include these late-breaking abstract presentations, selected for their high-quality and news-breaking research.

Late-Breaker Abstract Presentations

Saturday, May 2

Saturday, May 2

4:00pm–7:30pm

2849 Late Breaker Poster Session: Neonatal

Hall D & E

- 482*** **Cholestasis of Pregnancy and Neonatal Outcome.** Pratibha Ankola, Arun Aggarwal, Muhammad F. Noor. *Publication 2849.482*
- 483** **Mechanical Ventilation of Preterm Lambs for 3 Days Causes Alveolar Simplification and Persistently Altered Expression of Enzymes That Regulate Histone Acetylation.** K.H. Albertine, M. Dahl, J. Alvord, C. Blair, Z. Wang, L. Dong, A. Wint, M. McCoy, R. McKnight, D. Null, B.A. Yoder, R.H. Lane. *Publication 2849.483*
- 484** **Comfort Measures for Tissue-Damaging Procedures in Canadian NICU's: Have We Improved over the past Decade? EPIPAIN Canada.** Celeste Johnston, Keith J. Barrington, Anna Taddio, Ricardo Carbajal, The Epipain Canada Study Group. *Publication 2849.484*
- 485*** **VA ECMO Is Able To Maintain Brain Perfusion in a *Sus scrofa* Model of Endotoxic Shock.** Sherreen G. Batts, Thornton Mu, Sarah L. Lentz-Kapua, Catherine F.T. Uyehara. *Publication 2849.485*
- 486** **Maturation of Brain Activity in Preterm Infants with Post-Hemorrhagic Ventricular Dilatation.** Joanna C. Beachy. *Publication 2849.486*
- 487** **Feasibility of Flash-Heating Breastmilk To Reduce Maternal to Child Transmission of HIV.** Caroline J. Chantry, Sera L. Young, Monica Ngonyani, Kiersten Israel-Ballard, Deborah Ash, Margaret Nyambo. *Publication 2849.487*
- 488*** **The Clinical Impact of Leukotriene Receptor Antagonist in the Prophylaxis of Bronchopulmonary Dysplasia.** Yi-Ling Chen, I. Cheng, Shu-Chi Mu, Tsu-Fuh Yeh. *Publication 2849.488*
- 489** **Copper Status in Cholestatic Infants Should Guide Parenteral Nutrition Supplementation.** Juliana Frem, Charletta Thomas, Yvonne G. Sarson, Conrad R. Cole. *Publication 2849.489*
- 490** **Individual Patient Data Meta-Analysis: Novel Approach to Interpreting HFOV Trials in Preterm Infants.** Filip Cools, Lisa Askie, Martin Offringa, PreVILIG Collaboration. *Publication 2849.490*
- 491** **Reduction of Ventilator Associated Pneumonia (VAP) in the NICU after Implementation of VAP Bundle.** Michelle Donahoo, Carolyn Getman. *Publication 2849.491*
- 492*** **Long Term Economic Evaluation Alongside the Caffeine for Apnea of Prematurity (CAP) Trial.** D. Dukhovny, S.A. Lorch, B. Schmidt, L.W. Doyle, J.H. Kok, R.S. Roberts, K. Kamholz, N. Wang, J.A.F. Zupancic, The Caffeine for Apnea of Prematurity Trial Group. *Publication 2849.492*
- 493** **Genetic Variations in IL18RL1 and IL18RAP Associate with the Development of Bronchopulmonary Dysplasia in African Americans Infants.** J. Floros, D. Londono, D. Gordon, S. DiAngelo, G. Wang, Z. Lin, A. Singh, J. Shenberger, N. Thomas. *Publication 2849.493*
- 494*** **Assessing Safety and Performances of the Neonatal Mode Adult ICU Ventilators on a Test Bench.** Matteo Fontana, Antoine Payot, Sylvain Morneau, Martin Cyr, Francois Lellouche, Philippe Jouvot. *Publication 2849.494*
- 495*** **Humidified High Flow Nasal Cannula Versus Nasal CPAP in Preterm Infants Less Than 28 Weeks Gestation: A Retrospective Matched Case-Control Study.** Rashmi S. Gandhi, Ramon Fernandez, Tracy Coelho, Cassie Lawn, Heike Rabe. *Publication 2849.495*
- 496** **Intra Abdominal Hypertension and Bladder Pressure Measurements in Sick Neonates.** Dale R. Gerstmann, Donald M. Null. *Publication 2849.496*
- 497** **Long-Term Effects of Morphine Analgesia in Ventilated Preterm Neonates.** Wendy L. Ward-Begnoche, Sherry Ferguson, Richard W. Hall, Kanwaljeet S. Anand. *Publication 2849.497*
- 498** **Permissive Hypercapnia Is Associated with IVH in Hypotensive ELBW Infants but Not in Normotensive Infants.** Jeffrey R. Kaiser, Erika W. Hagen, Mona Sadek-Badawi, Mari Palta. *Publication 2849.498*
- 499** **Cathepsin-B Is Activated as an Executive Protease in Fetal Alveolar Type II Epithelial Cells Exposed to Hyperoxia.** Hyeon-Soo Lee. *Publication 2849.499*
- 500** **Shc Proteins Competitively Inhibit TGF- β -Induced Smad Signaling.** Susan M. Smith, Matt K. Lee. *Publication 2849.500*
- 501** **Fluoroimmunoassay of AFP and β -hCG from Dried Blood Spots Samples and Its Application in Prenatal Screening for Down's Syndrome during Second-Trimester.** Xia Liu, Li Zhang, Yu-xia Zhou. *Publication 2849.501*
- 502*** **Conserved Tyrosine Adjacent to the Fusion Peptide Domain of HIV gp41 Is Critical for Fusion.** John J. Manaloor, Mark E. Peeples. *Publication 2849.502*
- 503*** **Regulation of Autophagy in Intestinal Epithelial Cells during Starvation as an In Vitro Model of Necrotizing Enterocolitis.** Andrew Maynard, Ludmila Khailova, Amber Johnson, Katerina Dvorak, Bohuslav Dvorak. *Publication 2849.503*
- 504** **Third Trimester Middle Cerebral Artery Doppler Blood Flow Predicts Neonatal Behavioral State Regulation on Day 6 in Infants with Prenatal SSRI Antidepressant Exposure.** Tim F. Oberlander, Dan Rurak, Michael Papsdorf, Ursula Brain, Ruth Grunau, Ari Sanders, Janet DiPietro, Ken Lim. *Publication 2849.504*
- 505** **Irradiance Readings of Phototherapy Equipment in Some Neonatal Units in Nigeria - We Need More Light.** Joshua Owa, Tina Slusher, Olusegun Adebami, Fadero Francis. *Publication 2849.505*
- 506*** **Unique TLR8-Mediated Activation of Neonatal Antigen-Presenting Cells by Imidazoquinolines.** Victoria J. Philbin, Leighanne C. Gallington, Guadalupe Cortes-Garcia, Eugenie E. Suter, Ariel Shuckett, Richard L. Miller, Paul D. Wightman, Mark Tomai, Keith Mansfield, Sarah Davis, Isaac Kohane, Kamila Naxerova, Amity Paye, Liat Stoler-Barak, Ofer Levy. *Publication 2849.506*

* Indicates First Author is a Trainee (Student, Fellow, House Officer)



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Late-Breaker Abstract Presentations

Saturday, May 2 ~ Sunday, May 3

- 507 A Systematic Review of RCTs Comparing Placental Transfusion with Early Cord Clamping. Are More RCTs Necessary?.** Graham J. Reynolds, Heike Rabe, Jose L. Diaz-Rosello, William O. Tarnow-Mordi.
Publication 2849.507
- 508 The Process of Antenatal Consent in a Large Multicenter Trial.** Wade Rich, Kathy Auten, Marie Gantz, Ellen Hale, Angelita Hensman, Nancy Newman, Nancy Peters, Neil Finer.
Publication 2849.508
- 509 Electrical Cardiometry in the NICU, Is It Feasible?.** Mitch Rodriguez, Barbara Weaver, Andrew Bozeman, Bao P. Ho, Robert L. Vogel.
Publication 2849.509
- 510 The Incidence of Kernicterus in Canada 2007-2009.** Michael Sgro, Douglas Campbell, Vibhuti Shah.
Publication 2849.510
- 511 Neonatal Hypoxic-Ischemic Encephalopathy (HIE): Use of Stage of Encephalopathy and Amplitude Integrated EEG (aEEG) in Predicting Adverse Outcome.** S. Shankaran, A. Pappas, S. McDonald, The NICHD Neonatal Research Network.
Publication 2849.511
- 512* Amplitude Integrated Electroencephalogram (aEEG) Findings in Infants with Broncho-Pulmonary Dysplasia (BPD).** Ross Sommers, Abbot Laptook.
Publication 2849.512
- 513 Neonatal Thrombocytosis: A Report of 25 Patients with Platelet Counts Exceeding 1,000,000/mL.** Susan E. Wiedmeier, Erick Henry, Jill Barnett, Tricia Anderson, Robert D. Christensen.
Publication 2849.513
- 514 Adenoviral Vector-Mediated Transduction of VEGF Regulated by HRE.ppET-1 Improves Neural Functional Recovery after Hypoxic-Ischemic Brain Damage in Neonatal Rats.** Xiang-rong Zheng, Shang-shang Zhang, Yu-jia Yang, Xia Wang, Le Zhong.
Publication 2849.514
- 9:45 A Randomized Controlled Trial of Preventative Care at Home in the First Year of Life in Infants <30 Weeks' Gestation: Outcomes of Children and Mothers at 2 Years of Age.** Lex Doyle, Alicia Spittle, Carmel Ferretti, Jane Orton, Abbey Eeles, Peter Anderson, Nisha Brown, Kate Lee, Marilyn Bear, Roslyn Boyd, Terrie Inder.
Publication 3212.4
- 10:00 Inhaled Nitric Oxide (iNO) for the Prevention of Bronchopulmonary Dysplasia (BPD) in Preterm Infants. The EUNO Trial.** J.C. Mercier, H. Hummler, X. Durrmeyer, M. Sanchez-Luna, V.P. Carnielli, D. Field, A. Greenough, B. Van Overmeire, B. Jonsson, M. Hallman, J. Baldassarre.
Publication 3212.5
- 10:15 Nasal Intermittent Positive Pressure Ventilation (NIPPV) Versus Synchronized Intermittent Mandatory Ventilation (SIMV) after Surfactant Treatment for Respiratory Distress Syndrome (RDS) in Preterm Infants < 30 Weeks' Gestation: Multicenter, Randomized, Clinical Trial.** Rangasamy Ramanathan, Kris Sekar, Maynard Rasmussen, Jatinder Bhatia, Roger Soll.
Publication 3212.6
- 10:30* Neopuff Compared with Laerdal Self-Inflating Bag for the First Five Minutes of Resuscitation in Infants <29 Weeks Gestation at Birth: A Randomised Controlled Trial.** Jennifer A. Dawson, C. Omar F. Kamlin, Arjan B. te Pas, Georg Schmoelzer, Susan M. Donath, Colm P.F. O'Donnell, Peter G. Davis, Colin J. Morley.
Publication 3212.7
- 10:45 Stylet for Intubation of Newborn Infants; a Randomised Trial.** Liam A.F. O'Connell, C. Omar F. Kamlin, Jennifer A. Dawson, Colm P.F. O'Donnell, Colin J. Morley, Peter G. Davis.
Publication 3212.8

3:15pm–5:15pm

3682 Late Breaker Abstract Session II: General Pediatrics

Platform Session ~ Room 340

Chairs: Cynthia F. Bearer and Gary S. Marshall

Sunday, May 3

9:00am–11:00am

3212 Late Breaker Abstract Session I: Neonatology

Platform Session ~ Ballroom IV

Chairs: Carl L. Bose and Richard J. Martin

- 9:00 Heat Loss Prevention in Delivery Room: A Randomized Controlled Trial of Polyethylene Caps in Very Preterm Infants.** Daniele Trevisanuto, Nicoletta Doglioni, Matteo Parotto, Massimo Micaglio, Vincenzo Zanardo.
Publication 3212.1
- 9:15 Does Low Dose Hydrocortisone Improve Volumetric MRI Measures of Cerebral Growth in Extremely Low Birth Weight (ELBW) Infants at High Risk for Bronchopulmonary Dysplasia (BPD)? A Randomized Trial.** Nehal A. Parikh, Robert Lasky, Jon Tyson, Kathleen Kennedy, Yanjie Zhang, Xintian Yu.
Publication 3212.2
- 9:30 Randomised Clinical Trial of Brain-Washing v Tapping Fluid for Post-Hemorrhagic Ventricular Dilatation in Premature Infants: Improved Cognitive Development at 2 Years.** Andrew Whitelaw, Sally Jary, Grazyna Kmita, Jolanta Wroblewska, Eva Swietlinska, Marek Mander, Linda Hunt, Michael Carter, Ian Pople.
Publication 3212.3
- 3:15 Sleep-Related Breathing Problems and Pediatric Blood Pressure Regulation.** Terrance J. Wade, Graham J. Reid, Laura K. Fitzgibbon, Nicole S. Coverdale, John Cairney, Deborah D. O'Leary.
Publication 3682.1
- 3:30 Improvement of Influenza Vaccination Rate of High Risk Pediatric Patients in an Inner-City Academic Pediatric Primary Care Clinic.** Zeina M. Samaan, Jennifer L. Kemper, Mona E. Mansour.
Publication 3682.2
- 3:45* The Hepatitis B Vaccine Booster Response among the Youth Who Had Completed Neonatal Hepatitis B Vaccines - Clinical Trial.** Chyi-Feng Jan, Kuo-Chin Huang, Li-Min Huang, Donald E. Greydanus, Dele H. Davies.
Publication 3682.3
- 4:00 Febrile Seizures and Measles, Mumps, Rubella, and Varicella Virus Vaccine (MMRV): A National Survey of Physicians.** Christina A. Suh, Matthew F. Daley, Wan-Ting Huang, Lori A. Crane, Christine Babbel, Jennifer Barrow, Mona Marin, Shannon Stokley, Karen Broder, Brenda Beaty, Allison Kempe.
Publication 3682.4
- 4:15 Family Centered (FACE) Advance Care Planning for Teens with HIV/AIDS: 3-Months out - Advance Directives, Psychological Adjustment, Quality of Life, Spirituality and Adherence.** Maureen E. Lyon, Patricia A. Garvie, Robert McCarter, Linda Briggs, Jiang He, Lawrence J. D'Angelo.
Publication 3682.5



2009 PAS Annual Meeting

Late-Breaker Abstract Presentations

Sunday, May 3 ~ Monday, May 4

- 4:30 Significant Changes in Antibiotic Management of *Staphylococcus aureus* Infections in U.S. Children's Hospitals from 1999-2008.** Joshua C. Herigon, Adam L. Hersh, Jeff S. Gerber, Theoklis E. Zaoutis, Jason G. Newland. *Publication 3682.6*
- 4:45* Headache in Preschool-Aged Children in the Emergency Room: Clinical Experience and Use of Computed Tomography.** Mandeep K. Grewal, William McClintock, Himanshu Keulas, Karin B. Nelson, Tarannum M. Lateef. *Publication 3682.7*
- 5:00* Prenatal Phthalate Exposure Is Associated with Childhood Behaviors Common to Both ADHD and Conduct Disorder.** Stephanie M. Engel, Amir Miodovnik, Chenbo Zhu, Antonio Calafat, Manori J. Silva, Mary S. Wolff. *Publication 3682.8*

Monday, May 4

9:00am–1:00pm

4357 Late Breaker Poster Session: General

Hall D & E

- 467* Can Pneumatic Otopscopy Improve the Diagnostic Accuracy of Otitis Media with Effusion in a Clinical Setting? A Randomized Single-Blind Control Trial.** Talal Alkhatib, Lily H.P. Nguyen, Saleem Razack, Fahad Alsaab, Maida J. Sewitch. *Publication 4357.467*
- 468 Safety and Immunogenicity of HPV Vaccine Administered Concomitantly with or Sequentially after MenACWY-CRM and Tdap Vaccines.** A. Arguedas, C. Soley, C. Loaiza, G. Rincon, S. Guevara, A. Perez, W. Porras, O. Alvarado, L. Aguilar, A. Abdelnour, C. Tonussi, A. Anemona, L. Bedell, P. Dull. *Publication 4357.468*
- 469 TB Contact Tracing in Botswana – Knowledge and Acceptability.** Gorewang Seropola, Tonya Arscott-Mills, Modongo Chawa, Chaiphus Cynthia, Kurup Shobha, Phologolo Thabo, Harari Nurit, Freidman Harvey, Steenhoff Andrew. *Publication 4357.469*
- 470 Avoiding Parallel Systems: Contact Tracing for TB in Botswana.** Nurit Harari, Tonya Arscott-Mills, Thabo Phologolo, Robert Makombe, James Shepherd, Harvey Freidman, Andrew Steenhoff. *Publication 4357.470*
- 471 Enhanced TB Diagnosis in Batswana Children.** Malebogo Ntshimane, Tonya Arscott-Mills, Thabo Phologolo, Robert Makombe, James Shepherd, Lesedi Makeng, Farai Chinhoyi, Agnes Nthokwa, Freidman Harvey, Steenhoff Andrew. *Publication 4357.471*
- 472 Towards True Partnership – Early Lessons Learned in a Botswana Pediatric HIV-TB Program.** Tonya Arscott-Mills, Nurit Harari, Thabo Phologolo, Japhther Masunge, Robert Makombe, Oathokwa Nkomazana, Jibril Haruna, Finalle Rodney, Freidman Harvey, Steenhoff Andrew. *Publication 4357.472*
- 473 Efficacy of Live Attenuated Influenza Vaccine in Children Against Opposite-Lineage Influenza B Strains.** Robert B. Belshe, Christopher S. Ambrose, Kathleen Coelingh, Xionghua Wu. *Publication 4357.473*
- 474 Docosahexaenoic Acid (DHA)-Supplemented Toddler Beverage Increases Blood DHA Levels in a Dose-Dependent Manner AND Improves Respiratory Outcomes.** Susan E. Carlson, Laura M. Minns, Debra K. Sullivan, Melanie R. Curtis, Susan H. Mitmesser, Carol L. Berseth, Cheryl L. Harris, Deborah A. Diersen-Schade. *Publication 4357.474*
- 475* Pediatric Traumatic Brain Injury: The Utility of Beta-Natriuretic Peptide.** Todd P. Chang, Alan L. Nager. *Publication 4357.475*
- 476* Knowledge Regarding HIV Transmission among Young Adults in China.** Amy Cortis, Kylie Kanze, David Kanze, Rossana Baracco, Bonita Stanton, Deepak Kamat. *Publication 4357.476*
- 477 Developing an Easy Method To Follow Up Lab Results in a Paediatric Emergency Department Called "Results Diary".** Samir Deiratany, Jessica Thomas, Konstantia Diana Stavrou, Ananya Mitra Kar, Santanu Maity. *Publication 4357.477*
- 478 Risk of Injury over the Summer in Children and Adolescents with Attention-Deficit/Hyperactivity Disorder.** Mark Olfson, Steven Marcus, Michael Durkin, Paresh Chaudhari, George Wan. *Publication 4357.478*
- 479 Myeloid Dendritic Cells from Infants with RSV Bronchiolitis Have Impaired Capacity To Induce CD4 T Lymphocyte Proliferation.** Gagan Bajwa, Maria de Salas, Kristin Long, Juanita Lozano-Hernandez, Octavio Ramilo, Michelle A. Gill. *Publication 4357.479*
- 480 Developmental Screening Tools – How Do They Impact Pediatric Resident Knowledge?.** Ashweena Gonuguntla. *Publication 4357.480*
- 481 Characteristics of Children Presenting with Apparent Life Threatening Events Found To Have Physical Abuse.** Elisabeth Guenther, Annie Eisinger, Rajendu Srivastava, Joshua L. Bonkowsky. *Publication 4357.481*
- 482 Outcome of Childhood Systemic Lupus Erythematosus with Lupus Nephritis (SLE-LN) Treated with or without Cyclophosphamide.** Mohammad Ilyas, Asad Tolaymat. *Publication 4357.482*
- 483* NMDA Receptor Subunit Composition in Human Parietal Cortex and White Matter: A Developmental Profile.** L.L. Jantzie, R.D. Folkert, J.J. Volpe, F.E. Jensen, D.M. Talos. *Publication 4357.483*
- 484 Toward an Integrative Approach to the Management of Chronic Headache in Adolescents: It's Time, It Works.** Thomas K. Koch, Laura P. Rubiales, Christina D. Bethell. *Publication 4357.484*
- 485* Impact of Social Factors on Asthma Triage in Children.** Kevin Kuriakose, Jon Roberts, Simcha Pollack, Mary Cataletto. *Publication 4357.485*
- 486 Using Clinician Opinion To Design Clinical Trials That Change Standards-of-Care.** Khalid Ibrahim, Nigel Paneth, Edmund LaGamma, Philip L. Reed. *Publication 4357.486*
- 487* Validation of the New Schwartz Equation in a Non-CKD Pediatric Population.** Robin LeBlond, John Brandt, Amy Staples, Craig Wong. *Publication 4357.487*
- 488 Histological and Chemical Analytical Features of Melamine-Containing Urinary Calculi in Cats and Dogs Exposed to Recalled Pet Foods and the Importance of Stone Analysis in Pediatric Nephrolithiasis.** Michael R. Lewin-Smith, Victor F. Kalasinsky, Anandita A. Datta, Todd O. Johnson, Margaret A. Hanson, Florabel G. Mullick. *Publication 4357.488*

* Indicates First Author is a Trainee (Student, Fellow, House Officer)



2009 PAS Annual Meeting

Late-Breaker Abstract Presentations

Monday, May 4

- 489 **Alternate Light Source to Examine Bruising.** Maria Lombardi, Robin Altman, Jennifer Canter, Paul Visintainer. *Publication 4357.489*
- 490* **Subclinical Diabetic Peripheral Neuropathy Is a Frequent Complication in Children with Diabetes as Measured by of the NC-Stat® System.** Andrey Mamkin, Irene Mamkin, Victoria Isakova, Pagali Murali, Steven Pavlakis, Svetlana Ten. *Publication 4357.490*
- 491 **Family Centered Mass Casualty Simulation.** Margaret J. McCormick, Nikki Austin, Marcie Weinstein, Wayne Nelson. *Publication 4357.491*
- 492 **Postpartum Depression (PPD) in an At-Risk Population Is Moderated by Life Stressors and a Length Polymorphism in the Promoter of the Serotonin Transporter Gene (5-HTT).** Daniel Notterman, Jeanne Brooks-Gunn, Iulia Kotenko, Kate Bartkus, Sara McLanahan. *Publication 4357.492*
- 493* **Renal Ultrasound for Febrile UTI in Children with Normal Prenatal Ultrasound, Useful or Wastage of Resources?.** Vishal Pandey, Nada F. Haddad, Aradhana Pandey, Rupesh Raina. *Publication 4357.493*
- 494 **Chlamydial Infection in Asymptomatic Sexually Active Adolescent Females from High Risk Inner City Communities in the South Bronx: How Often Should We Screen Them?.** T. Pavlova Greenfield, R. Nunez, M. Bronshtein, E. Marcial, R. Tomkin, Y. Sitnitskaya. *Publication 4357.494*
- 495 **Profiling Scoliosis in Rett Syndrome.** Alan K. Percy, Hye-Seung Lee, Daniel G. Glaze, Steve A. Skinner, Kathleen J. Motil, Jeffrey L. Neul, Jane B. Lane, Suzanne P. Geerts, Judy O. Barrish, Fran Annese, Joy Graham, Lauren McNair. *Publication 4357.495*
- 496* **TLR2 Mediates Recognition of Staphylococcus Epidermidis and Is Required for Clearance of Bacteremia.** Melanie R. Power, Tobias Strunk, David Burgner, Andrew Currie, Doug Golenbock, Victoria Philbin, Leighanne C. Gallington, Michael Otto, Peter Richmond, Ofer Levy. *Publication 4357.496*
- 497 **Parent Perspectives on Immunization Messages.** Linda Radecki, Lynn M. Olson, Mary Pat Frintner. *Publication 4357.497*
- 498 **Trends in Autism Spectrum Disorder Diagnoses: 1994-2007.** Rebecca E. Rosenberg, Amy M. Daniel, Kiely Law, Paul A. Law, Walter E. Kaufmann. *Publication 4357.498*
- 499 **How Well Do We Screen for Speech and Language Disorders in Children?.** Joseph L. Sage, Nada F. Haddad. *Publication 4357.499*
- 500 **WITHDRAWN**
- 501 **Effects of Ketamine in the Macrophage Response to Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA).** Thomas Spentzas, Elizabeth A. Meals, Lorraine Lazar, Mark Rayburn, Keith B. English. *Publication 4357.501*
- 502 **Hepatitis A in Internationally Adopted Children: The Need for Screening for Acute and past Infection.** Roohi Abdulla, Marilyn Rice, Kelly Hicks, Mary Staat. *Publication 4357.502*
- 503 **Estimating the Burden of Rotavirus Hospitalizations and Monitoring Trends Using Capture-Recapture Methods.** Mary Staat, Marilyn Rice, Daniel Payne, Joseph Bresee, T.C. Mast, Stephanie Donauer, Richard Ward, David Bernstein, Umesh Parashar. *Publication 4357.503*
- 504* **Prospective Monitoring of Regulatory T Cells in Pediatric Renal Transplant Recipients.** James E. Tong, Qizhi Tang, Paul Brakeman, Peter G. Stock. *Publication 4357.504*
- 505* **Regulatory T Cells in Pediatric Renal Transplant Recipients.** James E. Tong, Qizhi Tang, Paul Brakeman, Peter G. Stock. *Publication 4357.505*
- 506 **Increasing Adherence to Outpatient Treatment for Pelvic Inflammatory Disease: The Results of a Behavioral Intervention.** Maria Trent, Shang-en Chung, Michael Burke, Allen Walker, Jonathan M. Ellen. *Publication 4357.506*
- 507* **911 (Nueve Once): Identifying Barriers to Prehospital Emergency Care for Spanish-Speaking Families.** Jennifer Watts, John Cowden, A. Paula Cupertino, M. Denise Dowd, Chris Kennedy. *Publication 4357.507*
- 508 **Acculturation, a Traditional Mexican/Central American Diet and Risk for Pediatric Obesity in Latino Schoolchildren in San Francisco, CA.** Janet M. Wojcicki, Norah Schwartz, Arturo Jimenez-Cruz, Montserrat Bacardi-Gascon, Kate Holbrook, Melvin B. Heyman. *Publication 4357.508*

Full Late- Breaker Abstracts available online at www.pas-meeting.org or at the Information Desk onsite.

Late Breaker Poster Session I: Neonatal

Saturday 4:00 PM-7:30 PM

2849.482

Poster Board 482

Resident

Cholestasis of Pregnancy and Neonatal Outcome

Pratibha Ankola, Arun Aggarwal, Muhammad F. Noor, Pediatrics, Metropolitan Hospital Center, New York Medical College, New York, NY.

BACKGROUND: Intrahepatic cholestasis of pregnancy (ICP) is a clinical syndrome of multifactorial pathophysiology, occurring during the 2nd half of pregnancy and persisting until delivery. The incidence varies from 0.1%-1.5% in USA.

OBJECTIVE: Objective of our study is to detect the effect of cholestasis of pregnancy on neonatal outcome and to determine if pregnancy outcome and neonatal morbidities have a correlation with maternal and/or baby's bile acid (BA) levels.

DESIGN/METHODS: A retrospective study was done at Metropolitan Hospital Center, NY, from the year 03-08. Total of 41 mothers were diagnosed with ICP. Data collected from medical records of women included pruritis, jaundice, gestational age at delivery, type of delivery and laboratory tests (hepatic function tests, Hepatitis C antigen (HCA), serum BA levels). Information from 40 babies charts included admission to NICU or well baby nursery, length of stay in the hospital, associated morbidities, and laboratory tests (Cord BA level, Hepatic function tests and serum HCA).

RESULTS: Mean gestational age at delivery was 37.7±1.96 weeks. 7 of 40 mothers delivered preterm. Mean gestational age of preterm neonates was 34.28±1.49 weeks. 40 of 41 mothers had pruritis and 17% were treated with UDCA. Total serum bile acid levels were increased in 73% (30/41) of mothers. The mean serum BA level in the mothers who delivered preterm was 57±51.16 which was significantly high compared with a mean of 34.25±29.64 in all women with ICP. Serum AST, ALT and Alkaline Phosphatase level were elevated in 43.9%, 41.5% and 95.1% women respectively. 17.5% (7/40) neonates were admitted in NICU, 27.5% (11/40) were admitted in the transitional nursery and 55% were admitted in well baby nursery. Admission in NICU was due to prematurity and/or respiratory distress syndrome (RDS). RDS was present in 10% (4/40) of newborns out of which 3 were term and 1 was preterm (33 weeks). 2 of 20 neonates had elevated serum BA level. Serum AST and ALT levels were elevated in 6 and 1 neonate respectively. Mean length of stay of babies in the hospital was 3±2.14 days and mean length of stay in NICU was 4.7±4.6 days.

CONCLUSIONS: Cholestasis of pregnancy was associated with increased incidence of preterm births. Bile acid levels were elevated significantly in mothers who had preterm births. There was increased incidence of respiratory distress syndrome in full term neonates and increase in incidence (35%, 14/40) of caesarean section in the mothers with ICP.

2849.483

Poster Board 483

Mechanical Ventilation of Preterm Lambs for 3 Days Causes Alveolar Simplification and Persistently Altered Expression of Enzymes That Regulate Histone Acetylation

K.H. Albertine, M. Dahl, J. Alvord, C. Blair, Z. Wang, L. Dong, A. Wint, M. McCoy, R. McKnight, D. Null, B.A. Yoder, R.H. Lane, Pediatrics, University of Utah, Salt Lake City, UT.

BACKGROUND: Preterm (PT) neonates who require prolonged mechanical ventilation (MV) and develop chronic lung disease (CLD) frequently have alveolar simplification and long-term respiratory problems. The underlying molecular mechanisms are unknown but may be determined by epigenetic changes in histone acetylation, which influence regulation of gene expression. For example, PT lambs treated daily with valproic acid, a histone deacetylase (HDAC) inhibitor, during MV for 3d had more normal alveolar formation than MV controls.

OBJECTIVE: We hypothesized that 3d of MV in the preterm lambs will cause persistent alveolar simplification and thickened mesenchyme.

DESIGN/METHODS: Pregnant ewes were given dexamethasone before delivery of preterm (PT) lambs (~128d gestation; term ~150d). The PT lambs were intubated, given surfactant, managed by MV for 3d, weaned to high-frequency nasal ventilation (akin to nasal CPAP) for 3d, and weaned from ventilation support and lived for 10wk more (PT weaned; n=3). Control lambs were born at term gestation and lived for 8wk more (control; n=3). Lung tissue was analyzed by morphometry and immunoblot.

RESULTS: At 10wk of age (equivalent to 2yr of age in humans), after 3d of MV and subsequent extubation of the PT lambs, alveolar secondary septation was ~40% less (p<0.05), whereas mesenchymal thickness in the airspace walls was ~20% greater (p<0.05), than controls. Interestingly, the 3d of MV also decreased HDAC1 protein expression (~60% less, p<0.05), and increased histone acetyltransferase 2 (HAT2) protein expression (~15% more; p<0.05), in the 10wk-old PT lamb lungs compared to controls.

CONCLUSIONS: We conclude that a relatively transient period of MV of the PT lamb causes alveolar simplification 10wk after extubation. The finding of persistently altered HDAC1 and HAT2 expression was unexpected. That persistent alteration long after the initial insult (prematurity and MV) suggests a relatively stable change in the epigenetic regulation of these genes. Based upon recent publications demonstrating that epigenetic regulation of genes is more dynamic than originally thought, our findings suggest that one mechanism through which an early-life event causes persistent changes in gene expression is through altering the regulation of HDAC1 and HAT2 expression. (HL62875, HL56401, HD41075, CHRC).

2849.484

Poster Board 484

Comfort Measures for Tissue-Damaging Procedures in Canadian NICU's: Have We Improved over the past Decade? EPIPAIN Canada

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BACKGROUND: In Neonatal Intensive Care Units (NICUs), pain from routine procedures has been undertreated according to surveys in several countries for the past 15 years. Preterm infants were reported to undergo more than 10 procedures per day in the first week of life with less than 20% receiving analgesics. Guidelines have now been published detailing non-pharmacological interventions such as sucrose, as well as pharmacological methods to prevent pain. We repeated a survey in NICUs in Canada conducted 11 years ago to determine if the use of comfort measures for procedural pain in preterm infants has increased.

OBJECTIVE: To describe the current use of comfort measures for procedural pain in Canadian NICU's.

DESIGN/METHODS: Fourteen Canadian NICUs (level III) were audited from February to October 2007. Data were collected by staff using a checklist and by research assistants conducting chart audits and following up with staff for missing information. All infants that were inpatients during the audit were followed for one week and all invasive procedures, both tissue damaging and non-tissue damaging were recorded with information on analgesic and non-pharmacological interventions.

RESULTS: 582 infants with mean gestational age of 32.1 (sd 4.9) weeks and mean birthweight of 1970 gms (sd 1055) comprised the sample. Half the sample were less than 2 weeks old at the time of the study. A total of 3541 tissue-damaging events, an average of 6 per infant, or less than one per day occurred, with 56% having one or less, although 23 had more than 10/day. Of those procedures 46.7% receiving no comfort measures, 5.6% received pharmacological interventions 14.3% received sucrose/glucose and 33.4% received other non-pharmacological interventions. Older postnatal age and higher CRIB scores predicted use of analgesia. For the commonest procedure, heelstick, only 12% of the time was sucrose given (275/2214) despite the excellent quality evidence of efficacy; 84% of heelsticks were not accompanied by any analgesia or only by non-pharmacologic means (swaddling, soother etc). No effective analgesia was given for 78% of peripheral iv insertions, 57% of endotracheal intubations, and 45% of lumbar punctures.

CONCLUSIONS: Although the mean number of procedures per day has dropped significantly, comfort measures, including sucrose analgesia, are still not administered according to guidelines.

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Fellow in Training**VA ECMO Is Able To Maintain Brain Perfusion in a *Sus scrofa* Model of Endotoxic Shock**

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BACKGROUND: Risk of intracranial hemorrhage after ECMO treatment of severe cardiorespiratory failure remains high at 20%. A contributing factor of intracranial hemorrhage while on ECMO may be excessive brain perfusion during hypoxemic reperfusion. In addition, whether all areas of the brain are equally perfused with ECMO is unclear.

OBJECTIVE: The objective of this study was to determine whether ECMO perfusion in a pig model of endotoxic shock can be delivered without causing brain tissue damage.

DESIGN/METHODS: The effect of venous-arterial ECMO on microcirculation of different brain regions was compared between 8 control pigs and 7 pigs (7-10 kg) administered i.v. endotoxin to achieve at least a 30% drop in mean arterial pressure (MAP). Cardiac output (CO), blood gases, MAP, and central venous and carotid artery pressures were obtained, and microspheres for blood flow (BF) determination injected, at baseline, after endotoxin administration, 60 minutes after ECMO induction, and 2 hours after ECMO stabilization. ECMO flow rates were adjusted to maintain MAP and CO close to baseline levels. Tissues harvested for determination of BF and histology included cerebral cortex, cerebellum, brainstem, and midbrain.

RESULTS: Endotoxin caused a 40% decrease in MAP, CO, and oxygen delivery compared to baseline (p<0.05). ECMO was able to prevent further deterioration of MAP but not fully return CO to baseline levels. Systemic vascular resistance tended to increase in response to this CO drop. In control animals, maintenance of MAP and CO with ECMO caused an increase in brain perfusion (p<0.05) in all areas of the brain. In contrast, during endotoxin, brain BF to all brain regions were held constant by ECMO and there were no significant differences in brain oxygen consumption or extraction. Both control and endotoxic pigs showed no evidence of acute neuronal necrosis in the cortex, hippocampus, deep grey nuclei, and cerebellum upon examination of microscopic sections from the first two hours of ECMO.

CONCLUSIONS: The brain is preferentially perfused during endotoxic shock and ECMO can maintain brain blood flow without causing overperfusion. Further, all brain regions appear to be equally perfused. In a healthy, control animal however, matching ECMO delivery with baseline CO causes overperfusion of the brain. Results show that ECMO in both control and endotoxin-exposed animals does not cause structural brain tissue damage in the acute stabilization period.

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Maturation of Brain Activity in Preterm Infants with Post-Hemorrhagic Ventricular Dilatation

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 BACKGROUND: Intraventricular hemorrhage (IVH) and its sequelae, post hemorrhagic ventricular dilatation (PHVD), are significant risk factors for developmental delay in preterm infants. Severe progressive PHVD, measured by serial cranial ultrasounds and rapidly increasing head circumference, is treated with placement of a reservoir to facilitate removal of CSF. Continuous amplitude-integrated electroencephalography (aEEG) is used to evaluate the maturational status of the brain through improvement in background activity and presence of sleep-wake cycles. Continuous background pattern and emergence of sleep wake cycles occurs by 30 weeks in infants without IVH.

OBJECTIVE: We hypothesize that infants with PHVD will demonstrate delay in brain maturation and removal of CSF will improve brain activity.

DESIGN/METHODS: Infants with severe progressive PHVD admitted for reservoir placement to Primary Children's Medical Center from 10/06 to 12/08 were eligible for this study. Clinical decisions (frequency of cranial ultrasound, timing of reservoir insertion, and frequency of CSF removal) were made by the attending physician. One to 2 times per week, aEEG was performed prior to, during and after CSF removal.

RESULTS: Fifteen infants were enrolled in this study. Infants had grade 2 (1), grade 3 (5), or grade 4 (9) IVH with average GA 27.8±1.6 weeks. Postnatal age at the time of reservoir placement was 34.7±12.6 days (32.5±1.8 weeks). Eight infants (53%) demonstrated a more continuous background pattern immediately after removal of CSF. Overall, infants achieved predominantly continuous background at 36.6±2.8 weeks and 3 infants never demonstrated continuity. After removal of CSF, 6 infants (40%) demonstrated emergence of sleep wake cycles. Sleep wake cycles were continuously present by 34.9±2.6 weeks. Seizures were present in 8 (53%) infants.

CONCLUSIONS: In infants with severe PHVD, maturation of brain activity (continuous background pattern and emergence of sleep wake cycle) was delayed at least 1 month when compared to preterm infants without IVH. Removal of CSF resulted in at least a transient improvement in brain activity as evidenced by earlier appearance and retention of sleep wake cycles and improved continuity of background. It is concerning that clinically silent seizures were noted in ~50% of the infants remote from the time of acute injury of IVH. We speculate that severe ventricular dilatation has an adverse effect on brain maturation and earlier resolution of hydrocephalus may lead to improved outcomes.

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Feasibility of Flash-Heating Breastmilk To Reduce Maternal to Child Transmission of HIV

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BACKGROUND: WHO recommends HIV+ mothers exclusively breastfeed (EBF) for 6 mos unless replacement feeding is acceptable, feasible, affordable, sustainable and safe. Risk of mother to child transmission (MTCT) is lower during EBF than mixed feeding. After 6 mos of EBF, adequate replacement foods are often unavailable and are immunologically inferior. Flash-heating (FH) is a simple technology for home pasteurizing breastmilk that inactivates HIV and preserves milk's nutritional and anti-infective properties.

OBJECTIVE: To determine feasibility of FH once complementary foods are introduced and to identify factors that promote or hinder successful FH.

DESIGN/METHODS: In this ongoing, prospective, longitudinal study, community health workers visit 100 HIV(+) mothers in Dar es Salaam, Tanzania weekly from 2 - 9 mos postpartum. The mother is counseled on FH if infant is HIV(-) at introduction of complementary foods. Participants are surveyed weekly about infant health and feeding practices, including frequency, duration and volume of Flash-heated milk. Unheated and heated milk samples are collected biweekly for bacterial and viral tests.

RESULTS: 24 of 61 (39%) mothers with HIV(-) infants have chosen FH. 8 have discontinued (mean duration 14 days) and 16 continue (mean duration 8 weeks thus far), including 4 mothers who continue FH after study termination at 9 mos postpartum. Mean frequency is 4 times daily, median and range of frequency are 3 and 1-7 respectively. Mean daily milk volume is 435 mL; range is 60 to 1080mL. 23 of 73 unheated milk samples have pathogens; all heated samples are bacteriologically negative. 50% of FH mothers have disclosed their status to their spouse. Mothers frequently gave non-disclosure as reason for deciding not to FH or for FH briefly. Field staff suggest stigma is a major obstacle to FH and could be reduced by providing FH instruction to all mothers, rather than only HIV(+) women, and encouraging disclosure of HIV status to partners.

CONCLUSIONS: FH is a novel, inexpensive and simple technology for reducing MTCT of HIV that some women can successfully use to improve their infant's diet after 6 mos of EBF. It could also be used during other high risk times, such as mastitis, nipple lesions or oral thrush in infant. FH may be most successful among women who have disclosed their status. Based on this feasibility data, an efficacy study of FH on infant health outcomes is warranted.

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Undergraduate Student

The Clinical Impact of Leukotriene Receptor Antagonist in the Prophylaxis of Bronchopulmonary Dysplasia

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 BACKGROUND: Montelukast (Singulair), a selective antagonist of the leukotriene D4 (LTD4), can inhibit bronchoconstriction and inflammatory cell infiltration which are also possible mechanisms of bronchopulmonary dysplasia.

OBJECTIVE: The primary aims of the study were to evaluate the impact of singulair administration on the duration of ventilator use and oxygen dependence. The secondary aims of the study were to evaluate the impact of singulair administration on the length of hospital stay, the nutrition status and the percentage of the oxygen dependence at PCA 36 weeks.

DESIGN/METHODS: This is a prospective, randomized study of neonates who are admitted within 72 hours of life and receive ventilator support more than 3 days (IMV, NIMV, CPAP). Thirty-two infants were enrolled in this study, and they were divided into either control group or singulair group according to their sequence of admission. Singulair (granule form, 2mg per day) was administered after the parental consent was obtained and feeding was initiated.

RESULTS: There is no difference between two groups in the demographic data including gestational age, birth weight, Apgar score at 1 and 5 minute, delivery route, the initial laboratory data and respiratory condition. The timing of initiating singulair administration was the 8.3th day of life on the average. The duration of ventilator use (study vs. control (median): 12 vs. 16 days, $p=0.406$) and oxygen dependence (study vs. control (median): 22.8 vs. 30 days, $p=0.850$), the length of hospital stay (study vs. control (median): 32 vs. 35 days, $p=0.985$) and the nutrition status was similar between the two groups. When we focus on infants with gestational age less than 32 weeks, there are seven neonates in both groups. The duration of ventilator use (study vs. control (median): 31 vs. 33.5 days, $p=0.749$), the nutrition status and the percentage of the oxygen dependence at PCA 36 weeks (bronchopulmonary dysplasia) was similar between the two groups. The duration of oxygen dependence (study vs. control (median) : 59 versus 67 days, $p=0.481$) and the length of hospital stay (study vs. control (median) : 59 versus 68 days, $p=0.608$) was shorter in the singulair group but not statistically significant.

CONCLUSIONS: There is no significant effect on the duration of ventilator use and oxygen dependence, the length of hospital stay, the nutrition status and the frequency of bronchopulmonary dysplasia after prophylactic singulair administration.

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Copper Status in Cholestatic Infants Should Guide Parenteral Nutrition Supplementation

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BACKGROUND: Copper (Cu) is an essential cofactor for multiple oxidative enzymes, including erythrocyte superoxide dismutase (SOD) and Ceruloplasmin (Cp). Cu deficiency occurs in cholestatic infants receiving reduced Cu in their parenteral nutrition (PN) and leads to anemia, bone abnormalities and growth retardation.

OBJECTIVE: To evaluate Cu status of cholestatic infants receiving regular and reduced doses of Cu in their PN.

DESIGN/METHODS: Prospective cohort study of cholestatic infants receiving > 50% of caloric needs from PN, recruited from 3 hospitals in Atlanta. Cholestasis is defined as a direct bilirubin > 2 mg/dl. The infants are divided into 2 groups. Group 1 comprises infants receiving 20µg/kg/day of Cu daily in their PN. Group 2 comprises 50 infants receiving ≤ 10µg/kg/day of Cu daily in their PN. Patients were evaluated at time of enrollment and monthly thereafter for 6 months if they continued to receive PN. Healthy control age-matched infants had serum Cu, Cp levels and SOD activity measured on a single occasion.

RESULTS: 67 infants (Control, n=13; Group 1, n=32; Group 2, n=22) were enrolled. Mean gestational age ± SD of the infants at birth was 31.4 ± 4.8 weeks, birth weight 2050 ± 1146 g, chronological age at enrollment 11.3 ± 10.2 weeks and weight on enrollment 3593 ± 1357 g. All groups were similar for these variables. Necrotizing enterocolitis (32%) was the most common cause of TPN dependence. There were differences noted between the groups at enrollment in the levels of ceruloplasmin and AST (table). 22.7% (5) of group 2 were identified with low serum copper with only 18% (4) having abnormally low Cp. There was no Cu deficiency in the other groups. Infants in group 2 received more red blood cell (rbc) transfusions compared to those in group 1. There was a significant relationship ($p<0.05$) between serum copper and Cp ($r=0.8$), total bilirubin ($r=0.5$) and PN duration ($r=0.3$).

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Biochemical values of infants at enrollment

	Control	Regular copper dose	Reduced copper dose
Serum copper (mg/dl) ¹	85.3±41.4	69.7±29.9	80.9±61.6
SOD activity	15.5±3.9	18.4±13.2	19.5±15.3
ALT (U/L)	94.7±77.8	121.6±72.7	134.6±106.7
AST (U/L) ²	78.1±38.6	180.3±146.5	205.4±191.8

p<0.05¹ p=0.056² between control and reduced

CONCLUSIONS: Infants receiving reduced copper in PN have low serum Cu and this is associated with need for more rbc transfusions. Cu status of patients on long term PN should be routinely monitored.

2849.490

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Individual Patient Data Meta-Analysis: Novel Approach to Interpreting HFOV Trials in Preterm Infants

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BACKGROUND: The interpretation of aggregate data meta-analysis of trials comparing high-frequency oscillatory ventilation (HFOV) with conventional ventilation (CV) in preterm infants has been confounded by heterogeneity in study design and outcomes. Individual patient data (IPD) meta-analysis offers potential benefits in elucidating and minimising the sources, nature and impact of such heterogeneity, providing new outcomes and insights into data interpretation.

OBJECTIVE: To determine if HFOV offers benefit over CV for neonatal outcomes, and to explore subgroup specificity and effect-modifying factors.

DESIGN/METHODS: A collaborative study group provided all available original patient level data from elective HFOV trials. Fourteen new variables and 13 new outcomes were created using pre-specified common definitions. Data were analyzed for a comprehensive range of 25 determinants, 25 outcomes and 10 subgroups.

RESULTS: Data from 3229 preterm infants (89% of all eligible infants) were obtained. The relative risk (RR) of death or bronchopulmonary dysplasia at 36 w postmenstrual age (BPD) was 0.95 (95% CI 0.88-1.03) and of death or severe adverse neurological event 1.00 (0.88-1.13). We found no evidence that trial-level factors (type of ventilator, ventilation strategy) or patient-level factors (gestation, small for gestational age, initial lung disease severity) modified the overall treatment effect. New findings include: reduced risk of surgical ligation of patent ductus [RR 0.67 (0.48-0.93)] and severe retinopathy of prematurity [RR 0.83 (0.70-1.00)] with HFOV. Gross pulmonary air leak was not significant different [RR 1.08 (0.88-1.32)], but risk of any pulmonary air leak was higher [RR 1.17 (1.02-1.34)] with HFOV. Infants whose mothers did not receive antenatal corticosteroids benefited more from HFOV [weighted mean difference in postnatal age at last day of O₂ -6.26 d (-11.53 to -0.99 d)]. Sensitivity analyses of degree of missing data and cross-over, and of trial size did not change the results.

CONCLUSIONS: This first neonatal IPD meta-analysis confirms previous findings that HFOV confers no significant benefit over CV for the combined outcome of death or BPD, and no increased risk of death or neurological harm. New information includes no evidence of effect modification by several patient- and trial-level factors. This powerful new tool unlocks exciting opportunities for mechanistic interpretation of clinical trial outcomes.

2849.491

Poster Board 491

Reduction of Ventilator Associated Pneumonia (VAP) in the NICU after Implementation of VAP Bundle

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BACKGROUND: Ventilator-Associated Pneumonia (VAP) is the second most common nosocomial infection in the United States. VAP infections are most commonly due to micro-aspiration of infected oral and/or gastric fluids or patient contact with contaminated caregivers hands or respiratory equipment. VAP in the NICU is difficult to diagnose and is associated with increased mortality, cost and length of stay.

OBJECTIVE: A multidisciplinary team was established to review the literature and develop a VAP Bundle for the NICU patient. While VAP bundles have been effective in reducing VAP in adult ICUs, there are few reports of results in the NICU. The goal was to reduce the incidence of VAP in the NICU.

DESIGN/METHODS: The NICU VAP Bundle included developmentally appropriate oral care with VAP Guard (Hawaii Medical Pembroke, MA) every 4 hours or at touch time, daily assessment for extubation, excellent hand hygiene, cleaning of high touch surfaces once per shift, closed suction system, changing circuits only when visibly soiled, normal saline NOT to be routinely used when suctioning, and suctioning of oral cavity FIRST prior to routine patient care. RN, RT and medical staff were trained on VAP prevention protocols. All ventilated infants were included in the study. Data on VAP infections for the 8 months prior to implementation of the VAP bundle were compared to data 10 months post bundle. CDC guidelines for infants less than 1 yr of age were used to diagnosis VAP. Each suspected case was reviewed by Respiratory Care Specialist, Radiologist, Neonatologist and Infection Control Nurse. VAP is reported as infections per 1,000 vent days.

RESULTS: During the 18 month study period there were 7 cases of VAP in our NICU, 6 cases before implementation of the VAP bundle and 1 case after. All infants had birth weights between 750 and 1,000 grams. In the eight months prior to the bundle implementation the VAP rate was 17.2 per 1,000 vent days. In the 10 months post implementation the rate dropped to 3 per 1,000 vent days.

Incidence of VAP Pre-Post Bundle in a 26 Bed Level III NICU

	Pre-Bundle	Post Bundle
Ventilator Days	349	333
Cases of VAP	6	1
VAP Rate per 1,000 vent days	17.2	3.0

CONCLUSIONS: Implementation of a VAP bundle including oral care reduces the incidence of VAP in the NICU.

2849.492

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Fellow in Training

Long Term Economic Evaluation Alongside the Caffeine for Apnea of Prematurity (CAP) Trial

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BACKGROUND: Recently, the Caffeine for Apnea of Prematurity (CAP) trial reported on premature infants with birth weights less than 1250 grams who received caffeine therapy or placebo for apnea of prematurity. Caffeine-treated infants had improved survival without neurodevelopmental impairment (NDI) at 18 to 21 months corrected age (New Engl J Med, 2007; 357:19). Although caffeine therapy was associated with a decrease in duration of ventilation, the cost implications have not been explored.

OBJECTIVE: To determine the cost-effectiveness of treatment with caffeine compared to placebo for apnea of prematurity, in infants with birth-weight less than 1250 grams, from birth through 18 to 21 months corrected age.

DESIGN/METHODS: We undertook a retrospective economic evaluation of the cost per survivor without NDI, using individual patient data from the clinical trial (n=1869). We included comprehensive direct medical costs either to the insurance payer or the hospital but excluded costs to parents and society, such as lost productivity. We multiplied local resource utilization data from the clinical trial, including days of ventilation, type of surgery or drug dosage, by unit costs for each resource. Unit costs were derived from two separate sources of Canadian costs for similar patient populations. We also included the costs of post-discharge hospitalizations using data from the Ontario Case Costing Initiative. We used a price of \$0.21 per mg of generic caffeine citrate for our base case analysis. All costs were expressed in 2008 Canadian dollars and discounted at 3%. The time horizon for this analysis extended through 18 to 21 months corrected age in order to match the clinical trial.

RESULTS: The mean cost per infant was \$124,467 in the caffeine group and \$133,505 in the placebo group (difference of \$9,038, adjusted p = 0.01). Cost-effectiveness analysis showed caffeine to be a "dominant" or "win-win" therapy: in 100% of 1000 bootstrap replications of the analysis, caffeine-treated infants had simultaneously better outcomes and lower mean costs. These results were robust to a twenty five-fold increase in the cost of caffeine in a one-way sensitivity analysis.

CONCLUSIONS: In comparison to placebo, caffeine therapy for apnea of prematurity in infants less than 1250 grams is economically appealing up to 18 to 21 month corrected age.

2849.493

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Genetic Variations in IL18RL1 and IL18RAP Associate with the Development of Bronchopulmonary Dysplasia in African Americans Infants

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BACKGROUND: Genetic influences account for more than 50% of the variation in the risk for developing bronchopulmonary dysplasia (BPD). Identification of specific genes associated with increased risk creates the potential to tailor prevention and/or treatment strategies to particular populations.

OBJECTIVE: To ascertain associations of targeted candidate genes (n=601) with BPD, we performed single nucleotide polymorphism (SNP) genotyping on DNA samples from 1099 infants with a gestational age < 35 weeks.

DESIGN/METHODS: The Illumina platform was used for genotyping 6930 SNPs including tag SNPs from the candidate genes, non-synonymous SNPs, and SNPs to assess ethnicity. Ancestry Informative markers were used to assign ethnicity for Caucasians (CA; n=922) and African Americans (AA; n=169). Association testing used the linear trend test with correction for multiple comparisons utilizing the Q-value method. BPD was defined as need for O₂ therapy at 28 days of life.

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RESULTS: Complete data for determination of BPD were available for 115 AA and 682 CA infants. Although the incidence of BPD was somewhat higher in the CA group the trend was not significant (CA: 22.4%; AA: 14.8%, $p=0.103$, z -test). Genotype analysis revealed multiple significant SNPs associated with BPD. In the African American BPD group, two SNPs, rs3771150 and rs3771171, remained statistically significant (vs. AA without BPD; $p < 0.05$) after correction for multiple comparisons. Within the AA group, the frequency of rs3771150 was 0.098 in infants without BPD and 0.38 in infants with BPD; for rs3771171, the frequency was 0.093 in infants without BPD and 0.38 in infants with BPD. The respective genes for these SNPs are interleukin 18 receptor accessory protein (IL18RAP; rs3771150) and interleukin 18 receptor 1 (IL18RL1; rs3771171).

CONCLUSIONS: Both IL18RAP and IL18RL1 are located on chromosome 2q12.1 approximately 80kb apart. IL18RL1 belongs to the interleukin 1 receptor family and mediates IL18 signal transduction and IL18RAP enhances IL18 binding activity of IL18RL1. Both are required for NF- κ B and MAPK8 (JNK) activation in response to IL18, indicating a role of inflammation. Since inflammatory processes play a pathogenic role in BPD, our data indicate that genes in the 2q12.1 locus may contribute to the development of BPD in African American infants. Supported by NIH HL34788.

2849.494

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Fellow in Training

Assessing Safety and Performances of the Neonatal Mode Adult ICU Ventilators on a Test Bench

Matteo Fontana, Antoine Payot, Sylvain Morneau, Martin Cyr, Francois Lellouche, Philippe Juvet. Pediatrics, CHU Sainte-Justine, Montréal, QC, Canada; Internal Medicine, Cardiology and Pneumology University Institute, Laval, QC, Canada. **BACKGROUND:** Test bench studies are essential to discover potentially harmful situations related to respirators.

OBJECTIVE: To assess safety and specific performances of adult ICU ventilators adapted and approved for newborns on a test bench with settings relevant to specific neonatal clinical conditions.

DESIGN/METHODS: Six adult ICU and one neonatal ventilator were connected to a test lung simulating breathing of a newborn lung. Trigger characteristics, accuracy of delivering the prescribed Positive Inspiratory Pressure (PIP), Positive End Expiratory Pressure (PEEP) and Volume (V) in Assist-Control mode were evaluated. Clinical conditions were simulated.

RESULTS: One adult ICU ventilator appeared to be unreliable and demonstrated very limited performance on every performed test. For the other six ventilators, quality of the trigger for a call of -2 cmH₂O was similar: time to trigger ranged between 45-60 ms; pressure needed to trigger was of 0.08-0.14 cmH₂O; Performance to pressurize the lung 150 ms after beginning of inspiration was better in the later generation of ventilators (up to 0.74 cmH₂O) than in the neonatal. All ventilators were able to compensate an increased resistance of 200 cmH₂O/l/s with a maximum difference ranging $\pm 12\%$ of the issued volume. Accuracy to deliver the prescribed V, PIP and PEEP varied from 5% for the best performing ventilator to 22% for the worst performing. A sudden change of 1.5L/min in the expiratory flow rate led to a minimal variation of the delivered PEEP by the five ventilators (up to 0.5 cmH₂O); delivered PIP variation ranged between 0.2 and 1 cmH₂O. However, sudden increase in lung compliance in Volume-Controlled mode led to a considerably increased delivered V among all respirators (up to 310% of prescribed V), representing potential risk of pneumothorax.

CONCLUSIONS: Bench tests are essential to evaluate the safety of ventilators before they are used on patients, particularly with low birth weight infants, whose lungs are susceptible to baro- and volutrauma. One of the tested ventilators was unable to adequately support respiratory efforts of simulated small newborns lungs. All other respirators showed a dangerous increase of the delivered V after sudden change of lung compliance, suggesting that particular attention must be paid to setting the limits. With such consideration, these ventilators seem to be well adapted for use in neonatology.

2849.495

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Fellow in Training

Humidified High Flow Nasal Cannula Versus Nasal CPAP in Preterm Infants Less Than 28 Weeks Gestation: A Retrospective Matched Case-Control Study

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BACKGROUND: Humidified high flow nasal cannula (HHFNC) provides non-invasive positive airway pressure. Trials to determine the safety and effectiveness of HHFNC in extremely low birthweight infants (ELBWI) have not been undertaken.

OBJECTIVE: To compare the respiratory outcome of HHFNC versus nasal CPAP (NCPAP) in ELBWI after matching for antenatal steroids, gestation, birthweight, surfactant and length of invasive mechanical ventilation.

DESIGN/METHODS: Retrospective matched case-control study between 2004 and 2008 in a single tertiary care neonatal unit. All patients below 28 weeks gestation without congenital anomalies included. Outcome measures analyzed: total days of NCPAP, HHFNC, non-invasive respiratory support and oxygen requirement; sepsis, postnatal dexamethasone, nasal bridge lesions, pneumothorax and oxygen requirement at 36 weeks and discharge, and discharge weight. Statistical analysis performed using dependent two-tailed Wilcoxon test. Statistical significance assumed if $p < 0.05$.

RESULTS: 39 ELBWI received HHFNC+NCPAP and 40 ELBWI received only NCPAP.

Characteristics and outcome of ELBWI on HHFNC + NCPAP or NCPAP alone

	HHFNC+NCPAP	NCPAP	p value
Gestational age	27 (26-28)	27 (26-27)	0.41
Birth weight	930 (782-1170)	980 (840-1078)	0.92
Antenatal steroids dose	1 (1-2)	1 (1-2)	0.71
Surfactant dose	1 (1-1)	1 (1-2)	0.14
Ventilation days	3 (1-9)	4 (1-13)	0.20
NCPAP	13 (5-28)	25 (10-41)	0.01
HHFNC	9 (4-19)		
Total days non-invasive respiratory support	30 (13-42)	25 (10-41)	0.39
Postnatal dexamethasone	1/39	2/40	0.56
Nasal bridge lesions	0/39 (HHFNC only)	10/79 (total NCPAP)	0.002
Pneumothorax	0/39	2/40	0.08
Oxygen at 36 weeks	14/39	9/40	0.21
Oxygen at discharge	4/39	3/40	0.66
Sepsis (total days of antibiotics)	14 (9-23)	11 (5-23)	0.98
Discharge weight	2250 (2007-2762)	2255 (2048-2478)	0.99

Table 1. Displayed are median and interquartile range or ratio of patients

CONCLUSIONS: Our study demonstrates that HHFNC significantly shortens the time on NCPAP without increasing overall length of non-invasive respiratory support in ELBWI. Unlike NCPAP HHFNC does not cause any nasal bridge trauma and potentially reduces the risk of pneumothorax. HHFNC produces equal respiratory outcome at discharge.

2849.496

Poster Board 496

Intra Abdominal Hypertension and Bladder Pressure Measurements in Sick Neonates

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BACKGROUND: Intra abdominal hypertension (IAH) is known to markedly increase the risk for bowel ischemia, end-organ dysfunction/failure and death. However, IAH is not well defined in the neonate.

OBJECTIVE: Using bladder pressure measurement as a surrogate for intra abdominal pressure (IAP), we sought to define the range of bladder pressure, and thus IAH, in neonates receiving intensive care who were ill enough to require an indwelling urinary catheter.

DESIGN/METHODS: Informed consent was obtained for NICU patients at Primary Children's Medical Center, Salt Lake City, UT, who required an indwelling urinary catheter. A pressure monitoring system (AbViser, Wolfe Tory Medical, Inc, Salt Lake City, UT) was attached to the catheter and periodic q2-4h static pressure measurements were made until the catheter was discontinued. Clinical diagnosis and outcome were recorded.

RESULTS: Between Jan 2006 and Apr 2008 32 neonates were enrolled in the study and data were collected on 30. Median birth weight and gestational age were 2580 g and 37 wk, respectively. Median duration of study was 5.5d. 18 neonates (60%) required staged abdominal surgery for gastroschisis/omphalocele (9), CDH (7), or bowel perforation (2). Other patients were being treated for PPHN (8), sepsis (3), or hydrops (1). Overall 13 (43%) required ECMO and 25 (83%) survived. 1219 bladder pressure measurements were obtained. The median bladder pressure (interquartile range) for all measurements was 8 mmHg (3-10 mmHg) with a mean (sd) of 7.1 (5.7) mmHg. The 90th %tile was 13 mmHg; 5 measurements were noted >25 mmHg. 85% of values >90th %tile occurred in patients post operatively, compared to 15% in patients pre-operatively or who did not have abdominal surgery ($p < 0.001$, Fisher's Exact). 13 of 18 post operative patients (72%) had bladder pressure measurements >90th %tile, compared to 2 of 12 non surgical patients (18%) ($p=0.008$, Fisher's Exact).

CONCLUSIONS: We conclude that as a surrogate for IAP, bladder pressure is easily measured in sick infants during neonatal intensive care. We found that median IAP (8 mmHg) was higher than the upper limit of normal central venous pressure (5.9 mmHg) for this patient population, raising concern for reduced/obstructed venous return. The 90th %tile of our data (13 mmHg) was in good agreement with the Grade 1 IAH boundary set by the World Society of the Abdominal Compartment Syndrome.org at 12 mmHg. For these data, IAH occurred most frequently in neonates following abdominal surgery.

2849.497

Poster Board 497

Long-Term Effects of Morphine Analgesia in Ventilated Preterm Neonates

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BACKGROUND: Poor neurological outcomes initially and later neurodevelopmental problems are common for preterm children in the NICU. Research suggests that those poor outcomes in preterm neonates might be reduced by morphine analgesia.

OBJECTIVE: This pilot study examines the long-term effects of pre-emptive morphine analgesia in ventilated preterm neonates during their NICU stay.

DESIGN/METHODS: Ex-preterm children who were enrolled in the NEOPAIN Trial were contacted for follow-up. The NEOPAIN trial was a placebo-controlled, blinded, clinical trial comparing the clinical and neurological outcomes of 898 preterm neonates randomized to receive continuous infusions of morphine or placebo in the NICU. This pilot project assessed 17 children (7 placebo and 10 morphine) at 5-7 years of age. One placebo subject

was excluded due to physical condition limiting ability to participate. The remaining 16 were assessed on a variety of outcome measures—the SB-V, CRS, WRAT-4, CBCL, VABS, and the NCTR Operant Task Battery.

RESULTS: Average age of the children was 6.007 years of age (SD = 0.2). The average chronicle age at birth was 26.75 weeks (SD = 0.59), and average birth weight was 1225 grams (SD = 64). Results on the operant tests suggested that the morphine group had greater variability in scores and performed significantly more poorly on the DMTS task, suggesting poor short-term memory. The DMTS choice response latency was significantly longer in the morphine group than the placebo group. Furthermore, morphine children were somewhat less accurate at each delay interval. No significant differences were found on the PR task. Additional outcome measures were assessed regarding cognitive, adaptive functioning, academic, executive functioning, emotional and behavioral skills. No significant differences were found between the placebo and morphine groups.

CONCLUSIONS: Results of this pilot study suggest that there are significant long-term differences among the placebo and morphine groups as children reach school age. While the sample size is small in the study, significant differences in measures assessing short-term memory were found. A more inclusive investigation of the effects of neonatal morphine on long term functioning is needed.

2849.498

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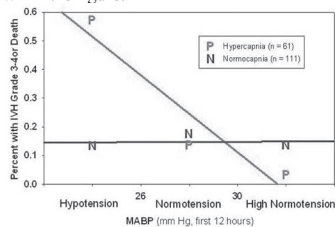
Permissive Hypercapnia Is Associated with IVH in Hypotensive ELBW Infants but Not in Normotensive Infants

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BACKGROUND: We found that VLBW infants classified as receiving permissive hypercapnia (PH) were no more likely to develop intraventricular hemorrhage (IVH) than infants classified as receiving normocapnia (Hagen EW et al. Pediatrics 2008;122:e583-e589). However, a subgroup of especially vulnerable infants with PH appeared to be at higher risk of IVH.

OBJECTIVE: To evaluate the interaction of hypotension and PH in the risk of IVH to test the hypothesis that hypotensive ELBW infants are at high risk of IVH when managed with PH. **DESIGN/METHODS:** Wisconsin ELBW infants born during 2003-2004 surviving at least 72 h were classified as receiving PH (n=61) or normocapnia (n=111) during the first 24 h according to a well-validated algorithm. For all infants, mean arterial blood pressure (MABP) during the first 12 h were averaged. Hypotension was defined as average MABP <gestational age in wks (<26 mm Hg, n=22). Normotension was categorized into 2 ranges: 26-30 mm Hg (n=68) and >30 mm Hg (high, n=82). The outcome of IVH grade 3-4 or death in the first 10 d was analyzed. Logistic regression was used to examine the interaction between PH and MABP, adjusted for gestational age. Odds ratios with CIs were obtained within BP groups.

RESULTS: Birth weight (783±118 vs 770±141 g), gestational age (25.8±1.9 vs 25.8±1.6 wks), and SNAP score (21.5±13.3 vs 23.8±13.1) were similar between infants with PH and normocapnia. Fraction of infants with grade 3-4/death at <10 d, within PCO₂ ventilatory strategy by MABP is shown in the figure.



There was an interaction (p=0.0029) between PCO₂ strategy and MABP in the relationship with IVH/death. The odds ratios [95% CI] for PH vs normocapnia for the outcome were 8.7 [0.72, 15] (p=.054), 0.75 [0.18, 3.6], and 0.3 [0.006, 2.9], for hypotension, normotension, and high normotension, respectively.

CONCLUSIONS: ELBW infants with hypotension and PH were more likely to develop severe IVH or die than those in the normocapnic group. Hypercapnia may be injurious when ELBW infants are hypotensive.

2849.499

Poster Board 499

Cathepsin-B Is Activated as an Executive Protease in Fetal Alveolar Type II Epithelial Cells Exposed to Hyperoxia

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BACKGROUND: Hyperoxic lung injury is a main contributing factor to the genesis of chronic lung disease in preterm infants. Type II(TII) cells are critical target of hyperoxia-induced lung injury. Apoptosis of TII cells has been observed as a critical event in the development of lung injury, and its mechanism has been mainly focused on caspase-dependent pathway. However, there have been some evidences that showed the morphological changes of alveolar epithelial cells(AECs) during hyperoxia presented generally necrotic or overlapping features of apoptosis and necrosis. Hence, the mechanisms that occur death of AECs during hyperoxia is required to be investigated more carefully.

OBJECTIVE: I hypothesized that fetal alveolar type II(FATII) cells might undergo death through not only caspase-dependent but caspase-independent pathway during hyperoxia which might induce necrosis and apoptosis-like cell death depending on the amount of proteolytic enzyme released secondary to hyperoxia.

DESIGN/METHODS: FATII cells were isolated on E19(term=E22), and cultured on silastic membranes and exposed to 65%-oxygen for 24h and 48h using an oxygen chamber. The cells in normoxic condition were used as controls. Cytotoxicity was analyzed by LDH release, and apoptotic activity, by TUNEL assay. Proteolytic enzyme, cathepsin-B(CB) activity was analyzed by assay kit, and caspase-3, 8 and 9 activities, by colorimetric activity assay kits. **RESULTS:** 65%-hyperoxia increased LDH release by 56%(<.05) and 67%(<.05), apoptosis by 4-fold(<.05) and 2.2-fold(<.05), CB activity by 43%(<.05) and 62%(<.05), caspase-3 activity by 36%(<.05) and 10%(NS), and caspase-9 activity by 28%(<.05) and 15%(<.05) at 24h and 48h respectively compared to controls. Caspase-8 did not change significantly during 48hs' hyperoxia.

CONCLUSIONS: 1) 65%-hyperoxia induces cell death via necrosis and apoptosis on FATII cells, and necrosis is increased significantly as time progresses. 2) CB activity is enhanced greatly in FATII cells exposed to 65%-hyperoxia, that implicates CB might play an important role in executing cell death program in FATII cells during hyperoxia. 3) Persistent increase in caspase-9 activity may be related to cell death via caspase-independent pathway mediated by CB. In conclusion, caspase-independent pathway mediated by cathepsin-B is presumed be involved in inducing FATII cell death during hyperoxia. This understanding may contribute to lead to the development of therapeutic strategies for lung injury in preterm infants.

2849.500

Poster Board 500

Shc Proteins Competitively Inhibit TGF-β-Induced Smad Signaling

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BACKGROUND: TGF-β signaling is canonically mediated by Smad proteins that are activated upon serine phosphorylation by TGF-β receptors. However, TGF-β receptors also possess a tyrosine kinase activity that enables them to directly bind and phosphorylate Shc adapter proteins, thereby initiating the well-characterized Shc signaling pathway leading to Erk MAP kinase activation. Since Shc and Smad proteins are both phosphorylated by the TGF-β receptor complex, these ligands may compete for the same kinases.

OBJECTIVE: We hypothesized that Shc silencing would increase TGF-β induced Smad activation. Since all three Shc proteins (46^{Shc}, p52^{Shc}, and p66^{Shc}) are phosphorylated by TGF-β, we further hypothesized that suppressing individual Shc isoforms would also increase Smad activation.

DESIGN/METHODS: Shc isoform expression was attenuated by transfecting Mv1Lu mink lung epithelial cells with either p66^{Shc} siRNA or a pan-Shc siRNA that silences all three Shc isoforms. Shc silencing was subsequently confirmed by Shc Western analysis. To assess Smad signaling, cells were co-transfected with the p3TP promoter-reporter construct and stimulated with 4 ng/ml TGF-β for 24 h. The cells were then lysed and the induced luciferase activity was quantitated by luminometry. To assess Smad2 phosphorylation, transfected cells were rested for 24 h, starved in serum-free medium overnight, and stimulated with 4 ng/ml TGF-β for up to 30 min. The cells were then lysed, resolved by SDS-PAGE, and subjected to phosphorylated Smad2 Western analysis.

RESULTS: Pan-Shc silencing was associated with 50% increase in TGF-β stimulated p3TP activity while p66^{Shc} silencing was associated with a 20% increase. Similarly, p66^{Shc} and pan-Shc silencing both increased TGF-β-induced Smad2 phosphorylation.

CONCLUSIONS: These results suggest that Shc proteins competitively inhibit Smad association with the TGF-β receptor complex, thereby regulating Smad signaling. Competitive inhibition of Smad activation appears to represent a mechanism by which the canonical Erk activation pathway regulates TGF-β signaling.

2849.501

Poster Board 501

Fluoroimmunoassay of AFP and β-hCG from Dried Blood Spots Samples and Its Application in Prenatal Screening for Down's Syndrome during Second-Trimester

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BACKGROUND: Second-trimester screening detecting maternal serum markers for DS is effective for selecting women for chorionic-villus sampling or amniocentesis . But in some part of China, DS screening is not yet well developed because of limited economic and laboratory conditions. We propose a new screening method in which AFP and β-hCG is detected with fluoroimmunoassay method from dried blood spots samples during second-trimester to provide an estimate of a woman's risk of having a pregnancy affected by DS. With dried blood spots method, it would be very convenient to transport screening samples to designated laboratories, and thus greatly promote DS screening nationwide. As commercial kits of AFP and β-hCG in dried blood spots are not yet available, we designed the experimental procedures first.

OBJECTIVE: Establish a method to detect AFP and β-hCG using dried blood spots on filter paper in second trimester and evaluate its feasibility in prenatal screening for DS. **DESIGN/METHODS:** We detected the level of AFP and β-hCG from extracts of dried blood spots samples collected during second-trimester with dissociation enhanced lanthanide fluoroimmunoassay (DELFLIA), and evaluated the recovery, imprecision and detection limit of this new method. With the confirm of its feasibility, We detected AFP and β-hCG from both dried blood spots and conventional serum samples collected from 1320 women of 15 to 20 gestational weeks. DS risk were evaluated through specificity, sensitivity, Youden Index and accuracy of AFP and β-hCG in dried blood spots and serum samples respectively.

RESULTS: In dried blood spots method, when corresponding whole-blood concentrations of AFP and β -hCG is $>0.5\mu\text{g/ml}$ and $>1\text{ng/ml}$ respectively, the recovery of AFP and β -hCG is $>92.6\%$ and $>94.5\%$ respectively; imprecision of both AFP and free β -hCG are $<10\%$. The correlation coefficient of AFP between serum and dried blood sample is 0.97 and free β -hCG is 0.96. The difference of screening results from the 1320 subjects between these two methods are not statistically significant. With serum screening test as golden standard, accuracy of dried blood spots method is 99.4%.

CONCLUSIONS: We explore a new method to detect the level of AFP and β -hCG through dried blood samples. The feasibility of dried blood spots method detecting AFP and β -hCG for DS screening is confirmed by our study.

2849.502

Poster Board 502

Fellow in Training

Conserved Tyrosine Adjacent to the Fusion Peptide Domain of HIV gp41 Is Critical for Fusion

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BACKGROUND: HIV is an enveloped retrovirus that requires fusion between its membrane and the target cell membrane to initiate infection. The envelope gene encodes the attachment and fusion glycoprotein, gp160, which undergoes cleavage by a furin-like convertase as it transits through the Golgi of an infected cell, yielding gp120 with the attachment sites, and gp41 with the fusion activity. Each gp41 molecule contains a fusion peptide at its N-terminus followed by two α -helices. Like other class 1 fusion proteins, gp41 is a trimer, which when triggered, forms a six-helix bundle that pulls the two membranes together, resulting in membrane fusion. Comparison of the gp41 sequence of the known class 1 fusion proteins of retroviruses and paramyxoviruses revealed a conserved tyrosine (Y75) in close proximity to the fusion peptide.

OBJECTIVE: Our hypothesis is that Y75 and its context are critical for fusion induction. DESIGN/METHODS: To test this, we individually mutated Y75 and the amino acids surrounding it, V69 through Q80, to alanine in gp160 JRFL. We have tested 7 of these mutants by transfection into TZM-bl cells and incubation at 37°C for 18 hr. Because TZM-bl cells express CD4 and CCR5, the two required HIV receptors, expression of a functional gp160 results in the fusion of the transfected cell with neighboring cells.

RESULTS: The Y75A mutation completely ablated fusion between adjacent cells, consistent with our hypothesis. Q79A diminished, but did not ablate fusion. The V69A, L70A, V72A, D78A and Q80A mutations had no effect on syncytia formation.

CONCLUSIONS: These results indicate that the conserved Y75 is critical for the gp41 fusion function.

2849.503

Poster Board 503

Student

Regulation of Autophagy in Intestinal Epithelial Cells during Starvation as an In Vitro Model of Necrotizing Enterocolitis

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BACKGROUND: Necrotizing enterocolitis (NEC) is a devastating intestinal disease and a leading cause of morbidity and mortality among premature infants. Premature neonates face severe starvation following birth when the trans-placental nutrient supply is suddenly interrupted until maternal milk can be safely administered. Autophagy is the major regulator in the turnover of cytoplasmic constituents, but is rapidly upregulated under starvation conditions as an initial mechanism of cell survival. We have previously shown that Beclin-1, an essential autophagy protein, is increased in a rat model of NEC compared to dam fed controls. An intestinal epithelial cell line was implemented to clarify the autophagy process under similar starvation conditions. ATG-5, LC3 and Beclin-1 are essential regulators in the formation of the autophagosome membrane required for the turnover of cellular components.

OBJECTIVE: The aim of this study was to evaluate the timeframe and effect of starvation on the expression of essential autophagy regulators in intestinal epithelial cells (IEC-6).

DESIGN/METHODS: Non-transformed rat intestinal epithelial IEC-6 cells were cultured in medium containing 10% fetal bovine serum (FBS). Media was replaced at time zero for predetermined time intervals with media containing 10% FBS and media devoid of 10% FBS. Expression of ATG5, Beclin-1 and LC3 were evaluated using Western blot.

RESULTS: Starvation significantly increased expression of ATG5 at 1 hour and continued through 12hrs. Expression of LC3II, the autophagosome membrane bound form of LC3, was significantly increased after 1.5hrs of starvation, while LC3I, the cytoplasmic LC3 isoform, was significantly decreased following starvation of 1.5hours. Starvation markedly increased Beclin-1 expression after 6hrs and continued through 12hrs. However, at 24hrs of starvation the amount of all autophagy proteins were markedly decreased compared to those in healthy control groups.

CONCLUSIONS: These results indicate an activation of the autophagy pathway in intestinal epithelial cells, IEC-6, as a result of starvation. Autophagy may have an important role in the short term protection against the starvation state related to NEC disease progression, but may lead to cell death if required in excess. Supported by the NIH Grant HD-39657 (to B.D.)

2849.504

Poster Board 504

Third Trimester Middle Cerebral Artery Doppler Blood Flow Predicts Neonatal Behavioral State Regulation on Day 6 in Infants with Prenatal SSRI Antidepressant Exposure

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BACKGROUND: Prenatal exposure to selective serotonin reuptake inhibitor (SSRIs) antidepressants increase risk for poor neonatal adaptation, however the fetal antecedents remain unknown.

OBJECTIVE: This study investigated associations between third trimester fetal vascular flow/indices and behavioral state regulation in 6-day old infants with prenatal SSRI exposure.

DESIGN/METHODS: At 36 weeks gestation Doppler middle cerebral artery (MCA) blood flow velocity waveforms (Aloka 5500) were obtained from SSRI exposed (EXP) (n=16) and nonexposed (NEXP) (n=30) fetuses at 0800 hrs, prior to daily SSRI dose. On day 6 (mean 142.4 hours after delivery) the Neonatal Assessment of the Preterm Infant (NAPI) and supplemental measures from the Neonatal Behavioral Assessment (NBAS) were used to assess newborn behavior. Maternal mood (Hamilton Rating Scale for Anxiety and Hamilton Rating Scale for Depression) at 36 weeks and 5-min Apgar scores were covariates.

RESULTS: At 36 weeks gestation MCA resistance indices (pulsatility index, resistance index, systolic/diastolic ratio) were significantly lower in the EXP group, controlling for maternal mood (all p 's < 0.05). In separate regression models (EXP, NEXP), lower MCA indices were associated with reduced neonatal alertness (NAPI), and behavioral state regulation (NBAS: examiner persistence, state regulatory capacity, robustness and endurance, increased irritability and cost of attention), but only among EXP infants, controlling for prenatal maternal mood and 5-minute Apgar scores (all p 's < 0.05). Irritability (NBAS) was also associated with increased maternal depression symptoms at 36 weeks gestation, but only in the NEXP. Prenatal MCA flow was not associated with measures of motor behavior.

CONCLUSIONS: SSRI exposure appears to moderate the relationship between 3rd trimester MCA blood flow and neonatal behavior. Reduced fetal MCA blood flow predicted blunted behavioral state regulation, but only in prenatally exposed neonates, controlling for maternal mood and Apgar scores. These findings suggest that the antecedents to altered neonatal behavior following prenatal SSRI exposure may be already evident during gestation. Thus, behavioral disturbances outside the immediate newborn period may reflect altered brain function rather than pharmacological toxicity or impact of maternal mood.

2849.505

Poster Board 505

Irradiance Readings of Phototherapy Equipment in Some Neonatal Units in Nigeria – We Need More Light

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BACKGROUND: Phototherapy is the most common treatment modality for neonatal hyperbilirubinaemia. A measure of the efficacy of phototherapy is the reduction in the in the exchange blood transfusions (EBT) which has reduced dramatically in developed countries. Many EBTs are still commonly being performed in newborn units in Nigeria. Efficacy of phototherapy shows a clear dose-response expressed as irradiance in watts per square meter per nanometre. To the best of our knowledge the irradiance of phototherapy machines are not routinely being monitored in Nigeria.

OBJECTIVE: To measure the irradiance of phototherapy machines in selected newborn units in Nigeria since this may be part of the problem.

DESIGN/METHODS: The units were visited without prior notice but the purpose of the visit was explained and permission obtained. Only the phototherapy machines in use on the day of visit were evaluated. The irradiance readings were taken at the levels of the babies using BiliBlanket Meter II by Ohmeda Medical.

RESULTS: A total of 63 readings from 12 units consisting of nine Teaching Hospital (2 State), two Federal Medical Centres and one State Specialist Hospital. Irradiance readings ranged between 0.5 and $18.4\mu\text{W/cm}^2/\text{nm}$ with mean and SD of 3.9 and 3.3. The phototherapy units varied widely from locally made ones, made from wood to old re-fabricated machines; to modern equipment in the relatively newer hospitals. The distance between babies and the phototherapy unit varied between 45 and 60 cm. The distributions of the readings were < 5 (47; 74.6%), 5-10 (12; 19.0%) and > 10 (4; 6.4%). For 13 imported 'intact' machines with all blue bulbs the readings were: range 2.5-18.4 $\mu\text{W/cm}^2/\text{nm}$; mean 7.6 and SD 4.4. For the 23 locally made, mostly with daylight bulbs the readings were: range 0.5-4.2 $\mu\text{W/cm}^2/\text{nm}$; mean 1.9 and SD 1.1.

CONCLUSIONS: None of the phototherapy units was delivering 'intensive phototherapy' defined as irradiance of $30\mu\text{W/cm}^2/\text{nm}$ or higher in the 400- to 520-nm band delivered. Adjustments to current phototherapy to provide intensive phototherapy are curricula to reducing the incidence of acute bilirubin encephalopathy in Nigeria.

2849.506

Poster Board 506

Fellow in Training

Unique TLR8-Mediated Activation of Neonatal Antigen-Presenting Cells by Imidazoquinolines

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BACKGROUND: Human newborns are functionally immunodeficient and mount poor memory responses creating an unmet medical need for effective neonatal vaccine adjuvants. Human neonatal APCs show impaired TLR-mediated activation in response to agonists of TLRs 1-7, reflecting the inhibitory effect of high cAMP levels in neonatal cells. In contrast, TLR8 agonists are capable of activating TNF production from APCs, suggesting efficacy as neonatal vaccine adjuvants.

OBJECTIVE: Development of TLR8 agonists as potential neonatal vaccine adjuvants requires a more comprehensive understanding of their immune-activating effects, their mechanism(s) of action, and the age range of their optimal effects.

DESIGN/METHODS: TLR8 agonist-induced TLR transcriptome activation in human neonatal cord blood MoS was assessed by quantitative RT-PCR, kinase activation using phospho-specific mAb-conjugated fluorescent beads, the role of cAMP using dibutyl (db)-cAMP and neonatal Mo-derived DC (MoDC) co-stimulatory molecule expression using flow cytometry. TLR-mediated cytokine production was measured in blood derived from Rhesus macaque monkeys at birth and throughout infancy. In addition, TLR8-induced CD40 expression was measured on infant Rhesus macaque myeloid DCs. siRNA experiments targeting TLR8 and Btk were performed using primary neonatal antigen presenting cells.

RESULTS: We have demonstrated that TLR8 agonists in neonatal APCs induce: a) broader and more robust activation of the TLR transcriptome and of cytokine protein production, b) co-stimulatory molecule upregulation, c) selective kinase phosphorylation, d) refractoriness to the inhibitory effects of db-cAMP, e) IFN- α expression (TLR7/8 agonist) and f) greater TNF production than other TLR agonists in neonatal and infant Rhesus macaque whole blood. Furthermore, selective mRNA knock-down of TLR8 and Btk reveals their importance in 3M002-induced TNF production in human neonatal APCs.

CONCLUSIONS: The unique ability of TLR8 agonists to trigger robust innate immune responses in neonatal APCs may reflect engagement of Btk signaling pathways refractory to cAMP-mediated inhibition and suggests that these agents may be effective vaccine adjuvants for neonates and infants.

2849.507

Poster Board 507

A Systematic Review of RCTs Comparing Placental Transfusion with Early Cord Clamping. Are More RCTs Necessary?

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BACKGROUND: Placental transfusion describes delayed clamping of the cord, milking cord blood into the baby (before or after clamping) or both, as the baby is held at or below the level of the placenta. Our Cochrane Review [Rabe H, et al. 2004] showed delayed clamping for 30 - 120 seconds reduced intraventricular haemorrhage (IVH) and blood transfusions versus early clamping, with no difference in other outcomes.

OBJECTIVE: To perform a systematic review of RCTs of placental transfusion versus early clamping of the umbilical cord in infants < 37 weeks gestation.

DESIGN/METHODS: We searched the Cochrane Pregnancy and Childbirth and Neonatal Group registers, Cochrane Central Register of Controlled Trials (Cochrane Library, Issue 4, 2007), PubMed and EMBASE to 16 January 2009 for relevant RCTs in infants < 37 weeks gestation.

RESULTS: We included 15 studies (734 infants). As in our earlier review, placental transfusion was associated with reductions in IVH and blood transfusions, with no difference in survival to discharge. New findings are increased mean BP at 4 h, and less necrotizing enterocolitis (NEC) and use of inotropic support.

Placental Transfusion (PT) v Early Cord Clamping (EC)

Outcome	No. of RCTs	PT	EC	Effect (Relative Risk or Mean Difference* and [range])	p value
Survival	13	316/326	326/343	1.04 [0.99, 1.09]	NS
Apgar 5 min	6	0.01*		[-0.09, 0.12]	NS
Mean BP 4 h	2	2.49*		[0.26 - 4.42]	0.03
Inotropes	4	9/78	22/80	0.42 [0.23, 0.77]	0.004
Transfused	7	43/186	74/206	0.60 [0.45, 0.80]	0.005
PDA	5	17/108	18/115	0.98 [0.55, 1.76]	NS
IVH	10	33/260	57/279	0.55 [0.38, 0.79]	0.001
IVH Grade 3,4	6	5/154	7/151	0.68 [0.23, 1.96]	NS
Oxygen 36 wks	5	19/104	28/105	0.69 [0.42, 1.13]	NS
NEC	5	24/117	40/124	0.62 [0.43, 0.89]	0.009

with permission CDSR

CONCLUSIONS: The probable benefits of placental transfusion now include a reduction in NEC, but long term outcomes are unknown, particularly in infants < 30 weeks gestation. Net clinical benefit or harm each remain possible. Large RCTs with childhood follow up are not only ethical, but essential. A planned prospective meta analysis of all new RCTs will help evaluate this promising intervention reliably.

2849.508

Poster Board 508

The Process of Antenatal Consent in a Large Multicenter Trial

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BACKGROUND: Research in infants involving randomization at the time of birth usually requires that informed consent be carried out in the antenatal period. Trial projections often fail to recognize that the number enrolled may be significantly less than those screened or consented.

OBJECTIVE: This study was designed to quantify the time and effort involved in enrolling infants into the NICHD Neonatal Research Network SUPPORT trial and to better predict the true cost of recruitment into a complex interventional trial requiring antenatal consent.

DESIGN/METHODS: A data form was designed to quantify eligible mothers at each center, determine who approached them, how often, the duration of contact and whether the infants were eventually enrolled.

RESULTS: 2798 women were identified at 18 collaborating units as being at risk for premature delivery at 24 to 27 6/7 wks GA between October 2005 and February 2009. 2211 were approached for informed consent. Most common reasons for not approaching included fetal abnormalities, active labor and language barriers. A study coordinator/research RN made 74% of all approaches. For 77% of those approached, consent was attempted < 3 times. (Overall mean 2.0 +/- 1.2). Estimated GA at time of screening was not different for those who consented vs those who did not. 7% of those screened were identified as having been approached for another maternal study and 1% for another neonatal study. Of the 2211 mothers approached, 1209 gave consent, 575 subsequently delivered 652 infants within study window, and 532 delivered 607 infants that were enrolled. 45 consented infants born in the GA window were not enrolled. Only 19% of those screened delivered infants subsequently enrolled in the study. There was a significant relationship between performing a neonatal consult and obtaining consent (p<.0001). Centers that are also NICHD Maternal Fetal Medicine network centers enrolled at a higher rate and were more likely to use < 30 minutes to request consent.

CONCLUSIONS: In a complex interventional trial of preterm infants, nearly 5 women were identified as likely to deliver a baby in the window for every infant enrolled in the trial. Extrapolating these data to all 1310 infants enrolled in the SUPPORT trial suggests that > 6000 women were screened. These data should assist in developing the true cost of trials requiring antenatal consent.

2849.509

Poster Board 509

Electrical Cardiometry in the NICU, Is It Feasible?

Mitch Rodriguez, Barbara Weaver, Andrew Bozeman, Bao P. Ho, Robert L. Vogel. Department of Pediatrics, Medical Center of Central Georgia, Macon, GA; Biology, Mercer University, Macon, GA; Professor of Biostatistics, Georgia Southern University, Statesboro, GA.

BACKGROUND: *Background:* The evaluation of the hemodynamic state of the critically ill neonate remains a challenge in neonatal medicine. Clinical indicators of the circulatory pathophysiology of the neonate have not been shown to be effective measurement tools in evaluating cardiac output (CO). An evaluation was begun of a new hemodynamic monitor, the Aesculon® (Cardiotronic, La Jolla, CA), designed to measure small stroke volumes (SV). The technology, Electrical Cardiometry, measures the difference in electrical impedance between systole and diastole due to changes in red blood cell orientation during the cardiac cycle and the flow time to derive thereof an estimate of SV.

OBJECTIVE: *Objective:* The aim of this study is to evaluate this noninvasive hemodynamic monitor in a Level III NICU for ease of use, tolerance, user reproducibility and baseline data.

Late Breaker Poster Session I: Neonatal

DESIGN/METHODS: *Methods:* Study period Oct. 2008-Feb. 2009. Institutional IRB approval obtained. Inclusion criteria: Weight > 500 grams, APGAR scores >3 at 5 minutes, no congenital heart disease, non-surgical neonates and stable cardiorespiratory status. The Aesculon® monitor was used to demonstrate its ease of application, tolerance and complications encountered in its use, the reproducibility of its CO values, and the relationship of CO and SV to weight.

RESULTS: *Results:* Data from 75 patients was analyzed; SV and CO values were obtained on all patients. More than 200 measurements were analyzed from 75 infants (590 to 4000 grams). Measurements were noninvasive with no infant discomfort or adverse events documented during the study period. Reproducibility was good with a variance component for operator < 1% and for time < 0.5% of total variability for both CO and SV. SV and CO correlated well with body weight. The measured cardiac output in our study population was 120cc/kg/minute to 350cc/kg/minute.

CONCLUSIONS: *Conclusions:* The application of the Aesculon monitor in the neonatal patient differs little from the usual monitoring system currently in place, making this process tolerated by the neonate. No serious adverse complications were identified during the period in which measurements were obtained. SV and CO data points were obtained in all our patients. Our study shows that electrical cardiometry derived CO and SV are reproducible and may be helpful in monitoring the NICU patient.

2849.510

Poster Board 510

The Incidence of Kernicterus in Canada 2007-2009

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BACKGROUND: Hyperbilirubinemia is the most common cause of neonatal readmission to hospital in Canada despite existing strategies aimed to identify these infants prior to discharge. Severe neonatal hyperbilirubinemia and kernicterus continue to be reported worldwide in otherwise healthy term infants. The incidence of kernicterus in Canada is not known.

OBJECTIVE: 1) Establish the incidence of kernicterus in Canada. 2) Identify epidemiological and medical risk factors which may be useful in preventing this disease, whether it is selective screening of newborns for serum bilirubin, G6PD deficiency and Coombs' testing, or measuring serum bilirubin in all newborns prior to discharge from hospital.

DESIGN/METHODS: **CASE DEFINITION** Children between 0 and 5 years of age with: Criteria 1 •History of significant neonatal hyperbilirubinemia (peak bilirubin >425µmol/L or exchange transfusion) and two or more of the following symptoms: a) extrapyramidal disorders eg. dystonia, athetosis, b) other movement disorder such as spasticity or hypotonia, c) gaze abnormalities, d) sensorineural hearing loss, e) intellectual deficits, f) enamel dysplasia of the deciduous teeth OR Criteria 2 •Abnormal MRI with bilateral lesions of basal ganglia/midbrain (globus pallidus+ subthalamic nucleus) with a history of neonatal hyperbilirubinemia. Data on children meeting the above case definition was collected prospectively through the Canadian Paediatric Surveillance Program between 2007-2009.

RESULTS: After 24 months of surveillance, 21 cases have been reported. 14 cases, have been confirmed, in 13 of the cases the diagnosis was established under one years of age. 11 infants diagnosed had abnormal MRIs. The remaining infants had neurological abnormalities consistent with kernicterus, a history of severe hyperbilirubinemia, and abnormal auditory evoked responses.

CONCLUSIONS: Kernicterus continues to occur in Canada at a rate that appears to be higher than previous estimates in the literature. A conservative estimate for the incidence of kernicterus in Canada would be 1 in 45,000 births (based on a Canadian birth rate of 300,000 infants per year). In light of new guidelines for the management of hyperbilirubinemia in Canada, ongoing surveillance is necessary to monitor if kernicterus is being prevented.

2849.511

Poster Board 511

Neonatal Hypoxic-Ischemic Encephalopathy (HIE): Use of Stage of Encephalopathy and Amplitude Integrated EEG (aEEG) in Predicting Adverse Outcome

S. Shankaran, A. Pappas, S. McDonald, The NICHD Neonatal Research Network

BACKGROUND: The Sarnat stages and aEEG are used to evaluate acute neonatal HIE. OBJECTIVE: To examine the relationship of stage of HIE at <6 hrs and aEEG by 9 hrs with outcome in infants with and without hypothermia therapy.

DESIGN/METHODS: Term infants with severe acidosis/birth resuscitation and HIE (moderate/severe) at <6 hrs were eligible in the NICHD RCT of whole body hypothermia for HIE or following RCT, when above criteria was met and aEEG attempted by 9 hrs. aEEG background was categorized as continuous normal voltage (CNV), discontinuous normal voltage (DNL), burst suppression (BS), continuous low voltage (CLV) or flat tracing (FT). Surviving infants had assessments at 18 months and primary outcome designated as death or moderate/severe disability.

RESULTS: 181 infants were enrolled (83 in RCT and 98 after RCT); 140 infants had aEEG by 9 hrs. 117 readings were usable (10 missing/13 technically unsatisfactory). 9 infants were lost to follow up; of 108 infants with outcome assessed, 57 received cooling at <6 hrs to 33.5°C for 72 hrs. Among all study infants, 71 had moderate, 37 severe HIE; aEEG background was CNV among 12 infants, 12 had DNL, 22 had BS, 26 had CLV and 36 had FT. 53 infants had death or moderate/severe disability. Primary outcome occurred in 30 severe vs 23 moderate HIE (P<.01) with sensitivity (SENS) 0.57, specificity (SPEC) 0.87, positive predictive value (PPV) 0.81 and negative predictive value (NPV) 0.68. Abnormal aEEG (BS, CLV or FT) was associated with primary outcome (n=47) P=.01 with SENS 0.89, SPEC 0.33, PPV 0.56 and NPV 0.75. Among cooled infants, abnormal aEEG (n=47) was associated with primary outcome (n=24) P<.01; among non-cooled infants, abnormal aEEG (n=37) was not associated with primary outcome (n=29) P=NS. Of 45 infants with aEEG <6 hrs, abnormal aEEG (n=30)

predicted primary outcome (n=20) P<.05, while abnormal aEEG at 6-9 hrs (n=54) was not related to primary outcome (n=33) P=NS. The PPV of primary outcome with an abnormal exam (moderate and severe HIE) among the 45 infants with aEEG < 6 hrs was .44, while PPV of abnormal aEEG in this group was .57.

CONCLUSIONS: Both stage of encephalopathy at <6 hrs and abnormal aEEG at <9 hrs are associated with death or disability following HIE; aEEG may enhance predictive accuracy, but both have limitations. The influence of cooling and time of acquisition of aEEG needs further study.

2849.512

Poster Board 512

Fellow in Training

Amplitude Integrated Electroencephalogram (aEEG) Findings in Infants with Broncho-Pulmonary Dysplasia (BPD)

Ross Sommers, Abbot Laptook, Pediatrics, Women and Infant Hospital, Providence, RI.

BACKGROUND: Infants with BPD are at risk for poor neurodevelopmental outcomes. Tests to determine which infants with BPD are at risk for poor outcome are needed.

OBJECTIVE: To determine if there are differences in the aEEG recordings of infants with and without BPD.

DESIGN/METHODS: This is a cross sectional study of infants who were ≤ 27 weeks at birth and did (n=12) or did not develop BPD (n=14). Infants with grade III/IV intra-ventricular hemorrhage, cystic peri-ventricular leukomalacia, and major anomalies were excluded. BPD was determined by a room air challenge test performed at 36⁺-36⁶ weeks. aEEG tracings were recorded at 36⁰-36⁶ weeks for 6 hours using the BrainZ BRM3. aEEG parameters from a cross cerebral channel were evaluated using offline software Analyze(BrainZ). Projected sample size is 15 infants per group. Demographic, perinatal, neonatal morbidities, and aEEG variables were compared between groups.

RESULTS: Infants with BPD had lower gestational age and birth weight, and a higher male predominance (25⁰±1 weeks, 668±195 grams, 67%) compared to non-BPD infants (26⁰±0.9 weeks, 816 ±167 grams, 29%, all p< 0.05). BPD infants had a longer duration of ventilation and more post-natal steroid use for blood pressure or ventilator dependence (42±24days, 75%) compared to non BPD (9±12 days, 0% all p< 0.01). There were no differences in race, culture positive sepsis, patent ductus arteriosus, necrotizing enterocolitis, or days to full feeds. At aEEG acquisition, BPD infants had lower weight, and a greater use of diuretics and caffeine (1702±426 grams, 33%, 50%) compared to non-BPD (2112±460 grams, 7%, 14%, all p<0.03). In between sleep wake cycles, BPD infants had a larger aEEG bandwidth (10±2.6 vs. 7.6±1.4 mcV, p< 0.01) and higher lower border voltage (8.8±0.9 vs. 8.0±0.6 mcV, p< 0.02) compared to non BPD infants. During sleep wake cycles BPD infants had larger bandwidth (15.6±3.3 vs. 12.3±1.9 mcV, p<0.005) but similar lower border voltage (5.8±1.1 vs. 6.0±1 mcV) compared to non BPD infants. Infants with BPD had less sleep wake cycles per hour compared to non BPD infants (0.52±0.08 vs. 0.62±0.09, p<0.01). There were no group differences for amount of time with a discontinuous tracing.

CONCLUSIONS: Infants with BPD have differences in their aEEG tracings compared to infants without BPD at 36 wks. Differences may reflect altered brain maturation, medication effects, or brain injury. Further study of infants with developing BPD using aEEG appears justified.

2849.513

Poster Board 513

Neonatal Thrombocytosis: A Report of 25 Patients with Platelet Counts Exceeding 1,000,000/mL

Susan E. Wiedmeier, Erick Henry, Jill Barnett, Tricia Anderson, Robert D.

Christensen, Department of Pediatrics/Division of Neonatology, University of Utah School of Medicine, Salt Lake City, UT; Department of Women and Newborns, Intermountain Healthcare, Salt Lake City, UT.

BACKGROUND: Thrombocytosis has been reported in neonates, but little is known of its prevalence, timing-onset, associated conditions, sequelae, and outcomes. To better understand thrombocytosis in neonates, we used the data repositories of a multi-hospital system to identify all neonates with a platelet count ≥ 1,000,000/µL.

DESIGN/METHODS: We identified all neonates with a platelet count recorded during the six-year period 2003 through 2008, in any Intermountain Healthcare facility. From archived electronic records and paper charts we obtained the information provided in this report for patients with a platelet count ≥1,000,000/µL.

RESULTS: Among 40,471 neonates who had one or more platelet counts during this period, extreme thrombocytosis was identified in 25 (prevalence estimate, 1 per 1,600). None of the cases were identified within the first week of life. Half occurred by day 36, but 25% did not occur until after day 48. The prevalence of thrombocytosis had no relationship with birth weight or gestational age but a predominance of female patients was noted. Eleven (44%) patients had antecedent infectious disorders documented and 7 (28%) had had antecedent surgical procedures performed. Four patients were healthy preterm infants with mild anemia. Only one patient had no recognized antecedent condition associated with thrombocytosis.

Conditions Associated With Extreme Thrombocytosis Condition	n(%)
Infection	11(44)
Surgical Procedure	7(28)
Cardiac	2
ENT	2
Neurologic	2
General	1
Metabolic	
Congenital Adrenal Hyperplasia	1
Hematologic	
Anemia	4(16)
Pharmacologic	
Prenatal methadone exposure	1
No predisposing condition identified	1

Only one of the 25 cases received antiplatelet treatment; thrombocytosis resolved in all. No instances of pathological thrombosis or hemorrhage were detected; no sequelae were identified, and no deaths occurred.

CONCLUSIONS: The 25 cases we report are all consistent with reactive thrombocytosis, not clonal thrombocytosis. We speculate that the pathogenesis generally involves an antecedent, recognized or unrecognized, infectious or inflammatory condition. From this series and the previously published reports, platelet counts up to 1,500,000/ μ L in the neonatal period do not seem to convey a significant risk of thrombosis, microvascular pathology, or hemorrhage, and do not require antiplatelet or cyto-reductive treatment.

2849.514

Poster Board 514

Adenoviral Vector-Mediated Transduction of VEGF Regulated by HRE. ppET-1 Improves Neural Functional Recovery after Hypoxic-Ischemic Brain Damage in Neonatal Rats

Xiang-rong Zheng, Shang-shang Zhang, Yu-jia Yang, Xia Wang, Le Zhong. Department of Pediatrics, Xiangya Hospital, Central South University, Changsha, Hunan, China.

BACKGROUND: Hypoxic-ischemic brain damage (HIBD) occurring around the perinatal period is one of the most commonly recognized causes of neonatal mortality and long-term serious neurologic sequelae in children. Gene transfer of VEGF to ischemic brain may be a promising approach for the treatment of hypoxic-ischemic brain damage (HIBD).

OBJECTIVE: We investigated a hypoxia-responsive element (HRE) and human preendothelin-1 (ppET-1) promoter to mediate VEGF expression given for neuroprotection to improve long-lasting neural functional recovery after HIBD in neonatal rats.

DESIGN/METHODS: An adenoviral vector, AVHP.VEGF, with 476bp of the ppET-1 promoter and 35bp of the HRE driving VEGF expression, was constructed. The other adenoviral vector, CMV.VEGF, was constructed as a control. Gene expression was studied *in vivo* by stereotaxic injection of the vector into hypoxic-ischemic (HI) rat brains. Seven-day-old rat pups were subjected to ligation of the left common carotid artery followed by 2 h of hypoxia (8% oxygen) or by sham operation. Rats received AVHP.VEGF, CMV.VEGF or buffer injection after three days of HI. The weight increase was studied seven days after HI. Expression of VEGF protein was determined using immunohistochemistry and Western blotting; neuronal apoptosis was examined using TUNEL seven days after injection. A battery of behavior trials were administered after the rats had achieved adulthood (30-34 postnatal days). The neurons number of unit area in cortical and CA1 subfield was detected using Nissl staining.

RESULTS: AVHP.VEGF-injected ischemic rats had higher weight growth rate compared with CMV.VEGF and buffer group ($P < 0.05$); AVHP.VEGF-injected ischemic rat brains had higher VEGF protein expression and fewer TUNEL-positive cells compared with CMV.VEGF and buffer group ($P < 0.05$). Learning, memory and sensorimotor functions in AVHP.VEGF-injected rats had been significantly improved compared with CMV.VEGF and buffer group ($P < 0.05$). The results of Nissl staining showed that neuron loss of cortex and CA1 region in the hippocampus had been significantly reduced in AVHP.VEGF-injected rats compared with CMV.VEGF and buffer group ($P < 0.05$).

CONCLUSIONS: VEGF gene delivery regulated by HRE.ppET-1 exerts a marked long-lasting neuroprotection by improving learning, memory and sensorimotor functions, and reducing neuron loss of cortex and CA1 subfield in the hippocampus.

Late Breaker Abstract Session I: Neonatology

Sunday

9:00 AM-11:00 AM

3212.1

Presentation Time 9:00 AM

Heat Loss Prevention in Delivery Room: A Randomized Controlled Trial of Polyethylene Caps in Very Preterm Infants

Daniele Trevisanuto, Nicoletta Doglioni, Matteo Parotto, Massimo Micaglio, Vincenzo Zanardo. Pediatric Department, University of Padua, Medical School, Azienda Ospedaliera Padova, Padova, Italy; Department of Pharmacology and Anaesthesiology, University of Padua, Medical School, Azienda Ospedaliera Padova, Padova, Italy.

BACKGROUND: It is crucial to keep preterm babies warm immediately after birth.

OBJECTIVE: To evaluate if polyethylene caps in preterm infants prevent heat loss after delivery better than polyethylene occlusive wrapping and conventional drying. Furthermore, we assessed if any benefit was sustained after cap removal.

DESIGN/METHODS: This was a randomised controlled trial of infants <29 weeks' gestation including 3 study groups: a) experimental group in which the heads of patients were covered with a polyethylene cap; b) polyethylene occlusive skin wrapping group; c) control group in which infants were completely dried. At birth, all infants were managed under infant warmer. Axillary temperatures were compared on neonatal intensive care unit admission immediately after cap and wrap removal and 1 hour later.

RESULTS: Of 96 infants randomly assigned (32 covered with caps, 32 wrapped; 32 controls) 1 died in the delivery room and 95 completed the study. In infants covered with cap ($36.1 \pm 1.4^\circ\text{C}$) mean axillary admission temperatures were similar to those of wrapped infants ($35.8 \pm 1.6^\circ\text{C}$), but significantly higher than controls ($35.3 \pm 0.8^\circ\text{C}$; $p < 0.01$). In wrapped infants, admission temperatures were significantly higher than control infants ($p = 0.01$). One hour later, mean axillary temperatures were similar between infants covered with cap ($36.5 \pm 0.7^\circ\text{C}$) and wrapped neonates ($36.2 \pm 0.7^\circ\text{C}$); both groups had higher temperatures than controls ($35.7 \pm 0.8^\circ\text{C}$; $p < 0.01$).

CONCLUSIONS: In very preterm infants, polyethylene caps are comparable to polyethylene occlusive skin wrapping in preventing heat loss after delivery. Both these methods are more effective than conventional treatment.

3212.2

Presentation Time 9:15 AM

Does Low Dose Hydrocortisone Improve Volumetric MRI Measures of Cerebral Growth in Extremely Low Birth Weight (ELBW) Infants at High Risk for Bronchopulmonary Dysplasia (BPD)? A Randomized Trial

Nehal A. Parikh, Robert Lasky, Jon Tyson, Kathleen Kennedy, Yanjie Zhang, Xintian Yu. Department of Pediatrics, Neonatal-Perinatal Medicine, University of Texas Medical School at Houston & Children's Memorial Hermann Hospital; Center for Clinical Research & Evidence-Based Medicine, University of Texas Health Science Center at Houston, Houston, TX.

BACKGROUND: BPD is a risk factor for cerebral atrophy/poor growth. Low dose hydrocortisone (HC) might avoid the adverse effects of high dose dexamethasone, yet still improve pulmonary function, & thereby improve brain volumes in infants at high risk for BPD.

OBJECTIVE: To test the hypothesis that high risk ELBW infants randomized to 7 days of low dose HC will have larger total cerebral tissue volume at term than do placebo treated infants.

DESIGN/METHODS: A predetermined sample size of 64 ELBW infants, between 10 to 21 days old & mechanically ventilated with a respiratory index score (RIS) ≥ 2 , were randomized to placebo (PL) or HC (dose: 3 mg/kg (tapered); cumulative: 17 mg/kg) IV/PO. Volumetric MRI was performed at 38 wks postmenstrual age (PMA); brain tissue classes & structures were segmented automatically & manually respectively, by masked independent assessors who achieved high reliability (inter- & intra-scanner correlation coefficients: 0.92-0.99). Brain volumes were adjusted by PMA at MRI (1st analysis) & intracranial volume (2nd analysis).

RESULTS: Groups were similar in GA (HC 25.7; PL 25.5), BW (677; 655g), RIS (4.8; 4.3), & other baseline variables. 8 of 31 HC & 8 of 33 PL infants died. HC had no discernible effect on brain volumes in 1^o or 2^o analyses or on respiratory outcomes. No adverse steroid effects, e.g., spontaneous intestinal perforation, infections, or poor growth, were noted. Long-term clinical outcomes are not yet available.

	Hydrocortisone ¹	Placebo ¹	P
Brain Volumes (mL)			
Total cerebral tissue ²	277.6 (7.6)	271.6 (11.1)	.64
Total white matter (WM)	132.5 (3.6)	127.1 (3.8)	.31
Total gray matter (GM)	127.2 (4.2)	131.4 (7.3)	.61
Cerebellum	16.8 (0.7)	17.1 (0.9)	.77
Subcortical GM	18.4 (0.4)	17.8 (0.7)	.45
Hippocampus	1.3 (0.1)	1.3 (0.1)	.51
36wk PMA Resp. Outcomes			
Survival without severe BPD, ³ n (%)	3 (10%)	5 (16%)	.71
Days on positive pressure	68.7 (2.6)	66.1 (3.0)	.52
Days on oxygen	69.7 (3.6)	70.2 (3.4)	.91

¹Mean (SE) unless indicated; ²Total WM & GM + Cerebellum; ³NIH Consensus Definition

CONCLUSIONS: Low dose, short course HC in high risk infants had no discernible benefit on rigorously assessed brain volumes at term or on pulmonary endpoints. Brain volumes can be precisely quantified as major outcome measures in neonatal trials. NINDS K23 NS048152. NCT00167544.

* Indicates First Author is a Trainee (Student, Fellow, House Officer)

3212.3

Presentation Time 9:30 AM

Randomised Clinical Trial of Brain-Washing v Tapping Fluid for Post-Hemorrhagic Ventricular Dilatation in Premature Infants: Improved Cognitive Development at 2 Years

Andrew Whitelaw, Sally Jary, Grazyna Kmita, Jolanta Wroblewska, Eva Swietlinska, Marek Mandera, Linda Hunt, Michael Carter, Ian Pople. Clinical Science, University of Bristol, Bristol, United Kingdom; Psychology, University of Warsaw, Warsaw, Poland; Neonatal Intensive Care and Neurosurgery, Medical University of Silesia, Katowice, Poland; Neurosurgery, Frenchay Hospital, Bristol, United Kingdom.

BACKGROUND: Preterm infants who develop progressive post-hemorrhagic ventricular dilatation (PHVD) have a very high risk of cerebral palsy, cognitive disability, visual and hearing loss and epilepsy. No clinical intervention has been proven to reduce neurodevelopmental disability in such infants.

OBJECTIVE: To test whether a new intervention for PHVD, DRainage, Irrigation and Fibrinolytic Therapy (DRIFT) reduces severe disability. This technique involves “washing out” the ventricles for 72-144 hours, reduces pressure, ventricular size and removes blood and cytokines (1).

DESIGN/METHODS: We randomly assigned 77 premature infants (gestational ages 24 to 35 weeks) with PHVD to either DRIFT (n=39) or standard treatment (n=38) i.e. tapping of cerebrospinal fluid (CSF) by reservoir as required to control excessive expansion. Neurodevelopmental assessment, the Bayley Scales of Infant Development II and components of disability were assessed by “blinded” examiners at 2 years past term, the last in February, 2009. 2 children did not have Bayley Scales but developmental information was available on 100% of survivors.

RESULTS: Of 36 survivors in the DRIFT group 11 (31%) had severe cognitive disability (Mental Development Index MDI <55) v 19 of 33 survivors (58%) in the standard group (p=0.02). Median MDI was 68 with DRIFT, and <50 with standard care. Walking, sitting, hand control, head control, speech, hearing, vision and epilepsy all showed trends in favor of DRIFT but were not statistically significant. Severe sensory-motor disability was found in 16 (44%) of infants with DRIFT and 18 (55%) of the standard group.

CONCLUSIONS: Severe cognitive disability was significantly reduced in the infants receiving DRIFT and median MDI was over 18 points higher. Trends towards reduction in sensory-motor were not significant. Motor disability from perinatal white matter injury, especially infarction, may not be amenable to such treatment but the earlier reduction in ventricular pressure, distortion, free iron and cytokines with DRIFT may reduce secondary global cerebral injury and protect cognitive development. This is the first intervention shown to improve outcome in PHVD. (www.controlled-trials.com number 80286058). 1: Whitelaw A et al. Pediatrics. 2003;111:759-65.

3212.4

Presentation Time 9:45 AM

A Randomized Controlled Trial of Preventative Care at Home in the First Year of Life in Infants <30 Weeks’ Gestation: Outcomes of Children and Mothers at 2 Years of Age

Lex Doyle, Alicia Spittle, Carmel Ferretti, Jane Orton, Abbey Eeles, Peter Anderson, Nisha Brown, Kate Lee, Marilyn Bear, Roslyn Boyd, Terrie Inder. Royal Women’s Hospital, Melbourne, Victoria, Australia; Victorian Infant Brain Studies, Murdoch Childrens Research Institute, Melbourne, Victoria, Australia; University of Queensland, Queensland, Australia; University of Washington, St. Louis, MO.

BACKGROUND: Very preterm infants have higher risks of developmental problems than do term infants, and their families undergo additional stress. Effective treatments to improve child development and caregiver mental health are urgently required.

OBJECTIVE: To determine the effectiveness of preventative care at home on child development and primary caregiver mental health at two years of age.

DESIGN/METHODS: 120 very preterm infants (<30 weeks) were randomly allocated to intervention or control groups. Each group received standard medical and nursing follow-up. The intervention group also received the preventative care program consisting of 9 visits at home over the first year from a physiotherapist and psychologist, focusing on the parent-infant relationship, parental mental health and infant development. At 2 years’ corrected age children were assessed blinded to group allocation with the Bayley Scales of Infant and Toddler Development-III (Cognitive, Language, & Motor Composite Scores). Mental health of the primary caregiver was assessed by the Hospital Anxiety and Depression Scale (HADS). Analysis was by intention to treat.

RESULTS: The two groups (61 intervention; 59 control) were similar in baseline characteristics. At 2 years of age 115 children (96%) were assessed using the Bayley Scales, and 103 carers completed the HADS. There were no statistically significant differences in the cognitive, motor or language composite scores between groups (Table). The primary caregivers of infants in the intervention group reported significantly less anxiety and depression (Table).

Outcomes at 2 years of age

Child	Intervention	Control	mean difference (95% CI)	P
	mean	mean		
Cognitive	99.0	95.6	3.4 (-1.7, 8.4)	0.19
Language	96.4	97.9	-1.4 (-8.1, 5.2)	0.67
Motor	99.9	98.6	1.3 (-4.5, 6.7)	0.66
Caregiver				
	%	%	Odds ratio (95% CI)	P
Anxious	21%	49%	0.28 (0.11, 0.71)	0.007
Depressed	9%	26%	0.27 (0.08, 0.93)	0.038

CI=confidence interval

CONCLUSIONS: A preventative care program for very preterm infants and their families significantly lowered the rates of primary caregiver-reported anxiety and depression, but did not have a major effect on cognitive, language or motor development of the child at 2 years.

3212.5

Presentation Time 10:00 AM

Inhaled Nitric Oxide (iNO) for the Prevention of Bronchopulmonary Dysplasia (BPD) in Preterm Infants. The EUNO Trial

J.C. Mercier, H. Hummler, X. Durrmeyer, M. Sanchez-Luna, V.P. Carnielli, D. Field, A. Greenough, B. Van Overmeire, B. Jonsson, M. Hallman, J. Baldassarre. For the EUNO Study Group.

BACKGROUND: Preterm infants are at risk of developing BPD and neurocognitive impairment. In animal models, iNO improves both gas exchange and lung structural development, but its use in infants at risk for BPD is still controversial.

DESIGN/METHODS: We performed a randomized, double-blind, placebo-controlled trial of iNO at 36 European centers involving 800 preterm infants who required either surfactant or continuous positive airway pressure (CPAP) for respiratory distress. Within 24h of birth, infants were randomly assigned to receive either iNO (5 ppm) or placebo gas for a minimum of 7 and a maximum of 21 days. Primary outcome was survival without BPD at 36 weeks of postmenstrual age.

RESULTS: Overall, there were no significant differences in survival without BPD (65.3% vs 65.5%), death (14.2% vs 10.5%) or BPD (21.3% vs 24.0%) between infants receiving iNO and those receiving placebo gas. Median duration of therapy was 20.7 vs 20.8 days.

Outcome No (%)	iNO	Placebo	RR (95%CI)
Primary: Alive w/o BPD at 36 wks	298/395 (65.3%)	262/400 (65.5%)	1.05 (0.78-1.43)
- GA <26 wks	75/141 (53.2%)	67/134 (50.0%)	1.14 (0.71-1.82)
- GA >26wks	183/254 (72.0%)	195/266 (73.3%)	0.94 (0.64-1.38)
Secondary: Alive at 36 wks	324/398 (86%)	359/401 (89%)	0.74 (0.48-1.15)
- BPD at 36 wks	81/339 (23.9%)	96/358 (26.8%)	0.83 (0.58-1.17)
- Alive w/o brain injury at 36 wks	181/261 (69.3%)	188/249 (75.5%)	0.78 (0.53-1.17)
- GA <26wks	66/109 (60.6%)	62/91 (68.1%)	0.72 (0.40-1.29)
- GA >26 wks	115/152 (75.7%)	126/158 (79.7%)	0.79 (0.46-1.35)

There was no difference in survival without significant brain injury (69.3% vs 75.5%). The median (range) days of assisted ventilation 41 (2-265) vs 44 (2-190) and hospitalization 86 (35-366) vs 88 (36-375) were similar in the two groups.

CONCLUSIONS: Early use of low-dose iNO does not improve survival without BPD or brain injury. We speculate whether the lack of iNO effect could be explained by the selection of infants at lower risk of BPD (89.9% of mothers received antenatal steroids, all infants were inborns, and 93% received caffeine), a higher percentage (82%) of Caucasians as compared to previous trials, and/or a too low iNO dose as half of the infants were on nasal CPAP.

3212.6

Presentation Time 10:15 AM

Nasal Intermittent Positive Pressure Ventilation (NIPPV) Versus Synchronized Intermittent Mandatory Ventilation (SIMV) after Surfactant Treatment for Respiratory Distress Syndrome (RDS) in Preterm Infants < 30 Weeks’ Gestation: Multicenter, Randomized, Clinical Trial

Rangasamy Ramanathan, Kris Sekar, Maynard Rasmussen, Jatinder Bhatia, Roger Soll. USC Division of Neonatal Medicine, Women’s and Children’s Hospital and Childrens Hospital Los Angeles, Keck School of Medicine of USC, Los Angeles, CA; Neonatology, University of Oklahoma Health Sciences Center, Oklahoma City, OK; Neonatology, Sharp Mary Birch Hospital for Women, San Diego, CA; Neonatology, Medical College of Georgia, Augusta, GA; Neonatology, The University of Vermont College of Medicine, Burlington, VT.

BACKGROUND: Duration of mechanical ventilation via the endotracheal tube (MVET) has a direct correlation with the development of bronchopulmonary dysplasia (BPD). Non-invasive ventilation using NIPPV has been shown to prevent extubation failures and decrease the duration of MVET. However, NIPPV has not been evaluated as a primary mode in preterm infants with RDS requiring surfactant.

OBJECTIVE: To determine the effect of early extubation to NIPPV vs. continued SIMV on the need for MVET at 7 days of age in preterm infants <30 weeks’ gestation requiring intubation and surfactant for RDS soon after delivery.

DESIGN/METHODS: Infants intubated for RDS and given poractant alfa within 60 minutes of birth were randomized within 120 minutes of birth to remain on SIMV or to be rapidly

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extubated to NIPPV. NIPPV was administered via the nasal or nasopharyngeal route using binasal prongs. Extubation to nasal continuous positive airway pressure was done according to study guidelines in the SIMV group. Caffeine was started prior to extubation in both groups. RESULTS:

	SIMV (n=57)	NIPPV (n=53)	OR (95% CI)	p
Birth weight (g)*	1099 ± 201	1052 ± 223	---	0.88
Gestational age (wks)*	27.9 ± 0.9	27.8 ± 0.9	---	0.61
MVET at 7 days of age	24/57 (42%)	9/53 (17%)	3.6 (1.5, 8.7)	0.005
Physiological BPD @ 36 wks PMA	26/57 (46%)	6/53 (11%)	6.6 (2.4, 7.8)	0.001
O ₂ PMA=postmenstrual age, *Mean ± SD	22/57 (39%)	11/53 (32%)	2.4 (1.02, 5.6)	0.044

The groups were similar regarding birth weight, gestational age, sex and antenatal steroid use. No differences were noted in surfactant doses, pneumothorax, patent ductus arteriosus, necrotizing enterocolitis, intraventricular hemorrhage, retinopathy of prematurity, or length of stay between the 2 groups. No case of gastric perforation was observed in either group. CONCLUSIONS: Extubation of surfactant treated preterm infants to NIPPV reduced the need for longer term mechanical ventilation via the endotracheal tube. NIPPV also resulted in significant reductions in physiological and clinical BPD in preterm infants at highest risk for BPD. No complications were associated with the use of NIPPV. [ClinicalTrials.gov NCT00486850; Funded by Dey LP and Chiesi Farmaceutici, SpA].

3212.7

Presentation Time 10:30 AM

Ph.D. Student

Neopuff Compared with Laerdal Self-Inflating Bag for the First Five Minutes of Resuscitation in Infants < 29 Weeks Gestation at Birth: A Randomised Controlled Trial

Jennifer A. Dawson, C. Omar F. Kamlin, Arjan B. te Pas, Georg Schmoelzer, Susan M. Donath, Colm P.F. O'Donnell, Peter G. Davis, Colin J. Morley. Neonatal Services, The Royal Women's Hospital, Parkville, Victoria, Australia; Murdoch Children's Research Institute, Parkville, Australia; Leiden University, Leiden, Netherlands; National Maternity Hospital, Dublin, Ireland.

BACKGROUND: Positive end expiratory pressure (PEEP) is routinely used during mechanical ventilation (MV) in NICU. There is little information about the use of PEEP during delivery room (DR) resuscitation. The Neopuff Infant Resuscitator (a T-piece which provides PEEP during MV) and the Laerdal bag (which does not) are in common use in DRs worldwide. Limited data are available to guide clinicians choosing between these devices.

OBJECTIVE: To compare the SpO₂ in the first 5 minutes for newly born infants resuscitated with a Neopuff or Laerdal bag.

DESIGN/METHODS: Randomized controlled trial (Australian New Zealand Clinical Trials Registry -ACTRN12607000062426) of Neopuff vs. Laerdal bag in infants <29 weeks' gestation who received assisted ventilation after birth. Oxygen saturation (SpO₂) and heart rate were recorded using a Masimo pulse oximeter with the sensor on the right wrist applied immediately after birth. HR and oxygen saturation data were not included if the oximeter displayed poor signal quality. All infants were initially ventilated with air. 100% oxygen was started at 5 min if the SpO₂ was <70% or beforehand if heart rate was <100 bpm and not rising or cardiac massage was required. Infants were intubated if they remained apneic or bradycardic. Recruitment was completed on Feb 13/09.

RESULTS: Mean (SD) birthweight and gestational age were 881 (205) g and 26 (1.2) wk; 71% had received antenatal steroids. There were no significant differences in rates of intubation in the DR or in the first 24 hr. Likewise there were no significant differences in rates of BPD or death before discharge. SpO₂ and heart rate measurements and Apgar scores are shown in the table.

	Neopuff (n=41)	Laerdal Bag (n=38)	P value
SpO ₂ at 5 min*	50 (31) n=34	53 (25) n=36	0.73
Heart rate at 5 min*	127 (34) n=36	132 (33) n=36	0.71
Apgar 1 min#	5 (2-6)	5 (3-6)	0.81
Apgar 5 min#	7 (6-8)	7 (5-8)	0.85

Data are *mean(SD) or #median(IQR)

All except 3 babies met the criteria for receiving 100% oxygen by 5 min of age.

CONCLUSIONS: In infants < 29 wk gestation receiving mask ventilation in the DR there were no differences in short-term outcomes following resuscitation with the Neopuff or Laerdal Bag.

3212.8

Presentation Time 10:45 AM

Styler for Intubation of Newborn Infants; a Randomised Trial

Liam A.F. O'Connell, C. Omar F. Kamlin, Jennifer A. Dawson, Colm P.F. O'Donnell, Colin J. Morley, Peter G. Davis. Neonatal Services, Royal Women's Hospital, Melbourne, Australia; University of Melbourne, Melbourne, Australia; National Maternity Hospital, Dublin, Ireland.

BACKGROUND: Neonatal intubation is a mandatory skill for pediatric trainees. Surveys show that operators, particularly junior trainees, often fail when attempting the procedure or take longer than the NRP recommended maximum time of 20 s. A styler (introducer) is commonly used to facilitate the procedure but efficacy and safety are unknown.

OBJECTIVE: To compare styler vs no styler for orotracheal intubation in neonates. DESIGN/METHODS: Randomized, controlled trial conducted at RWH, Melbourne, Australia, stratified by setting of intubation: delivery room (DR) or neonatal intensive care unit (NICU). Muscle relaxants and opiates were routinely used for NICU intubations. Sample size of 300 (calculated to show a 16% absolute difference in success rates at first attempt) was achieved on February 4th 2009. Duration of intubation attempts and presence of blood stained endotracheal aspirates in the 24 hours post-intubation were recorded.

RESULTS: Three hundred and two intubations in 232 infants were randomized. Mean (SD) gestational age was 29 (5) weeks and birth weight was 1320 (975) grams. Residents and fellows performed 76% and 24% of intubations, respectively. Overall success rate at first attempt was 55%. There was no difference in success rates between the two randomized groups (Styler – 57%; No Styler – 53%; p=0.47). Median (IQR) duration of intubation attempts was similar in both groups [Styler – 35 (23-54) seconds; No Styler – 32 (20-51) seconds; p=0.25]. Blood stained aspirates occurred in 10% of styler and 13% of no styler intubations (p=0.52).

Success rate by sub-group

	Success Rate (%) Styler (n=149)	Success Rate (%) No Styler (n=153)	p
Fellows	67 (22/33)	69 (27/39)	0.82
Residents	54 (63/116)	47 (54/114)	0.29
DR intubations	54 (34/63)	55 (33/60)	0.91
NICU intubations	59 (51/86)	52 (48/93)	0.30
< 1000grams PMA	53 (39/74)	62 (46/74)	0.25
< 29 weeks PMA	49 (39/79)	53 (40/76)	0.68
Success within 20 seconds	12 (10/85)	19 (15/81)	0.17

CONCLUSIONS: Many intubation attempts fail and success rates are not improved by the use of a styler. Duration of intubation usually exceeds the time recommended by NRP. Use of a styler did not appear to increase the risk of airway trauma.

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3:15 PM-5:15 PM

3682.1

Presentation Time 3:15 PM

Sleep-Related Breathing Problems and Pediatric Blood Pressure Regulation

Terrance J. Wade, Graham J. Reid, Laura K. Fitzgibbon, Nicole S. Coverdale, John Cairney, Deborah D. O'Leary. Community Health Sciences, Brock University, St Catharines, ON, Canada; Psychology, Family Medicine, and Pediatrics, the University of Western Ontario, London, ON, Canada; Family Medicine, and Psychiatry, McMaster University, Hamilton, ON, Canada.

BACKGROUND: Sleep-related breathing problems (SRBP) and short sleep duration are linked with obesity among adults and children. In adults, SRBP and sleep duration are associated with increased sympathetic nervous system activity and high blood pressure (BP); this change occurs via decreased vagal baroreflex gain (BRG), a measure of BP regulation. It is unknown if SRBP and sleep duration influences BP regulation in children. Moreover, it is unclear if the effect of SRBP on BRG is a consequence of excessive body mass.

OBJECTIVE: To examine the relationship between SRBP and short sleep duration and BP regulation among children.

DESIGN/METHODS: Analyses included 225 grade 6-8 children from the HBEAT Study who were randomly selected to undergo BRG assessment in a laboratory-based protocol from an original sample of 1,285 children whose BP and body mass were measured at school. Following an initial 5 minutes of supine rest, 5 minutes of continuous beat-to-beat BP (Finapres) and RR interval (RRI) were recorded (standard ECG). Spectral indices were computed using Fast Fourier Transform. High frequency (HF) and low frequency (LF) power spectral areas were set to 0.15-0.4 Hz and 0.04-0.15 Hz, respectively. Parent-reported child sleep duration on weekdays and SRBP was measured using the Pediatric Sleep Questionnaire. Generalized regression analyses were conducted with 198 children with complete data.

RESULTS: In correlations, HF-BRG (r = -0.19; p=0.006) and LF-BRG (r = -0.18; p=0.011) were both negatively related to SRBP. BRG and sleep duration were not significantly related. In regression analyses, increases in SRBP were related to lower HF- and LF-BRG (p<.001), after adjusting for sleep duration and body mass index. That is, breathing problems were independent of body mass. Further, higher body mass was independently associated with lower HF- and LF-BRG (p<.001) adjusting for SRBP.

CONCLUSIONS: Reductions in autonomic activity in children are due, in part, to SRBP, independent of body mass. Despite their young age, baroreceptor function is already altered demonstrating a reduction in BP regulation.

3682.2

Presentation Time 3:30 PM

Improvement of Influenza Vaccination Rate of High Risk Pediatric Patients in an Inner-City Academic Pediatric Primary Care Clinic

Zeina M. Samaan, Jennifer L. Kemper, Mona E. Mansour. General and Community Pediatrics, Cincinnati Children's Hospital Medical Center, Cincinnati, OH.

BACKGROUND: Vaccination is a crucial strategy in preventing influenza infection and its

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associated morbidity and mortality. This is particularly true in high risk patients- children with asthma, and children age 6 months to 59 months.

OBJECTIVE: To identify and implement effective strategies to improve vaccination among high risk population seen during 07-08 and 08-09 flu seasons. Our improvement goal for these two seasons was to vaccinate 95% of children seen in clinic during influenza season that met high risk criteria- all those over 6 months of age with asthma, and those 6 months to 59 months of age.

DESIGN/METHODS: Multiple strategies were identified and implemented. Interventions fit into 3 categories: increasing access for patients, provider team education/reminders, and patient education. Interventions to increase access included open access to scheduling, walk in flu shot visits, walk-in flu clinic on all Saturdays during the flu season, and registration and vaccination of eligible siblings of patients attending visits. Interventions to provide clinical decision support were use of a standardized order set as well as flu alert in the EMR, training of MA/RN to request flu shot of provider if order omitted for an eligible patient, and posting reminders for providers in workroom area at computer stations. To increase patient awareness of importance and need for flu vaccine reminders were posted in examination rooms and bathrooms, and flu reminder post cards were completed by families during clinic visits well before the start of the flu season and were mailed to them when the flu vaccine became available. In addition clinic flu collaborative leaders attended institution wide meetings to learn and share influenza vaccination strategies on a bimonthly basis during 07-08 and 08-09 flu seasons.

RESULTS: Pre intervention rates (06-07season) were 72% of the asthma target population and 68% of the 6-59 months target population seen for a visit. Post intervention rates (07-08 and 08-09 seasons) were 84% of the asthma target population and 89% of the 6-59 months of age target population seen in our clinic.

CONCLUSIONS: Clinic specific improvement strategies in collaboration with hospital wide activities strikingly improved influenza vaccination rates among high risk patients in hospital-based, inner-city teaching pediatric clinic.

3682.3

Presentation Time 3:45 PM

Fellow in Training

The Hepatitis B Vaccine Booster Response among the Youth Who Had Completed Neonatal Hepatitis B Vaccines – Clinical Trial

Chyi-Feng Jan, Kuo-Chin Huang, Li-Min Huang, Donald E. Greydanus, Dele H. Davies. Family Medicine, National Taiwan University Hospital, Natioanl Taiwan University, Taipei, Taiwan; Pediatrics, National Taiwan University Hospital, Natioanl Taiwan University, Taipei, Taiwan; Pediatrics, Kalamazoo Center for Medical Studies, Michigan State University, Kalamazoo, MI; Pediatrics and Human Development, College of Human Medicine, Michigan State University, East Lansing, MI.

BACKGROUND: For persons aged 18-23 years who have received complete hepatitis B vaccination in the neonatal or infant period, but who are seronegative for hepatitis B surface antigen (HBsAg), core antibody against hepatitis B (anti-HBc), and surface antibody against hepatitis B (anti-HBs), the need for a booster of hepatitis B vaccine remains in debate.

OBJECTIVE: The aim of this study was to investigate the booster response of hepatitis B vaccine for the youth who had received complete doses of hepatitis B vaccines at their neonatal stage in Taiwan.

DESIGN/METHODS: The study was conducted between October 2007 and Jan 2009. The main target population was the cohort of youth born after July 1984 who received hepatitis B virus markers checkup within 2 years of immunization including HBsAg, anti-HBc, and anti-HBs and whose results were negative for all three of these viral markers. The neonatal hepatitis B vaccination records were linked through the Taiwanese CDC databank. Signed informed consent was obtained from seronegative subjects for these 3 viral markers. The participants received three doses of hepatitis B vaccine (Engerix-B Injection, recombinant HBsAg, 20mcg/ml/vial, GSK) at 0, 1st and 6th month during follow-up. Their anti-HBs status was checked at baseline, one week, one month, sixth month, and seven months following the first dose of hepatitis B vaccine. The primary endpoint of measurement was the rate of seroconversion with anti-HBs antibodies. This study was approved by Institutional Review Board of National Taiwan University Hospital, ClinicalTrials.gov ID: NCT00792610.

RESULTS: One hundred and twenty seven participants were identified as having evidence of neonatal hepatitis B vaccination records either from the Taiwanese CDC databank linkage or from their own child stage records. All had received the three doses of Engerix-B immunizations and the five follow-up tests for hepatitis B viral markers. The anti-HBs seropositivity rates for subjects one week, one month, 6 months, and 7 months after receiving their first dose of hepatitis B vaccine were: 20.5%, 75.6%, 92.9%, and 99.2%, respectively.

CONCLUSIONS: To ensure anti-HBs seroconversion rates higher than 90%, at least two doses of hepatitis B booster doses are recommended for those who received complete hepatitis B vaccination in neonatal or infant period and are seronegative for three hepatitis B viral markers during their youth period.

3682.4

Presentation Time 4:00 PM

Febrile Seizures and Measles, Mumps, Rubella, and Varicella Virus Vaccine (MMRV): A National Survey of Physicians

Christina A. Suh, Matthew F. Daley, Wan-Ting Huang, Lori A. Crane, Christine Babbel, Jennifer Barrow, Mona Marin, Shannon Stokley, Karen Broder, Brenda Beaty, Allison Kempe. Pediatrics, University of Colorado Denver (UCD), Aurora, CO; Children's Outcome Research Program, The Children's Hospital, Aurora, CO;

Colorado School of Public Health, UCD, Aurora, CO; CDC, Atlanta, GA.

BACKGROUND: Preliminary post-licensure data showed that children 12-15 months who received MMRV vaccine had an increased risk of febrile seizures 5-12 days post-vaccination compared to children who received MMR and varicella (MMR+V) vaccines separately. Risk in 4-6 yr old children was not assessed. In 2/08, the Advisory Committee on Immunization Practices (ACIP) removed its preference for administering MMRV over MMR+V vaccines.

OBJECTIVE: To assess among pediatric (Peds) and family medicine (FM) physicians nationally: 1) awareness of febrile seizure risk after MMRV; 2) intended practice regarding MMRV use; 3) attitudes regarding severity of febrile seizures; and 4) factors associated with intended MMRV use.

DESIGN/METHODS: Survey administered 10/08-1/09 to Peds and FM physicians from a nationally representative research network. In the survey, respondents were informed about MMRV-associated febrile seizure risk and current ACIP recommendations.

RESULTS: Response rates were 76% Peds (n=321) and 71% FM (n=299). 71% Peds and 26% FM were aware of MMRV-associated febrile seizure risk (p<.001). After being provided with risk data, 21% Peds and 9% FM would give MMRV to a healthy 12-15 month old (p<.001); 38% Peds and 20% FM would give MMRV to a healthy 4-6 year old (p<.001). Less than 15% of physicians considered febrile seizures a serious medical event, but >90% thought parents considered febrile seizures serious. Pediatric specialty (OR=3.33, CI 1.70-6.55), perceived potential to increase varicella vaccine up-to-date rates (OR=4.46, CI 2.41-8.28) and parent preference for fewer injections (OR=3.75, CI 2.02-6.79) were positively associated with recommending MMRV to a healthy 12-15 month old; increased physician concern regarding febrile seizures (OR=0.14, CI .05-.40), increased perceived parental concern for febrile seizures (OR=.50, CI .26-.97) and importance of AAP/AAFP/ACIP recommendations in their decision-making (OR=.34, CI .18-.64) were negatively associated.

CONCLUSIONS: After being provided with data regarding febrile seizures and MMRV, a minority of physicians would recommend MMRV to a healthy child aged 12-15 months. Both physician and parent concerns about febrile seizures were important factors in this decision. Despite lack of data in 4-6 year olds, a minority would give MMRV in this age group.

3682.5

Presentation Time 4:15 PM

Family Centered (FACE) Advance Care Planning for Teens with HIV/AIDS: 3-Months out – Advance Directives, Psychological Adjustment, Quality of Life, Spirituality and Adherence

Maureen E. Lyon, Patricia A. Garvie, Robert McCarter, Linda Briggs, Jiang He, Lawrence J. D'Angelo. Division of Adolescent and Young Adult Medicine, Children's National Medical Center, Washington, DC; Department of Pediatrics, St. Jude Children's Research Hospital & Univeristy of Tennessee College of Medicine, Memphis, TN; Children's Research Institute, Community and Clinical Research, Children's National Medical Center, Washington, DC; Gundersen Lutheran Medical Foundation, Inc., LaCrosse, WI.

BACKGROUND: Concerns about introducing emotional distress have impeded families from initiating conversations regarding advance care planning for teens with HIV/AIDS. However, studies suggest talking about death and dying with youth with a life-threatening illness can be beneficial.

OBJECTIVE: To compare 3-month outcomes of the Family Centered (FACE) Advance Care planning intervention vs. controls regarding advance directives, psychological adjustment, quality of life, spirituality and medication adherence.

DESIGN/METHODS: A 2-group, randomized, controlled trial in two hospital-based clinics from 2006-2008 with teens with HIV aged 14 to 21 years and their surrogates (N=38 dyads). Three 60-90 minute sessions were conducted one week apart. 3-month outcome measures were: complete advance directive; Beck Depression and Anxiety Inventories; Pediatric Quality of Life & General Health Assessment; Spiritual Well Being Scale of Functional Assessment of Chronic Illness Therapy; and Medication Adherence Self-Report Inventory.

RESULTS: Advance Directives were completed at a significantly higher rate in the FACE intervention than control group (p<.001). Psychological Adjustment (anxiety, depression) and Quality of Life did not significantly differ from baseline to 3-month follow-up, or by intervention vs. control for teens. But intervention surrogates perceived their teen as getting worse at 3 months compared with baseline, emotionally (p=0.0162) and at school (p=0.0192). At 3-month follow-up intervention teens reported significantly lower spirituality than controls (p=0.0216) with a significant decrease over time compared to controls (p=0.0146). Teens with behaviorally-acquired HIV increased adherence to Highly Active Antiretroviral Treatment (HAART) from 79% to 90% at 3-month follow-up (p=0.0361).

CONCLUSIONS: The FACE intervention did not unduly distress teens, as psychological adjustment and quality of life were maintained. The secular approach of FACE may have decreased spirituality for teens. Family involvement may have increased HAART adherence for teens with behaviorally-acquired HIV. The FACE intervention appears to have increased surrogates' awareness of their teens' emotional and school difficulties.

3682.6

Presentation Time 4:30 PM

Significant Changes in Antibiotic Management of *Staphylococcus aureus* Infections in U.S. Children's Hospitals from 1999-2008

Joshua C. Herigon, Adam L. Hersh, Jeff S. Gerber, Theoklis E. Zaoutis, Jason G. Newland. Pediatrics, Children's Mercy Hospital & Clinics, Kansas City, MO; Pediatrics, University of California, San Francisco, San Francisco, CA; Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: The emergence of community-associated methicillin-resistant *S. aureus* (CA-MRSA) has led to an epidemic increase in the number of children hospitalized with *S.*

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aureus (SA) infections. Geographic variation exists both in the prevalence of CA-MRSA and in antibiotic (ab) susceptibility among CA-MRSA isolates. Recent data has demonstrated that SA infections in children's hospitals have increased with CA-MRSA comprising over 50% of cases. The impact of this epidemic on ab prescribing for children hospitalized with SA infections is unknown.

OBJECTIVE: To describe trends in ab management for SA infections from 1999 to 2008 among hospitalized children.

DESIGN/METHODS: A retrospective cohort study was conducted using the Pediatric Health Information Systems database to describe the ab management of inpatients with SA infection at 25 freestanding pediatric hospitals in the US. Patients admitted from 1/1/99-6/30/08 with ICD-9 codes for SA (041.11, 038.11, 482.41, V09.0) who also received one or more of the following abs, vancomycin, clindamycin, linezolid, trimethoprim-sulfamethoxazole, cefazolin, oxacillin and nafcillin, were evaluated in the included cases.

RESULTS: A total of 89,227 patients had a discharge diagnosis for a SA infection with 38,517 of those cases being MRSA over the 10 year study period. The incidence of MRSA increased 8-fold, from 3 to 25 cases per 1000 patients. Correspondingly, among patients with SA infections, use of agents that treat CA-MRSA doubled, from 284 to 570 days per 1000 patient days ($P < .001$), while drugs that only cover MSSA declined by 56%, from 220 to 105 days per 1000 patient days ($P < .001$). Nearly 80% of the increase in CA-MRSA abs was attributable to clindamycin. During the study period, clindamycin use rose over 3-fold, increasing from 16% of SA cases in 1999 to 52% in 2008 ($P < .001$), replacing vancomycin as the leading ab for CA-MRSA infections.

CONCLUSIONS: Ab prescribing patterns have changed substantially during the past decade, reflecting the emergence of CA-MRSA. Clindamycin is now the most commonly prescribed ab for SA infections among hospitalized children. The rapid increase in clindamycin use raises concerns about promotion of resistance and raises the importance of continuous monitoring of local susceptibility patterns.

3682.7

Presentation Time 4:45 PM

Medical Student

Headache in Preschool-Aged Children in the Emergency Room: Clinical Experience and Use of Computed Tomography

Mandeep K. Grewal, William McClintock, Himanshu Keulas, Karin B. Nelson, Tarannum M. Lateef, Department of Neurology, Children's National Medical Center, Washington, DC; George Washington University School of Medicine, Washington, DC; National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD.

BACKGROUND: Limited data exist on the utility of computed tomography, a potentially harmful procedure, in the evaluation of young children with headache presenting to the Emergency Room.

OBJECTIVE: To describe emergency room experience with children aged two through five years with headache, and to determine whether computed tomographic (CT) scans led to better acute management.

DESIGN/METHODS: We examined records of 364 children aged two through five years who presented with headache to a large urban emergency room between July 1, 2003 and June 30, 2006. By reviewing initial history and examination, we first identified patients with secondary headaches (i.e., pre-existing pathology such as ventriculo-peritoneal shunts, brain tumors or acute illnesses including viral syndromes, fever, probable meningitis, or trauma). Charts of the remaining patients with apparent primary headaches were reviewed for headache history, neurological examination, laboratory and neuroimaging studies, final diagnosis and disposition.

RESULTS: Based on initial history and physical examination, 306 (84%) children had secondary headaches. In 72% of these, acute febrile illness and viral respiratory syndromes accounted for the headaches. Among the 58 (16%) who had no recognized central nervous system disease or systemic illness at presentation, 28% had a CT scan performed. Of these, one scan was abnormal, showing a brainstem glioma; this patient had an abnormal neurological examination on the day of presentation. In 15/16 (94%) patients, the CT scan did not contribute to diagnosis or management. In 59% of children with apparently primary headaches, no family history was recorded.

CONCLUSIONS: Most headache in the pediatric Emergency Room is due to common minor infectious diseases. In view of the cost and small but non-trivial risk due to radiation exposure in young children, a thorough history and physical examination are likely to be more helpful and less harmful than computed tomographic scans in most cases.

3682.8

Presentation Time 5:00 PM

Fellow in Training

Prenatal Phthalate Exposure Is Associated with Childhood Behaviors Common to Both ADHD and Conduct Disorder

Stephanie M. Engel, Amir Miodovnik, Chenbo Zhu, Antonio Calafat, Manori J. Silva, Mary S. Wolff, Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY; National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA.

BACKGROUND: The lower molecular weight phthalates are used primarily in personal care products including fragrances, shampoos, cosmetics and nail polish. Biomonitoring of phthalate metabolites in urine, blood, semen, amniotic fluid and breast milk has identified virtually ubiquitous exposure in humans. The consequences of prenatal exposure to phthalates on childhood behavior and development have not previously been reported.

OBJECTIVE: Phthalates may act as potential endocrine disruptors by altering the activity and availability of endogenous hormones such as testosterone and thyroid hormone. Given the

importance of these hormones to the developing brain, we undertook an investigation of the potential neurobehavioral sequelae of prenatal phthalate exposure in a prospective birth cohort. **DESIGN/METHODS:** The Mount Sinai Children's Environmental Health Study enrolled a multiethnic prenatal population of 404 singleton, primiparous women in New York City between 1998 and 2002. Maternal urines were collected in the third trimester and analyzed for phthalate metabolites and creatinine concentrations. Two well-validated childhood cognitive and behavioral assessment tools based on parental reports, the Behavioral Assessment System for Children (BASC) and the Behavior Rating Inventory of Executive Function (BRIEF), were conducted at ages 4, 6 and 8.

RESULTS: In multivariate adjusted models, increased log low molecular weight (LMW) phthalate metabolite concentrations were significantly associated with poorer BASC scores on the clinical scales of Aggression, Attention Problems, Conduct Problems and Depression, on the Externalizing Problems composite scale and on the Behavioral Symptoms Index. For the BRIEF, increased log-LMW phthalate concentrations were significantly associated with poorer scores on the Global Executive Composite index and the Emotional Control scale.

CONCLUSIONS: We report on the association between early phthalate exposure and increased aggression, attention problems and conduct problems as well as emotional control problems in childhood; these behaviors are commonly seen in both ADHD and conduct disorder. Given the ubiquity of phthalates in the environment, the public health impact of even small adverse effects on neurodevelopment may translate into an increased prevalence of clinically evident impairment across the population. Replication of these findings is needed.

Late Breaker: General

Monday

9:00 AM-1:00 PM

4357.467

Poster Board 467

Resident

Can Pneumatic Otopscopy Improve the Diagnostic Accuracy of Otitis Media with Effusion in a Clinical Setting? A Randomized Single-Blind Control Trial

Talal Alkhatib, Lily H.P. Nguyen, Saleem Razack, Fahad Alsaab, Maida J. Sewitch, Otolaryngology-Head & Neck Surgery, McGill University, Montreal, QC, Canada; Pediatrics, McGill University, Montreal, QC, Canada; Medicine, McGill University, Montreal, QC, Canada.

OBJECTIVE: To determine if pneumatic otoscopy improves the diagnosis of otitis media with effusion (OME) among pediatric residents in a clinical setting.

DESIGN/METHODS: Study design: a randomized single-blind control trial. Candidates: Pediatric residents PGY 1-4 Patient population: children attending the otolaryngology pre-operative clinic from September 2008-January 2009. Exclusion criteria: children less than one year of age, major ear surgery, ears with cerumen impaction, and type C tympanograms.

Power calculation: sample size per group = 59 examinations (meaning 6 candidates performing 10 exams each), ($r = 0.1$) VIF = 1.9. Calculations are based on the difference in the correct diagnosis between the two groups that we hypothesized to be 10%. Methods: thirty pediatric residents (fixed sample size) were divided into Pneumatic otoscopy (intervention) and otoscopy only (control) groups by stratified randomization according to PGY level. Both groups received an hour of theory on otitis media with effusion. The intervention group received an extra teaching in the form of pneumatic video-oto-endoscopic videos and a practice session to ensure familiarity with the intervention. Every resident from each group examined a total of 10 ears. Each resident filled a standardized form noting his/her diagnosis (normal vs. OME) for each child. The principal investigator performed a tympanogram for each child making an objective diagnosis of normal middle ear (type A tympanogram) or OME (type B tympanogram). The findings of each resident were compared to the tympanogram results. Proportions of correct diagnoses between the intervention and control groups were compared using chi-square analysis.

RESULTS: three residents dropped out of the study. Thirteen residents fell into the intervention group while 14 residents served as controls. The intervention group examined 130 ears while the control group examined 139 ears. The intervention group were 60% correct in their diagnoses vs. 59% for the control group (Chi-square = 0.68 at $df = 1$, $p = 0.34$) a difference that is statistically insignificant.

CONCLUSIONS: proportions of correct diagnoses between the pneumatic group and that between the otoscopy-only group were the same (around 60%). Pneumatic otoscopy did not seem to significantly improve the diagnosis of otitis media in clinical settings.

4357.468

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Safety and Immunogenicity of HPV Vaccine Administered Concomitantly with or Sequentially after MenACWY-CRM and Tdap Vaccines

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BACKGROUND: The US ACIP recommends that adolescents receive quadrivalent meningococcal conjugate, Tdap booster and three serial HPV vaccinations. Administering all indicated vaccines together at a single visit increases the likelihood that each of the vaccines are received on schedule and as early as possible.

OBJECTIVE: We previously reported data supporting concomitant use of a quadrivalent meningococcal CRM₁₉₇ conjugate vaccine, MenACWY-CRM, with Tdap, and now present the

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data from the concomitant and sequential HPV vaccination series in that trial.

DESIGN/METHODS: In this Phase III study 1620 adolescents in Costa Rica aged 11-18 yrs received: i) MenACWY-CRM concomitantly with Tdap and HPV then HPV at 2 and 6 mo or ii) MenACWY-CRM then Tdap at 1 mo or Tdap then MenACWY-CRM at 1 mo, followed by HPV at 2, 4 and 8 mo. Immune responses against HPV virus-like particles for types 6, 11, 16 and 18 were measured at baseline and one month after the third HPV injection by competitive Luminex immunoassay (cLIA) in terms of anti-HPV seroconversion and geometric mean titers (GMTs). Local and systemic reactions were collected by diary card for 7 days post-vaccination. Medically significant adverse events and serious adverse events (SAEs) were collected throughout the study period.

RESULTS: One month after the third HPV dose $\geq 99\%$ subjects in both vaccine groups seroconverted to HPV. The seroconversion rate in the group receiving first HPV dose co-administered with MenACWY-CRM and Tdap was non-inferior to the rate in the vaccine group receiving HPV alone (lower limit of 95% CI for the group difference $> -5\%$) for all four types. Anti-HPV GMTs in the concomitant vaccine group were also non-inferior to the vaccine group receiving HPV alone (lower limit for the 95% CI anti-HPV GMTs group ratio was > 0.5), though there was a trend towards lower GMTs in the concomitant vaccine group for all four HPV types. All vaccines were well-tolerated. The proportions of subjects experiencing local or systemic reactions or experiencing an SAE were similar.

CONCLUSIONS: Data from this study support the co-administration of MenACWY-CRM, Tdap, and HPV vaccine in adolescents.

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TB Contact Tracing in Botswana – Knowledge and Acceptability

Gorewang Seropola, Tonya Arscott-Mills, Modongo Chawa, Chaiphus Cynthia, Kurup Shobha, Phologolo Thabo, Harari Nurit, Freidman Harvey, Steenhoff Andrew. Botswana-UPenn Partnership, Gaborone, Botswana; Princess Marina Hospital, Gaborone, Botswana; Botswana National Tuberculosis Program, Gaborone, Botswana.

BACKGROUND: Tuberculosis is a global emergency affecting a third of the world's population. In the developing world, children <14 years constitute 15% of TB cases. Pediatric TB is acquired from a contact source. Rates of TB contact tracing have historically been low in Botswana.

OBJECTIVE: To assess knowledge and attitude to contact tracing in both pediatric caregivers and adult TB patients.

DESIGN/METHODS: A survey was developed to assess patient's views on TB contact tracing. From 1st August to 30th November 2008, the questionnaire was administered to adult TB patients and caregivers of pediatric TB cases at Princess Marina Hospital in Botswana's capital city.

RESULTS: Sixty one people were interviewed - 38 adults with TB (55% female) and 23 caregivers of pediatric TB cases (96% female). Highest level of education for the 61 people were: no schooling 15%, junior school 16%, middle school 47%, high school 15% and tertiary 7%. Thirty-three interviewees (54%) were unemployed. A good basic knowledge of TB transmission was demonstrated by 58/61 (95%) while 55/61 (90%) knew that TB was curable. Regarding their or their child's TB status, nineteen (31%) said they were comfortable with this while 42 (69%) said they were worried about it. Thirty six people (59%) felt comfortable with contact tracing being done in their homes and 25 (41%) felt that the health system should improve the contact tracing system. Mornings were the preferred visiting time (57%) while 18% preferred afternoons and 25% evenings. Six people (10%) complained of TB-related stigma either at home or at work. Concerns expressed included about person-to-person TB transmission in the community. Most patients (75%) lived within a 30mile radius of the hospital.

CONCLUSIONS: In this urban population, there was a good basic knowledge of TB including contact tracing. Contact tracing as a concept was also well accepted. Based on this and its documented public health benefits we recommend that contact tracing in Botswana be given higher priority in all pediatric and smear positive adult TB cases.

4357.470

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Avoiding Parallel Systems: Contact Tracing for TB in Botswana

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BACKGROUND: Botswana has the 5th highest incidence of TB in Africa. Most pediatric TB cases can be traced to a TB contact. Identifying close contacts of smear-positive pulmonary TB cases and the source case when the index case is a child is a primary means of identifying new TB cases and controlling infectious TB.

OBJECTIVE: To assess (1) integration between adult and pediatric TB management and (2) contact tracing in adult and pediatric TB.

DESIGN/METHODS: A descriptive cross-sectional observational study using semi-structured, open-ended interviews of nurses, TB coordinators, and doctors at 5 sites. Sites spanned urban, semi-urban and rural settings representing varied patient populations and access to health services. Sites included referral hospitals in the north and south, a district hospital, and 2 primary hospitals. In addition, interviews were conducted with staff of 5 district health teams, 7 local clinics and health posts in 4 sites. Themes reported during the interviews were recorded.

RESULTS: The management of adult and pediatric TB was parallel rather than integrated. Due to limited human resources minimal contact tracing was conducted with estimates ranging from 0-15%. Efforts to identify pediatric contacts of adult TB patients were not routinely

made. For pediatric TB, attempts to identify the adult contact occurred in $<50\%$ of cases. At the large referral hospitals, MDR TB clinics saw adult TB patients solely; no pediatric contacts were seen. Contact tracing was made particularly difficult by the mobility of family members and patients' homes that were far from health care sites. Interviewees generally agreed that the health educator assistant was the correct cadre to conduct contact tracing.

CONCLUSIONS: Currently, most TB care in Botswana is rendered separately for adults and children. To improve utilization of limited resources, we advocate enhanced integration of adult and pediatric TB care, a key component of an effective TB control strategy. This will improve identification and screening of pediatric contacts of adult TB cases enhancing early diagnosis and treatment of pediatric TB. Additionally, a family TB clinic would facilitate complete family contact screening and promote joint responsibility. Lastly, due to the influx of many foreign doctors, country-specific TB/HIV training is likely to enhance collaborative adult and pediatric TB/HIV care.

4357.471

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Enhanced TB Diagnosis in Botswana Children

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BACKGROUND: Botswana has the 5th highest incidence of TB in Africa. The diagnosis of pediatric TB is challenging due to non-specific signs and symptoms, an inability to produce sputum and paucibacillary disease. We implemented a pediatric cough team at Bamelete Lutheran Hospital (BLH) focusing on gastric aspirates (GA).

OBJECTIVE: (1) To enhance diagnosis of pediatric TB through GA (2) To train health care workers (HCW) in the optimal collection of pediatric sputum samples.

DESIGN/METHODS: BLH hospital, 22 miles from Botswana's capital city, serves a semi-urban population of 65,000 and admits 1,200 children/year. From September 2008, a cough team visited BLH 5 days/week. The team taught nurses and educated laboratory and medical staff about GA's. The goal was to perform 3 aspirates on every child (<13 years) suspected of having pulmonary TB. Data on trainees and children (age, sex, address, contact details, HIV status, chest X-ray, date of aspirate, results) were recorded. Outcomes included GA smear and culture results and number of HCW trained.

RESULTS: Of 180 admissions, 26 children (50% female) had 77 gastric aspirates. Mean age was 5.4 years. HIV status was known in 16/26 (62%) and 13/16 (81%) were HIV-infected. Sixteen (62%) had a chest X-ray and 15/16 (94%) X-rays were abnormal. Five of 26 children (19%) were admitted for GA. Of 77 aspirates, all TB smears were negative and aspirates from 5 children (19%) were TB culture-positive. Four of these 5 children (80%) had been discharged from hospital without a final diagnosis of TB - the GA thus changed their medical course. Eighteen local nurses performed GA's with 39% (30/77) of GA's done by local staff. Implementation challenges included accessing N95 respirators and laboratory difficulties (incomplete records, delays in sending for culture).

CONCLUSIONS: Gastric aspirates have been successfully implemented in a district hospital in Botswana. The procedure has led to enhanced diagnosis of pediatric TB. Local HCW are able to perform the procedure. Feedback has improved the laboratory's record keeping and resulted in N95 respirator availability at BLH. We recommend scale up of this pilot project to enhance diagnosis of pediatric TB in all hospitals in Botswana, particularly in those areas with the highest prevalence of TB.

4357.472

Poster Board 472

Towards True Partnership – Early Lessons Learned in a Botswana Pediatric HIV-TB Program

Tonya Arscott-Mills, Nurit Harari, Thabo Phologolo, Japhther Masunge, Robert Makombe, Oathokwa Nkomazana, Jibril Haruna, Finale Rodney, Freidman Harvey, Steenhoff Andrew. Botswana-UPenn Partnership, Gaborone, Botswana; Botswana National TB Program, Gaborone, Botswana; Nyangabgwe Referral Hospital, Francistown, Botswana; Botswana National TB Program, Gaborone, Botswana; Botswana National TB Program, Gaborone, Botswana; Ministry of Health, Gaborone, Botswana; Pediatrics, Children's Hospital of Philadelphia, Gaborone, Botswana.

BACKGROUND: Proposing and implementing effective programs with long-term sustainability is challenging. We sought to implement a pediatric HIV/TB program to strengthen diagnosis, treatment and educational services for TB infected patients at all levels in the Botswana health system. This required a partnership with international and local partners.

OBJECTIVE: We want to document a successful strategy for partnership in Pediatric TB/HIV care.

DESIGN/METHODS: Development of the concept began with consultation with potential partners, locally and internationally. The key stakeholders included Botswana Ministry of Health, in-country Centers for Disease Control staff, Children's Hospital of Philadelphia and the Botswana-UPenn Partnership. These partners were integral to designing the program, proposal writing and implementation. Basic to all discussions and collaboration was an

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awareness of appropriate cross-cultural communication.

RESULTS: This collaboration has led to project implementation with defined commitments from both international and local partners, cost and staff sharing, a focus on local priorities and a planned exit strategy. Using an established plan of outreach from a tertiary hospital has allowed the hospital to commit to covering housing cost and transportation of the program's outreach to the primary and secondary hospitals. This facilitates easier exit of international staff as local staff will be able to continue outreach as expenses are already locally owned and in accordance with an established outreach program. The outreach has been tailored to the schedule and training needs of the local staff in accordance with national HIV/TB guidelines. Implementation of the program has involved frequent dialog and discussion at the regional and local level which have resulted in program.

CONCLUSIONS: Effective partnerships require collaboration from stakeholders from the conceptualization of the program through implementation. This facilitates local ownership, led by national priorities and strategies. Partners need to state what they plan to contribute to the program. Utilization of the strengths of the various partners is key throughout the entire process. This leads to easier implementation and maximizes prospects for better outcomes and long-term sustainability.

4357.473

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Efficacy of Live Attenuated Influenza Vaccine in Children Against Opposite-Lineage Influenza B Strains

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BACKGROUND: Since the 1980s, 2 antigenically distinct lineages of influenza B (Victoria and Yamagata) have circulated, often both during the same season. Annual influenza vaccines include a single B strain, which in 4 of the past 7 seasons did not match the lineage of the predominant circulating B strains. Based on the available data for both trivalent inactivated vaccine (TIV) and live attenuated influenza vaccine (LAIV), vaccine efficacy against opposite-lineage B strains has been estimated to be low or non-existent. LAIV is not approved for use in children <24 months of age.

OBJECTIVE: To estimate the efficacy of LAIV in children against opposite-lineage B strains. **DESIGN/METHODS:** A systematic analysis of clinical studies of LAIV was conducted. The incidence of opposite-lineage B in all treatment groups was extracted. Efficacy was calculated by study.

RESULTS: Significant circulation of influenza B viruses of the opposite lineage to the vaccine occurred in 5 placebo-controlled studies in previously unvaccinated children 6-47 months of age and 1 TIV-controlled study in children 6-59 months of age. In all cases, the vaccine contained a Yamagata lineage strain and circulating strains were of the Victoria lineage.

Study	Year	Treatment Regimen ^a	LAIV		Control		Efficacy, % (95% CI)
			Incidence, % (95% CI)	Control	Incidence, % (95% CI)	Control	
Formal, year 1	2000-01	LL	0.9 (0.0-5.3)	1.5 (0.0-3.1)	4.1 (2.6-5.7)	4.1 (2.6-5.7)	-41 (-74, -9)
		LL	4.4 (2.9-5.9)	4.7 (3.0-6.5)	8 (7.4-8.6)	8 (7.4-8.6)	-18 (-49, 13)
		LL	1.3 (0.6-2.0)	2.2 (1.6-2.8)	4.4 (3.8-5.0)	4.4 (3.8-5.0)	-70 (-81, -59)
Informal, year 2	2001-02	LL	2.6 (0.9-4.3)	1.8 (0.0-3.6)	1.8 (0.0-3.6)	1.8 (0.0-3.6)	-18 (-49, 13)
		LAP	2.2 (0.7-3.7)	2.2 (1.6-2.8)	1.1 (0.0-2.2)	1.1 (0.0-2.2)	-34 (-67, 0)
		PPV	1.2 (0.0-2.4)	2.1 (1.5-2.7)	5 (4.4-5.6)	5 (4.4-5.6)	-76 (-87, -65)
Brazil, year 2	2002	LAP	1.9 (0.9-2.9)	1.9 (1.3-2.5)	3.4 (2.8-4.0)	3.4 (2.8-4.0)	-43 (-54, -32)
		LPL	6.2 (4.9-7.5)	10.2 (8.9-11.5)	10.2 (8.9-11.5)	10.2 (8.9-11.5)	-39 (-50, -28)
		PPV	3.9 (3.0-4.8)	4.2 (3.3-5.1)	8.2 (7.3-9.1)	8.2 (7.3-9.1)	-52 (-63, -41)
Brazil	2004-05	LL	5.5 (4.0-7.0)	5.5 (4.0-7.0)	10.8 (9.3-12.3)	10.8 (9.3-12.3)	-49 (-60, -38)
		LL	5.5 (4.0-7.0)	5.5 (4.0-7.0)	10.8 (9.3-12.3)	10.8 (9.3-12.3)	-49 (-60, -38)

LL, Live Attenuated Influenza Vaccine; LAP, Live Attenuated Influenza Vaccine; LPL, Live Attenuated Influenza Vaccine; PPV, Placebo.

^aLAIV, P-Placebo; TIV, trivalent inactivated vaccine.

^bSeparately non-dominant virus group in year 1, non-dominant virus 2 years separated by death.

^c1 or 2 doses given as recommended.

CONCLUSIONS: In the studies analyzed, LAIV generally did not provide statistically significant efficacy against B strains of the opposite lineage to the vaccine strain. The only significant efficacy was in a season with a 10.2% attack rate and was lower than LAIV efficacy against B strains of the same lineage observed in other studies. Influenza vaccines containing B strains of both lineages should be considered to enhance protection. Sponsored by MedImmune.

4357.474

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Docosahexaenoic Acid (DHA)-Supplemented Toddler Beverage Increases Blood DHA Levels in a Dose-Dependent Manner AND Improves Respiratory Outcomes

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BACKGROUND: The US National Health and Nutrition Examination Survey found low toddler DHA intake. Higher RBC phosphatidylethanolamine (PE) DHA in infancy has been associated with improved development and visual acuity through 6 years of age.

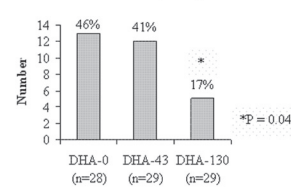
OBJECTIVE: To determine DHA intake in a group of US toddlers and the effect of DHA-supplemented ready-to-drink cow milk-based toddler beverage on blood lipid indicators of DHA status.

DESIGN/METHODS: In this double-blind, randomized, single-center, controlled, parallel-group 60-day study, healthy 18- to 36-month-old children (n=86) received a daily serving of beverage supplemented with: 0 (DHA-0, Enfagrow®), MJN, Evansville, IN), 43 (DHA-43) or 130 (DHA-130) mg algal DHA/237 ml serving. A dietitian obtained 24-hour diet recall at days 0 (baseline), 30, and 60. Blood drawn at baseline and day 60 was analyzed for DHA and arachidonic acid (ARA) (weight % total fatty acids) in RBC [total, phosphatidylcholine (PC), and PE] and plasma [total and phospholipids (PL)] by capillary column gas chromatography. Individual daily DHA intake was estimated using Nutrient Data System for Research (v. 2006);

Minneapolis, MN). Adverse events were recorded.

RESULTS: After adjustment for baseline, RBC DHA (total, PC, PE) and plasma DHA (total, PL) increased in a dose-dependent manner from baseline to day 60 (P<0.05); ARA levels remained fairly constant with no evidence of reduced ARA status due to DHA intake. Group differences were detected for incidence of adverse (P=0.013) and respiratory events (P=0.04) during the 60 day study. Median food DHA intake was 10.0 mg/day.

Toddlers with ≥1 Respiratory Event



CONCLUSIONS: Supplemental DHA increased DHA in blood lipid classes and was associated with decreased respiratory events in a group of 18 to 36-month-old toddlers. This study confirms low DHA intakes in US toddlers and demonstrates that a DHA-supplemented beverage can improve DHA status.

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Fellow in Training

Pediatric Traumatic Brain Injury: The Utility of Beta-Natriuretic Peptide

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BACKGROUND: Serum Beta-Natriuretic Peptide (BNP) levels have been shown to rise dramatically in adult trauma patients, specifically for those with traumatic brain injury (TBI) and with intracranial hemorrhage (ICH). The rise correlates with severity of injury. BNP levels may be an ideal serum marker for pediatric TBI, as current assays for BNP levels can be processed in minutes. If used as a TBI screening tool, it may help avoid CT radiation exposure in some pediatric patients.

OBJECTIVE: We hypothesize that serum BNP levels would be significantly elevated in pediatric trauma patients with intracranial bleeding on head CT at the time of ED visit. Our goal was to determine whether serum BNP levels could be a screening tool to predict head CT results.

DESIGN/METHODS: Serum BNP levels were drawn from 95 consecutive "level I status" pediatric trauma patients in a busy, urban, level I Trauma Center Pediatric Emergency Department. Patients had high-impact mechanisms, were altered, or were physiologically unstable; those with subsequent discovery of past cardiac or renal problems were excluded. Patients were subsequently divided into a Negative Bleed or Positive Bleed group based on CT results. Clinical data such as loss of consciousness (LOC), Glasgow Coma Scale (GCS), injury severity score (ISS), and hospital course were collected. Results were compared using a Wilcoxon Rank-Sum test and Spearman correlation coefficients.

RESULTS: 74 subjects were in the Negative Bleed group and 21 in the Positive Bleed group. BNP levels did not differ significantly between groups (5.92 vs. 7.28 pg/mL, p = 0.42). BNP levels did not correlate with LOC, GCS, ISS, or hospital stay.

BNP Associations

	Association / Spearman Correlation	p-value
LOC	no association by Wilcoxon Rank-Sum test	0.88
GCS	-0.034	0.75
ISS	-0.151	0.14
ICU Days	-0.086	0.41
Hospital Days	-0.115	0.27

Clinical, Hospital Use, and Laboratory Data

	Negative Bleed	Positive Bleed
LOC (%)	14.9%	76.2%
Mean GCS	14.7	10.1
Mean ISS (Injury Severity Score)	5.6	15.6
Mean ICU Days	0.32	2.7
Mean Hospital Days	1.8	7.0
Mean BNP level (pg/mL)	7.28	5.92

CONCLUSIONS: BNP levels drawn at the time of ED visit do not appear to be a predictor for intracranial hemorrhage in pediatric trauma patients. A head CT still remains the best modality for diagnosing ICH. Pediatric research on the prognostic value of serial BNP levels in ICH is warranted.

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House Officer

Knowledge Regarding HIV Transmission among Young Adults in China

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BACKGROUND: According to data from 2005, an estimated of 650,000 people in China were living with HIV/AIDS. The knowledge of transmission of HIV is key to the prevention of AIDS.

OBJECTIVE: Determine the knowledge regarding HIV transmission and prevention, as well as the source of this knowledge, among young Chinese adults.

DESIGN/METHODS: A survey was conducted among students from two different universities

in the city of Kaifeng, province of Henan, China.

RESULTS: Six hundred and seventy eight students (46.5% males and 53.5% females) participated in this survey. Almost all students (95%) were aware that HIV can be transmitted by sharing needles, by blood transfusions, and by vaginal sex. The majority (70%) knew that HIV could be spread upon condom breakage. However, several misconceptions about HIV were reported, with up to one-third of the respondents reporting that HIV could be transmitted by kissing; that showering after intercourse reduces the chances of getting infected with HIV, that HIV can be transmitted by sharing eating utensils; that a good diet and sleep prevents HIV infection; that birth control pills protect from getting infected with HIV; and disturbingly, only one-third knew that HIV could be contracted with the very first intercourse. Interesting differences in HIV knowledge were observed between male and female respondents: 73.5% of males and 80.9% of females correctly answered that anybody can get infected with HIV ($p=0.03$); 78.6% of males and 67.5% of females knew that HIV is transmitted by oral sex ($p=0.002$); 39.5% of males and 26.6% of females believed that voiding after intercourse reduces the chances of HIV infection ($p<0.01$), and only 31.1% of males and 23.9% of females knew that not having sex is the best protection against HIV ($p=0.04$). The majority (90.6% of males; 82.1% of females) of students acknowledged having received any HIV education. Regarding the source of HIV information, 80.1% received it in school, 6% in the community, 3.4% at home, and 0.7% in church.

CONCLUSIONS: Even though the majority of students received education regarding HIV, we found substantial gaps in their knowledge, regarding HIV transmission and prevention. It is, therefore, important for educators in China to devise better methods to educate young adults about HIV transmission and protection from HIV infection so that the spread of this devastating infection can be controlled.

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Developing an Easy Method To Follow Up Lab Results in a Paediatric Emergency Department Called "Results Diary"

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BACKGROUND: In March 2007 the Child Health Department of the Royal Free Hospital embarked on an innovation to improve Child Health and transform the delivery of care in our service. So a 24-hour a day consultant-provided service in general paediatrics was introduced. Coinciding with this implementation, we undertook a review of lab results ordered by clinicians in ED. The timely receipt of all lab results ordered by clinicians is central to the reliability of care, by ensuring patients and parents receive the necessary information and treatment. Anecdotally we felt multiple handovers between junior doctors lead to results were not be followed up, and risking patient safety.

OBJECTIVE: To receive 100% of blood results by the end of the day and 95% of other results within 48 hours by the end of June 2008.

DESIGN/METHODS: After exploring different solutions, we decided to pilot a centralised "Results Diary". Results to be followed up were written by the requester into the Results Diary, along with the provisional diagnosis and what actions, if any, had already been taken. Doctors, Nurses and physician assistants were responsible for following up all results. The Results Diary was also used to keep all parents informed and advice of any treatment and follow-ups arranged. All relevant staffs were briefed on the role of the Results Diary on regular basis and through induction programme for new staff.

RESULTS: Initial samples in May 2007 revealed over 20% of samples were not followed up. By June this dropped to below 5%. We attribute this familiarity with the Result Book and its improvement to the service. By May 2008 95.5% of results were being followed up. This result was also attributable to responsibility for checking shifting from the nursing staff to the physicians' assistants and physicians themselves. The percentage of instances where follow up action was not taken when it was required also dropped from 27.5% in 2007 to 10.7% in 2008. Since this success we have fully implemented the Results Book. Over both the trial period and full implementation 100% of blood results were followed up.

CONCLUSIONS: This is a simple and easily sustainable improvement in practice, which has significantly increased the quality of patient care.

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Risk of Injury over the Summer in Children and Adolescents with Attention-Deficit/Hyperactivity Disorder

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OBJECTIVE: To describe rates and predictors of injury over the summer among youth diagnosed with attention-deficit/hyperactivity disorder (ADHD) who were consistently treated with stimulants during the preceding spring.

DESIGN/METHODS: Claims data were analyzed to examine the risk of treatment for an injury diagnosis (ICD-9-CM: 800-999, except 905-909.9 and 958-958.8) during the summer. The analysis was limited to privately insured youth, ages 6-17 years, who were diagnosed with ADHD and consistently prescribed stimulants (medication possession ratio $\geq 60\%$) during the 90 days before summer. A total of 4,500,291 person-days of follow-up from 69,244 patients were analyzed. Daily rates of injury were used in a multivariate Cox proportional hazards regression with censoring at date of first injury diagnosis or end of summer, whichever occurred first. Each summer day was classified with respect to stimulant treatment. Other covariates included patient demographics, selected mental health diagnoses and mental health

treatment patterns.

RESULTS: The overall rate of injury was 9.79 per 10,000 days of follow-up. The highest daily rates of injury were observed for youth who had mental health inpatient treatment or an anxiolytic prescription during the spring. The adjusted hazard ratio of injury was not significantly related to daily stimulant treatment (Hazard Ratio: 1.02, 95% Confidence Interval: .96-1.08). However, it was significantly increased for adolescents as compared with children (1.19, 1.12-1.27), for males as compared with females (1.23, 1.14-1.32) and for youth diagnosed with a disruptive behavior (1.13, 1.02-1.26) or mood (1.12, 1.01-1.24) disorders and for youth prescribed anxiolytics (1.41, 1.19-1.68), antipsychotics (1.18, 1.06-1.32), or antidepressants (1.14, 1.06-1.24), or treated as mental health inpatients (1.36, 1.08-1.72) during the 90-day lead in period.

CONCLUSIONS: In this population, demographic characteristics and mental health treatment patterns during the preceding spring were predictive of injury over the summer. Although daily stimulant treatment as defined here was not associated with either a significantly increased or decreased risk of injury, further research is needed using more precise measures of medication taking behavior. The information in this study may help clinicians and parents identify children and adolescents at higher risk of summer injury.

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Myeloid Dendritic Cells from Infants with RSV Bronchiolitis Have Impaired Capacity To Induce CD4 T Lymphocyte Proliferation

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BACKGROUND: RSV is the leading cause of lower respiratory tract disease in infants. Influenza (Flu) viruses are also common pathogens in children, accounting for numerous hospitalizations. Studies in young children indicate that dendritic cells (DCs), antigen presenting cells responsible for inducing primary T lymphocyte responses, are recruited to the respiratory tract during RSV and Flu infections and that recruitment of these cells is differentially affected by these two viruses. In vitro DC studies suggest dramatic differences in DC function in response to RSV and influenza viruses. To date, there have been no studies evaluating DC patients with RSV or influenza.

OBJECTIVE: To determine whether RSV and Flu differentially affect the capacity of DCs to initiate CD4 T cell responses in vivo.

DESIGN/METHODS: Myeloid DCs (mDCs) were purified from nasopharyngeal wash and blood samples by flow cytometry-assisted cell sorting. The functional capacity of purified airway DCs from patients with RSV ($n=20$) and influenza ($n=10$) was compared. This was measured in two ways: 1. as a raw percentage of proliferating CD4 T cells after 6-day co-cultures of patient airway dendritic cells with purified allogeneic CD4 T cells and, 2. As an alloproliferative index, which represents the percentage of CD4 T cell proliferation induced by purified airway mDCs from RSV/influenza patients relative to the CD4 T cell proliferation induced by purified blood DCs isolated from a healthy control donors ($n=20$).

RESULTS: mDCs purified from the airways of patients with RSV displayed significantly diminished capacity to drive CD4 T cell alloproliferation compared with mDCs purified from patients with Flu and with those from healthy donors. The functional capacity of purified mDCs from RSV patients increased significantly after resolution of the RSV infection (in the same patients), providing further evidence that acute infection with RSV interferes with mDC function. Airway mDCs purified from patients with Flu, unlike those from RSV patients, were capable of inducing significant CD4 T cell alloproliferative responses.

CONCLUSIONS: RSV impairs respiratory mDC function in patients with bronchiolitis while influenza does not. These results indicate that mDCs are differentially affected by RSV and influenza viruses in vivo, which may contribute to the divergent T cell immune responses induced by these viruses.

4357.480

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Developmental Screening Tools – How Do They Impact Pediatric Resident Knowledge?

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BACKGROUND: Seventy percent of children with developmental disabilities are missed every year despite traditional evaluations by physicians. The American Academy of Pediatrics recently published the new Bright Futures guidelines, which formally recommends developmental screening with a valid tool at 9 months, 18 months and 30 months of age. However, a concern has been voiced by medical educators about the potential negative impact of these screening tools on knowledge for learners.

OBJECTIVE: The purpose of this study was to evaluate the effect of a validated developmental screening tool on resident knowledge of normal development.

DESIGN/METHODS: Pediatric residents completed a knowledge test of normal development, an in-service training exam (ITE), and a self-assessment survey before and after the implementation of the developmental screening tool, Ages and Stages Questionnaires® (ASQ), in their continuity clinic.

RESULTS: With a sample size of 22 subjects, there was 93% power to detect a two-fold difference in the knowledge scores between each resident. The average pre-ASQ knowledge scores were $50.1 \pm 13\%$ on the development exam and $62 \pm 11\%$ on the ITE, whereas the average post-ASQ knowledge scores were $50.6 \pm 8\%$ on the development exam and $68 \pm 9\%$ on the ITE. A paired t test showed that the developmental test scores did not significantly differ before and after the use of ASQ ($p = 0.86$). However, the statistical test revealed that the residents' ITE

scores did significantly improve despite having used the ASQ ($p = 0.0001$).

CONCLUSIONS: The baseline knowledge of developmental milestones was low, but the general knowledge was close to the national average. This result is consistent with previous studies of developmental knowledge. As is expected of residents going through their training, their scores on the ITE improved; however, their follow-up developmental test scores did not improve. While the results of this study suggest that the ASQ does not degrade resident knowledge, further studies including control subjects and longer-term follow up developmental tests are needed to draw definitive conclusions on the impact of knowledge for learners.

4357.481

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Characteristics of Children Presenting with Apparent Life Threatening Events Found To Have Physical Abuse

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BACKGROUND: Physical child abuse is an important cause of morbidity and mortality in infants who have had an apparent life-threatening event (ALTE), but clinical characteristics of these infants are poorly described.

OBJECTIVE: To identify clinical risk factors associated with child abuse in ALTE patients.

DESIGN/METHODS: Retrospective study of all infants, 0-12 months, admitted for an ALTE (1999-2003), and followed through 2006. Patients were evaluated for evidence of presenting or subsequent physical child abuse; statistical analysis was performed to identify characteristics associated with abuse.

RESULTS: There were 627 patients; 48% were male. Nine (1.4%) were diagnosed with child abuse. Five patients were diagnosed in the ED on the basis of abnormal exam findings. Four patients were not diagnosed until their hospitalization or subsequent follow-up. No significant differences were noted between ALTE patients who had abuse or not for patient age (4 vs. 3 months, $p = 0.32$), male sex (67 vs. 48%, $p = 0.33$), reported ethnicity ($p = 0.20$), or reported rescue breaths (11 vs. 8%, $p = 0.54$). However, more children with abuse documented a 911 call (56 vs. 22%, $p = 0.029$), had a history of vomiting (56 vs. 19%, $p = 0.018$), seizures (44 vs. 18%, $p = 0.078$), or irritability (22 vs. 3%, $p = 0.033$). When adjusted for patient age, sex and preterm history, the OR for abuse were 6.11 times for 911 call ($p = 0.015$), 9.39 if seizures ($p = 0.011$), 5.19 if vomiting ($p = 0.025$), and 12.18 if irritable ($p = 0.018$).

CONCLUSIONS: The infant presenting to the ED with a history of ALTE is at high risk for abuse. Physical abuse is often missed by current ED management, especially in infants without physical exam findings. The presence of vomiting, seizures, irritability, or a call to 911 are significantly associated with heightened risk for child abuse.

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Outcome of Childhood Systemic Lupus Erythematosus with Lupus Nephritis (SLE-LN) Treated with or without Cyclophosphamide

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BACKGROUND: We retrospectively analyzed the clinical and histopathological features, treatment modalities and outcome of 44 children and adolescents with biopsy-proven lupus nephritis (LN).

OBJECTIVE: To determine the outcome of childhood LN according to clinical presentations, histopathological features, and their response to immunosuppressive agents (prednisone and/or oral MMF/Azathioprine) with or without IV cyclophosphamide (CYC) bolus therapy at our university center.

DESIGN/METHODS: All pediatrics patients diagnosed with systemic lupus erythematosus (SLE) and biopsy-proven lupus nephritis (LN) treated with immunosuppressive agents with or without CYC were identified. The clinical course, renal outcome and treatment-related toxicities were examined in both groups.

RESULTS: A total of 49 patients with SLE were studied (85% female; mean age 12.1 years; mean SLE duration 5.89 years). Forty-four patients had renal biopsy, out of these 23 patients (52.3%) had severe LN (WHO Class IV and V) and 21 patients (47.7%) had mild to moderate LN (WHO Class I, II and III). Twenty one patients (47.7%) developed impaired serum creatinine. Twenty-two patients (50%) received monthly IV CYC bolus for initial presentation of severe LN; six patients (27.3%) who did not initially received IV CYC for moderate LN progressed to severe LN and required monthly IV CYC bolus. Sixteen patients (72.7%) with mild to moderate LN were maintained on prednisone and/or oral MMF/Azathioprine. At the completion of IV CYC infusion and after a follow-up of 217 cumulative patients years, six patients (21.4%) responded completely, 17 (60.7%) responded partially and five (17.8%) developed chronic renal insufficiency or ESRD. Failure to respond completely to CYC and the poor compliance were the independent predictors of poor renal outcome. Alopecia was the most frequent toxicity with the IV CYC regimen. Poor adherence to medical regimen and higher cumulative doses of CYC were independent risk factors.

CONCLUSIONS: The Children with LN tolerated IV CYC well. The IV CYC with immunosuppressive agents rather than immunosuppressive agents alone determines the optimum treatment response to severe LN. About one-fourth patients (27.3%) with initial moderate LN (WHO Class II and III) progressed to severe LN (WHO Class IV) while on immunosuppressant without IV CYC bolus. Patients who received the IV CYC and maintained on immunosuppressant had better outcome.

4357.483

Fellow in Training

NMDA Receptor Subunit Composition in Human Parietal Cortex and White Matter: A Developmental Profile

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BACKGROUND: Human neonates are susceptible to cerebral hypoxia-ischemia (HI), with age-associated vulnerabilities of white matter and cerebral cortex to cell death caused by excitotoxicity. In vitro and in vivo data indicate expression of AMPA and NMDA receptor (AMPA and NMDAR) subunits contribute to this vulnerability. AMPAR subunits are developmentally regulated in the human telencephalon (Talos, J Comp Neurol 2006) and NMDAR subunit NR1 is differentially expressed in neurons, astrocytes and oligodendrocytes in premature human brain (Manning, J Neurosci 2008).

OBJECTIVE: We examined patterns of NMDAR receptor subunit expression in human parietal cortex and white matter samples from 18 post-conceptual weeks to 61 years. We hypothesized NMDAR composition changes significantly throughout gestation, and that specific subunits associated with enhanced NMDAR function are expressed at higher levels in white matter during the preterm period, and in cortex during term and neonatal periods compared to adults.

DESIGN/METHODS: NMDAR subunit expression was evaluated by Western blot analyses of human parietal white matter and cortex samples collected from autopsy cases with normal neuropathological diagnoses ($n=48$), as approved by the Clinical Research Committees at our hospitals.

RESULTS: Expression of NR1, NR2A, NR2B, NR2C, NR2D and NR3A subunits vary with cerebral maturation, with profiles significantly changing through mid and late gestation. In white matter, levels of NR1 are 942% of adult levels in preterm infants ($p<0.01$), whereas NR1 levels at term are 178% of adult. Similarly preterm, levels of NR2B and NR2D represent 354% of adult ($p<0.01$) and 254 % of adult ($p<0.05$). In cortex, NR2B and NR3A subunits are significantly higher during preterm, term and neonatal periods, compared to adult ($p<0.05$). At term, NR3A levels are 670% of adult expression.

CONCLUSIONS: These data demonstrate developmental increases in NMDAR subunit expression implying enhanced NMDAR function in white matter, and may account for regional vulnerability to HI cell death observed in preterm infants. In cortex the expression of NMDAR subunits associated with longer NMDAR current decay and decreased sensitivity to magnesium block during term and neonatal periods may increase susceptibility to HI injury and seizures at this age. These data support therapeutic strategies with NMDAR antagonists, with target validation in human tissue. Support Contributed By NS038475, 1DP10D003347.

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Toward an Integrative Approach to the Management of Chronic Headache in Adolescents: It's Time, It Works

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BACKGROUND: Headache is a frequent occurrence in adolescents with a reported prevalence of 8-23%. Headaches numbering more than 15 days per month is considered chronic daily headache (CDH) and has a significant impact on quality of life. Frequently pharmacologic therapy alone is insufficient to address the scope of CDH. Complementary and alternative medicine (CAM) is a diverse and historically rich practice consisting of a variety of potentially beneficial non-pharmacologic approaches which has been shown to be of benefit in adults.

OBJECTIVE: To report on the utility and acceptability of an integrative CAM approach with acupuncture, guided imagery, and supplements to treat chronic daily headache in adolescents. **DESIGN/METHODS:** Comparative case studies on 11 adolescents with CDH documenting the integrative therapy provided and a qualitative analysis of acceptability and its therapeutic and quality of life impact.

RESULTS: Eleven adolescents were referred for evaluation and treatment of frequent disabling headache. Ages at initial visit ranged from 11 to 17 years. Nine of the eleven were being treated with prescription medications including OTCs with poor efficacy. A multi-faceted integrative approach utilizing CAM therapy was undertaken. All 11 patients received acupuncture and most received nutritional recommendations. Guided imagery was used in half and 8 patients received some homeopathy. Craniosacral therapy was provided to 7 and 3 received Chinese herbs. All eleven patients tolerated the treatments well with not adverse events. There was a significant composite benefit with a 94% reduction in headache frequency. Five of nine patients were able to discontinue their medications.

CONCLUSIONS: Integrative therapy to treat CDH in adolescents can have dramatic results in lowering headache burden and a return to function. It is acceptable and experienced as safe by both patients and families and often preferred by parents who are concerned about the safety of prolonged drug therapy. The potential long-term benefits imply that it may be a cost effective approach to a common and often difficult problem not well addressed by standard medical therapy alone. A hurdle to more widespread use of integrative therapy is its poor coverage by insurance and public assistance programs. The evidence base supporting the use of CAM therapies needs to be expanded and constantly reviewed. Traditional scientific double blinded studies may not be the optimal design method.

4357.485

Fellow in Training

Impact of Social Factors on Asthma Triage in Children

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BACKGROUND: Asthma is responsible for a quarter of all emergency department (ED) visits in the United States. Studies have cited multiple contributing factors responsible for ED utilization by asthmatic children. Poor parental assessment of asthma severity, inadequate self-management, lack of resources, and parental worry are a few of these factors. Interestingly all these factors are focused on the patient and their families. Multiple investigations previous performed at our institution suggested another focus which may contribute to ED utilization by asthmatics. These preliminary studies demonstrated many of patients contacted their primary care physicians (PCP) and were advised to go to the ED during expected office hours. Further, three-quarters of asthmatic children who came through our ED were discharged home.

OBJECTIVE: Our objective was to explore factors influencing physician's decision making to utilize the ED for asthmatic children.

DESIGN/METHODS: PCP-response questionnaires were mailed to pediatricians affiliated with our institution. The questionnaire explored reasons for ED referral. Statistical analysis was performed using the SAS Inc., Cary, NC software.

RESULTS: 147 surveys were analyzed. Acute respiratory symptoms and lack of response to medication were the major factors influencing ED referral. Interestingly, 47% reported parental concern as a major factor. Seventy nine percent believed space limitations to administer treatments, insufficient staffing, and limited equipment to be minor factors. Busier practices and group practices responded that space limitation, insufficient staff, and limited equipment (all $p < 0.05$) were less of an influence for referral compared to their counterparts.

CONCLUSIONS: Symptoms based markers of severity ranked highest as a triage indicator. Pediatricians also ranked parental stress and anxiety about their child's asthma as a significant triage indicator to refer to the ED. Improved asthma education, self-management and asthma action plans may improve parent – provider communication and decrease ED referrals.

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Using Clinician Opinion To Design Clinical Trials That Change Standards-of-Care

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BACKGROUND: Trials are useful only if clinicians would adopt new research findings in their clinical practice. In planning a trial of thyroid hormone treatment in ELGANs, we surveyed neonatologists to identify trial qualities that would influence adoption of a new treatment if the trial showed efficacy.

OBJECTIVE: To investigate which trial characteristics and results would be most effective in translating thyroid hormone treatment into clinical practice among neonatologists.

DESIGN/METHODS: A sample of 226 neonatologists from the Perinatal Section listserv of the AAP completed a 13-item web-based questionnaire about a hypothetical clinical trial of thyroid hormone treatment in infants <28 weeks of gestation. Three study parameters (sample size, effect size, and outcome) were varied to evaluate their impact on the likelihood that clinicians would adopt the intervention. The survey assumed no adverse results of treatment. If the respondent indicated a $\geq 80\%$ probability of using the intervention, we considered the response positive for treatment adoption.

RESULTS: Respondents were leaders in their field; 83% had presented at grand rounds in the last year and 98% were practicing at Level III NICUs. All three parameters affected the reported likelihood of using thyroid treatment. A drop in cerebral palsy (CP) was more persuasive than an improvement in IQ. If CP were lowered by 50%, 81% of respondents would adopt, but if the reduction were 25%, only 50% would adopt. A halving of Bayley scores < 80 would prompt adoption in 2/3 of respondents, while 41% would adopt if such low Bayleys were reduced by 25%. Just 56% would change practice if mean Bayley scores improved by 10 points. Sample size was also important as 64% would change practice if there were 400 subjects / arm, as compared to only 29% if the sample size was 200 subjects / arm. Nearly 50% of responders submitted supplemental comments indicating engagement in the issues of decision making.

CONCLUSIONS: In planning clinical trials it is useful to consider how study parameters may affect the translation of findings into clinical practice. Relying on statistical criteria alone for sample size determination may not be enough to translate important research findings into practice.

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House Officer

Validation of the New Schwartz Equation in a Non-CKD Pediatric Population

Robin LeBlond, John Brandt, Amy Staples, Craig Wong, Pediatrics, University of New Mexico, Albuquerque, NM.

BACKGROUND: Recently, Schwartz et al (JASN 2009; in press) used data from the NIH-funded Chronic Kidney Disease in Children (CKiD) study to generate new serum creatinine-based equations for estimation of glomerular filtration rate (eGFR), including an update of the

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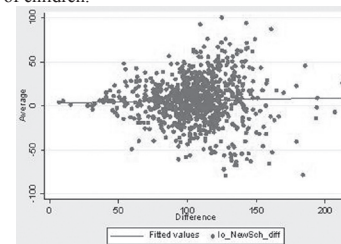
commonly used bedside equation. However it is not clear if the equation can be generalized to pediatric populations outside of the CKiD study, and needs validation. We have used the updated eGFR equation on a sample of pediatric patients with varying renal function to evaluate the correlation between the new Schwartz equation and iothalamate clearance tests.

OBJECTIVE: Our objective was to validate the updated Schwartz equation using a population with less impairment in renal function than the CKiD population.

DESIGN/METHODS: We retrospectively analyzed 888 iothalamate clearance tests (from 566 children). There were two outliers that were removed from the final analysis. Ages ranged from 1 to 23 years with a mean serum creatinine of 0.56 mg/dl. Diagnoses included those with solid tumor malignancies both pre and post chemotherapy and chronic kidney disease and those with functioning renal transplants. We performed a Bland –Altman plot to determine the measure of agreement between the two methods.

RESULTS: The mean eGFR by iothalamate was 108 ml/min/1.73m² and by the new Schwartz estimation was 103 ml/min/1.73m². The Bland-Altman plot is below. The mean difference between the two estimations is 5.99 ml/min/1.73m² (95% CI 4.29 – 7.69). Pitman's Test of difference in variance resulted in an $r = 0.029$ and p value of 0.392.

CONCLUSIONS: The newly purposed bedside Schwartz equation demonstrated good agreement with the iothalamate renal clearances in our patient population. This population includes children with normal renal function and normal body habitus, a concern noted by Schwartz et al. Although further validation among children with normal renal function and adolescents is warranted, the new equation appears to be a valid bedside estimating equation for GFR in this sample of children.



4357.488

Histological and Chemical Analytical Features of Melamine-Containing Urinary Calculi in Cats and Dogs Exposed to Recalled Pet Foods and the Importance of Stone Analysis in Pediatric Nephrolithiasis

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BACKGROUND: Melamine-associated nephrolithiasis in cats and dogs was reported in the U.S. in 2007 in animals developing acute renal failure associated with the consumption of melamine- and cyanuric acid-contaminated pet food. A consistent feature was the presence of unusual urinary crystals containing melamine and cyanuric acid, which are distinguishable in particular from calcium oxalate. Nephrolithiasis in children is relatively uncommon, however, there have been recent well-publicized reports associated with consumption of contaminated products in several countries. We believe that the features of the melamine-containing calculi seen in cats and dogs will be of interest to those investigating the etiology of urinary stone formation in the pediatric population.

OBJECTIVE: To illustrate the histological and chemical analytical features of melamine-containing urinary crystals seen in cats and dogs with renal failure associated with the consumption contaminated pet food.

DESIGN/METHODS: A retrospective review of melamine-associated nephrolithiasis in cats and dogs in which histopathological review and chemical analysis by scanning electron microscopy with energy dispersive X-ray analysis (SEM/EDXA) and infrared spectroscopy (IR) was performed.

RESULTS: Three dogs and two cats had melamine-containing crystals in necropsy kidney sections confirmed by IR. All had developed acute renal failure. Four cases were associated with the 2007 U.S. pet food recall, and one case was from a 2004 incident of pet food-associated illness in Taiwan. All animals also had calcium oxalate monohydrate crystals. Calcium oxalate and melamine-containing crystals were distinguishable in routine H&E-stained slides, and also had distinguishing histochemical staining characteristics.

CONCLUSIONS: The histological and chemical analytical features of melamine- and cyanuric acid-containing urinary crystals are characteristic and are direct evidence of consumption of melamine and cyanuric acid in cats and dogs. Although consumption of recalled pet food by humans is unlikely, it is not inconceivable. Future contamination of products ingested by humans has broader potential for the development of crystals similar to those illustrated. The

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rapid recognition of these crystal may speed detection of contamination in the future.

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Alternate Light Source to Examine Bruising

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BACKGROUND: A forensic tool that could identify bruising that is not visible to the naked eye could provide invaluable evidence in child abuse cases. Sub-clinical bruises are bruises that are not visible under normal white light but that can be visualized with tunable white light or ultraviolet light (i.e.- an alternate light source). There have been numerous case reports describing how an alternate light source documented sub-clinical bruises in adults and children that were not visible in white light. However, a controlled study comparing findings under white versus alternate light has never been done.

OBJECTIVE: The objective of this study was to investigate the technique of utilizing tunable white and ultraviolet light (i.e.- an alternate light source) in the detection of subclinical bruising. In particular, the goal was to establish sensitivity and specificity of a tunable white and ultraviolet light source, the Mini-Crimescope®400. In future research, using the baseline data and information established from this study, we hope to develop recommendations for the utilization of this alternate light source in the medical evaluation of the potentially abused child.

DESIGN/METHODS: This was a prospective, blinded, randomized validation study to evaluate the performance of an alternate light source, the Mini-Crimescope®400. On day 0, a bruise was induced on randomly selected subjects. On days 1, 7, and 14 a first investigator determined the presence of bruising under white light and documented findings on a body map. Then, a second investigator determined the presence of bruising using the alternate light source and documented those findings on a separate body map. Both investigators were blinded to the randomization and each other's exams. Findings on visible light and alternate light were compared and statistically analyzed.

RESULTS: The sensitivity of the Mini-Crimescope®400 was 90% on day 1, 80% on day 7 and 85% on day 14 as compared to 75%, 65%, and 30% respectively with visible light. The specificity of the Mini-Crimescope®400 was 51% on day 1, 57% on day 7, and 53% on day 14 compared to 71%, 81%, and 87% with visible light.

CONCLUSIONS: The results show that the Mini-Crimescope®400 is a valuable tool in detecting bruises when bruises have faded to the naked eye. An alternate light source may be a valuable tool in the forensic examination of a child abuse case.

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Fellow in Training

Subclinical Diabetic Peripheral Neuropathy Is a Frequent Complication in Children with Diabetes as Measured by of the NC-Stat® System

Andrey Mamkin, Irene Mamkin, Victoria Isakova, Pagali Murali, Steven Pavlakis, Svetlana Ten.

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BACKGROUND: Diabetic peripheral neuropathy (DPN) is a frequent complication of diabetes in adults. It is characterized by a progressive loss of nerve fibers. Nerve conduction studies (NCS) are the most objective measure of DPN. Subclinical DPN is common among children with type 1 diabetes (DM1). However there is only limited data on screening of children with DM1 for DPN possibly due to paucity of minimally invasive technology.

OBJECTIVE: To establish NCS normative data in healthy children using the NC-Stat® System technology and to then compare these results to those from children with DM1 To establish this methodology of NCS examination as a means to diagnose sub clinical stages of DPN among children with DM1 Hypothesis: NC-stat System can identify nerve conduction abnormalities in children and therefore may serve as an effective screen for subclinical DPN in children with DM1.

DESIGN/METHODS: This is a cross-sectional study looking at subclinical DPN in children who have DM1 for more than 4 years and normal neurological exam. They were compared to a control group that included healthy age matched participants with an HbA1C<6%. All subjects were studied with a NCS testing performed on median nerve, peroneal nerve and bilateral sural nerves. The instrument acquired and reported the mean Distal Motor Latency (DML), Distal Sensory Latency (DSL) and median F-wave parameters for nerves.

RESULTS: Data from NCS analysis of showed significant difference in F-wave mean, DML and DSL between study and control groups except for peroneal DML analysis that appeared to be non-statistically different.

CONCLUSIONS: According to the NCS analysis of motor and sensory nerves in the pediatric patient with intermediate and long standing DM1 there was significant difference in conductivity between the groups. The fact that none of the patients with DM1 had neurological complaints or clinical manifestations of nerve abnormalities and were not diagnosed with DPN, proved that nerve damages appear much earlier than clinical symptoms. DPN is much more prevalent in DM1 patents with intermediate or long standing diabetes than originally accepted. In our study we found that DPN can be found subclinically on early stages. It is also confirmed that NC-Stat system is non-invasive, sensitive tool for measurement of motor and

sensory nerve conductions and detection DPN in children and adolescents.

4357.491

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Family Centered Mass Casualty Simulation

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BACKGROUND: Franco et al (2006) showed that academic and medical institutions can make significant contributions to bolstering the Nation's disaster health infrastructure, even if they do not house traditional emergency medicine programs. Families are often displaced during a mass casualty event and maintaining the integrity of the family should be a concern for all health professionals.

OBJECTIVE: This project tests a simulation model to increase the surge medical capacity (number and skill of responders) to a disaster. The simulated disaster was an F4 Tornado occurring during a school day. This field training exercise (FTX) operated under the premise that responders and hospitals were overwhelmed. This FTX was sponsored by Towson University with support from volunteer federal and state, civil and military partners.

Collaborative training goals were to augment the state's surge capacity under a unified incident command system. Objectives included improving physician and nurses' training in the didactic exposition of disaster triage "Simple triage and rapid treatment" (S.T.A.R.T.).

DESIGN/METHODS: This "real-time" FTX was held in a building of opportunity (BoO), a campus hall with three gyms (holding 200 or more cots, 150 chairs, ample open space, arranged in standard triage treatment areas (delayed-yellow, minor-green, immediate-red, dead-black), two clinical labs and classrooms that served as a morgue and Incident Command Center. The victims and their families were community members and students. These participants were given a medical scenario to role play and over 500 smart victims were treated by nurses and physicians in less than four hours. Maryland emergency triage tags were completed by staff and used bar coding to track victims from the incident site to treatment zones and transport to the hospital. Members of the Critical Incident Stress Foundation were present to intervene with psychological first aid in the event of possible or perceived psychological / behavioral emergencies during the drill.

RESULTS: Outcome measures reflected a solid perception that a unique educational experience had been created. There was a better understanding by future health care providers of their role in family reconciliation, psychological care and response during a mass casualty event.

CONCLUSIONS: This exercise encouraged collaboration between an academic institution and a civilian Medical Reserve Corps in a model of total community engagement to build Americas' health preparedness infrastructure.

4357.492

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Postpartum Depression (PPD) in an At-Risk Population Is Moderated by Life Stressors and a Length Polymorphism in the Promoter of the Serotonin Transporter Gene (5-HTT)

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BACKGROUND: PPD is a health concern with implications for children of affected mothers. Prior research shows that a 5-HTT allele (S, short) associated with low expression of the serotonin transporter increases the risk of depression following stressful life events. In contrast, a recent finding suggests that the S allele decreases the risk of PPD.

OBJECTIVE: We examine whether the surprising protective effect of the S allele on PPD is moderated by mothers' exposure to life stressors. We also examine whether a child's 5-HTT genotype influences a mother's risk of PPD.

DESIGN/METHODS: Data are from the Fragile Families and Child Wellbeing Study, a nationally representative, longitudinal study of new mothers who gave birth in 20 large US cities. Mothers were interviewed in the hospital shortly after birth and were re-interviewed at one, three and five years after birth. DNA from the mother and child was collected from saliva. Life stressors were measured at birth or the one-year follow-up and include poverty, material hardship, low social support, domestic violence, unsafe neighborhood, father-incarceration, low education, young mother, children with other partners, unhealthy behaviors, non-marital birth, family history of depression and low birth weight child. DNA (approximately 1000 samples for this report) was analyzed for the 5-HTTLPR length polymorphism by PCR followed by gel electrophoresis to distinguish the short (375 bp) and long (419 bp) allele forms. Logistic regression was used to test for main and interaction effects.

RESULTS: There is a significant protective effect of the S allele on PPD and it is strongest among mothers with no life stressors. However, the S allele becomes a risk factor for PPD with the addition of each life stressor. A child's 5-HTT status may play a role in moderating these associations.

CONCLUSIONS: These results can be explained by a model in which the S allele protects against PPD by attenuating the hypothesized decrease in concentration of synaptic serotonin after parturition. However, the overall effect of the S allele is to reduce resilience, so in the presence of high stress, the S allele is associated with depression even after parturition. The finding that the child's 5-HTT genotype might influence the risk of PPD is novel and could be

explained by early behavioral differences in children with the SS genotype.

4357.493

House Officer

Renal Ultrasound for Febrile UTI in Children with Normal Prenatal Ultrasound, Useful or Wastage of Resources?

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BACKGROUND: Urinary tract infection is one of the most common bacterial infections in children. UTIs can be complicated by renal scarring in 6% of the cases, often leading to end stage renal disease. Renal scarring is often due to vesicoureteral reflux (VUR) which is best detected by the voiding cystourethrography (VCUG). Renal ultrasound (RUS) is not sensitive nor specific in detecting VUR or kidney scarring. The current guidelines call for RUS and VCUG as part of the management of a first febrile UTI in children. With the widespread use of prenatal Ultrasound, most renal abnormalities are diagnosed before birth. Performing RUS during an episode of febrile UTI seems a repetition of efforts and a waste of resources.

OBJECTIVE: To determine the benefits (in terms of improved patient outcome) of renal ultrasound in the management of a first febrile UTI in children.

DESIGN/METHODS: This is a retrospective chart review of children diagnosed with UTI at Metrohealth Medical Center in Cleveland between January 2000 and March 2007. We only included: Healthy children under 6 yrs., with first febrile UTI confirmed by a positive urine culture, who had RUS as part of their management, and who have had prenatal ultrasounds readily available to review. The results of all imaging studies are reviewed. The impact of RUS in regards to change in therapy is thus evaluated. Cases with first time detected renal anomalies are then further analyzed to see if the antenatal ultrasound was done and if it showed renal anomalies too.

RESULTS: 571 culture positive UTI charts were reviewed. 54 children <6yr (50 <2yr) of age fulfilled inclusion criteria. 41/54 RUS had normal results (75.9%), 13/54 had abnormal RUS (24.0%). The abnormalities detected were: pyelonephritis (n=2), focal pyelonephritis (n=1), chronic inflammation (n=1), hydronephrosis (n=8) of which 4 cases were antenatally diagnosed. The 4 newly diagnosed hydronephrosis did not show significant reflux on VCUG and none required further intervention. One case of horse-shoe kidney was newly diagnosed, without change in management. Out of the 54 patients, 42 had a VCUG done. The Incidence of reflux (grade 2 or more) was 9/42 (21.4%). Of these 9 cases, 8 had normal RUS, 1 showed UPJ abnormality with no required surgery.

CONCLUSIONS: Our data demonstrate the lack of clinical usefulness of routinely performing ultrasonography during the first febrile UTI in children with normal prenatal ultrasound results.

4357.494

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Chlamydial Infection in Asymptomatic Sexually Active Adolescent Females from High Risk Inner City Communities in the South Bronx: How Often Should We Screen Them?

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BACKGROUND: The incidence of *Chlamydia trachomatis* infection among adolescents in the United States 1,132 cases per 100,000, or 7-11 % of youth. It is an important cause of pelvic inflammatory disease (PID) and infertility. Center for Disease Control (CDC) recommends annual testing for Chlamydia in sexually active adolescent females, and retesting of those who were positive 3 months after treatment.

OBJECTIVE: to analyze the incidence of *Chlamydia trachomatis* infection in sexually active female adolescents patients who were initially tested negative during 12 month follow up period.

DESIGN/METHODS: a retrospective review of medical records of cohort of 13 – 21 years old female adolescents from January 1 through June 30, 2008. Each study subject was followed through a 12 month cycle from the time of the testing. Re-testing within a one year follow-up cycle was done either due to clinical suspicion or as a part of routine adolescent care at our institution. The genital (vaginal or/and cervical swab)sample or urine was tested utilizing CBD ProbeTec ET System C. trachomatis amplified-DNA assay (Becton Dickinson Diagnostic Systems). We had analyzed an incidence of *Chlamydia trachomatis* infection during the 12 months follow-up cycles in the subjects who initially tested negative, in three age groups: early (13-15 years old), mild- (16-18 years old) and late adolescence (≥ 19 years old).

RESULTS: Of 415 study subjects, 43 (10.36%) tested positive for *Chlamydia trachomatis* and were treated. Of those 372 subjects who tested negative at the start of 12 months of follow up cycle, 22 (5.9%) tested positive at re-screen within a cycle period. All 3 of 54 (5.5%) patients in the early adolescent group were re-tested because of clinical suspicion. The older Chlamydia-infected patients were, the higher proportion of them was asymptomatic: 75% (9/12) of 16 – 18 year olds, and 85.7% (6/7) of 19 – 21 year olds. Chlamydia infection was found at re-screening within 4 month of initial testing in 8 instances, and in 7 additional instances in each of the next two quarters of the year. There were no cases of PID among study patients.

CONCLUSIONS: Chlamydial infection can be easily missed with annual screening, especially in older asymptomatic sexually active adolescent females. More frequent screening may

improve prevention of complications of *Chlamydial infection* in adolescent females.

4357.495

Profiling Scoliosis in Rett Syndrome

Alan K. Percy, Hye-Seung Lee, Daniel G. Glaze, Steve A. Skinner, Kathleen J. Motil, Jeffrey L. Neul, Jane B. Lane, Suzanne P. Geerts, Judy O. Barrish, Fran Annese, Joy Graham, Lauren McNair, Pediatrics, University of Alabama at Birmingham, Birmingham, AL; Data Coordinating Center, University of South Florida, Tampa, FL; Pediatrics, Baylor College of Medicine, Houston, TX; Greenwood Genetic Center, Greenwood, SC.

BACKGROUND: Rett syndrome (RTT) is a neurodevelopmental disorder seen primarily in females due to *MECP2* mutations in 90-95%. In advance of clinical trials, understanding co-morbidities such as scoliosis is critical. Scoliosis is reported in >87% by adulthood. Prior studies reflect small sample size, parent completed questionnaires, and limited comparison by specific *MECP2* mutations.

OBJECTIVE: To characterize the clinical spectrum of scoliosis in RTT preparatory to clinical trials.

DESIGN/METHODS: The NIH-funded Rare Disease Network RTT consortium consists of three primary RTT centers and four traveling clinics in the US. Evaluations include clinical status (classic vs. atypical RTT), *MECP2* mutations, clinical severity, and presence, frequency, and treatment of scoliosis. The relationship between scoliosis and other clinical characteristics was assessed at enrollment in participants with Classic RTT seen from March 2006 to January 2009. We used logistic regression adjusting for age in years.

RESULTS: There were 669 female participants with complete diagnosis, including 566 Classic RTT (85%), 79 atypical RTT and 24 non-RTT. Of those with Classic RTT, 527 (93%) had a *MECP2* mutation, 37% were under 5 years old and 23% were older than 16 years old. Scoliosis was present in 280 (50%), and of those, 68 had scoliosis surgery before enrollment. Presence of scoliosis was positively associated with overall clinical severity ($p<.0001$), deceleration of head growth ($p=0.0215$), younger age of regression onset ($p=0.0039$), delayed, absent or lost ability to sit ($p=0.0186$) and walk ($p<.0001$), peripheral vasoconstriction ($p=0.0082$), seizures ($p=0.0168$) and constipation ($p=0.0002$). Lower BMI or bone fractures did not show significant association after adjusting for age. Scoliosis was not seen with acquired and conserved hand use. Among 518 participants with a known mutation, R133C, R294X, R306C or c-terminal deletions, known to be associated with milder severity, had lower frequency of scoliosis ($p<.0001$).

CONCLUSIONS: Scoliosis is common in RTT, increasing in frequency with age. This study showed that presence of scoliosis varies by mutation and is positively associated with overall clinical severity and several co-morbidities. Development of intervention strategies to reduce scoliosis progression is essential as is accounting for these factors in the design of clinical trials.

4357.496

Fellow in Training

TLR2 Mediates Recognition of Staphylococcus Epidermidis and Is Required for Clearance of Bacteremia

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BACKGROUND: Staphylococcus epidermidis (SE) is a nosocomial pathogen causing infection in immunocompromised populations, including those at the extremes of age.

OBJECTIVE: The mechanisms by which SE engages the host innate immune system are incompletely defined, and we therefore undertook the current study, employing live SE strain 1457.

DESIGN/METHODS: Human in vitro experiments were performed with human adult peripheral blood mononuclear cells to examine a SE-induced TLR transcriptome and cytokine production. Neutralizing TLR2 and TLR6 monoclonal antibodies were used to examine LSE-induced IL-6 production. The role of TLR2 was assessed by measuring cytokine production from human embryonic kidney cells transfected with TLR2 and TLR2-deficient primary murine peritoneal macrophages (pmacs). TLR2-deficient mice were injected with LSE intravenously (iv), plasma cytokine production was determined 1 h post-infection and bacterial clearance was examined up to 24 and 48 h later.

RESULTS: Exposure of human adult peripheral blood mononuclear cells to SE activated a TLR transcriptome and induced production of TNF, IL-6 and IL-10. SE was found to release a soluble factor (SE-S) that activates cytokine production in a TLR2-dependent manner. Neutralizing anti-TLR2 monoclonal antibody inhibited SE-derived soluble factor-induced IL-6 production in human whole blood tested in vitro. Transfection of human embryonic kidney cells with TLR2 conferred IL-8 responsiveness to SE. TLR2-deficient primary murine macrophages demonstrated impaired SE-induced TNF production, especially at low concentrations of SE. TLR2-deficient mice demonstrated reduced early cytokine production and impaired clearance of SE bacteremia after iv injection.

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Late Breaker Poster Session: General

CONCLUSIONS: Thus TLR2-mediated recognition of SE-S may contribute to clearance of SE bacteremia in vivo.

4357.497

Parent Perspectives on Immunization Messages

Linda Radecki, Lynn M. Olson, Mary Pat Frintner, Research, American Academy of Pediatrics, Elk Grove Village, IL.

BACKGROUND: Amid increasing questions from parents regarding immunizations, pediatricians seek to best address families' information needs. Little is known about parent preferences for communication about immunizations.

OBJECTIVE: Obtain parent perspectives on vaccine promotion messages.

DESIGN/METHODS: We conducted 3 focus groups targeted to middle-class families. Parents of children ≤ 36 months were recruited through community flyers. Parents reviewed 5 messages; a standard list of questions elicited parent reactions. Sessions were recorded/transcribed to review key themes. Based on primary theme conveyed, we categorized messages as *scientific or emotional*.

RESULTS: Sample: 23 mothers, 1 father; largely white (88%) and educated (88% ≥ 4 -yr degree). 50% first-time parents. All children had received some/all recommended vaccines, but many parents expressed concerns about safety and the schedule. Several delayed vaccines. Scientific messages: 2 statements addressed autism and vaccine overload. Parents valued emphasis on scientific studies but requested further supporting evidence. "I want to know what those studies are. Where can I find them?...and why should I value those studies above others?" "...to me, facts are more important than emotions. I'd rather hear 'we did a study and this is what turned out'" "It doesn't give you 'why' - why is timing so important? I've never understood that" Emotional messages: Generally, parents rejected perceived fear or guilt to promote immunizations. Statements encouraging vaccines to prevent illness or death were largely viewed as inappropriate. "...it was alarmist and negative, that might turn people off." "...messages about kids should be more positive..." Parents valued messages that created a personal connection and facilitated discussion. "...makes you feel like you and your pediatrician make the decision." "...I think this opens up communication with your doctor" "Maybe it needs something in there..." "Talk to your doctor about making the choice that's right for your child."

CONCLUSIONS: Messages that lacked substantive/scientific explanation or evoked fear or guilt were generally not endorsed. Participants sought messages that respect them as parents and acknowledge concerns in a nonthreatening way. Results suggest that families value messages that provide explanation from trusted sources. While most US parents opt to vaccinate, many likely have questions and concerns. Understanding and responding to their perspectives is critical to assure public trust and support for immunizations.

4357.498

Poster Board 498

Trends in Autism Spectrum Disorder Diagnoses: 1994-2007

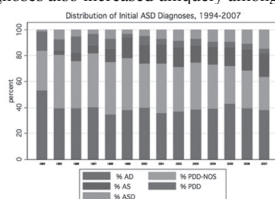
Rebecca E. Rosenberg, Amy M. Daniel, Kiely Law, Paul A. Law, Walter E. Kaufmann, Medical Informatics, Kennedy Krieger Institute, Johns Hopkins Medical Institutes, Baltimore, MD; Mental Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD; Center for Genetic Disorders of Cognition & Behavior, Kennedy Krieger Institute, Johns Hopkins Medical Institutes, Baltimore, MD.

BACKGROUND: During the past two decades, the autism spectrum disorder (ASD) knowledge base has experienced a tremendous evolution concerning clinical presentation and etiology. However, this increase in information has left many clinicians unsatisfied with the current taxonomic approach of ASD.

OBJECTIVE: Our objectives are three-fold: (1) to summarize functioning of DSM-IV-TR ASD in the field; (2) to identify external factors contributing to overall increased ASD diagnoses; and (3) to inform development of DSM-V ASD classification.

DESIGN/METHODS: We analyzed predictors of parent-reported initial diagnosis (autism, pervasive developmental disorder-not otherwise specified [PDD-NOS], pervasive developmental disorder ['PDD'] and autism spectrum disorder ['ASD'], and Asperger syndrome [AS]), among 6,176 individuals with autism spectrum disorders diagnosed from 1994 through 2007 from an national online autism registry. We used chi-square analysis and ANOVA to test differences within the same and multinomial logistic regression to determine OR of each diagnosis (mOR), as well as multivariate logistic regression to explore specific predictors' impact on diagnosis.

RESULTS: Overall, distribution of diagnoses was influenced by a secular time trend factor; other significant factors included ethnicity, white race, geographic location, urbanicity, and initial evaluator. Since 2001, most initial diagnoses of AD and AS have remained steady while 'PDD' and PDD-NOS have decreased. 'ASD' diagnoses have increased, especially among school-based teams; AS diagnoses also increased uniquely among these evaluators.



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CONCLUSIONS: Findings from this study suggest that current diagnostic guidelines may not be meeting all community evaluator needs.

4357.499

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How Well Do We Screen for Speech and Language Disorders in Children?

Joseph L. Sage, Nada F. Haddad, Internal Medicine-Pediatrics, MetroHealth Medical Center-Case Western Reserve University, Cleveland, OH; Pediatrics, MetroHealth Medical Center-Case Western Reserve University, Cleveland, OH.

BACKGROUND: Speech and language disorders are common, affecting 5-10% of children. Children with these disorders can be identified as early as 18 months of age. They can be screened for hearing loss and referred to speech therapy. Early detection and referral can improve performance in school. We sought to determine the age that pediatricians at our facility make a diagnosis of speech and language disorders.

OBJECTIVE: 1. At what age are our patients being diagnosed with speech and language disorders? 2. Do we order a hearing evaluation on these patients? 3. Are these patients being referred to speech therapy?

DESIGN/METHODS: This is a retrospective chart review. We did an electronic medical record review of all patients seen in the on-campus pediatric clinic (by pediatric nurse practitioners, residents and attending physicians) between the years of 2000-2003. We reviewed all the charts of patients who were given a diagnosis of speech delay/disorder or language delay/disorder. We reviewed: age at diagnosis; screening method used to make diagnosis; was the diagnosis made by the parent, PCP or another physician; did the child undergo a hearing screen; what intervention was taken at the time of diagnosis; was the child multilingual; other chronic illnesses. We excluded from our final review patients who had a diagnosis of a language disorder prior to transfer to our clinic, who transferred care to our clinic and were diagnosed at the first visit, children from multilingual households, or children with mental retardation or developmental delay.

RESULTS: 426 patients were identified with speech or language delays or disorders. 320 of them were diagnosed by our providers. The average age at time of diagnosis was 32.9 months, and the median age at diagnosis was 29 months. 77 children (24%) were not referred for a hearing evaluation and 49 (15%) were not referred for speech therapy or early intervention.

CONCLUSIONS: Providers in our practice are not diagnosing speech or language disorders at an optimal age. This corroborates previously published data about the diagnosis of speech and language disorders. We can use this data to educate our providers, introduce a speech and language development screening tool that would help with early detection and treatment of disorders, and improve our patient care.

4357.500

Poster Board 500

WITHDRAWN

4357.501

Poster Board 501

Effects of Ketamine in the Macrophage Response to Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA)

Thomas Spentzas, Elizabeth A. Meals, Lorraine Lazar, Mark Rayburn, Keith B. English, Memphis Childrens Foundation, University of Tennessee, Memphis, TN; LeBonheur Childrens Medical Center, University of Tennessee, Memphis, TN.

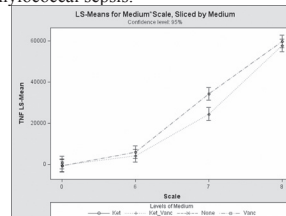
BACKGROUND: CA-MRSA infections are very virulent and can be manifested as necrotizing pneumonia, sepsis and fasciitis with lethal sequelae. Ketamine has been advocated as a critical care sedative in septic patients due to its blood pressure elevation effects. In addition there are a few reports suggesting that it has anti-inflammatory action.

OBJECTIVE: To determine whether the presence of ketamine changes the response of RAW 264.7 murine macrophages as measured by secretion of TNF.

DESIGN/METHODS: RAW 264.7 murine macrophages were stimulated for 18 hrs with 10^6 , 10^7 and 10^8 cfu/mL of MW2/wild type MRSA (isolate of septic patients) Supernatants were collected and assayed for TNF concentration by ELISA.

RESULTS: Preliminary results indicate deferential MW2 response - $F(3,10) = 4.18$ $p < 0.05$. Presence of ketamine stimulates significantly less TNF production (9738.5 ng/ml SE= 1967.6 ng/ml $t(10) = 4.95$ $p < 0.05$, at 10^7 cfu/mL of MW2. At levels of 10^6 and 10^8 cfu/mL of MW2 the presence of ketamine still had TNF suppression effect but did not reach significance at $p < 0.05$.

CONCLUSIONS: Our preliminary data indicate that ketamine plays a significant role in suppressing TNF secretion by macrophages exposed to a MRSA. These finding can have therapeutic impact on Staphylococcal sepsis.



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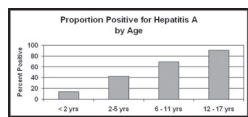
Hepatitis A in Internationally Adopted Children: The Need for Screening for Acute and past Infection

Roohi Abdulla, Marilyn Rice, Kelly Hicks, Mary Staat, Cincinnati Children's Hospital Medical Center (CCHMC), Cincinnati, OH.

BACKGROUND: Hepatitis A virus (HAV) is endemic in most of the birth countries of internationally adopted children, yet very little is known about HAV in this population. OBJECTIVE: To determine the prevalence of acute HAV infection and HAV immunity in internationally adopted children who recently arrived to the United States (US). DESIGN/METHODS: Records from September 25, 2006 through September 30, 2008 of children evaluated at the International Adoption Center at CCHMC and screened for HAV within four months of their arrival to the US were examined. The age- and country-specific prevalence of acute hepatitis A infection and hepatitis A immunity was determined. RESULTS: Overall, 292 children had HAV serology. Of the 288 with total HAV serology, 31% were positive. Immunity varied by birth country and age with the lowest in China (10%) and the highest in children from Africa. Among children <2 years of age only 14% had immunity compared to 91% in children 12-17 years of age. For HAV IgM testing, 3 of 273 children (1%) tested positive, were asymptomatic and 18, 27 and 41 months of age from Russia, Kazakhstan and the Caribbean. The child from Russia transmitted the infection to her unvaccinated father.

Number of Children Tested and Proportion with Total Hepatitis A Immunity by Age and Country of Origin

	< 2 Years	2 - 5 Years	6 - 11 Years	12 - 17 Years	Overall
Country of Origin	N (%)	N (%)	N (%)	N (%)	N (%)
China	56 (9%)	23 (13%)	1 (0%)	---	80 (10%)
Guatemala	47 (19%)	7 (71%)	7 (86%)	1 (100%)	62 (33%)
Russia	36 (14%)	20 (30%)	2 (0%)	---	58 (18%)
Ethiopia	9 (22%)	9 (89%)	5 (100%)	1 (100%)	24 (67%)
Kazakhstan	4 (25%)	5 (80%)	2 (50%)	---	11 (55%)
Other	12 (8%)	14 (50%)	18 (67%)	9 (89%)	53 (53%)
TOTAL	164 (14%)	78 (42%)	35 (69%)	11 (91%)	288 (31%)



CONCLUSIONS: Hepatitis A infection and immunity varies by birth country; however as many as 1% are infected upon arrival to the US and may transmit the infection to non-immune contacts.

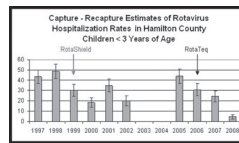
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Estimating the Burden of Rotavirus Hospitalizations and Monitoring Trends Using Capture-Recapture Methods

Mary Staat, Marilyn Rice, Daniel Payne, Joseph Bresee, T.C. Mast, Stephanie Donauer, Richard Ward, David Bernstein, Umesh Parashar, Cincinnati Children's Hospital Medical Center, Cincinnati, OH; Centers for Disease Control and Prevention, Atlanta, GA; Merck Research Laboratories, West Point, PA.

BACKGROUND: Rotavirus (RV) surveillance is needed to provide estimates of disease burden and to evaluate the impact of vaccination programs. OBJECTIVE: To use capture-recapture methods to estimate the burden of RV hospitalizations over time and to compare surveillance methods. DESIGN/METHODS: Children <3 years of age residing in Hamilton County, OH (HC) hospitalized with acute gastroenteritis (AGE) and laboratory-confirmed RV between 1997-2002 and 2005-2008 were identified through two independent surveillance systems: an active system (AS) with prospective enrollment of children admitted with AGE and a passive system (PS) of children identified by testing as part of their usual medical care. Capture-recapture methods compared cases from both systems to estimate the number of missed cases from either system. Using census data for HC, rates for RV hospitalizations were estimated. Using capture-recapture as the gold standard, the sensitivity of adjusted active, unadjusted active and passive surveillance was determined. RESULTS: 361 cases were identified only in the AS and 121 only in the PS, with an additional 131 matching cases captured by both systems. Using capture-recapture methods, there were a total of 946 HC children <3 years hospitalized for RV over 10 seasons with an overall rate of 27/10,000 (95% CI: 26, 29). Rates varied by year: highest in 1998 [48.5/10,000 (95% CI: 41, 56)] and significantly lower in 2008 after RV vaccine introduction [4.6/10,000 (95%CI: 2.3, 6.9)]. Age-specific rates were highest in the youngest age group <3 months (44/10,000) followed by 3-5 months (28/10,000), 6-11 months (29/10,000); 12-23 months (32/10,000) and 24-35 months (19/10,000). Compared to capture-recapture methods, the adjusted AS had the highest sensitivity (100%) followed by unadjusted AS (56%) and PS (31%). CONCLUSIONS: Capture-recapture methods are a useful tool to estimate RV disease burden and to monitor trends over time.



4357.504

Poster Board 504

**Fellow in Training
Prospective Monitoring of Regulatory T Cells in Pediatric Renal Transplant Recipients**

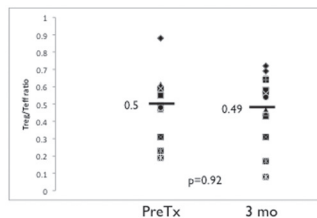
James E. Tong, Qizhi Tang, Paul Brakeman, Peter G. Stock, Pediatric Nephrology, University of California at San Francisco, San Francisco, CA; Surgery, University of California at San Francisco, San Francisco, CA.

BACKGROUND: Natural regulatory T cells (Tregs) are a subset of T cells that express cell surface markers CD4 and CD25 and intracellular transcription factor Foxp3. Because Tregs suppress the function of effector T cells (Teffs), there has been increasing interest in the role of Tregs in transplantation where the balance of Teffs outweighs Tregs.

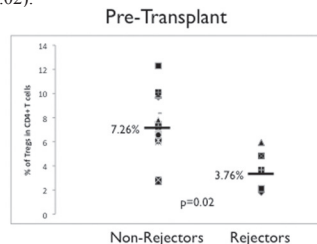
OBJECTIVE: We aimed to monitor the effect of immunosuppression on Tregs through transplantation.

DESIGN/METHODS: We performed flow cytometric analysis of peripheral blood at specified times to profile Tregs in a prospective cohort of twenty unselected, consecutive pediatric renal transplant recipients undergoing standard immunosuppression of daclizumab, tacrolimus, mycophenolate mofetil, and steroids.

RESULTS: From baseline to 3 months post transplantation, Tregs decreased from 6.5% (SD=2.8%, n=20) to 4.4% (SD=1.9%, n=20) (p=0.02). The percentages of CD4+CD25+Foxp3- Teffs decreased within the same time frame; thus, the ratio of Tregs to Teffs was unchanged.



Furthermore, prior to transplant, rejection-free patients had 7.26% (SD=2.5%, n=16) Tregs in peripheral blood compared to 3.67% (SD=2%, n=4) in those patients who have had at least one episode of rejection (p=0.02).



CONCLUSIONS: These results show that rejection-free recipients have increased baseline Tregs compared to recipients with rejection. Together, our data suggests that percentage of Tregs may be a useful marker for predicting rejection in pediatric renal transplant patients, and patients with lower baseline Tregs may require more aggressive immunosuppression from the onset of transplantation.

4357.505

Poster Board 505

**Fellow in Training
Regulatory T Cells in Pediatric Renal Transplant Recipients**

James E. Tong, Qizhi Tang, Paul Brakeman, Peter G. Stock, Pediatric Nephrology, University of California at San Francisco, San Francisco, CA; Surgery, University of California at San Francisco, San Francisco, CA.

BACKGROUND: Regulatory T cells (Tregs) are a subset of T cells that are hypoproliferative and can modulate the action of effector T cells (Teff). Because Tregs suppress Teffs, there has been increasingly more interest in their role in autoimmunity and transplantation where the balance of Teff overwhelmingly outweighs Tregs.

OBJECTIVE: We hypothesized that at one year post transplantation, recipients without any episodes of acute cellular or humoral rejection would have higher percentages of natural Tregs (CD4+CD25+Foxp3+) among CD4+ T cells compared with those recipients who have had previous episodes of rejection.

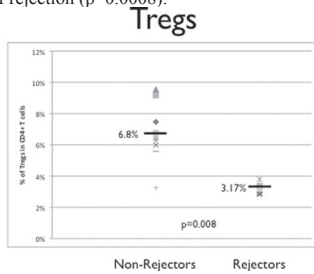
DESIGN/METHODS: We used FACS analysis of peripheral blood to profile T cells in a retrospective cohort of fifteen unselected, consecutive pediatric renal transplant recipients undergoing standard immunosuppression of daclizumab, tacrolimus, mycophenolate mofetil, and steroids.

* Indicates First Author is a Trainee (Student, Fellow, House Officer)

Patient Demographics

	Non-Rejectors (n=10)	Rejectors (n=5)	Non-Rejectors DDRT (n=5)	p-value
Age (years)	13.6	15.8	15.2	NS
Type of Donor (DD:LR)	5:5	5:0	5:0	NS
eGFR at 1 mo post tx (mL/min/1.73m ²)	113.6	114.1	113	NS
eGFR at 6 mo post tx (mL/min/1.73m ²)	121.7	91.8	111.6	0.05
eGFR at 12 mo post tx (mL/min/1.73m ²)	119.2	98.2	123.2	0.04
BK polyoma viruria	11%	40%	20%	NS
Cold Ischemia Time (hours)	4.5	10	8	0.02
Warm Ischemia Time (mins)	26.2	29.4	27.6	NS
Tacrolimus trough at 12 mo (ug/L)	6.6+/-1.2	6.9+/-0.6	6.9+/-1.3	NS
Mycophenolate dose (mg/m ² /day)	582+/-75	619+/-75	562+/-75	NS

RESULTS: At 12 months post transplantation, rejection free patients had 6.8% (SD=1.8%, n=10) Tregs in their peripheral blood compared to 3.17% (SD=0.4%, n=5) Tregs in those who had at least one episode of rejection (p=0.0008).



CONCLUSIONS: This result shows that pediatric kidney transplant recipients who are rejection free have significantly increased percentages of Tregs compared to those with prior episodes of rejection. This data, if confirmed, could be a marker for those patients who may tolerate reduction in immunosuppression.

4357.506

Poster Board 506

Increasing Adherence to Outpatient Treatment for Pelvic Inflammatory Disease: The Results of a Behavioral Intervention

Maria Trent, Shang-en Chung, Michael Burke, Allen Walker, Jonathan M. Ellen, Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD.

BACKGROUND: Centers for Disease Control and Prevention's outpatient treatment recommendations for pelvic inflammatory disease (PID) require that the patient and provider engage in a complex set of behaviors. In 2003, we instituted a systems-level intervention aimed at improving provider diagnosis, counseling, and treatment for PID. The intervention significantly improved provider behavior but only minimally affected patient adherence behaviors (72-hour follow-up and medication completion).

OBJECTIVE: To examine the effectiveness of a brief behavioral intervention at the time of PID diagnosis on subsequent patient adherence behaviors among urban adolescents.

DESIGN/METHODS: 121 adolescents with mild-moderate PID were enrolled in a multi-site randomized trial. All participants received standardized clinical care, completed baseline audio computerized self- interviews, received a full course of medications at discharge, and were interviewed after the 2-week treatment period. The intervention group also watched a 6 minute theory-based video. Adherence measures included medication completion, temporary sexual abstinence, partner notification, partner treatment, and return for 72-hour visit. Data were evaluated using multivariate regression analysis.

RESULTS: The mean age was 17.3 years (s.d. 1.7), 92 % were African American, 89% were recruited from an academic hospital center, and 30% had a documented STI at baseline. 64% were located for the 2-week interview. Intervention participants had higher rates of 72 hour follow-up (32 vs. 17%), and partner treatment (73 vs. 56%), in bivariate analyses at p=0.1 level. While controlling for insurance status, # partners in the past 3 months and STI history, only the partner notification finding persisted in multivariate models (AOR=3.10; 95% CI: 1.03-9.39, p=.045).

CONCLUSIONS: A brief behavioral intervention for PID is effective in increasing partner notification, a key form of secondary prevention of STIs. Despite this finding, other behavioral data suggests that adolescents with PID remain at risk for treatment failure and repeat infection. Additional structural supports may be necessary to facilitate adherence in outpatient settings.

4357.507

Poster Board 507

Fellow in Training

911 (Nueve Once): Identifying Barriers to Prehospital Emergency Care for Spanish-Speaking Families

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BACKGROUND: Racial, ethnic and language based disparities occur throughout the US health care system. Pediatric prehospital emergency medical services are less likely to be used by Hispanics. As a prelude to providing equitable care, barriers must be identified so they can be overcome.

OBJECTIVE: To identify perceptions of and barriers to prehospital pediatric emergency care (911) access among Spanish-speaking parents.

DESIGN/METHODS: A qualitative study involving 6 focus groups was conducted at local community centers serving predominately Hispanic neighborhoods. Spanish-speaking parents with limited English proficiency participated in groups led by a bilingual professional moderator using a semistructured discussion guide. Topics discussed included experiences, knowledge, beliefs, fears, barriers, and improvement strategies. All groups were audiotaped, transcribed, and reviewed for recurring themes.

RESULTS: A total of 49 parents (90% mothers) participated in 6 focus groups. Though parents believed that 911 was available to all and should be used for emergencies, many were uncertain of how to use it, or what qualified as an emergency. Important barriers to 911 use in Spanish-speaking communities included language discordance, fear of financial consequences, and fear of exposing immigration status. Parents strongly desired to learn more about 911 through multiple outlets, including classes, brochures and posters, and radio and television campaigns.

CONCLUSIONS: Prehospital emergency care should be available to all children. Addressing barriers to 911 use in Spanish-speaking communities through education could improve the equity of health care delivery at this crucial early step, while also decreasing the amount of non-emergency 911 use. Emergency medical systems (EMS) might adapt their services to improve their ability to reach all children in need, regardless of language or documentation status.

4357.508

Poster Board 508

Acculturation, a Traditional Mexican/Central American Diet and Risk for Pediatric Obesity in Latino Schoolchildren in San Francisco, CA

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BACKGROUND: Population based surveys show that acculturation to American culture increases risk of obesity in children, although it is not clear what aspects of acculturation increase obesity risk.

OBJECTIVE: To assess whether acculturation to the United States including Americanization of the diet is associated with pediatric obesity in a Latino population in San Francisco Bay Area schools.

DESIGN/METHODS: Convenience sampling methods were used to recruit a cross-sectional sample of Latino children and their parents at San Francisco Bay Area Schools (n=288). Children and parents' weights and heights were measured and demographic and diet data were collected.

RESULTS: Most (81.3%) of the children interviewed were US-born, while 54.2% of mothers were born in Mexico. Mean child age was 10.2±1.1 (SD) years. Mean BMI percentile in children was 80.2±25.6; 62.5% of children were obese or overweight (BMI %ile ≥ 85). Children with obese parents had 4 times the odds of being overweight or obese compared with children of non-obese parents (Odds Ratio [OR] 4.06, 95% Confidence Interval [CI] 1.46-11.31). As a marker of acculturation, children who spoke more English in their homes had more than 2 times the risk of being overweight or obese (OR 2.12; 95%CI 1.05-4.29). Children who ate traditional Mexican or Central American foods more frequently had a lower risk of overweight and obesity compared with children who did not regularly consume these foods. Increased weekly consumption of tacos was associated with a decreased risk of being overweight or obese (OR 0.42; 95%CI 0.21-0.85) as was frequent consumption of tortas (OR 0.50; 95%CI 0.25-1.00). Consumption of burritos neared significance (OR 0.48; 95%CI 0.22-1.04).

CONCLUSIONS: Consumption of traditional Mexican and Central American foods may be associated with reduced risk for pediatric overweight and obesity. Future studies need to clearly delineate the dietary factors associated with acculturation and increased risk for obesity.