Program Guide

March 9–11, 2007 • Crowne Plaza Philadelphia • Philadelphia, PA





THE EASTERN SOCIETY FOR PEDIATRIC RESEARCH

19th Annual Meeting

In cooperation with:
The Center for Continuing Education,
Tulane University Health Sciences Center

Eastern SPR
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Dear Colleagues,

Welcome to the 19th Annual Meeting of the Eastern Society for Pediatric Research (Eastern SPR) and to our host city of Philadelphia, the Cradle of Liberty!

The Eastern SPR Council and Planning Committee are confident that you will enjoy our exciting offerings of State-of-the-Art Plenary Talks plus Subspecialty Sessions featuring leading clinical & scientific authorities integrated among the many high-quality original research abstracts as well as the highly popular Lunch with the Professor educational program for trainees.

The goals of the Eastern SPR Annual Meeting are to create a forum: i) in which young investigators can present their research in a structured yet relaxed atmosphere, ii) where regional clinicians can be exposed to cutting edge clinical and basic science and iii), to enable timely educational programs addressing important topics in Pediatrics, iv) providing opportunities for trainees to network with senior investigators/researchers in an informal setting.

NEW FOR 2007: The continued successes of our previous meetings has enabled an entirely web-based system for membership, registration and payments, in making timely announcements, in enhanced room booking services, and for the improvement in the overall ease of running the meeting. In addition, we will again have centralized informatics enabling presenters to load their slide-show in advance at a speaker-ready station.

ACKNOWLEDGEMENTS: The organization of this meeting would not have been possible without the help of the administrative offices of the American Pediatric Society (APS) and the Society for Pediatric Research (SPR). We are especially grateful to: Debbie Anagnostelis, Executive Director, Kathy Cannon, Belinda Thomas, Sonya Lansford, and Barbara Anagnostelis. We also recognize the energetic efforts of the Eastern SPR Planning Committee and Council Members for their guidance and vision in selecting this new venue and the efforts of Tulane University in New Orleans as our 2007 sponsor for CME program. Lastly, our corporate and leading academic sponsors were instrumental in making this meeting possible.

Most of all, we want to thank you for attending and for contributing your wisdom in the pursuit of excellence. We look forward to seeing you in Philadelphia!

Bruce D. Gelb, MD
President

Edmond F. LaGamma, MD, FAAP
Secretary

Lawrence M. Nogee, MD
Chair, Planning Committee

Meeting Services & CME Accreditation

Registration and CME Desk Hours

Registration will be held in the Liberty Ballroom Foyer. Registration hours are as follows:

Friday, March 9	4:30pm – 7:00pm
Saturday, March 10	7:30am – 7:00pm
Sunday, March 11	7:30am – 1:00pm

Abstract Publication

All abstracts being presented at the 2007 Eastern SPR Annual Meeting are printed in this Program Guide, beginning on page 15.

Audio/Visual Information

All oral presentations must be made using PowerPoint. Computers and LCD projectors will be provided. Slide projectors will not be provided. Presenters should have submitted their presentations in advance, but still are required to check in at Speaker Ready.

Speaker Ready (Board Room-2nd floor)

Presentations will be loaded onto a central computer during the session prior to the session in which the presentation is to be made (i.e., Friday evening for Saturday morning presentations, Saturday morning for Saturday afternoon presentations, and Saturday afternoon for Sunday morning presentations). Please also bring your CD-ROM, ZIP drive or flash memory.

Business Center

The Business Center at the Crowne Plaza Philadelphia Center is located on the 2nd floor, adjacent to the Constitution Room.

CME Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of Tulane University Health Sciences Center and the Eastern Society for Pediatric Research. Tulane University Health Sciences Center is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Designation Statement

Tulane University Health Sciences Center designates this educational activity for a maximum of **11.5** *AMA PRA Category 1 Credits™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Tulane University Health Sciences Center presents this activity for educational purposes only and does not endorse any product, content of presentation, or exhibit. Participants are expected to utilize their own expertise and judgment while engaged in the practice of medicine. The content of the presentations is provided solely by presenters who have been selected because of their recognized expertise.

Disclosure Policy

It is the policy of the Center for Continuing Education at Tulane University Health Sciences Center to plan and implement all of its educational activities in accordance with the ACCME's Essential Areas and Policies to ensure balance, independence, objectivity and scientific rigor. In accordance with the ACCME's 2004 Standards for Commercial Support, everyone who is in a position to control the content of an educational activity certified for *AMA PRA Category 1 Credit™* is required to disclose all relevant financial relationships with any commercial interests within the past 12 months that creates a real or apparent conflict of interest. Individuals who do not disclose are disqualified from participating in a CME activity. Individuals with potential for influence or control of CME content include planners and planning committee members, authors, teachers, educational activity directors, educational partners, and others who participate, e.g. facilitators and moderators. This disclosure pertains to relationships with pharmaceutical companies, biomedical device manufacturers, or other corporations whose products or services are related to the subject matter of the presentation topic. Any real or apparent conflicts of interest related to the content of the presentations must be resolved prior to the educational activity. Disclosure of off-label, experimental or investigational use of drugs or devices must also be made known to the audience.

Procedures for CME Credit

To receive the appropriate number of CME credits, it is important to do the following:

- Locate your verification form included with your registration packet or ;ick one up at the Registration Desk.
- Complete your verification form as you attend each activity.
- On your departure date, turn in your completed verification form at the Registration desk.

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University of Maryland, Baltimore, MD

Eastern SPR Schedule-at-a Glance

Crowne Plaza Philadelphia
March 9-11, 2007

Friday, March 9

6:00pm–7:30pm

Poster Session I & Reception
— Liberty Ballroom C —

Saturday, March 10

8:15am–10:30am

Cardiopulmonary
— Liberty Ballroom B —

Developmental Biology
— Declaration Room —

General Pediatrics I: Epidemiology & Outcomes
— Constitution Room —

Infectious Disease
— Freedom Room —

FEATURED TALK:
Peter Krause
Development of a Novel Vaccine for Prevention of Tick-Borne Infections

Metabolism & Obesity
— Liberty Ballroom A —

Neonatology I: Neonatal Pulmonology
— Independence Ballroom —

FEATURED TALK:
Rose Viscardi
The Innate Immune Response to Ureaplasma

10:45am–11:45am

Plenary Session I
— Independence Ballroom —

MENTOR OF THE YEAR PRESENTATION:
Elizabeth McAnarney, University of Rochester
Young Adolescent Pregnancy: Weighing the Balance

12:00pm–1:00pm

Lunch with the Professor
— Liberty Ballroom A —
Heber Nielsen, Tufts University
Demystifying the NIH

Eastern SPR Business Meeting
— Congress Room—

1:10pm–4:00pm

Plenary Session II
— Independence Ballroom —

PLENARY LECTURE:
Philip Shaul, University of Texas, Southwestern
Signaling Modules in Endothelial Cell Caveolae: Identifying the Battlefield and the Combatants in the War of Cardiovascular Health

YOUNG INVESTIGATOR PRESENTATIONS: (2:00pm–4:00pm)

Saturday, March 10 continued on next column: →

4:15pm–5:45pm

Adolescent Medicine
—Declaration Room —

Endocrinology & Metabolism
— Freedom Room —

General Pediatrics:Medical Education
— Liberty Ballroom A —

Neonatology II: Epidemiology & Outcomes
— Independence Ballroom —

Nutrition & Growth
— Liberty Ballroom B —

Pulmonary and Asthma
— Constitution Room —

6:00pm–7:30pm

Poster Session II
— Liberty Ballroom C —

Sunday, March 11

8:30am–9:30am

Plenary Session III
— Independence Ballroom —

PRESENTATION OF THE YOUNG INVESTIGATOR AWARDS

PLENARY LECTURE:
Paul Offit, Children's Hospital of Philadelphia
The Rotavirus Vaccine: From Bench to Bedside

9:45am–12:00pm

Emergency Medicine
— Freedom Room —

General Pediatrics III: Preventative Pediatrics
— Constitution Room —

FEATURED TALK:
Matilde Irigoyen
Health Services Research in Underserved Settings

Genetic Basis of Disease
— Declaration Room —

FEATURED TALK:
Kate Ackerman
Genetic Mouse Models of Diaphragm and Lung Development as tools for Understanding Human Congenital Diaphragmatic Hernia

Neonatology III: Clinical Studies
— Liberty Ballroom C —

Neurobiology
— Liberty Ballroom B —

FEATURED TALK:
Rebecca Ichord
Childhood Stroke: Progress and Opportunities

Pulmonary Development & Injury
— Liberty Ballroom A —

FEATURED TALK:
Susan Guttentag
Lung Injury From the Inside Out

• • • Friday, March 9, 2007 • • •

Poster Session I

6:00 PM-7:30 PM **Liberty C**

1 Sulforaphane Is Cytotoxic to Neuroblastoma Both In Vitro and In Vivo
Lee Dorf, Satyan Kalkunte, Rakesh Singh, Laurent Brard, Giselle Saulnier Sholler. – Abstract 1

2 Nifurtimox Is Cytotoxic to Catecholamine-Containing Cells Which Is Enhanced by Ascorbic Acid and Suppresses Neuroblastoma Growth In Vivo
Giselle Saulnier Sholler, Lee Dorf, Jennifer Straub, Laurent Brard, Rae Nishi. – Abstract 2

3 Receipt of Opiates by Pediatric Oncology Patients Who Died in Hospitals
Andrea Orsey, Jean Belasco, Jonas Ellenberg, Kathryn Schmitz, Chris Feudtner. – Abstract 3

4 Simple Measure of Impact of Lupus Erythematosus in Youngsters© (SMILEY©)-Responsiveness To Change in Disease Activity
Lakshmi N. Moorthy, M. Peterson, M. Baratelli, M. Harrison, K. Onel, E. Chalom, B. Eulie, A. Adams, L. Barinstein, E. MacDermott, L. Barillas, S. Angeles, P. Hashkes, D. Bork, A. Reiff, S. Hong, L. Vazquez, T. Lehman. – Abstract 4

5 Vaginal Wet Mounts on Asymptomatic Adolescent Females; Are They Beneficial?
Kate Stampler, Alexis S. Lieberman, Maria Fraga, Arnold Cohen. – Abstract 5

6 The Antiseizure Medication Valproic Acid Regulates Catecholamine Production by a Threshold Concentration Dependent Effects on TH mRNA Synthesis and Degradation
A. D'Souza, B.B. Nankova, E. Onem, P. Patel, E. LaGamma. – Abstract 7

7 Blood Pressure Predicts Severity in Childhood Guillain-Barre Syndrome
Carrie Edwards, Francis J. DiMario. – Abstract 8

8 Pulmonary Hypertension in Children and Adolescents with Sickle Cell Disease
Aziza S. Sedrak, Sreedhar P. Rao, Scott T. Miller, Vahid Hekmet, Madu Rao. – Abstract 8

9 Blood Lead Changes during First Two Years of Life in the Infants Born to Women with High Lead Concentration
Tatyana Gabinsky, Asha Ittoop, Claudia Cosmineanu, Gospodin Stefanov, Melvin Gertner. – Abstract 9

10 Lead Poisoning among Inner City Children before 9 Months of Age: Is Testing Needed?
Santosh Kumar, Margaret Clark-Golden, Nathan Graber, Jeremy Weedon, Robert J. Karp. – Abstract 10

11 Perceptions of the Medical Home among Inner City Families
Melissa S. Stockwell, Matilde Irigoyen, Sally E. Findley, Linda F. Cushman, Rachel F. Dannefer, Anne E. Siegler. – Abstract 11

12 Youth Knowledge of Unhealthy Lifestyle Choices and Obesity Vary by Gender and Behavior
H.L. Brumberg, B. Reyna, C. Hunter-Grant, V. Allen, D. Faulkner. – Abstract 12

13 Prevalence of Asthma in Inner City South Bronx Pediatric Immigrant Population Aged 3-17 Years
Veronica F. Reyes, Olumide Oyefeso, Akila Muthukumar, Radha Biswas, Anil Pawa, Ronald Bainbridge, Ayoade Adeniyi, Richard Neugebauer. – Abstract 13

14 Training Pediatric Residents in Advocacy: The Role of Resident Advocacy Projects
Leora N. Mogilner, Maida Galvez, Shuba Kamath, Deborah Steinbaum, Carolyn Rosen. – Abstract 14

15 The Interpersonal Physician Trust Scale is Reliable and Valid for Use in Parents of NICU Infants
Gerri R. Baer, Richard Ittenbach, Robert M. Nelson. – Abstract 15

16 Parental Knowledge and Attitude Regarding Eczema in Children of the South Bronx
Laura Daugialaite, Murali Yelugapuri, Ogechukwu Menkiti, Anbu Muthusamy, Ayoade Adeniyi, Ronald Bainbridge, Richard Neugebauer. – Abstract 16

17 Methicillin Resistant Staph Aureus Infections in the First Year of Life: A Ten-Year Lookback of Cases at a Large US Birthing Center
Ana Krishnan, Karen R. Carpenter. – Abstract 17

18 A Comparison of Congenitally HIV Infected and Affected Adolescents. Psychosocial and Behavioral Profile: Implications for Clinical Care
Katlyne Lubin, Laura Netburn, Marsha Edell. – Abstract 18

19 Treatment of Early Onset Culture Negative Sepsis
Meghan Tappin, Adriann Combs, Shanthy Sridhar, Joseph DeCristofaro. – Abstract 19

20 Classification of Severity of Sepsis Improves Mortality-Risk Prediction in Premature Infants
Naveed Hussain, Allyson Abo, Matra Barker. – Abstract 20

21 Is it Safe to Keep Umbilical Vein Catheters for More than 7 Days?
S. Sannoh, N. El-Khoury, B. Clones, J. Munoz, B. Parvez. – Abstract 21

22 Isolated Placental Vasculopathy/Coagulopathy Is a Risk Factor for Intracranial Hemorrhage in Extremely Low Birth Weight Infants (Birth Weight < 1000g)
Rita P. Verma, Cynthia Kaplan, Ram Niwas, Hai Fang. – Abstract 22

23 Growth Comparison of Late Preterm vs. Very Preterm Infants at 12 Months Corrected Age
Jordan Kase, Jessica Kalia, Heather Brumberg, Paul Visintainer, Maria Pici. – Abstract 23

24 Is the Prevalence of Abdominal Wall Defects in the Hudson Valley Region of New York State a Public Health Concern?
Tania Mangones, Emilie Cobert, Paul Visintainer, Sergio G. Golombek, Heather L. Brumberg. – Abstract 24

25 Nitrosative and Oxidative Markers of Necrotizing Enterocolitis: Feasibility Pilot Data from the Biomarkers of Necrotizing Enterocolitis (BioNEC) Study
Michael A. Posencheg, Craig Harvey, Pamela A. Scott, Kathleen Mooney, Kerrie Kelly, David A. Munson, Richard Markowitz, Andrew J. Gow. – Abstract 25

26 Early Neonatal Daily Weight Loss (DWL) and Bronchopulmonary Dysplasia (BPD) in Extremely Low Birth Weight Infants (ELBW, Birth Weight < 1000g)
Rita P. Verma, Syed Shibli, Hai Fang. – Abstract 26

27 Oral Vitamin E Supplementation and the Neonatal Outcome of the Very Low Birth Weight Infants
Ruby Mehta, Myron Sokal, Dominique Jean-Baptiste, Rohini Thodge, M. Roger Kim. – Abstract 27

28 Rate and Clinical Predictors of Ductus Arteriosus Re-Opening in Very Low Birthweight Infants
Vlad Ianus, Martha Mance, Julie Nye, Richard Tucker, Ronald Clyman, James Padbury. – Abstract 28

29 Osteopenia of Prematurity and Nonrenal Hypokalemia: An Assessment of Related Factors in VLBW Infants at New York Methodist Hospital
Natalia Karpova, Saiqa Nabi, Madhavi Jasti, Khaja Raziuddin, Nitin Ron, Asjad Khan, Rica Vizarra-Villongco, Madhu Gudavalli, Ali Nadroo. – Abstract 29

30 Vitamin D Deficiency: Also Prevalent Also among Term Infants and Formula Fed Infants
Radhika Purushothaman, Bhubanesh Bhatta, Svetlana Ten. – Abstract 30

31 Do Newborns with Inborn Errors of Cobalamin Who Are Identified through Newborn Screening Have a Better Outcome?
Patricia A. Galvin-Parton, Davina Prakash, Maria Puangco, Jody Weiss. – Abstract 31

32 A Comparison of Exercise Capacity in Men and Boys in Cold and Hot Environments
Sean C. Hagenbuch, Thomas Rowland, David Pober. – Abstract 32

• • • Saturday, March 10, 2007 • • •

Neonatology I: Neonatal Pulmonology Platform Session

8:15 AM-10:30 AM **Independence Ballroom**

Moderator: Rose Viscardi, University of Maryland, Baltimore

8:15 AM **Angiopoietin 2 Is Increased in Tracheal Aspirates from Premature Infants Developing Bronchopulmonary Dysplasia**
Zubair H. Aghai, Sosun Faqiri, Judy Saslow, Tarek Nakhla, Akanksha Kumar, Riva Eydelman, Louise Strande, Gary Stahl, Paola Leone, Vineet Bhandari. – Abstract 33

8:30 AM **Dexamethasone Suppresses Angiopoietin 2 in Tracheal Aspirates of Ventilated Premature Infants**
Zubair H. Aghai, Sosun Faqiri, Tarek Nakhla, Judy Saslow, Akanksha Kumar, Riva Eydelman, Louise Strande, Gary Stahl, Paola Leone, Vineet Bhandari. – Abstract 34

8:45 AM **Adenosine Receptors Modulate Cytokine Production by Cord Blood Monocytes (CBM)**
Raul Chavez-Valdez, Marsha Wills-Karp, Elizabeth A. Cristofalo, Amy Nathan, Estelle B. Gauda. – Abstract 35

9:00 AM **Heat Shock Protein (HSP) 70 Secretion by Tracheal Tissue during Mechanical Ventilation: Association with Indices of Tissue Function and Modeling**
Euming Chong, Robert Locke, Kevin C. Dysart, Aaron S. Chidekel, Thomas H. Shaffer, Thomas L. Miller. – Abstract 36

9:15 AM **Variations in Surfactant Use among Infants 30-34 Weeks' Gestation with Respiratory Distress Syndrome (RDS)**
Heather C. Kaplan, Scott A. Lorch, Jennifer Pinto-Martin, Mary Putt, Jeffrey H. Silber. – Abstract 37

9:30 AM **Availability of Trivalent Inactivated Influenza Vaccine (TIV) to Parents of Neonatal Intensive Unit Patients: Secondary Effect on Healthcare Worker Vaccination Rates**
Shetal Shah, Martha Caprio. – Abstract 38

9:45 AM **Lamellar Bodies in the Tracheal Aspirate of Neonates: Relationship with Gestational and Post-Partum Age**
Avinash Purohit, Anna Petrova. – Abstract 39

10:00 AM FEATURED TALK
The Innate Immune Response To Ureaplasma
Rose Viscardi

General Pediatrics I: Epidemiology & Outcomes Platform Session

8:15 AM-10:30 AM **Constitution**

Moderator: Maida Galvez, Mt. Sinai School of Medicine, New York

8:15 AM **Lead in Pregnancy: A Universal Screen – Is It Necessary**
Tatyana Gabinsky, Asha Ittoop, Claudia Cosmineanu, Gospodin Stefanov, Melvin Gertner. – Abstract 40

8:30 AM **Impact of Maternal Smoking on Auditory Behavior in Infants**
Shama Praveen, Naveed Hussain, Cheryl Oncken, Denise Ortiz, Vijayakumar Praveen, Anna Dongari Bagtzoglou, Jonathan Covault, Henry Kranzler, Stephen Walsh. – Abstract 41

8:45 AM **Under-Treatment of Minority Children with Attention Deficit Hyperactivity Disorder**
Evelyn Berger, Mary McKay, Jeffrey Newcorn, William Bannon, Danielle Laraque. – Abstract 42

9:00 AM **QI: HIV Testing of the Children of Adult Patients in a HIV Treatment Program**
Jamal C. Harris, Janet Giddy, Monty Thomas. – Abstract 43

9:15 AM **Elemental Mercury Exposure in a New Jersey Daycare Center Located at a Former Mercury Thermometer Manufacturing Site**
Maida P. Galvez, Damiris Perez, Nita Vangeepuram, Jacqueline Moline, Joel A. Forman, Philip J. Landrigan, Jerald Fagliano, Eddy A. Bresnitz. – Abstract 44

9:30 AM **Hospitalizations for Ambulatory Care Sensitive Conditions among Children with Sickle Cell Disease**
Suzette O. Oyeku, Andrew D. Racine. – Abstract 45

9:45 AM **Twenty-Eight Inner-City Youth in the Juvenile Justice System: A Close Look**
Nancy M. Elbasty, Nancy L. Brodsky, Joan M. Giannetta, David Shera, Sabrina Ford, Hallam Hurt. – Abstract 46

10:00 AM **MRSA in Pediatrics; Bracing up for an Epidemic**
Helen Kest, Edward D. Ziga, Yasir Alqaqaa, Beverly Nieves, Albert Sanz. – Abstract 47

10:15 AM **Central City Immunization Disparities, 2000-2004**
Sally E. Findley, Matilde Irigoyen, Melissa S. Stockwell, Shaofu Chen. – Abstract 48

Cardiopulmonary Platform Session

8:15 AM-10:30 AM **Liberty B**

Moderator: Philip Shaul, University of Texas, Southwestern, Dallas

8:15 AM **Deletion of the Cardiac L-Type Calcium Channel (CaV1.2) Causes Embryonic Death**
George A. Porter, Ashwani Sharma. – Abstract 49

8:30 AM **Sildenafil Mediated Angiogenesis Leads to Cardioprotection in Rat Myocardial Ischemia Reperfusion Model: Role of VEGF-1 and Ang-1 System**
Ramesh Vidavalur, Suresh Varma Penumathsa, Srikanth Koneru, Mahesh Thirunavukkarasu, Nilanjana Maulik. – Abstract 50

8:45 AM **Pressure-Flow Relationship: Relevance of Glenn Shunt with Right Ventricular Outflow Obstruction**
Joshua Wiesman, Nancy Ross-Ascuitto, Serafin DeLeon, Robert Ascuitto. – Abstract 51

9:00 AM **Near Infrared Spectroscopy Predicts Blood Lactate Level in Children Following Cardiac Surgery**
Sujata B. Chakravarti, Jason C. Katz, Alexander Mittnacht, Khanh Nguyen, Umesh Joashi, Barry A. Love, Shubhika Srivastava. – Abstract 52

9:15 AM **Angiotensin II-Induced Calcium Changes in Pulmonary Artery Endothelial Cells**
X.M. Li, X.M. Zhao, V. Gueorguiev, E. Sabban, K.M. Lerea, L.A. Parton, Susan C. Olson. – Abstract 53

9:30 AM **Effect of Dopamine on Pulmonary and Systemic Pressures in Control and PPHN Neonatal Lambs**
Khaver I. Kirmani, Rita M. Ryan, Frederick C. Morin III, James A. Russell, Daniel D. Swartz, Sylvia F. Gugino, Karen A. Wynn, Vasanth H. Kumar, Satyan Lakshminrusimha. – Abstract 54

9:45 AM **CEACAM6: A Hormonally Regulated Surfactant-Associated Protein in Lung Type II Cells**
Philip L. Ballard, Linda W. Gonzales, Venkat Kolla, Nicole Bailey. – Abstract 55

10:00 AM **TACE Activity during Murine Lung Development**
Sandy Murray, Lucia Pham, MaryAnn V. Volpe, Sujatha M. Ramadurai, Heber C. Nielsen. – Abstract 56

10:15 AM **In Utero Androgen Exposure Affects Hoxb-5 Protein Levels and Spatial Localization in Developing Murine Lung**
MaryAnn V. Volpe, Karen T. Wang, Lucia D. Pham, Heber C. Nielsen, Sujatha M. Ramadurai. – Abstract 57

Developmental Biology Platform Session

8:15 AM-10:30 AM **Declaration**

Moderator: Phyllis Dennery, Children's Hospital of Philadelphia, Philadelphia

8:15 AM **Differential Brain Tissue Expression of IL-6 and TNF-α in Newborn and Adult Mice after LPS Exposure**
David Sorrentino, Andy Wen, Joel Cooper, Alex Kusnecov. – Abstract 58

8:30 AM **ErbB4 Regulation in Fetal and Adult Rat Alveolar Type II Cells**
Washa Liu, Katja Zscheppang, MaryAnn V. Volpe, Heber C. Nielsen, Christiane E.L. Dammann. – Abstract 59

8:45 AM **Unique Pattern of NF-κB Activation Mediates Developmental Differences in Response to Hyperoxia in Lung Fibroblasts**
Clyde J. Wright, Guang Yang, Phyllis A. Dennery. – Abstract 60

9:00 AM **Interaction between Sox4 and the Wnt Signaling Pathway**
Paul Anziano, Sarah Wehrli, Michele Scheerer, Kathryn Maschhoff. – Abstract 61

9:15 AM **Mechanism of Caspase-3 Activation and Nuclear DNA Fragmentation during Hypoxia in the Cerebral Cortex of Newborn Piglets**
Ming-Chou Chiang, Jahan Ara, Saneyuki Yasuda, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 62

9:30 AM **Lung NF-κB Regulates HIFα Transcriptional Activation and Expression in the Late Prenatal Period**
Guang Yang, Jessica Bordner, Angela Hu, Phyllis A. Dennery. – Abstract 63

9:45 AM **Inflammation-Induced Disruption of Oligodendrocytes and Its Link to Periventricular Leukomalacia in Preterm Infants**
Heather M. French, Michal Elovitz, Judy Grinspan, Rebecca A. Simmons. – Abstract 64

10:00 AM **Differential Effects of Metalloporphyrins on the Toll-Like Receptor Signaling Pathway**
Sylvie M. Noordermeer, Frank A. Wagener, Guang Yang, Frans G. Russel, Phyllis A. Dennery. – Abstract 65

10:15 AM **Cardiotrophin-1 Prevents Neuronal Death In Vivo and In Vitro**
Tongchun Wen, Augusto Sola, Hui Peng, James Moore, Marta Rogido. – Abstract 66

Infectious Diseases Platform Session

8:15 AM-10:30 AM **Freedom**

Moderator: Peter Krause, Connecticut Children's Medical Center, Hartford

8:15 AM **The Role of Paneth Cells in Neonatal Gastrointestinal and Invasive Candidiasis**
Christina M. Long, Lamia M. Soghier, David L. Goldman. – Abstract 67

8:30 AM **Production and Application of Recombinant Human Bocavirus Virus-Like Particles**
Deniz Kesebir, Susan Cotmore, Peter Tattersall, Anthony D'Abramo, Jr, Carla Weibel, Jeffrey S. Kahn. – Abstract 68

8:45 AM **Chlorhexidine Disinfection of Central Venous Catheters' Access Ports Decreases Line Sepsis**
Sulaiman Sannoh, Barbara Clones, Maria Montecalvo, Jose Munoz, Boriana Parvez. – Abstract 69

9:00 AM **A Cluster of Transfusion Associated *Babesia microti* Infections in Very Low Birth Weight Infants**
Kari A. Simonsen, Joseph I. Harwell, Fatima R. Muriel, Shabnam Lainwala. – Abstract 70

9:15 AM **Deciphering the Checkpoints for B Cell Selection in Neonatal Cord Blood**
Kavita Kasat, Jie Xu, Karen Hendricks-Munoz, Amy Reichlin. – Abstract 71

9:30 AM **Differential Inflammatory Response (IR) to LPS Is Affected by Mode of Delivery (MOD)**
Danthanh Hoang, Jeffrey Perlman, Hong Lin, Reshma Narula, Yin Xu, Diane Applegate, Susana Cunningham-Rundles. – Abstract 72

9:45 AM **Polymerase Chain Reaction Technique in the Diagnosis of Neonatal Sepsis: Future Gold Standard?**
Victoria Lima, Angel Alpuche, Daniel Noyola, Ruth Soria, Karla Nieto. – Abstract 73

10:00 AM **FEATURED TALK**
Development of a Novel Vaccine for Prevention of Tick-Borne Infections
Peter Krause

Metabolism & Obesity Platform Session

8:15 AM-10:30 AM **Liberty A**

Moderator: Svetlana Ten, Infants and Children's Hospital of Brooklyn at Maimonide, New York

8:15 AM **What Is the Critical Age for Obesity Development in Early Childhood?**
Melissa E. Glassman, Matilde Irigoyen, Sally E. Findley, Shaofu Chen. – Abstract 74

8:30 AM **Obesity Perception in Adolescents and Their Guardians in an Inner City, Minority Population**
Vimla P. Bhagwandin, Candace J. Erickson, David H. Rubin. – Abstract 75

8:45 AM **Compulsive Eating and Body Dissatisfaction in Inner-City Obese Adolescents**
Douglas Kugel, Jessica Rieder, Carmen R. Isasi. – Abstract 76

9:00 AM **The Role of a Child's Gender on Latino Parental Attitudes towards Obesity**
Melissa E. Glassman, Marilyn Figueroa, Linda Cushman, Patricia Hametz, Matilde Irigoyen. – Abstract 77

9:15 AM **Relationship between Obesity and Grade Level in Bronx Elementary School Children**
Marina Reznik, Arthur E. Blank, David Appel, Philip O. Ozuah. – Abstract 78

9:30 AM **Prevalence of Obesity and Metabolic Syndrome in 7th Grade Urban Children**
Sunil K. Sinha, Amrit Bhangoo, Viral Gala, Margarita Smotkin−Tangorra, Irina Kazachkova, Jessica Hileman, Neesha Ramchandani, Joyce Munga, Deborah DeSantis, Debbie Perez, Steven Shelov, Michael Rosenbaum, Lisa Altshuler and Svetlana Ten. – Abstract 79

9:45 AM **Why Do Some Adolescents Lose Weight and Others Not?: A Qualitative Study**
Diana Harris, Alexis Lieberman, Jessica Robbins. – Abstract 80

10:00 AM **Improved Access to Physical Activity Facilities: Impact on Overweight, Inner-City, Minority Adolescents**
Juli Tomaino, Unab Khan, Jessica Rieder, Carmen Isasi. – Abstract 81

10:15 AM **Projecting the Burden of Childhood Obesity in America to 2030: Demographics and Disparities**
Leonardo Trasande, Clyde B. Schechter, Matthew W. Gillman, Trudy L. Burns, David A. Savitz, Philip J. Landrigan. – Abstract 82

Plenary Session I

10:45 AM – 11:45 AM **Independance Ballroom**

10:45 AM **Welcome**
Annoucement of the Mentor of the Year Award

10:55 AM **Young Adolescent Pregnancy: Weighing the Balance**
Elizabeth McAnarney
University of Rochester Medical Center, Rochester, NY

Lunch with the Professor's Educational Program

12:00 PM – 1:00 PM **Liberty A**

12:00 PM **Demystifying the NIH**
Heber Nielsen
Tufts New England Medical Center, Boston, MA

Eastern SPR Business Meeting

12:00 PM – 1:00 PM **Congress**

Plenary Session II And Young Investigator Finalists

1:10 PM-4:00 PM **Independence Ballroom**

1:10PM **Signaling Modules in Endothelial Cell Caveolae: Identifying the Battlefield and the Combatants in the War of Cardiovascular Health**
Philip Shaul, University of Texas, Southwestern, Dallas, TX

FACULTY YOUNG INVESTIGATOR FINALISTS

2:00 PM **Cosmetic Outcomes of Absorbable Versus Nonabsorbable Sutures in Pediatric Facial Lacerations**
Raemma P. Luck, Robert E. Flood, Dalit Eyal, John Saludades, John Gaughan. – Abstract 83

2:15 PM **Effect of Human Single Chain Variable Fragments (scFv) Specific to the Candida albicans Adhesin, Als3, on Adherence to Endothelial Cells**
Joseph M. Bliss, Sonia S. Laforce-Nesbitt. – Abstract 84

2:30 PM **VEGF Attenuates Hyperoxic Injury through Decreased Apoptosis in Explanted Embryonic Rat Lung**
Americo Esquibies, Alia Bazzy-Asaad, Farshid Ghassemi, Hitoshi Nishio, Anil Karihaloo, Lloyd Cantley. – Abstract 85

2:45 PM **Break**

TRAINEE AWARD FINALISTS

3:00 PM **Functional Ischemia and Phosphodiesterase-5 Inhibitor Therapy in a Mouse Model of Muscular Dystrophy**
Akihiro Asai, Jeevendra Martyn, Shingo E. Yasuhara. – Abstract 86

3:15 PM **In Vivo Functions of Heme Oxygenase-1 in Postnatal Lung Development**
Monica Zhang, Rashmin C. Savani, Phyllis A. Dennery, Sara Lin. – Abstract 87

3:30 PM **Phosphatase-Defective *PTPN11* Mutations Causing LEOPARD Syndrome Have Gain-of-Function Effects during *Drosophila* Development**
Cindy J. Wang, Fitnat Topbas, Huiwen Ying, Kimihiko Oishi, Bruce D. Gelb. – Abstract 88

3:45 PM **Mechanisms by Which Maternal Obesity Induce Obesity in the Offspring**
Sarbattama Sen, Lisa A. Salvador, Rebecca A. Simmons. – Abstract 89

Neonatology II: Epidemiology & Outcomes Platform Session

4:15:00 PM-5:45:00 PM **Independence Ballroom**

Moderator: Augusto Sola, UMDNJ and Morristown Memorial Hospital, Morristown

4:15 PM **Treatment-by-Gender Effect When Aiming To Avoid Hyperoxia in Preterm Infants in the NICU**
Richard Deulofeut, Armando Castillo, Golde Dudell, Augusto Sola. – Abstract 90

4:30 PM **Modifies the Neurodevelopmental Effects of Perinatal Stressors**
Jiliu Xu, Bernie Z. Karmel, Judy M. Gardner, Michael J. Flory, Anantham Harin, Anthony Barone, Simon S. Rabinowitz. – Abstract 91

4:45 PM **Gender Effect of Tocolytic Dose of Magnesium Sulfate for the Treatment of Preterm Labor on Neonatal Mortality and Morbidity among Preterm Infants**
Mayoor S. Bhatt, Lourdes M. Cohen, Susana Rapaport. – Abstract 92

5:00 PM **Comparison of Utilization of Interventional Therapies between Moderately Preterm and Very Preterm Infants at 12 Months Corrected Age**
Jessica L. Kalia, Jordan Kase, Paul Visintainer, Heather L. Brumberg, Maria Pici. – Abstract 93

5:15 PM **Transport of Premature Infants Increases the Risk for Intraventricular Hemorrhage: Myth or True?**
Mohamed A. Mohamed, Hany Z. Aly. – Abstract 94

5:30 PM **Outcomes in Macrosomic Newborns of Non-Diabetic Mothers**
Srikant Das, Marybeth Patterson, David Schutzman, Agnes Salvador. – Abstract 95

Nutrition & Growth Platform Session

4:15 PM-5:45 PM **Liberty B**

Moderator: Edmund LaGamma, The Maria Fareri Children's Hospital at Westchester Medical Center, New York Medical College, Valhalla

4:15 PM **The Effects of a Revised Total Parenteral Nutrition Strategy on Neonatal Outcomes**
Dalbir Singh, Pradeep Mally, Karen Hendricks-Munoz, Linda Kao, Deborah Machalow. – Abstract 96

4:30 PM **G6PD Deficiency – Yet Another Association with Necrotizing Enterocolitis?**
David L. Schutzman, Rachel Porat. – Abstract 97

4:45 PM **Hypercalcemia among Very Low Birth Weight (VLBW) Infants on Full Enteral Nutrition**
Daniel T. Robinson, Richard A. Ehrenkranz, Sharon Arrigoni, Thomas Carpenter, Patrick G. Gallagher. – Abstract 98

5:00 PM **The Effects of Enteral Protein Type on Feeding Tolerance and Growth Rate in VLBW Infants**
R. Vembenil, M. Dejhalla, S. Ward, M. Mercado, S. Haram, M. Katzenstein, H. Brumberg, E.F. LaGamma, B. Parvez. – Abstract 99

5:15 PM **The Prevalence of Hypercholesterolemia in Overweight and Obese Adolescents in the South Bronx**
Umang Gupta, Kartika Khanna, Mirian Lugo, Thanakorn Jirasevijinda, Ronald Bainbridge, Ayoade O. Adeniyi, Richard Neugebauer. – Abstract 100

5:30 PM **Macrocephaly in Former Preterm Infants: A 'Growing' Concern?**
Frances Orlando, Noah Cook, Nancy Brodsky, David Shera, Hallam Hurt. – Abstract 101

General Pediatrics II – Medical Education – Platform Session

4:15 PM-5:45 PM **Liberty A**

Moderator: Catherine Skae, Albert Einstein College of Medicine, Bronx

4:15 PM **Impact of Training Pediatric Residents in Domestic Violence Screening**
Maria D. McColgan, Collen Fitzpatrick, Monique Dalvi, Sandra H. Dempsey, Martha B. Davis, Corinne Lagermasini, Jessica McKee, Angelo Giardino. – Abstract 102

4:30 PM **Knowledge of Shaken Baby Syndrome among Caregivers of Young Infants in an Urban Primary Care Center**
Kirsten A. Bechtel, Kim Le, John M. Leventhal, Eve Colson. – Abstract 103

4:45 PM **Resident Knowledge and Comfort with Pediatric Pain Management**
Kathryn Scharbach, Iman Sharif, Catherine C. Skae. – Abstract 104

5:00 PM **Pediatric Residency Call and Night Float Trends after Implementation of ACGME Work Hour Regulations**
Jodi K. Wenger, Stuart N. Karon. – Abstract 105

5:15 PM **Resident Knowledge and Confidence about Breastfeeding in a Poor Urban Community**
Melissa Tesher, Sarah Siegel, Iman Sharif, Deborah Campbell. – Abstract 106

5:30 PM **Education in Neonatal Oxygenation Has Been Insufficient: A Need for Darning**
Augusto Sola. – Abstract 107

Adolescent Medicine Platform Session

4:15 PM-5:45 PM **Declaration**

Moderator: Elizabeth McAnarney, University of Rochester Medical Center, Rochester

4:15 PM **Addressing Health-Risk Behaviors in Pre-Adolescent Children**
Evelyn Berger, Wing Wah Ho, Susan Zylbert, Mary Rojas, Danielle Laraque. – Abstract 108

4:30 PM **Childhood Witnessing and Subsequent Experiences with Interpersonal Violence among College Students**
Christine M. Forke, Rachel K. Myers, Marina Catallozzi, Donald F. Schwarz. – Abstract 109

4:45 PM **Improving Access to Behavioral Health Care in an Inner City Teen Clinic**
Alexis S. Lieberman, Michael DeStefano. – Abstract 110

5:00 PM **Physician Assessment of Menorrhagia in Adolescents**
Nicole E. Kucine, Barbara M. Ostfeld, Lisa A. Michaels. – Abstract 111

5:15 PM **Incidence and Risk Factors for Sexually Transmitted Infections (STIs) in an Urban Adolescent HIV Positive Population**
Natalie Neu, Alwyn Cohall, John Nelson, Christina Gagliardo, Andrea Nye. – Abstract 112

5:30 PM **Should Inner-City Adolescents Be Seen Every 6 Months for Well-Visits?**
Jerico Alvaran, Alexis S. Lieberman. – Abstract 113

Endocrinology & Metabolism Platform Session

4:15 PM-5:45 PM **Freedom**

Moderator: Jake Kushner, Children's Hospital of Philadelphia, Philadelphia

4:15 PM **Hypoglycemia Associated Autonomic Failure (HAAF): A Hypothesis on a Molecular Mechanism**
Amrita S. Nayak, Bistra B. Nankova, Eylem Onem, Edmund F. LaGamma. – Abstract 114

4:30 PM **Nutrient Regulation of Chondrocyte Proliferation and Differentiation**
Mimi S. Kim, Ke-Ying Wu, Philip A. Gruppuso, Chanika Phornphutkul. – Abstract 115

4:45 PM **Adaptive Beta Cell Proliferation Is Greatly Limited with Advanced Age**
Matthew M. Rankin, Jake A. Kushner. – Abstract 116

5:00 PM **Study of Glycemic Profiles with Continuous Glucose Monitoring System (CGMS) in Poorly Controlled Type 2 Diabetes Mellitus (DM) Adolescents**
Haiyan Lu, Jose B. Quintos, Dawn Hagerty Hagerty, Salvador Castells. – Abstract 117

5:15 PM **Decreased Free T4 in Term and near Term Infants Requiring Inhaled NO**
Erika M. Yencha, Amy Mackley, David A. Paul. – Abstract 118

5:30 PM **Body Mass Index in Central Brooklyn: Relation to Birthweight and Rate of Growth in the 1st Six Months of Life**
Tawana Winkfield-Royster, Leo Amoruso, Steven Todman, Jeremy Weedon, Robert J. Karp. – Abstract 119

Pulmonary & Asthma Platform Session

4:15 PM-5:45 PM **Constitution**

Moderator: Lance Parton, New York Medical College, Valhalla

4:15 PM **Efficacy of Prophylaxis in a Home Setting in Reducing the Incidence of RSV Hospitalization**
Caroline O. Chua, Vanessa V. Mercado, Marvin Siegel, Sergio G. Golombek. – Abstract 120

4:30 PM **In Vitro IL-8 Promoter Activity Following Engineered Peptide Exposure**
Shruti M. Paranjape, Neeraj Vij, Steven Mazur, Pamela L. Zeitlin. – Abstract 121

4:45 PM **Does Ethnicity Affect Pediatric Asthma Admissions?**
Whitney Young, Todd Lyons, Georgine S. Burke, Christopher L. Carroll, James F. Wiley, Sharon R. Smith. – Abstract 122

5:00 PM **Effect of Perfluorchemical (PFC) Liquids and Superoxide Dismutase (SOD) on Protein Oxidation and Mechanics in the Hyperoxic Lung**
D.J. Malone, J. Wu, A. Joseph, T.H. Shaffer, J.M. Davis, J.A. Kazzaz, M.R. Wolfson. – Abstract 123

5:15 PM **Use of Furosemide in Preterm Infants – Are the Effects Related to the Maturity of the Infant?**
Clarice M. Staves, John A. Casey, Naveed Hussain, Ted S. Rosenkrantz. – Abstract 124

5:30 PM **Pepsin, a Marker of Gastric Content Is Increased in Tracheal Aspirates from Premature Infants Developing Bronchopulmonary Dysplasia**
Sabeena Farhath, Zubair Aghai, Judy Saslow, Tarek Nakhla, Jeanett Camacho, Sam Sounder, Zhaoping He, Dev Mehta. – Abstract 125

Poster Session II

6:00 PM-7:30 PM **Liberty C**

1 **Legal Needs Assessment of Families Accessing Care at an Inner-City Community Health Center**
Jamal Harris, Katherine O'Connor, Iman Sharif. – Abstract 126

2 **Improving Asthma Care by Primary Care Pediatricians: An Interactive Approach**
Tyra Bryant-Stephens. – Abstract 127

3 **An Innovative Model for the PBLI Competency in a Pediatric Residency**
Barbara A. Kelly, Alexis S. Lieberman, Alan M. Schindler, Anna Marie Carr. – Abstract 128

4 **Provider Self-Efficacy in the Recognition and Management of Suspected Child Abuse before and after an Educational Intervention in Grenada, West Indies**
Linda D. Arnold, Andrea G. Asnes, Kimberly Martin, Karen A. Santucci. – Abstract 129

5 **Gaps in Communication: Comparison of Attitudes, Perceptions and Acceptance between Parents and Pediatric Residents Regarding Complementary¸ Alternative Medicine**
Mimi McEvoy, Thanakorn Jirasevijinda, Maria Marzan, Mariko Koya, Elaine Hsieh, Elizabeth Alderman. – Abstract 130

6 **High Levels of Rotavirus Vaccine Ineligibility among Philadelphia Children: Narrowly Defined Age Group Recommendations Meet the Reality of Vaccination Implementation**
Irini Daskalaki, C. Victor Spain, Michael G. Eberhart, Sarah S. Long, Barbara Watson. – Abstract 131

7 **Emotional Experiences in Fathers of Medical NICU Babies: A Pilot Study over Time**
Amy B. Mackley, Robert G. Locke, Rachel Joseph, Michael L. Spear. – Abstract 132

8 **Use of Event-Related Potentials To Assess Language and Developmental Outcome in Extremely-Low-Birth Weight Infants**
Aimee C. Knorr, Richard A. Ehrenkranz, Dennis L. Molfese, Eric Langlois, Linda Mayes. – Abstract 133

9 **Neurobehavioral Assessment Predicts Motor Outcome in Preterm Infants**
Bonnie E. Stephens, Jing Liu, Barry Lester, Linda Lagasse, Seetha Shankaran, Henrietta Bada, Charles Bauer, Abhik Das, Rosemary Higgins. – Abstract 134

10 **Hematologic Effects of Preeclampsia on Very Low Birthweight (VLBW) Infants with Evidence of Placental Pathology**
Kelly J. Zook, Jennifer L. Kern, Amy B. Mackley, David A. Paul. – Abstract 135

11 **Neonatal Blood Transfusions: Do Our Guidelines Need To Be Revised?**
Kavita Kasat, Pradeep Mally, Karen Hendricks-Munoz. – Abstract 136

12 **Chronic Exposure to Dopamine Stimulates Na-K-ATPase Pump in Proximal Tubule Cells**
Sudha Garimella-Krovi, Triv Rajkhowa, James Springate, Mary Taub. – Abstract 137

13 **Elevated IL-6 Expression in the Placental Microenvironment of the Extremely Low Birth Weight (ELBW) Infant: Is There an Association with Bronchopulmonary Dysplasia (BPD)?**
Elisabeth McGowan, Stefan Kostadinov, Kathryn McLean, Abbot Laptook, Surendra Sharma. – Abstract 138

14 **Early Discharge of Newborns and Readmissions for Hyperbilirubinemia – A Continued Dilemma**
Santosh Parab, Anthony Barone, Jiliu Xu, Anantham Harin. – Abstract 139

15 **Does Race Impact Hemoglobin Level in Pregnant Women**
Mohamed A. Mohamed, Charles Macri, Hany Z. Aly. – Abstract 140

16 **Maternal Factors and Risk of Late Preterm Delivery**
Jessica L. Kalia, Paul Visintainer, Jordan Kase, Heather L. Brumberg. – Abstract 141

17 **A Comparison of Broviac Lines Inserted at Bedside vs. in the Operating Room**
J. Lee, B. Clones, S. Sannoh, W. McBride, B. Parvez. – Abstract 142

18 **Risk Factors for Primary-Series Immunization Delay of Very Low Birthweight (VLBW) Preterm Infants in the Neonatal Intensive Care Unit (NICU)**
Shetal I. Shah, Adina Rothberger, Lauren Parnel, Rachel Karin. – Abstract 143

19 **Relationship of Ambulance Sirens during Neonatal Transport, Decibel Level and Quantified Impulse as Measured by Biophysical Accelerometery**
Shetal I. Shah, Martha Caprio. – Abstract 144

20 **Neonatal Endotracheal Intubation (ETI) Performance Survey: Impact of a Neonatology Fellowship Program on Resident Training**
Madhavi Sangem, Rose M. Viscardi, Alison J. Falck. – Abstract 145

21 **Do the Clinical Outcomes in ELBW Babies Vary According to the Type of Surfactant Being Used?**
Vanessa V. Mercado, Ioana Cristea, Nora Ali, ChauChau Pham, Sonya Strassberg, Lance A. Parton. – Abstract 146

22 **Changing Use of Surfactant over 6 Years and Its Relationship to Chronic Lung Disease**
Euming Chong, Jay S. Greenspan, Sharon Kirkby, Jennifer Culhane, Kevin C. Dysart. – Abstract 147

23 **The Relationship between Congenital Malformations and Preterm Birth**
Jordan S. Kase, Paul Visintainer. – Abstract 148

24 Varied Light Wavelength Dectectioin of Bruising
Michael J. Soltis, Karen Santucci, Kirsten Bechtel, John Leventhal. – Abstract 149

25 Nosocomial Infections in the Mount Sinai NICU in an Era of Restricted Antibiotic Use
Kathleen A. Gibbs, Andrew Campbell, Ian R. Holzman, Betsy Herold, Stephen Jenkins. – Abstract 150

26 Characterization of Incidence and Natural History of Systemic Hypertension in Premature Infants
Swathanthra Melekote, Naveed Hussain, Vijayakumar Praveen. – Abstract 151

27 The Use of Dexamethasone (DEXA) in Very Low Birth Weight (VLBW) Infants before and after the 2002 AAP Recommendations
Tarek Nakhla, Zubair Aghai, Judy Saslow, Nosrat Razi, Sonia Imaizumi, Gary Stahl. – Abstract 152

28 Umbilical Cord Arterial and Venous Unbound Free Fatty Acid Concentrations in Term Infants
Vasudha Tulsyan, Alan Kleinfeld, Swetha Sama, Edward Battista, Michael Graff, James P. Kampf, Andrew H. Huber, Thomas Kwan, Baolong Zhu, Thomas Hegyi. – Abstract 153

29 The Effect of Gestational Age, Postnatal Age and Inhaled Nitric Oxide (iNO) on Lung Interleukin (IL)-6 and IL-8 mRNA in Newborn Lambs
Rita M. Ryan, Ibrahim S.I. Mohamed, Richard D. Bland, Daniel D. Swartz, Philip L. Ballard, Lori Nielsen, Huamei Wang, Karen A. Wynn, Satyan Lakshminrusimha, Vasanth H. Kumar. – Abstract 154

30 Influence of Gender on Work of Breathing (WOB) in Preterm Infants on Nasal Continuous Positive Airway Pressure (NCPAP)
Kee H. Pyon, Zubair Aghai, Robert H. Habib, Judy G. Saslow, Sherry E. Courtney. – Abstract 155

31 SNAP II™ Index: An Alternative to the COMFORT Scale in Assessing the Level of Sedation in Mechanically Ventilated Pediatric Patients
Federico I. Fernandez-Nievas, Kenneth J. Banasiak, Clifford W. Bogue. – Abstract 156

32 Diabetes in Pediatric Liver Transplant Recipients: Not Rare and Often Persistent
Genna W. Klein, Arti A. Patel, Fenella Greig, Sharon J. Hyman, Nanda Kerkar, Benjamin Shneider, Sukru Emre, Elizabeth Wallach, Robert Rapaport. – Abstract 157

• • • Sunday, March 11, 2007 • • •

Plenary Session III

8:30 AM – 9:30 AM **Independence Ballroom**

8:30 AM **Presentation of Young Investigator Awards**

8:40 AM **Plenary Lecture –The Rotavirus Vaccine: From Bench to Bedside**
Paul Offit
Children's Hospital of Philadelphia, Philadelphia, PA

Neurobiology – Platform Session

9:45 AM-12:00 PM **Liberty B**

Moderator: Rebecca Ichord, Children's Hospital Philadelphia, Philadelphia

9:45 AM **Hypothermia Increases Erythropoietin Receptor Expression in Neurons through an Adenosine and ATP Signaling Pathway**
James Moore, Hui Peng, Tong Wen, Marta Rogido, Augusto Sola.– Abstract 158

10:00 AM **Caspase-9 and Caspase-3 Activity and Expression in Cerebral Cortical Tissue Following Acute Reduction in the Circulating Red Cell Mass in Newborn Piglet**
Michelle Kelly, Alan B. Zubrow, Joanna Kubin, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 159

10:15 AM **Effect of Hyperoxia on Serine Phosphorylation of Apoptotic Proteins in the Mitochondrial Membranes of the Cerebral Cortex of Newborn Piglets**
Nadege A. Brutus, Qazi M. Ashraf, Eddie Chang, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 160

10:30 AM **Inflammatory Changes in Germinal Matrix Hemorrhage in a Premature Rabbit Pup Model**
Paraskevi Georgiadis, H. Xu, C. Chua, F. Hu, L. Collins, C. Huynh, E.F. LaGamma, P. Ballabh. – Abstract 161

10:45 AM **Effect of Post-Hypoxic Administration of leu-glu-his-asp-fluoromethylketone (LEHD-fmk) on the Activity of Caspase-9 and Caspase-3 in the Cerebral Cortex of Newborn Piglets**
Purvi Jethva, Ming-Chou Chiang, Alan B. Zubrow, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 162

11:00 AM **Mechanism of Hypoxia-Induced Post-Translational Modification (Tyrosine Phosphorylation) of Apoptotic Proteins in the Cytosol of the Cerebral Cortex of Newborn Piglets**
Saneyuki Yasuda, Jahan Ara, Qazi M. Ashraf, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 163

11:15 AM **Tyrosine Phosphorylation of Apoptotic Proteins during Hyperoxia in Mitochondria of the Cerebral Cortex of Newborn Piglets**
Manjula Mudduluru, Alan B. Zubrow, Eddie Chang, Om P. Mishra, Maria Delivoria-Papadopoulos. –Abstract 164

11:30 AM **FEATURED TALK**
Stroke: Progress and Opportunities
Rebecca Icord

Pulmonary Development & Injury Platform Session

9:45 AM-12:00 PM **Liberty A**

Moderator: Susan Guttentag, Children's Hospital of Philadelphia, Philadelphia

9:45 AM ***In Utero* Treatment with Antisense-CFTR Decreases Surfactant Protein A and B mRNA in the Lung but Increases Phospholipid Secretion in Alveolar Type II Cells in Adult Rats**
Ashraf Gad, Delon Callender, Erin Killeen, Janet E. Larson, J. Craig Cohen, Avinash Chander. – Abstract 165

10:00 AM **Azithromycin Suppresses Activation of Nuclear Factor-kappaB and Production of Pro-Inflammatory Cytokines in Tracheal Aspirate Cells from Premature Infants**
Zubair H. Aghai, Aruna Kode, Riva Eydelamn, Judy Saslow, Tarek Nakhla, Gary Stahl, Louise Starnde, Paola Leone, Irfan Rahman. – Abstract 166

10:15 AM **Increased Expression/Activation of Matrix Metalloprotease-9 (MMP-9) in Hyperoxic Injury in Developing Lung**
Anne Chetty, Gong-jee Cao, Heber C. Nielsen. – Abstract 167

10:30 AM **Role of Interferon-γ (IFN-γ) in Murine Lung Development**
Anantha Harijith, Rayman Choo-Wing, Robert Homer, Vineet Bhandari. – Abstract 168

10:45 AM **Heme Oxygenase-1 (HO-1) Localizes to the Nucleus in Hyperoxia**
Sacha Kassovska-Bratinova, Guang Yang, Phyllis Dennery. – Abstract 169

11:00 AM **Chronic Hypercapnia Accelerates Alveolar Formation and Maturation in the Neonatal Mouse**
Alfin G. Vicencio, Zhongfang Du, Bernice Morrow. – Abstract 170

11:15 AM **Toll like Receptor-4 Is Expressed in the Fetal and Neonatal Lungs: Implication in Hyperoxia Induced Lung Injury**
Kamran Husain, Jeanette Camacho, Judy Saslow, Maitreyee Maheshwari, Tarek Nakhla, Riva Eydelman, Louise Strande, Robin Perry, Gary Stahl, Zubair Aghai. – Abstract 171

11:30 AM **FEATURED TALK**
Lung Injury from Inside Out
Susan Guttentag

Genetic Basis of Disease – Platform Session

9:45 AM-12:00 PM **Declaration**

Moderator: Kate Ackerman, Boston Children's, Harvard, Boston

9:45 AM **Tbx1, DiGeorge Syndrome and Ash2l: A New Interacting Cofactor**
Jason Z. Stoller, Jonathan A. Epstein. – Abstract 172

10:00 AM **Phenotypical Relevance of the Y402H Mutation of Factor H in Children with Complement Based MPGN II/DDD and aHUS**
Rajesh G. Krishnan, Christina Gerth, Thomas Dietlein, Bernd Hoppe, Elise Heon, Peter F. Zipfel, Christoph Licht. – Abstract 173

10:15 AM **Single Nucleotide Polymorphisms (SNPs) of Interleukin-8 (IL8) and BPD in ELBW Infants**
Joie Fisher, Esther Koai, Chauchau Pham, Nora Ali, Hima Maramreddy, Sonya Strassberg, Lance A. Parton. – Abstract 174

10:30 AM **Noonan Syndrome/Leukemia Causative Gain-of-Function *PTPN11* Mutations Induce Apoptosis during *Drosophila* Hematopoiesis**
In-Kyong Kim, Kimihiko Oishi, Bruce D. Gelb. – Abstract 175

10:45 AM **Single Nucleotide Polymorphisms (SNPs) of Fas and Fas Ligand (FasL) and BPD in ELBW Infants**
Hima B. Maramreddy, Annie Yao, Nora Ali, Chau Pham, Joie Fisher, Sonya Strassberg, Lance A. Parton. – Abstract 176

11:00 AM **A Mutation in the CXCR2 Chemokine Receptor Results in an Isolated Myelokathexis Phenotype Observed in WHIM Syndrome**
Andrew L. O'Shaughnessy, George A. Diaz. – Abstract 177

11:15 AM **Transient in Utero Knockout (TIUKO) of CFTR Results in Permanent Physiologic and Histologic Changes in the Lungs of Sprague-Dawley Rats**
Joseph J. Hudak, III, J. Craig Cohen, Ashok Chandran, Janet E. Larson. – Abstract 178

11:30 AM **FEATURED TALK**
Genetic Mouse Models of Diaphragm and Lung Development as tools for Understanding Human Congenital Diaphrgmatic Hernia
Kate Ackerman

Neonatology III: Clinical Studies Platform Session

9:45 AM-12:00 PM **Liberty C**

Moderator: Rita Ryan, Children's Hospital of Buffalo, Buffalo

9:45 AM **Clinical Practice and SpO2 Technology in the Prevention of ROP in ELBW Infants**
Armando R. Castillo, Richard Deulofeut, Augusto Sola. – Abstract 179

10:00 AM **Cost-Effectiveness of Early Treatment for Retinopathy of Prematurity (ETROP)**
Karen L. Kamholz, Cynthia H. Cole, John A.F. Zupancic. – Abstract 180

10:15 AM **Levels of (SpO2) between 85% and 93% Are Associated with Normoxemia in Newborns (NB) Receiving Oxygen Therapy (FiO2>0.21) in the Neonatal Intensive Care Unit (NICU)**
Armando R. Castillo, Hernando Baquero, Freddy Neira, Ramiro Alvis, Ann Critz, Richard Deulofeut, Augusto Sola. – Abstract 181

10:30 AM **Avoiding Hyperoxemia during Neonatal Resuscitation: Time to Response of Different SpO2 Monitors**
Hernando Baquero, Ramiro Alviz, Augusto Sola. – Abstract 182

10:45 AM **What Factors Influence Whether Neonatologists Attend Deliveries at the Limits of Viability (20-23 wks GA)?**
P. Groening, P. Patel, H. Brumberg, L.A. Parton, E.F. LaGamma, M. Zia. – Abstract 183

11:00 AM **Challenges in Provision of a Directed Blood Donor Program in Infants 1250gms**
Moi Louie, Shetal Shah, Karen Hendricks-Munoz, Pradeep Mally. – Abstract 184

11:15 AM **A Practice Plan (PP) to Lower the Initiating FiO2 in the Delivery Room (DR) in Very Low Birth Weight (VLBW) Infants Requiring Respiratory Support (RS) Is Feasible**
Anita Stola, Jeffrey Perlman. – Abstract 185

11:30 AM **Free Bilirubin Concentrations (UCBf) in the Newborn Infant**
Vasudha Tulsyan, Alan Kleinfeld, James P. Kampf, Andrew H. Huber, Thomas Kwan, Baolong Zhu, Scott Bader, Thomas Hegyi. – Abstract 186

11:45 AM **Noise Level in Neonatal Intensive Care Unit before and after Interventions**
Shruti Gupta, Donna Baranek, Carol Catania, Janet E. Larson. – Abstract 187

General Pediatrics III: Preventative Pediatrics Platform Session

9:45 AM-12:00 PM **Constitution**

Moderator: Iman Sharif, Albert Einstein College of Medicine, Bronx

9:45 AM **Intervention Services of Macropremies during the First Three Years — A Pilot Study**
Nadeem A. Hashmi, Brenda Hussey-Gardner, Fernando Mena, Rose M. Viscardi. – Abstract 188

10:00 AM **A Comparison between the Rx Medibottle and Oral Syringe in Dosing Infants with a Bitter-Tasting Medication: A Randomized Controlled Clinical Trial**
Jolly Radhakrishnan, Khudsia R. Irfan, Richard Neugebauer, Glickman Cynthia, Stefan Hagmann, Murli U. Purswani. – Abstract 189

10:15 AM **Does Television Viewing during Middle-School Lead to Poorer School Performance?**
Iman Sharif, Thomas A. Wills, James D. Sargent. – Abstract 190

10:30 AM **Recurrent Urinary Tract Infections: Risk Factors and Effectiveness of Prophylaxis in a Primary Care Cohort**
Patrick H. Conway, Brandon Henry, Avital Cnaan, Theoklis Zaoutis, Robert Grundmeier, Ron Keren. – Abstract 191

10:45 AM **Introduction of a Modified Neonatal Resuscitation Course to Lay Midwives in the Dominican Republic**
Robert W. Comer, Barbara Graves, Jane Cross. – Abstract 192

11:00 AM **Does the Perceived Intrusiveness of Child Sexual Abuse Affect Caregiver's Willingness To Act?**
Ingrid Walker-Descartes, Mary Rojas, Yvette Sealy, Satya Laren, Danielle Laraque. – Abstract 193

11:15 AM **Smoking Cessation in Caregivers of Pediatric Emergency Department Patients**
Sabina B. Singh, Donald Marks, Brigitte M. Baumann, Edwin J. Boudreaux. – Abstract 194

11:30 AM **FEATURED TALK**
Health Services Research in Undersearved Settings
Matilde Irigoyen, Albert Einstein Medical Center and Thomas Jefferson University, New York, NY

Emergency Medicine: Platform Session

9:45 AM-12:00 PM **Freedom**

Moderator: David Listman, St. Barnabas Hospital, Bronx

9:45 AM **Low Risk Criteria for Pelvic Radiography in Pediatric Blunt Trauma Patients**
Andrew T. Wong, KeriAnne B. Brady, David H. Rubin, David A. Listman. – Abstract 195

10:00 AM **A Decade of Change in Pediatric Emergency Department Utilization**
Melissa S. Stockwell, Sally E. Findley, Matilde Irigoyen.

10:15 AM **Utility of Procalcitonin To Identify Young Febrile Infants at Low Risk of Serious Bacterial Infections**
Scott Weiss, Andrew Dauber, Vincenzo Maniaci, Eric Nylen, Richard Bachur.

10:30 AM **End-Tidal Carbon Dioxide: The Wave of the Future**
Melissa L. Langhan, Lei Chen.

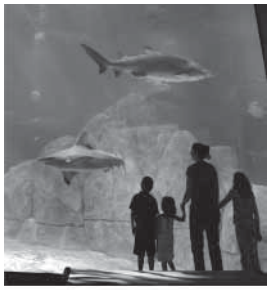
10:45 AM **Impact of Sexual Assault Nurse Examiners on the Evaluation of Sexual Assault in a Pediatric Emergency Department**
Kirsten Bechtel, Deborah Gallagher, Elizabeth Ryan.

11:00 AM **Using Spectroscopy To Assess the Ages of Bruises**
Susan J. Duffy, John W. McMurdy, Gregory D. Jay, Gregory P. Crawford.

11:15 AM **Relationship of Serum S100B and Intracranial Injury in Children with Accidental Closed Head Trauma**
Kirsten Bechtel, Sarah Frasure, James Dziura, Christine Simpson.

11:30 AM **Does Parental Perception of the Quality of Their Primary Care Matter in the Decision Whether To Use the Pediatric Emergency Department for Episodic Illness?**
Kimberly A. Bleier, Andrew D. Racine, Jeffrey R. Avner, Elizabeth M. Alderman.

11:45 AM **Adolescent Use of Emergency Department: Does Source of Primary Care Make a Difference?**
Elizabeth M. Alderman, Jeffrey R. Avner, Andrew D. Racine.


2007 ESPR Abstracts

Poster Session I

Friday, March 9, 2007 **6:00 PM-7:30 PM**

1 Undergraduate Student

Sulforaphane Is Cytotoxic to Neuroblastoma Both In Vitro and In Vivo

Lee Dorf, Satyan Kalkunte, Rakesh Singh, Laurent Brard, Giselle Saulnier Sholler. Pediatrics, University of Vermont, Burlington, VT; Gynecology and Obstetrics, Brown University, Providence, RI.

BACKGROUND: Neuroblastoma (NB) is a tumor which grows aggressively, metastasizes, and is resistant to multimodal therapy. Developments of novel therapeutic strategies are needed. In search of safe therapeutic agents for the pediatric population, we screened dietary derived sulforaphane for in vitro and in vivo cytotoxicity to neuroblastoma cells.

OBJECTIVE: To determine the cytotoxicity of sulforaphane to neuroblastoma cells in vitro and in vivo and to understand the signaling pathways involved in the mechanism of action of sulforaphane.

DESIGN/METHODS: NB cells SMS KCNR, SY5Y, SKNSH and IMR32 were treated with 0-100 μM of Sulforaphane, for 48 hours. Cytotoxicity was assessed by MTS assay. Apoptosis was evaluated by DNA fragmentation analysis and by immunoblot analysis of caspases 3,8,9, PARP and Bcl-2. The signaling pathways were assessed by western blot analysis of MAPK p42/44, p38 and AKT. Xenograft models were used to investigate the effects of Sulforaphane on NB. Nude mice were injected with 10^7 SMSKCNR cells and fed food with or without 2mg of Sulforaphane daily for 28 days. The resected tumors were analyzed with immunohistochemistry stains KI67, CD31 and neuron-specific enolase (NSE).

RESULTS: Sulforaphane induces apoptosis in neuroblastoma cells SY5Y, SKNSH, SMSKCNR and IMR32. Apoptosis induced by Sulforaphane in SMSKCNR cells was confirmed by fragmentation of genomic DNA. Sulforaphane induced activation of caspase 9 (intrinsic pathway) and caspase-3. Sulforaphane lead to the inactivation of PARP-1 and decreased expression of Bcl-2. Sulforaphane reduced the phosphorylation of survival signaling mediated by ERK1/2 and AKT in a dose-dependent manner. The mice xenograft model showed a decrease in tumor proliferation and angiogenesis based on Ki67 and CD31staining respectively with treatment. Tumor weights showed no significant correlation with treatment but a decrease in NSE tumor marker and an increase in hemorrhage was found within the treated tumors.

CONCLUSIONS: Sulforaphane is a potent apoptotic drug which is cytotoxic to NB. Sulforaphane inhibits the survival and chemo-resistance signals AKT and ERK1/2. In vivo, sulforaphane decreases cellular proliferation and angiogenesis. Thus, safe phyto-pharmaceuticals such as Sulforaphane deserve further research as therapeutic agents for NB.

2

Nifurtimox Is Cytotoxic to Catecholamine-Containing Cells Which Is Enhanced by Ascorbic Acid and Suppresses Neuroblastoma Growth In Vivo

Giselle Saulnier Sholler, Lee Dorf, Jennifer Straub, Laurent Brard, Rae Nishi. Pediatrics, University of Vermont, Burlington, VT; Obstetrics and Gynecology, Brown University, Providence, RI.

BACKGROUND: Well tolerated new treatments for childhood neuroblastoma are needed. We have previously shown that nifurtimox induces apoptosis of neuroblastoma cells in culture. Pharmacologic doses of ascorbic acid induces cell death in cancer cell lines and catalyzes the conversion of nifurtimox to nitro anion free radicals. We further evaluated these treatments for their efficacy in neuroblastoma.

OBJECTIVE: To elucidate the mechanism of action of nifurtimox and study its effects in vivo in a xenograft mouse model.

DESIGN/METHODS: Neuroblastoma cell lines (SMS KCN, SMSKCNR, SY5Y) were cultured and treated with 1 to 10 ug/ml nifurtimox. Cells were also incubated with 0.05-0.5mM ascorbic acid with or without nifurtimox. Cell viability was assessed by calcein AM assays. Apoptosis was detected by activated caspase-3 by western blot. Chick embryo sympathetic and parasympathetic neurons were cultured and treated with nifurtimox (1-20ug/ml) and counted for cell survival. A mouse xenograft model was used to evaluate the effect of nifurtimox on neuroblastoma in vivo. Nude mice were injected with 10^7 SMSKCNR cells in the left flank and fed food with or without nifurtimox (150mg/kg/day) for 28 days. Tumors were evaluated by immunohistochemisty.

RESULTS: Nifurtimox cytotoxicity was enhanced when combined with ascorbic acid. At 48 hours cell viability was decreased to 80% with nifurtimox, 50% with ascorbic acid, and 10% with both. Cell viability decreased in a dose dependent manner in all cell lines. Nifurtimox treatment showed an increase in caspase-3 activity. Cytotoxicity was reversed by pretreatment with AMPT. Nifurtimox induced cell death in sympathetic, but not parasympathetic, neurons. Xenografts show a decrease in tumor weights and a decrease in NSE staining in mice treated with nifurtimox.

CONCLUSIONS: Nifurtimox inhibits neuroblastoma growth in vivo in mice xenografts. Ascorbic acid is cytotoxic to neuroblastoma cells and potentiates the efficacy of nifurtimox induced apoptosis. The mechanism of action involves the reaction with catecholamines and formation of free radicals. Nifurtimox and ascorbic acid are well tolerated in children and therefore this combination may be a novel adjunctive therapy in the treatment of neuroblastoma.

3 Fellow in Training

Receipt of Opiates by Pediatric Oncology Patients Who Died in Hospitals

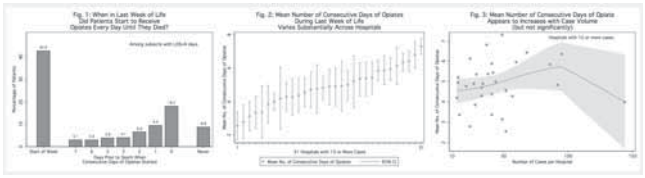
Andrea Orsey, Jean Belasco, Jonas Ellenberg, Kathryn Schmitz, Chris Feudtner. Oncology, Children's Hospital of Philadelphia, Philadelphia, PA; Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania, Philadelphia, PA.

BACKGROUND: Efforts to improve the quality of pediatric end-of-life care are hindered by the lack of quality indicators that could be compared across hospitals.

OBJECTIVE: We sought to develop a quality of care indicator by measuring within a cohort of pediatric oncology patients who died while hospitalized the proportion that received opiates on consecutive days up to the day of death during their last week of life, and to assess practice variation between hospitals.

DESIGN/METHODS: We used detailed hospital administrative data from the Pediatric Health Information System regarding 2,195 subjects 0-24 years of age who were treated at 34 hospitals between 2001-2005.

RESULTS: Among the 1488 subjects who were hospitalized for a week or longer prior to death, 46% received opiates for all 7 days prior to death, while 18% did not receive opiates on consecutive days until the day they died, and 9% never received opiates on consecutive days (fig 1). Among the 31 hospitals that had more than 10 subjects, the mean number of consecutive days of opiate receipt varied substantially across hospitals (fig 2), with hospitals that had more cases tending to start consecutive days of opiates earlier during the last week of life than hospitals with fewer cases (fig 3), but this relation is not statistically significant.



CONCLUSIONS: With appropriate case-mix adjustment, consecutive days of opiate treatment may be a useful quality indicator to motivate hospitals to examine end-of-life care practice patterns.

4

Simple Measure of Impact of Lupus Erythematosus in Youngsters© (SMILEY©)-Responsiveness To Change in Disease Activity

Lakshmi N. Moorthy, M. Peterson, M. Baratelli, M. Harrison, K. Onel, E. Chalom, B. Eulie, A. Adams, L. Barinstein, E. MacDermott, L. Barillas, S. Angeles, P. Hashkes, D. Bork, A. Reiff, S. Hong, L. Vazquez, T. Lehman. Peds -Rheum, Robert Wood Johnson Med Sch -Univ of Med.& Dentistry of NJ, New Brunswick, NJ; Research, Hosp for Special Surgery -HSS, NY, NY; Peds -Rheum, La Rabida Chld Hosp, Chicago, IL; Peds Rheum, HSS, NY, NY; Peds -Rheum, Maimonedes Med Ctr, Brooklyn, NY; Peds -Rheum, St Barnabus Med Ctr, Livingston, NJ; Peds -Rheum, Chld Hosp LA, LA, CA; Peds -Rheum, CCF, Cleveland, OH; Peds Rheum, San Jorge Chld Hosp, San Juan, PR.

BACKGROUND: We previously described the development of Simple Measure of the Impact of Lupus Erythematosus in Youngsters© (SMILEY©), a novel, brief, valid & reliable health-related quality of life (QOL) tool for children with systemic lupus erythematosus (SLE). SMILEY© has parallel child/parent reports with 5 faces-scale responses & percentage scores. Higher scores mean better QOL.

OBJECTIVE: To determine responsiveness of SMILEY© to change in SLE activity.

DESIGN/METHODS: In this longitudinal multicenter study, children 2-18 years & parents completed child/parent reports of SMILEY© at two evaluations. Both times, we obtained SLE Disease Activity Index (SLEDAI), Physicians Global Assessment (PGA) & chid/parent assessments of SLE status (ASLE) & global QOL (AQOL).

Change (Δ) in child/parent SMILEY© scores (ΔSMILEY©) were correlated with corresponding ΔASLE & ΔAQOL, ΔSLEDAI & ΔPGA using Spearman rho.

RESULTS: At baseline, 43 children (35 girls) with SLE had mean age 14 ±3 years; SLE duration 1-184 months; median SLEDAI 4; & modal PGA 2. Median SMILEY© scores were 63 (child) & 61 (parent; n 40). Mean interval between two evaluations was 5.5± 5 mos.

ΔTotal child SMILEY© score correlated with ΔPGA (r 0.4, p 0.02, n 42) & Δchild ASLE (r 0.4, p 0.007, n 40). ΔChild ASLE correlated with ΔSLEDAI (r 0.3, p 0.03, n 40) & ΔPGA (r 0.4, p 0.02, n 40). ΔTotal parent SMILEY© score correlated with Δparent ASLE (r 0.5, p 0.01, n 31).

CONCLUSIONS: SMILEY© is responsive to change in SLE activity on preliminary analysis & will be an important adjunct to clinical care & research. Subejcts will be evaluated prospectively to confirm findings. Further analysis will be conducted to assess relationship of parent SMILEY© & SLE activity.

5 Medical Student

Vaginal Wet Mounts on Asymptomatic Adolescent Females; Are They Beneficial?

Kate Stampler, Alexis S. Lieberman, Maria Fraga, Arnold Cohen. Medical Student, Philadelphia College of Osteopathic Medicine, Philadelphia, PA; Department of Pediatrics, Albert Einstein Medical Center, Philadelphia, PA; Department of OB/GYN, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: Wet mounts are commonly performed at the time of pelvic exam. However, there is a paucity of data on the usefulness of wet mounts in asymptomatic teen patients.

OBJECTIVE: To determine if wet mounts in asymptomatic teen women are useful in detecting Gonorrhea or Chlamydia, compared to DNA amplification testing.

DESIGN/METHODS: We retrospectively reviewed charts for 93 consecutive asymptomatic patients seen between March and September, 2006 for a routine visit. Data was collected re: patients' previous STI history, week in menstrual cycle, date of last coitus, use and type of contraceptives; vaginal pH, presence or absence of discharge, appearance of cervix, wet mount results and cervical testing results. Outcome measures were findings on wet mount and result of DNA amplification test on cervical sample for Gonorrhea and Chlamydia.

RESULTS: Wet mounts were abnormal in 29 (31.2%) patients. *T vaginalis* was diagnosed in 8 (8.8%) patients, bacterial vaginosis in 11 (12.1%), *Candida* in 5 (5.5%). *N gonorrhoeae* was diagnosed by DNA amplification in 2 (2.2%) patients and *C trachomatis* in 9 (9.7%). There was no significant relationship between abnormal wet mount and positive *N gonorrhoeae* and *C trachomatis* (p=0.083). After excluding the patients with abnormal wet mounts who had *T vaginalis*, BV or Candida, all the remaining patients with positive *N gonorrhoeae* and *C trachomatis* had normal wet mounts. For *N gonorrhoeae*, the wet mount had a sensitivity of 0%, specificity of 92.6%, PPV of 0%, and a NPV of 95%. For *C trachomatis*, the wet mount had a sensitivity of 0%, specificity of 92.1%, PPV of 0%, and a NPV of 89%.

CONCLUSIONS: Wet mounts were not useful to detect *N gonorrhoeae* and *C trachomatis* in asymptomatic teen patients. The finding of *T vaginalis* and BV in these asymptomatic patients may justify continuing wet mount evaluation but this practice needs further study to determine if treatment in this asymptomatic population will result in clinically significant effects.

6 Fellow in Training

The Antiseizure Medication Valproic Acid Regulates Catecholamine Production by a Threshold Concentration Dependent Effects on TH mRNA Synthesis and Degradation

A. D'Souza, B.B. Nankova, E. Onem, P. Patel, E. LaGamma. Division of Newborn Medicine, Maria Farari Children's Hospital, Valhalla, NY.

BACKGROUND: The anticonvulsant drug valproic acid (VPA) is effective for treatment of bipolar mood disorders and seizures. Prenatal exposure to VPA is associated with neural tube defects and autism. Since VPA requires chronic treatment for its effects, it has been suggested that alterations of signaling pathways and gene expression may be involved in its actions. Our recent results (Shah P. et al., Brain Research. 2006) revealed that the diet-derived short chain fatty acid butyrate and VPA (a structural dimer of butyrate) can regulate the expression of genes such as tyrosine hydroxylase (TH), the rate limiting enzyme in catecholamine bio-synthesis.

OBJECTIVE: To determine whether VPA:

1. Affects the expression of the endogenous TH gene in a tissue culture model (PC12; rat pheochromocytoma).

2. Regulates TH expression at the level of the TH promoter via specific *cis*-and *trans*-acting factors or by RNA degradation.

DESIGN/METHODS: PCR-based site directed mutagenesis was used to introduce mutations (verified by sequence analysis) into the wild-type TH promoter driving the expression of a luciferase reporter gene. Wild-type and mutated constructs were transiently transfected into PC12 cells. After the designated treatment with VPA, cells were harvested and reporter activity measured. The effect of VPA on TH mRNA and protein levels were determined by northern and western blot analyses.

RESULTS: VPA in therapeutic range (0.1 to 6 mM) caused a dose-dependent activation of TH gene transcription, required an intact cyclic AMP response element (CRE) plus binding of the transcription factor CREB. Mutations in the recently discovered BRE binding site (butyrate response element; Patel P. et al., Dev Brain Res.2005) or changes in the distance between the BRE and the CRE sites in the TH promoter, affected the response to VPA. In contrast, VPA treatment at similar concentrations(1mM, 6mM) resulted in significantly reduced TH mRNA levels.

CONCLUSIONS: Butyrate and its dimer VPA, displayed similar effects on TH gene expression utilizing common promoter motifs and CREB transcription factors and demonstrate a threshold concentration-dependent degradation of TH mRNA.

Speculations:These findings suggest a novel method through which VPA and ketogenic diets can alter dopaminergic dependent behavior.

7

Blood Pressure Predicts Severity in Childhood Guillain-Barre Syndrome

Carrie Edwards, Francis J. DiMario. Health Fellows Program, Trinity College, Hartford, CT; Pediatrics, Connecticut Children's Medical Center, Hartford, CT.

BACKGROUND: Guillain-Barre syndrome (GBS) is an acute, demyelinating polyneuropathy characterized by progressive, symmetrical motor weakness of more than one limb, and areflexia or hyporeflexia. The annual incidence in children is estimated to be from 0.1-1.7/100,000. GBS is the most common cause of acute generalized paralysis in the United States for all age groups. Motor weakness varies, as does the affect on autonomic function including heart rate, vasomotor stability, sweating, continence, and blood pressure.

OBJECTIVE: In this investigation we sought to correlate incidence and degree of autonomic dysfunction with the degree of motor impairment in children hospitalized with GBS.

DESIGN/METHODS: After IRB approval, all hospitalized subjects with a discharge diagnosis ICD-9 code of 357.0 were obtained for retrospective review. Charts were verified for diagnostic criteria of GBS, age less than 19 years, and exclusionary criteria. Recorded data included: demographics, etiology, CSF formula, EMG/NCV results, dysautonomic events, complications / interventions, motor disability grade (MDG), all blood pressure / heart rate measures and calculated daily averages per subject, and outcomes.

RESULTS: There were 26 subjects (12 boys, 6 exclusions), mean age of 11.3 years (range 6-17 years). The average hospital stay was 10.6 days. 24/26 subjects underwent 3-5 days of IVIg, 1/26 underwent plasmapharesis and 1/26 was not treated. All 26 recovered by 2-6 months without functional residual disability. Only bradycardia and sweating disturbances were dysautonomic events not observed. Hypertension occurred in 18/26 (69%) and tachycardia in 20/26 (77%). The proportion of children with hypertension and/or tachycardia increased as did the MDG score (r=.98, p<0.03). The more severely disabled patients (GBS stages 4 and 5) had a significantly higher mean percent elevation of BP (7.72%) than did others(GBS stages 1, 2, and 3). Hypertension occurred 9-15 days from symptom onset on hospital days 2-6, and within 24-48 hours of maximum motor disability in 89%.

CONCLUSIONS: Multiple autonomic disturbances compound the course of childhood GBS. The development of hypertension approximates the appearance of maximum motor disability in most children with GBS. Children with higher deviation from normal blood pressure will experience a more severe course of illness.

8 Fellow in Training

Pulmonary Hypertension in Children and Adolescents with Sickle Cell Disease

Aziza S. Sedrak, Sreedhar P. Rao, Scott T. Miller, Vahid Hekmet, Madu Rao. Pediatrics, State University of New York - Downstate Medical Center, Brooklyn, NY.

BACKGROUND: Pulmonary hypertension (PHT) occurs in 20-40% of adults with sickle cell disease (SCD); prevalence in childhood is not well established. In adults, recurrent acute chest syndrome (ACS) is associated with chronic sickle cell lung disease and perhaps PHT. Hematologically normal children with obstructive sleep apnea (OSA) are at risk for PHT.

OBJECTIVE: To determine the prevalence of PHT in children with SCD and explore potential associations with abnormal pulmonary function tests (PFTs), OSA, or other clinical or laboratory factors.

DESIGN/METHODS: Of 48 subjects (age 5-21 yr, med 12 yr), 38 (79%) had Hb SS; 5 each had Hb SC and Sß-thal (3 $ß^+$, 2 $ß^0$) (10.4%). Eleven (22.9%) were on chronic transfusion (7 CVA, 3 abnl TCD, 1 pain); 19 (39.5%) were on hydroxyurea (HU) (10 ACS, 9 pain). All subjects had Doppler echocardiography; PHT was defined as age and body mass index-adjusted tricuspid regurgitant jet velocity (TRV) of $\geq$ 2.5 mm/sec. A comprehensive history included queries for cardiopulmonary, neurological and OSA symptoms. If OSA history was suggestive, polysomnography was done.

RESULTS: Of 31 (64.5%) who had PFTs, 17 (54.8%) had restrictive abnormalities and three (9.6%) obstructive; 11 (35.4%) had normal PFTs. Three subjects (6.2%) with a history of OSA had polysomnography; 1 was normal, 2 had OSA. Four of the 48 patients (8.3%) had PHT (TRV values 2.52, 2.55, 2.61, and 2.91). All were $\geq$ 10 yr old (10, 11, 17 & 18 yr) and had Hb SS. None were symptomatic. One had restrictive PFT and none had OSA (NS). Of the other clinical and laboratory parameters examined, only elevated serum indirect bilirubin was associated with PHT; there was a trend toward association with elevated reticulocyte count and low fetal Hb levels.

Characteristics of Study Patients

	PHT	No PHT	p Value
Fetal Hb (%) (Mean)	3.7	7.9	0.154
Age (Mean) (Years)	13.5	12	0.564
Reticulocytes (%)	13.8	8.25	0.087
Indirect bilirubin (mg/dl) (Mean)	5.4	2.2	0.027

CONCLUSIONS: The prevalence of PHT our pediatric sickle cell population was 8.3%. As reported in adults, there may be an association between PHT and more severe hemolysis. We could find no association with abnormal PFTs or OSA.

9

Blood Lead Changes during First Two Years of Life in the Infants Born to Women with High Lead Concentration

Tatyana Gabinsky, Asha Ittoop, Claudia Cosmineanu, Gospodin Stefanov, Melvin Gertner. Pediatrics, Elmhurst Hospital Center, Elmhurst, NY.

BACKGROUND: In children even low blood lead levels (BLL) are associated with neurotoxic effect and potential poor developmental outcome. NYC DOH recommends screen all children participating in Medicaid program for BLL at the age 12 and 24 months.

OBJECTIVE: Evaluate the ability of the recommended screen to identified infants born to the mothers with elevated lead level.

DESIGN/METHODS: Retrospective charts revue of the infants born to mothers with BLL's > 10 μg/dL in the Elmhurst Medical Center (EMC). Women were screened during prenatal evaluation. Infants had venous sampling at birth, at 1, 2, 4, 12, and 24 month as was recommended by NYC DOH. Only babies who had follow-up for 24 month were included.

RESULTS: From January 2002 to October 2006 20,263 women were screened for elevated lead level. 18,378(90.7%) were foreign born. 35%, 21.1%, and 16.5% of the women from Bangladesh, Mexico, and Pakistan respectively had BLL $\geq$ 5 μg/dL. 211 (1.04%) had mean BLL 15.26 μg/dL (SD =6.12; range 11 -56). 126 (59.7%) women delivered babies in the EMC and 51 infant had follow-up for 24 month. At birth mean BLL was 20.5 μg/dL (SD= 3.02; range 11-44). At one month mean BLL was 17.8 μg/dL (SD=2.04; range 12 – 32); at 2 month – mean was 10.1 μg/dL (SD=1.7; range 7-15); at 4 month - mean was 8.83μg/dL (SD=2.4; range 7 -18); at 12 month – mean was 5.55 μg/dL (SD=1.45; range 1-8); and at 24 month – mean 3.33 μg/dL (SD= 1.09; range 1-6).

CONCLUSIONS: During the first year of life blood lead level declines sharply. Routine screen of the children at 12 and 24 month may not identify infants born with high lead level.

10 Medical Student

Lead Poisoning among Inner City Children before 9 Months of Age: Is Testing Needed?

Santosh Kumar, Margaret Clark-Golden, Nathan Graber, Jeremy Weedon, Robert J. Karp. Pediatrics, SUNY-Downstate Medical Center, Brooklyn, NY; Department of Health, City of New York, New York, NY.

BACKGROUND: In 1991, the Centers for Disease Control (CDC) established an action level for blood lead of (Pb) 10μgm/dL, with screening starting at 9 months. It was recognized, however, that at some point in the future a lower cut-off would be likely. Recent data suggest that neurodevelopmental effects can be documented for children with Pb levels at 5μgm/dL. There is concern, without data for support that children may be accumulating levels in this range before 9 months of age.

OBJECTIVE: We sought to estimate the proportion of children in Brooklyn, NY having positive Pb results when assessed before 9 months of age, and whether early elevated levels persist.

DESIGN/METHODS: We reviewed a data file tracking all venous blood lead screening done at Brooklyn NYCHHC facilities between 1994-1998. We identified 2149 children who were screened before 9 months of age. The number identified as having an initial positive Pb result and those with a confirming subsequent positive result at any age were determined. Pb positivity was defined in two ways: Pb≥5μgm/dL, and Pb≥10μgm/dL at a laboratory with an intrasample variability of 13%.

RESULTS: Of these 2149 early screen children, 335 (16%) had a level ≥ 5μgm/dL, and of these, 70 (20%) had subsequent levels ≥ 5μgm/dL. Most of the 335 (73%) did not have any follow-up levels. Sixty one children (2.8% of 2149) had blood leads ≥ 10μgm/dL. Only 17 of these had follow-up data; 14 of 17 children (or 0.7% of the total early cohort) had at least one subsequent Pb level ≥10μgm/dL.

CONCLUSIONS: At the time of testing children in this data set, Pb levels between 5 and 10μgm/dL were not recognized as elevations, which may explain the low rate of follow-up testing. Contemporary concerns differ. These data show 3% of children screened earlier than suggested by CDC guidelines had elevations in Pb levels likely to affect neurodevelopment. By contrast, confirmed Pb levels above the 1991 CDC standard of ≥10μgm/dL were uncommon prior to 9 months of age. The data suggest a heightened need for early lead risk assessment and testing for infants at their early visits for well child care.

11

Perceptions of the Medical Home among Inner City Families

Melissa S. Stockwell, Matilde Irigoyen, Sally E. Findley, Linda F. Cushman, Rachel F. Dannefer, Anne E. Siegler. General Pediatrics; Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND: The American Academy of Pediatrics states that every child should have a medical home, yet little is known about the perceptions inner city families have of a medical home.

OBJECTIVE: To identify the perceptions of the medical home domains among inner city families.

DESIGN/METHODS: We conducted a bilingual, cross-sectional survey of 244 families visiting a primary care clinic (n=40), a subspecialty clinic (n=76), or a pediatric emergency department (n=128) at an academic medical center in New York City. The survey included questions from previously validated surveys on the medical home domains: continuous, accessible, comprehensive, coordinated, family centered, compassionate, and culturally effective care. Questions most strongly associated with each domain on factor analysis were used to calculate mean scores for each domain. Children with ≥75 of 100 points in every domain had a medical home. Parents' responses regarding the most important aspect of getting care for their child were also categorized into the domains. We conducted bi- and multivariate analyses to assess the impact of age, sex, race/ethnicity, limited English proficiency (LEP), insurance, maternal education, immigration, patient-doctor racial/ethnic concordance, child health status, and primary care site on the domains.

RESULTS: 79% of children were Latino, 13% Black, 77% had Medicaid, and 42% had LEP. Family-centered care was most important for Black families (28%), and comprehensive care for Latino families (26%) and families with LEP (30%). Most families (86%) identified a regular doctor, but only 39% had a medical home. LEP, female sex, poorer health status and patient-doctor discordance were associated with lacking a medical home. On multivariate analysis, families with LEP (AOR 2.24 95% CI: 1.16-4.34); children in less than excellent health (AOR 1.99 95% CI: 1.02-3.90); and those with patient-doctor discordance (AOR 2.0 95% CI: 1.03-3.93) were twice as likely to lack a medical home.

CONCLUSIONS: Less than half of inner city children surveyed had a medical home. Cultural factors and child's health status were better predictors of having a medical home than were insurance or having a regular doctor. Cultural differences in the relative importance of medical home domains also existed and need to be considered when designing programs to foster medical homes.

12

Youth Knowledge of Unhealthy Lifestyle Choices and Obesity Vary by Gender and Behavior

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BACKGROUND: Obesity continues to rise in children and teens and is associated with increased morbidities such as diabetes. In order to develop programs addressing these needs, social health marketing research is essential. Although studies have focused on adult and parental knowledge and attitudes of obesity, little is known regarding youth understanding of unhealthy lifestyle choices and resultant outcomes.

OBJECTIVE: To determine factors affecting youth knowledge regarding unhealthy lifestyle choices and obesity in 2 zip codes.

DESIGN/METHODS: Surveys were collected (6/06-10/06) from 437 youth (mean ± SD=15.5±2.2 yrs) at community events, centers, schools, and in public areas in Mt. Vernon and Peekskill, NY. Chi square analysis was used.

RESULTS: Youth identified themselves as 58.1% female (F), 41.4% male (M), 21.5% Hispanic, 12.8% White, 76.9% Black, 2.3% Asian, 1.8% Native Hawaiian or Other Pacific Islander, 5.9% American Indian or Alaska Native and 14% Others. Females more than males overestimated the prevalence of overweight among youth (63% vs. 37%, p=0.015). However, females better understood the role genetics play in overweight (67%F vs. 33%M, p=0.014) and diabetes (64%F vs. 36%M, p=0.005). Of those who did not realize the connection between overweight and diabetes, 87% were Black vs. 13% Non-Black (p=0.047). Poorer nutritional behaviors were associated with incorrect knowledge about the prevalence of overweight (p=0.001) and the link between television (TV)-watching and overweight risk (p= 0.002). Surprisingly, correct knowledge about the link between TV-watching and overweight risk was higher among frequent TV-watchers (p=0.045), but lower among frequent video game players (p=0.009). Higher parental education was positively associated with correct knowledge about: TV-watching and overweight risk (p=0.013), the role genetics play in diabetes (p= 0.002) and the link between maternal diabetes and neonatal outcome (p=0.043).

CONCLUSIONS: Youth knowledge regarding obesity and resultant outcomes are significantly affected by demographic and behavioral factors. This research will be used to develop targeted public health initiatives in these two communities.

13

House Officer

Prevalence of Asthma in Inner City South Bronx Pediatric Immigrant Population Aged 3-17 Years

Veronica F. Reyes, Olumide Oyefeso, Akila Muthukumar, Radha Biswas, Anil Pawa, Ronald Bainbridge, Ayoade Adeniyi, Richard Neugebauer. Pediatrics, Bronx Lebanon Hospital Center, Bronx, NY; Sergievesky Center, Columbia University, Manhattan, NY.

BACKGROUND: Asthma is a serious health concern especially in the South Bronx, which has had the highest asthma prevalence, hospitalizations and deaths in New York City. Several studies report slightly higher asthma prevalence among adult immigrants as compared with native born populations.

OBJECTIVE: Accordingly, we hypothesized that the asthma prevalence in the pediatric immigrant population exceeds that of U.S. born children with non-immigrant mothers living in the South Bronx.

DESIGN/METHODS: We conducted a cross-sectional study in the Pediatric clinics, emergency room and inpatient service at the Bronx Lebanon Hospital Center. The study involved an in-person administration of a 5-point questionnaire, the Brief Pediatric Asthma Screen, previously validated, and supplemented with questions regarding the mother and child's birthplace, length of stay in the U.S. and family history of asthma. The questionnaires were administered to the parents/caregivers of children aged 3 to 17 years. Exclusion criteria were past history of prematurity, chronic lung disease, congenital malformations or cardiovascular problems. Participation was entirely voluntary.

RESULTS: Of the 157 subjects approached, 153 consented to participate of whom 147 were study eligible. Age range was 3 to 17 yrs; mean age, 8.3 yrs; 50% of subjects were males. Of 147 subjects, 55 (37%) comprised U.S. born mothers and children (Group A); 23 (16%) comprised mothers and children both born outside the U.S. (Group B). The remaining subjects comprised mothers born outside the U.S. with children born in the U.S. In Group A, 58% had previously been diagnosed with asthma; in Group B 26%. The asthma prevalence in Group B was significantly lower than that in Group A ($p<0.02$). The asthma prevalence in the remaining mother/child group (42%) did not differ significantly from the prevalence either in Group A or Group B.

CONCLUSIONS: These pilot study results do not support our hypothesis that asthma prevalence among immigrant children is higher than that among U.S. born children with non-immigrant mothers. The prevalence of asthma among the former group was in fact significantly lower than that of U.S. born children.

14

Training Pediatric Residents in Advocacy: The Role of Resident Advocacy Projects

Leora N. Mogilner, Maida Galvez, Shuba Kamath, Deborah Steinbaum, Carolyn Rosen. Pediatrics, Mount Sinai Medical Center, New York, NY; Pediatrics, Tufts-New England Medical Center, Boston, MA.

BACKGROUND: ACGME guidelines mandate a "structured educational experience…that prepares residents for the role of advocate for the health of children within the community." Community-based resident advocacy projects are a tool that can be used to teach advocacy skills to residents. By identifying a need in the community and developing a strategy to solve it, residents learn, hands-on, about what child advocacy entails.

OBJECTIVE: To describe the project topics, mentors and designs chosen by residents in order to better understand the role of the advocacy project in pediatric education.

DESIGN/METHODS: As part of the community pediatrics block rotation, second year residents design and implement an advocacy project of their choosing. Residents choose a mentor in their field of interest to work with and keep a log of their contacts and work completed. Upon completion of the rotation, they are required to submit a project summary detailing their advocacy experience. Each year, four projects are chosen for presentation at Advocacy grand rounds.

RESULTS: Between 7/03-6/06, 39 residents completed advocacy projects. Topics were chosen from a broad range of themes, including: health promotion and disease prevention (25), child development (4), special health care needs (3), injury prevention (2), needs of at-risk populations (2), school health (1), health care access (1) and resident education (1). Within the most popular category, health promotion/disease prevention, obesity was studied by 7 residents, exercise by 6 and smoking by 3. 75% of residents chose mentors from within Mount Sinai and 25% chose mentors from community partners. Of the latter group, 8 mentors were from the Department of Health and 2 were from local community agencies. Project design varied, with education featured prominently--7 residents developed new patient education materials and 3 residents developed new curricula for pediatric residents. 3 projects resulted in CATCH grant applications, 1 of which was funded.

CONCLUSIONS: Advocacy projects are an effective means of teaching advocacy to pediatric residents. Through these experiences, residents learn about the wide variety of health issues faced by their patients, work with mentors, and design novel, innovative strategies to address their patients' problems.

15

Fellow in Training

The Interpersonal Physician Trust Scale is Reliable and Valid for Use in Parents of NICU Infants

Gerri R. Baer, Richard Ittenbach, Robert M. Nelson. Pediatrics, Children's Hospital, Philadelphia, PA; Biostatistics and Data Management; Anesthesia and Critical Care.

BACKGROUND: Trust in the physician may be vital for parents of infants in intensive care, where life-or-death decisions are made. Trust has been linked to patient satisfaction, adherence, evaluation for serious illness, and hospitalization. Trust may mitigate feelings of vulnerability.

OBJECTIVE: To generate a valid and reliable measure of parental trust in physicians in the NICU. We adapted an established instrument, the Wake Forest Interpersonal Physician Trust Scale (IPTS).

DESIGN/METHODS: Cross-sectional survey of 49 parents of children in an academic NICU. Infants were admitted ≥5 days, not undergoing a major procedure that day, and not imminently dying. Several parents participated in interviews. The study was approved by the CHOP IRB. We used Spearman correlations. Mann-Whitney and Kruskal-Wallis tests were used to compare trust scores. We used Stata 9.0 and SAS 9.1.

RESULTS: The adapted IPTS had strong internal consistency (Cronbach's alpha = .89) and test-retest reliability (r = .97, p<.0001). There were no statistically significant differences in median trust by gender, race, religion,

education, insurance status, having a previous sick child, having been hospitalized, infant ventilation status, requirement for inotropes, or end-of-life discussion. Construct validity was supported (Table 2). In parent interviews, common themes were the importance of communication, problems trusting when physicians go off-service, and the value of trust in nurses and in the institution. Parents lost trust in physicians who did not listen to their assessments of their children.

Demographic Data

	%
Sex	
Female	81.6
Male	18.4
Race	
White	59.2
Black	24.5
Hispanic	12.2
Asian	2.0
Missing	2.0
Religion	
Catholic	42.9
Protestant	28.6
Hindu	2.0
None	16.3
Missing/Other	10.2
Some college education	71.4

Correlations with Selected Scales and Variables

	r	p
Pedi-TIPS (n=47)	0.77	<.001
Distrust (reverse-score)	0.56	<.001
Satisfaction w/MD	0.63	<.001
Satisfaction Hospital	0.32	.026
Desire different MD	-0.10	.50
Would recommend MD	0.23	.12
Disagreement w/MD	-.22	.12

CONCLUSIONS: The adapted IPTS was reliable and valid in parents of infants in the NICU. It demonstrated reliability and construct validity. It may be used to help quantify important variables involved in decision making in neonatal intensive care.

16

Parental Knowledge and Attitude Regarding Eczema in Children of the South Bronx

Laura Daugialaite, Murali Yelugapuri, Ogechukwu Menkiti, Anbu Muthusamy, Ayoade Adeniyi, Ronald Bainbridge, Richard Neugebauer. Pediatrics, Bronx-Lebanon Hospital Center (BLHC), Bronx, NY.

BACKGROUND: Eczema is a common disorder in children. Parental knowledge/ adherence to complex treatment regiments is important in improving eczema control. Most studies attempting to identify determinants of parental perceptions of eczema and factors influencing adherence to treatment were done abroad. We therefore set out to evaluate these factors in an inner-city U.S. population.

OBJECTIVE: 1.To assess parental perceptions of children's eczema in South Bronx.

2. To explore the factors related to eczema, which are of main concern to parents.

DESIGN/METHODS: A questionnaire was administered to parents/caregivers of children with eczema and emancipated minors with eczema. The survey was conducted in the pediatric clinics, emergency department and ward at BLHC between Nov 2005 and Nov 2006.

RESULTS: There were 74 respondents. 11.4% of parents felt moisturizers were not helpful, 24.3% found them extremely helpful. 17.7% reported topical steroids not being helpful, 33.9% extremely helpful. 48.5% of parents using topical immunomodulators found them quite to extremely helpful. 47.5% believed avoiding frequent/prolonged baths is not helpful. Commonest problems identified by parents: itchiness - extremely worrisome (65.3%); constant demand for skin care and avoiding environmental triggers - moderately to extremely worrisome (71.3% and 58.1%, respectively). Loss of sleep and removing certain foods from diet were not perceived as major problems (40.5% and 51.9%, respectively). The most important factors affecting adherence were: understanding and support from the doctor (61%), type of medicine (38%) and family support (17%). No one mentioned finances as being important. 13.3% of college graduates believed eczema is contagious while less educated respondents believed it is not (P<0.03). Better educated respondents were more likely to believe that eczema is influenced by the environment (P< 0.006).

CONCLUSIONS: Itchiness, constant demand for skin care and avoiding environmental triggers are the most concerning problems reported by parents/caregivers of children with eczema. While there is insufficient understanding of eczema among parents, the majority believe that physicians play the most significant role in adherence to treatment. More parental education is needed, preferably from primary care physicians.

17

House Officer

Methicillin Resistant Staph Aureus Infections in the First Year of Life: A Ten-Year Lookback of Cases at a Large US Birthing Center

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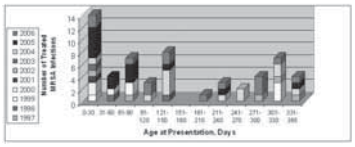
BACKGROUND: Historically, methicillin-resistant Staphylococcus aureus infections are associated with patients in hospitals (HA-MRSA). Recently, reports of community-associated MRSA infections (CA-MRSA) among infants with no health care-associated risk factors are increasing.

OBJECTIVE: To evaluate the epidemiology of CA-MRSA infections in children in the first 12 months of life for evidence of a community MRSA reservoir.

DESIGN/METHODS: Retrospective review of positive MRSA cultures. From 1997 to 2006, 57 positive (non-surveillance) cultures were identified in ill children less than 12 months of age at IFHC.

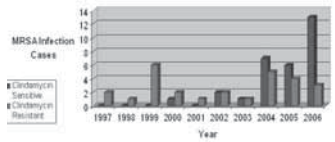
RESULTS: 25% (14/57) of MRSA infections occurred in the first 30 days of life and 63% (36/57) in the first 4 months of life.

Ten-Year Incidence of MRSA Infections in the First Year of Life at Inova Fairfax Hospital for Children



A substantive change occurred during the 10 year lookback at MRSA sensitivity to clindamycin. Whereas, 79% (15/19) of MRSA were resistant to clindamycin (HA-MRSA pattern)1997-2003, 68% (26/38) of MRSA were sensitive to clindamycin (CA-MRSA pattern) 2004-2006.

Ten Year MRSA Clindamycin Resistance Pattern at Inova Fairfax Hospital for Children



CONCLUSIONS: 25% of all MRSA infections in the first year of life occur by 30 days of age. 68% of MRSA infections in the first year are now sensitive to clindamycin (CA-MRSA pattern). This pattern of occurrence and sensitivity is compatible with vertical transmission from a maternal reservoir (rectal/vaginal) and not a hospital reservoir.

18

A Comparison of Congenitally HIV Infected and Affected Adolescents. Psychosocial and Behavioral Profile: Implications for Clinical Care

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BACKGROUND: Several studies investigating the psychosocial impact of HIV/AIDS report that infected children are at risk for higher rates of ADHD, anxiety, depression and low self esteem. With increased longevity, it is critical to examine further the mental health status of this population in a controlled manner.

OBJECTIVE: To compare the behavioral and psychiatric self report profile of a group of congenitally HIV infected adolescents with a group of HIV affected adolescents in a developmental evaluation clinic that specializes in treating individuals with HIV. The term affected was broadly defined to include siblings, whether biological or foster and children living with an HIV positive parent.

DESIGN/METHODS: The Achenbach Youth Self- Report was administered to 25 congenitally HIV infected and 25 affected adolescents who regularly visit the clinic for developmental care. Patients were systematically invited to participate in the study as they came for appointments. Age, sex, race/ethnicity, exposure to prenatal teratogens, developmental diagnosis, academic status and IQ were obtained to control for differences between the groups. Statistical methods included t test and chi square.

RESULTS: There were no differences between the groups in Achenbach internalizing, externalizing, and total scores but both groups had elevated scores in all three areas. The mean age for the infected was 14.8yrs and the mean age for the affected was 14.1yrs. The infected and affected groups differed only in ethnicity Forty-eight percent of the infected were male while 44% of the affected were male. There were no differences between the two groups in terms of IQ scores and prevalence of learning disability.

CONCLUSIONS: This study shows that there are no differences in self-report of behavioral issues and in internalizing and externalizing behaviors between groups of HIV infected and affected adolescents. Both groups have a higher prevalence of behavioral issues when compared to the general population based on norms. These findings indicate that the behavioral profile of these adolescents may not be due only to direct effects of HIV on the brain, but to other stressors as well. This study suggests the need to closer examine the mental health services available to the HIV child and adolescent infected and affected population.

19

Treatment of Early Onset Culture Negative Sepsis

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BACKGROUND: Sepsis is a common diagnosis in the neonatal intensive care unit (NICU). The diagnosis of sepsis is readily made with a positive blood culture for a known pathogen. It is more difficult to diagnose sepsis when the blood culture is negative. We reviewed the data from our regional perinatal center database to examine the population of patients with early onset, culture negative sepsis.

OBJECTIVE: To determine whether the most common reason for continuing antimicrobial treatment for the first seven days in NICU patients with a negative blood culture was based upon an abnormal laboratory value alone.

DESIGN/METHODS: The records of all patients with early onset, culture negative sepsis admitted to the NICU at Stony Brook University Hospital in 2005 were reviewed for the following data: gestational age (GA), birth weight, maternal GBS status, admission CRP, admission temperature, admission CBC and differential, percent neutrophil and band count, persistance of tachypnea or presence of desaturations at 24 hours of life, admission CXR, and discharge diagnosis. Early onset culture negative sepsis was defined as a course of antibiotics given for more than six days within the first week of life despite a negative blood culture.

RESULTS: 125 infants had a diagnosis of early onset, culture negative sepsis. 29 of them had a radiological or discharge diagnosis of pneumonia and were excluded. A final cohort of 88 is reported here. 76% of infants had at least one abnormal lab value (Table); 24% had none. Moreover, clinical symptoms of tachypnea and desaturations were present in 83%. Four infants in the cohort were treated without these clinical signs or chemical evidence of sepsis: two with suspected congenital infection (syphilis and HSV), one with a congenital anomaly and one with recurrent hypoglycemia and temperature instability.

Median BW	2372 gms
Median GA	34.6 weeks
Maternal GBS unknown	44%
Admission Temp (Median)	36.6
Neutropenia (ANC<2500)	23%
ANC<1500	8%
Neutrophilia (ANC>14,400)	21%
Immature:Total neutrophil ratio, I:T>0.16	60%
CRP>1 at 12hrs of age (26 of 41)	63%

CONCLUSIONS: Abnormal laboratory values alone are not used to make the diagnosis of culture negative sepsis. The presence of clinical symptoms of tachypnea and desaturations at 24 hours of life was the most frequent finding for continued antibiotic treatment for early onset, culture negative sepsis in our NICU.

20

Classification of Severity of Sepsis Improves Mortality-Risk Prediction in Premature Infants

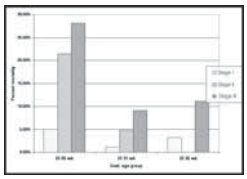
Naveed Hussain, Allyson Abo, Matra Barker. Pediatrics, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: Among infants in the NICU, not all episodes of sepsis are similar and their outcomes vary based on severity. Severity of sepsis, if classified into stages, can have a major role in predicting outcomes as shown by studies in adults (Bone, 1996).

OBJECTIVE: The aim of this study was to use a classification system for staging severity of sepsis to predict mortality in premature infants.

DESIGN/METHODS: A retrospective study was done of 1864 premature infants admitted to the John Dempsey Hospital NICU between 1999-2003. Infants with culture positive nosocomial sepsis were classified as: Stage I - sepsis without major organ dysfunction and with transient signs and symptoms; Stage II - sepsis with metabolic acidosis, oliguria; or septic shock with need for pressors /intravascular volume expansion; Stage III - multiple organ dysfunction defined as septic shock with one of the following: severe neurologic changes or seizures, DIC, anuria, or anasarca. Pre-discharge mortality and prediction models were studied.

RESULTS: Overall incidence of nosocomial sepsis was 16.3% (n = 304). Severity of sepsis was distributed as: stage I (60%); stage II (19%); and stage III (21%). Sepsis severity stages were not related to sex, race, birth weight or gestational age (GA). Mortality rates increased significantly (p< 0.001) with increasing sepsis severity (I, 2.8%, II, 13.7% and III, 23.5%) independent of GA group (Fig). Infants with stage I had similar mortality-risk to those without sepsis. However, stage II increased mortality-risk 2-fold and stage III increased mortality-risk 5-fold.



CONCLUSIONS: Classification of sepsis into 3 stages is predictive of neonatal mortality. Diagnosis of culture positive sepsis alone may not be sufficient to determine outcome risk and staging of sepsis severity needs to be incorporated as a tool in research design and clinical prognostication in the NICU.

21 Fellow in Training

Is it Safe to Keep Umbilical Vein Catheters for More than 7 Days?

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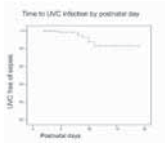
BACKGROUND: Based on 2002 CDC recommendations supported by epidemiological studies UVCs may be used up to 14 days. Concerns about complications such as infection, portal vein thrombosis and NEC remain, and extended use UVC (> 7days) is not universally adopted.

OBJECTIVE: UVC use up to 14 days will not increase the risk of line sepsis or NEC.

DESIGN/METHODS: This is a prospective observational study of all UVC in our RNICU. The interim data from 6/05-10/06 is presented. The incidence of line sepsis, NEC and device utilization were evaluated in 2 groups: short use (≤7days) and extended use (>7days).

RESULTS: 164 patients with optimally placed UVCs were reviewed, 102 in the short and 62 in the extended group. BW and GA in the short and extended groups were 1803±1174g vs1487±1017g and 32±6 vs 30±6 wks with 42% and 50 % being ELBW respectively (*Mean±STDEV)(p=ns*). Neonates in the extended group (all and the ELBW) were sicker as reflected by more vent. days. Overall UVC sepsis was 6.5/1000 cath-days: higher in the extended group (11/1000 vs 2/1000 cath-days) but PICC sepsis was higher in the short group (16/1000 vs 7/1000 cath-days) (*p<0.05*). Cumulative UVC/PICC sepsis rate was similar in both groups. Device utilization was decreased for UVC in the short group and for PICC in the extended group. There was no UVC sepsis in the ELBW in the short group but PICC sepsis was higher (18% vs 2% infected lines and 15/1000 vs 8/1000 cath-days, *p<0.05*). Kaplan Meier analysis showed no change in the UVC infection rates beyond 11 days. NEC incidence was similar.



CONCLUSIONS: We observed higher UVC sepsis in the long group, higher PICC sepsis in the short group, but similar cumulative sepsis and overall high infection rates. Extended UVC did not increase NEC. Since UVC infection did not increase beyond 11 days, we speculate that maneuvers aimed at decreasing line colonization are more prudent than line type and duration.

22

Isolated Placental Vasculopathy/Coagulopathy Is a Risk Factor for Intracranial Hemorrhage in Extremely Low Birth Weight Infants (Birth Weight < 1000g)

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BACKGROUND: Placental inflammation (chorioamnionitis, funisitis, villitis, vasculitis: PI) & vasculopathy/ coagulapathy (infarction, hemorrhage ischemia, abruption, thrombosis: PV) present in combination have been studied as outcome predictors in preterm infants. However, the effects of isolated PI or PV on neonatal outcomes are not known. ELBW have the highest morbidity & mortality.

OBJECTIVE: To study the effects of isolated PI & PV on outcomes in ELBW infants.

DESIGN/METHODS: *Population*: ELBW infants born during a 2-year study period. *Excluded:* hydrops fetalis, congenital anomalies, multifetal gestation. *Variables:* Placental histopathology (PH) studied prospectively by a single pathologist blinded to outcomes. Standard neonatal/maternal variables extracted via computerized investigation /chart reports. Placentas with isolated inflammation included in PI & with isolated vasculopathy/ coagulapathy in PV group. Placentas without PI or PV considered normal (NL). *Statistical analysis*: t test, chi square/ fisher exact tests & multiple regression analysis. P=0.05 for significance.

RESULTS: Total placentas=88. 50 had combined PI & PV findings. *PI (n=12)*: PIP_{max} & FiO_{2max} on day of life (DOL)3, fluid intake on DOL 1, total days on mechanical ventilation & use of postnatal steroid lowest & PPROM highest among all groups. ROP lower & gestational age higher compared to NL. *PV (n=19)*: Birth weight lowest & maternal hypertension (MH), C-section highest among all. *NL (n=7):* 5 min. apgar score lowest. No MH, PPROM, intra-periventricular hemorrhage (IVH) or periventricular leukomalacia (PVL). The occurrence of IVH & PVL lower than PI & PV; of MH lower than PV & of PPROM lower than PI.

Multiple Logistic regression analysis done to evaluate PH as risk factor for neurological complications revealed no increased risk of PVL in PV or PI, & an increased risk of IVH in PV (Odd's ratio = 4.9, 95% CI = 1-24.7, p =0.05) but not in PI (Odd's ratio = 1.3, 95% CI = 0.3 - 4.2, p = 0.7).

CONCLUSIONS: In ELBW infants 1) Isolated PV increases the risk of IVH 2) PI decreases severity of acute/ chronic lung disease 3) A normal PH rules out IVH or PVL.

23

Growth Comparison of Late Preterm vs. Very Preterm Infants at 12 Months Corrected Age

Jordan Kase, Jessica Kalia, Heather Brumberg, Paul Visintainer, Maria Pici. Pediatrics, New York Medical College, Valhalla, NY; Department of Epidemiology and Biostatistics, School of Public Health at NYMC, Valhalla, NY; Pediatrics, Childrens Rehabilitation Center, White Plains, NY.

BACKGROUND: Current literature has shown that very preterm (VP;<32 weeks) infants do not grow as well as their full term (FT) counterparts in the NICU or in early childhood. Although moderately, late preterm (MLP) infants (32-36 weeks) comprise the majority of preterm (PT;<37wks) births, few studies report on their long term growth outcomes.

OBJECTIVE: Evaluate for differences in growth between MLP and VP infants at three time periods: birth (B), discharge (D/C) and 12 months corrected age (CA).

DESIGN/METHODS: Retrospective cohort study of PT children D/C from Maria Fareri Children's Hospital and its' regional affiliates seen at the Regional Neonatal Follow-up Clinic from 01/2003-10/2006 who were evaluated at a CA of 12 mo±2. MLP anthropometrics [weight (wt), length (ht), and head circumference (hc)] expressed as percentiles (%) were compared to VP patients in all time periods utilizing a two tailed t-test. Linear regression assessed confounding effects of antenatal, demographic, and neonatal variables. Paired t-tests evaluated growth of patients within each group.

RESULTS: There were 169 infants (VP=77; MLP=92). There was no difference between the two groups in growth % measurements at B: [MLP vs VP wt: 53.8 vs 50.9% (p=0.48); ht: 51.6 vs 44.6% (p=0.08); hc: 52.6 vs 45.4% (p=0.12)]; at D/C: [MLP vs VP: wt: 36.4 vs 33% (p=0.37); hc: 43.4 vs 39% (p=0.33)]; or 12 month CA [MLP vs VP: wt: 47.4 vs 45.2% (p=0.64); ht: 55.7 vs 57.7% (p=0.7); hc: 58 vs 59.1% (p=0.81)]. None of the 10 potential confounding variables affected this relationship. Within groups, there was a reduction from mean Bwt to D/Cwt [MLP 54 to 35.9% (p=0.00); VP 51.3 to 33% (p=0.00)] and no change between Bwt and 12 mo CA [MLP: 54 to 46.5% (p=0.09); VP: 51.3 to 45.2% (p=0.09)] HC reduced from B to D/C [MLP: 55.3 to 44.8% (p<0.01); VP 46.9 to 38.5% (p=0.02)] which surpassed Bhc at 12 mo CA (MLP: 55.3 to 59.7% (p=0.03); VP: 46.9 to 59.3% (p<0.01)].

CONCLUSIONS: Growth expressed as a % and adjusted for GA is equal between MLP and VP in all 3 time periods. Although VP children are known to have poor growth in comparison to their FT counterparts, in this cohort, at 12 mo CA, both groups equaled or surpassed their birth % ranks.

24 Fellow in Training

Is the Prevalence of Abdominal Wall Defects in the Hudson Valley Region of New York State a Public Health Concern?

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BACKGROUND: Nationwide epidemiologic studies demonstrate an increasing trend in prevalence for gastroschisis and a declining trend for omphalocele. Racial and ethnic disparities have been suggested but studies are inconclusive.

OBJECTIVE: To determine the prevalence of gastroschisis and omphalocele in the Hudson Valley Region of New York State over a ten year period by race and ethnicity.

DESIGN/METHODS: New York State Department of Health Vital Statistics and Congenital Malformations Registry databases obtained by race and ethnicity from 1992 to 2001 across the 7 counties of the Hudson Valley Region (Dutchess, Putnam, Orange, Rockland, Sullivan, Ulster, and Westchester). Live-birth cases of gastroschisis and omphalocele diagnosed up to 2 years of age were included. Poisson regression, adjusting for population size, was used for analysis of relative risks (RR).

RESULTS: There were 58 infants with either gastroschisis (29) or omphalocele (29) identified from a birth population of 2,354,280. Over the ten year period the overall prevalence of abdominal wall defects was 2.5 per 10,000 live births, of which 1.2 per 10,000 live births were for gastroschisis and 1.2 per 10,000 live births for omphalocele. There was no significant evidence of temporal trend for either gastrochisis [RR=0.81, 95% CI 0.39-1.69] or omphalocele [RR=0.53, 95% CI 0.0.24-1.13]. However, there were regional differences in prevalence among the 7 counties. There was a significantly higher risk of abdominal wall defects for Orange County [prevalence 3.2 per 10,000 live births; RR=1.98, 95% CI 1.03-3.79] as compared to the other 6 counties. There was no evidence of racial/ethnic variations among abdominal wall defects for Non-Hispanic White, Non-Hispanic Black, Hispanic and Other categories.

CONCLUSIONS: In the Hudson Valley Region of New York State, the temporal trend of abdominal wall defects is inconsistent with reports from other populations. However, there are regional differences among the counties, which may have implications for public health surveillance and prenatal monitoring.

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Nitrosative and Oxidative Markers of Necrotizing Enterocolitis: Feasibility Pilot Data from the Biomarkers of Necrotizing Enterocolitis (BioNEC) Study

Michael A. Posencheg, Craig Harvey, Pamela A. Scott, Kathleen Mooney, Kerrie Kelly, David A. Munson, Richard Markowitz, Andrew J. Gow. Divison of Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA; Department of Pharmacology and Toxicology, Rutgers University, Piscataway, NJ; Department of Radiology, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Necrotizing Enterocolitis (NEC) remains a major cause of morbidity and mortality in premature infants. Early diagnosis is difficult and often confused with feeding intolerance. Animal models indicate that oxidative stress and aberrant nitric oxide (NO) metabolism in the intestine may be involved in its pathogenesis. We propose that markers of both oxidative and nitrative stress in stool may prove to be valuable markers of the disease and potentially aid in diagnosis.

OBJECTIVE: The objective of this pilot analysis is to determine the feasilibility of detecting markers of nitrosative and oxidative stress in stool samples of premature infants.

DESIGN/METHODS: We are prospectively enrolling VLBW infants in the BioNEC study. Stool samples are being collected at specified time points during postnatal life as well as with episodes of feeding intolerance and NEC. 48 random samples from 8 patients were defrosted and solubilized in a 2:1 mixture of chloroform and methanol. Following sonication, phosphate buffer was added and the samples were centrifuged to separate them into an aqueous and organic phase. Both phases were analyzed for protein content. Utilizing differential chemical reduction chemiluminesence, both phases were analyzed for nitrite and total nitrogen oxide (NOx) content. Evaluation for nitrotyrosine and F_2-isoprostanes is being performed using ELISA.

RESULTS: Nitrite was detected at concentrations of 1.61 +/- 0.37 pmoles/mg protein in the organic phase and 26.17 +/- 9.0 pmoles/mg protein in the aqueous phase. NOx concentrations were 14.32 +/- 4.22 pmoles/mg protein in the organic phase and 154.06 +/- 22.39 pmoles/mg protein in the aqueous phase. The limit of detectibililty of F_2-isoprostanes is 20 ng/mg protein and for nitrotyrosine is 5 pmoles/mg protein, both well below that previously reported from other bodily fluids.

CONCLUSIONS: The ability to measure these four markers in the stool enables us to analyze whether these markers differentiate infants with feeding intolerance and NEC.

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Early Neonatal Daily Weight Loss (DWL) and Bronchopulmonary Dysplasia (BPD) in Extremely Low Birth Weight Infants (ELBW, Birth Weight < 1000g)

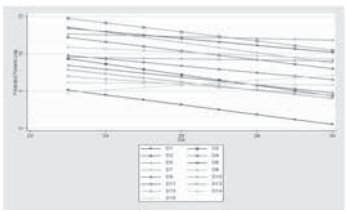
Rita P. Verma, Syed Shibli, Hai Fang. Pediatrics, State University of New York, Stony Brook, NY.

BACKGROUND: DWL & its clinical implication are not known in ELBW.

OBJECTIVE: To study DWL during its entire course as outcome predictor in ELBW.

DESIGN/METHODS: Standard neonatal variables extracted retrospectively via computerized reports & chart reviews in ELBW during a 3 year study period. DWL on DOL 1-15 calculated from birth weight (BW). Statistics: Pearson's correlation co-efficient, regression & multivariate logistic regression analyses. P= .05 for significance.

RESULTS: Gestational age (GA,M±SD) and BW were 26.1 ± 2 wks & 779.9±157 g. DWL correlated with BPD (r = -0.3, p=.02) & ROP (r= -0.3, p = .05) on DOL 15 & antenatal steroid (ANS) on DOL 4 (r = - 0.3, p=.05) & DOL 10 (r= - 0.3, p= .04) only. After controlling for GA DWL remained associated with BPD on DOL 15 (OR = .89, 95% CI = .81-.98, p=.02) & with ANS on DOL 4 (OR = .88, 95% CI = .78-1, p= .05) & DOL 10 (OR = .91, 95% CI =.84-1, p = .05).



CONCLUSIONS: Reversed DWL on DOL 15 is protective for BPD in ELBW. ANS decreases DWL. DWL correlates with GA on DOL 1-8.

DWL (%) and GA

DOL	DWL(M+/-SD)	Correlation co-efficient	p	Regression slope	P
1	1.9(4.2)	-0.4	<0.01	-0.73	<0.01
2	5.7(6)	-0.2	0.06	-0.6	0.06
3	9.3(6)	-0.32	<0.01	-0.9	<0.01
4	11.8(6)	-0.32	<0.01	-0.96	<0.01
5	11.3(7)	-0.3	0.01	-0.8	0.01
6	11(7)	-0.3	<0.01	-0.98	<0.01
7	10(7)	-0.3	<0.01	-0.99	<0.01
8	9(7)	-0.2	0.05	-0.7	<0.05
9	6.4(6.7)	-0.17	0.1	-0.5	0.1
10	4.8(7)	-0.14	0.2	-0.5	0.2
11	3.9(7)	-0.2	0.1	-0.6	0.1
12	2.6(8)	-0.12	0.3	-0.45	0.3
13	1.1(8)	-0.14	0.2	-0.6	0.2
14	0.4(8)	-0.03	0.8	-0.1	0.8
15	-2(9)	-0.06	0.6	-0.3	0.6

27 House Officer

Oral Vitamin E Supplementation and the Neonatal Outcome of the Very Low Birth Weight Infants

Ruby Mehta, Myron Sokal, Dominique Jean-Baptiste, Rohini Thodge, M. Roger Kim. Pediatrics, Brookdale University Hospital Medical Center, Brooklyn, NY.

BACKGROUND: Vitamin E supplementation, an antioxidant for very low birth weight infants is beneficial in decreasing retinopathy of prematurity and blindness. However, the studies show an increased risk of sepsis but a variable outcome on the chronic lung disease.

OBJECTIVE: To assess neonatal outcome after oral vitamin E supplementation.

DESIGN/METHODS: This is a retrospective study comparing 3 groups of preterm infants with birth weight <1250g; group I: 78 infants before vitamin E supplementation was started in 2002, group II: 51 infants without oral vitamin E supplementation and group III: 96 infants with oral vitamin E supplementation between 2002-2005. Group III was supplemented orally with 25 IU of vitamin E when feeds were established. The mean length of vitamin E supplementation in group III was 18.4 (8-108) days. The pertinent study variables are in table; birth weight(BW), gestational age(GA), antenatal and neonatal steroids, late onset, fungal and coagulase negative sepsis, intraventricular hemorrhage(IVH), retinopathy of prematurity(ROP), and oxygen requirement at 36 weeks of GA (CLD), and length of stay(LOS). Infants were excluded if they died before 12 hrs of life, there was no oral intake, congenital anomalies or NICU stay <2 weeks.

RESULTS: The finding shows no significant difference in BW, GA, and LOS by ANOVA, antenatal and neonatal steroid, IVH, ROP, CLD by Chi square test, among the 3 groups. Linear regression controlled with other variables including GA shows that late onset sepsis has a strong association with vitamin E supplementation (p=.001).

	Neonatal outcome			
Group	I (2000-01)	II (2002-05)	III (2002-05+Vit E)	P
# of infants	78	51	96	
BW(g)	930±220	955±183	934±193	0.782
GA(wk)	27±2.5	27±2.2	26±2	0.843
Antenatal steroid	49(63%)	34(67%)	67(70%)	0.625
Neonatal steroid	6(7.7%)	4(7.8%)	7(7.3%)	0.991
Late onset sepsis	12(15%)	18(35%)	46(48%)	0.000*
Fungal sepsis	3(3.8%)	7(14)%	12(13%)	0.090
IVH	15(19%)	6(12%)	18(19%)	0.488
ROP	23/72(32%)	13/41(31%)	20/93(21%)	0.251
CLD	22(28%)	11(22%)	34(35%)	0.202
LOS(d)	73±35	70±26	79±31	0.219

CLD: oxygen requirement at 36 weeks gestational age. *=significant

CONCLUSIONS: The study shows late onset sepsis was higher in premature infants supplemented with vitamin E.

28 Fellow in Training

Rate and Clinical Predictors of Ductus Arteriosus Re-Opening in Very Low Birthweight Infants

Vlad Ianus, Martha Mance, Julie Nye, Richard Tucker, Ronald Clyman, James Padbury. Pediatrics, WIHRI, Providence, RI; Pediatrics, UCSF, San Francisco, CA.

BACKGROUND: Ductus arteriosus (DA) is important in the morbidity and mortality of premature infants. The gold standard for diagnosis is echocardiography. Clinical criteria for determining the patency of the DA are often used. Previous studies done to assess the patency of DA and the associated signs and symptoms were done over short time frames.

OBJECTIVE: To determine the rate and timing of the DA reopening, as demonstrated by Doppler flow on echocardiogram, as well as the association with clinical parameters and interventions in infants born under 28 weeks gestation.

DESIGN/METHODS: The subjects were followed with serial echocardiograms with Doppler flow, daily for the first 10 days of life (DOL), or until the *initial closure* of the DA (no Doppler flow for 7 consecutive days), and weekly thereafter. If flow was detected again at any time (*re-opening*), the subject was followed with daily echocardiograms until 7 days of absent flow, and weekly thereafter. The medical team caring for the subjects was blinded to the results. Univariate proportional hazard (Cox) regression analysis was done for the relationship with selected clinical indicators over the 7 days prior to re-opening to account for censored and time dependent predictors.

RESULTS: 78 infants were admitted to the NICU during the study period. 64/78 were enrolled. The 14/78 exclusions were for early death, refusal, and malformations. The enrolled subjects were followed with an average of 31.3 echo exams/subject. 10/64 never closed their DA, and 8/10 were ligated. Initial closure was achieved in 54/64 subjects (mean DOL 8.1), and of these 12/54 re-opened (mean DOL 29.7). The association of clinical parameters with risk of re-opening is shown in the table.

Proportional Hazard (Cox) Regression			
Univariate predictors	**Hazard Ratio**	**95% CI**	**p value**
Hyperactive precordium	0.986	0.205-4.739	0.9864
Mechanical ventilation	2.303	0.570-9.296	0.2414
Murmur	0.929	0.293-2.945	0.9003
Pressors/inotropes	2.111	0.448-9.944	0.3448
Worsening of status	2.839	0.805-10.012	0.1046
Cardiomegaly	48.497	3.033-775.381	0.0061

CONCLUSIONS: Late re-opening of the DA is a relatively frequent event in very premature infants. Clinical parameters are poor indicators for the detection of this event.

29 House Officer

Osteopenia of Prematurity and Nonrenal Hypokalemia: An Assessment of Related Factors in VLBW Infants at New York Methodist Hospital

Natalia Karpova, Saiqa Nabi, Madhavi Jasti, Khaja Raziuddin, Nitin Ron, Asjad Khan, Rica Vizarra-Villongco, Madhu Gudavalli, Ali Nadroo. Pediatrics, New York Methodist Hospital, Brooklyn, NY.

BACKGROUND: The cause of osteopenia of prematurity is multifactorial. Very Low Birth Weight (VLBW) infants tend to retain CO_2 and 70% of CO_2 exists as bicarbonate. A reduction in the incidence of osteopenia of prematurity was noted at New York Methodist hospital over 12 years. The role of potassium in maintaining bone health is not well appreciated in VLBW infants.

OBJECTIVE: The purpose of this study was to assess acetate levels, potassium intake, acid base status and related findings associated with infants having osteopenia of prematurity so that a correlation could be established between these findings and the change in incidence of osteopenia.

DESIGN/METHODS: A retrospective cross-sectional study of 328 VLBW (480-1250g) infants born between June1992- December 2004 at New York Methodist Hospital was performed. A computerized database was constructed of all valid data extracted from the medical records.

The subjects of the study were 328 VLBW infants born between 1992-2004. The infants' gestational age ranged from 24 to 32 weeks (27.7 ± 3.2 wks) and their birth weight from 480 to 1250 g (930 ± 213 g).

Radiographs were reviewed for decreased lucency of the cortical bone, washed-out appearance, cupping and fraying at epiphyses.

RESULTS: Potassium administration increased from 1.9 mEq/kg/day on wk1 to 6mEq/kg/day on wk8 ($p<0.0001$). The intake of acetate decreased from 2mEq/kg/day to zero from wk 1 to wk 8. Serum potassium levels declined from 5.7 mmol/L on wk 1 to 3.6 mmol/L on wk 8 ($p<0.0001$). Creatinine levels and phosporus levels remained relatively stable.The bicarbonate level increased from 16mmol/L to 32mmol/L.

The incidence of osteopenia of prematurity was less than 2%, and compared favorably to nationally reported data.

CONCLUSIONS: The incidence of osteopenia of prematurity at New York Methodist Hospital was significantly less than the incidence in nationally reported data. We conjecture that metabolic alkalosis had a beneficial effect by preventing demineralization. The hypokalemia observed in our study seems to be the result of metabolic alkalosis causing an intracellular to extracellular potassium shift.

30 Fellow in Training

Vitamin D Deficiency: Also Prevalent Also among Term Infants and Formula Fed Infants

Radhika Purushothaman, Bhubanesh Bhatta, Svetlana Ten. Pediatric Endocrinology, Infants and Childrens Hospital at Maimonides Medical Center, Brooklyn, NY; Pediatrics, Infants and Childrens Hospital at Maimonides Medical Center, Brooklyn, NY.

BACKGROUND: Vitamin D deficiency is a common among Hispanic & African-American infants and also breastfed and preterm infants (PT). Vitamin D deficiency is not considered a common etiology of hypocalcemia in full term (FT) formula fed infants.

OBJECTIVE: We evaluated etiology of hypocalcemia in infants presented in the ER in the last 3 years.

DESIGN/METHODS: Clinical and biochemical profile was extracted from the medical records of infants admitted for the diagnosis of hypocalcemia or hypocalcemic seizures in the last 3 years.

RESULTS: 12 infants (1 girl&11 boys, 11 FT and 2 PT) were admitted with the diagnosis of hypocalcemia or hypocalcemic seizures in the last 3 years. Vitamin D deficiency accounted for 11 (9 FT and 2 PT) and DiGeorge syndrome for 1 case. All except one were formula fed. PT infants presented at 2 months of age, boy with DiGeorge syndrome at 3 days and 67% of FT presented from 6-10 days of life. Four children were Hispanic, 4 Pakistani, 2 Caucasian, 1 Asian and 1 Bangladeshi. 10 of the 12 (83 %) had seizures as the presenting symptom, which were focal in 2 (16%) of the infants & generalized in 8. In the other 2, hypocalcemia was an incidental finding. Term infants had no secondary intact PTH elevation as opposed to pre-term infants. Vit D25 values were from 10 to 20 ng/ml (mean 13 ± 3.6). Phosphate level was elevated in 7 of 12 infants.

COMPARISON OF BIOCHEMICAL PROFILE BETWEEN TERM & PRETERM INFANTS

	AGE AT DIAGNOSIS (DAYS)	INTACT PTH (PG/ML)	VITAMIN D 25 (NG/ML)	CALCIUM (MG/DL)	PHOSPHORUS (MG/DL)
FT	6.5 +/- 2.5	37.1 +/- 18.8	13 +/- 3.6	6.7 +/- 1	9.2 +/- 1.8
PT	56	155.5 +/- 7.7	20	6.5 +/- 0.3	8.6 +/- 0.8
DiGEORGE	3	51		7.6	6.6

CONCLUSIONS: Vitamin D deficiency is prevalent among hypocalcemic FT, formula fed infants, especially boys (91%) which is in contrast to published literature. All FT infants had relatively low iPTH values, suggesting lack of compensatory increase in iPTH in response to low calcium. Vit D25 level was not extremely low, but transient hypoparathyroidism in infancy and immature renal response to parathyroid hormone may have induced hyperphosphatemia and hypocalcemic seizures.

Vitamin D supplementation should be considered not only for breast fed infants but also for full-term or formula fed infants.

31

Do Newborns with Inborn Errors of Cobalamin Who Are Identified through Newborn Screening Have a Better Outcome?

Patricia A. Galvin-Parton, Davina Prakash, Maria Puangco, Jody Weiss. Pediatrics, SOM, SUNY at Stony Brook, Stony Brook, NY.

BACKGROUND: There are 10 different inherited defects in the cobalamin pathway which frequently go unrecognized. A high degree of suspicion is usually necessary to pursue correct investigations. In recent years, newborn screening programs have been able to identify affected infants prior to onset of symptoms.

OBJECTIVE: We wish to compare clinical outcome of six infants diagnosed with inborn errors of cobalamin. Four of the infants had Cbl C/D deficiency and two had TCII deficiency. Four of the infants were diagnosed after the onset of symptoms and two were diagnosed through recently expanded Newborn Screening.

DESIGN/METHODS: Our Patients had full metabolic and hematologic work-ups. Bone marrow and imaging studies are included. Biochemical, complementation and molecular genetic studies were used for confirmation of diagnosis as well as for prenatal studies.

RESULTS: Infant 1 was diagnosed at 4 months and had a complicated prenatal and postnatal course. Diagnosis was confirmed through complementation studies on skin cultured fibroblasts. The only method of prenatal detection was biochemical analysis of amniotic fluid and complimentation studies of amniocytes. This family terminated two affected pregnancies and then delivered a healthy baby. Infant 2 was diagnosed in the hospital at 10 weeks. He had a stormy first year and spent much time in the hospital. This family has not pursued another pregnancy since amniocentesis was their only option and they wouldn't terminate an affected pregnancy. Infants 3 and 4 were found to have TCII deficiency and although both were very sick at presentation, they have done very well following diagnosis and treatment. Infants 5 and 6 were detected through newborn screening. At 14 and16 months of age, neither infant has required rehospitalization. We were able to confirm these infants diagnosis not only with complementation studies but also with DNA mutation analysis. This meant that in addition to amniocentesis, these families would also have the option of preimplantation genetic diagnosis.

CONCLUSIONS: Expanded newborn screening provided the last two infants with a stable first year of life compared to infants diagnosed while in crisis. The newly identified gene mutations allowed an alternate option of prenatal diagnosis. Infants identified through newborn screening appear to have an improved course, at least in the short term.

32 House Officer

A Comparison of Exercise Capacity in Men and Boys in Cold and Hot Environments

Sean C. Hagenbuch, Thomas Rowland, David Pober. Department of Pediatrics, Baystate Medical Center, Springfield, MA; Department of Exercise Science, University of Massachusetts, Amherst, MA.

BACKGROUND: Children have been believed to tolerate exercise in elevated ambient temperature less well than adults due to an inferior cardiovascular response.

OBJECTIVE: The purpose of this study is to address these differences, and attempt to determine the limiting factor of exercise capacity in these groups.

DESIGN/METHODS: Eight adult (A) males(31.8 + 2.9 yrs) and eight boys (B) (11.7 + 0.4 yrs) performed steady load cycling at approximately 65% peak VO_2 to exhaustion in both hot (H)(A: 88.0 + 0.6°; B: 87.9 + 0.5°) and cool (C) (A: 67.7 + 1.8°; B: 67.3 + 1.1°) environmental conditions. All subjects were healthy, nonacclimatized and nontrained. Cardiac output, heart rate, rectal temperature (T_r), rating of perceived exertion, blood pressure, and calculated arterial venous oxygen difference were obtained, subjects were allowed to drink water ad libitum, and percent dehydration was calculated from body weight loss.

RESULTS: Total time of exercise (mins) was significantly shorter in the hot environment (AH: 30.46 + 8.84; BH: 29.30 + 6.19, AC: 42.88 + 11.79; BC: 41.38 + 6.30, $p<0.05$), but there were no differences between boys and men ($p> 0.05$). There were no significant differences in change in cardiac index(Q_{index}), percent dehydration or rectal temperatures between environments or groups ($p>0.05$).

Results

	Q_{index} at 5 mins (L/min/m2)	Q_{index} at 5 mins (L/min/m2)	Percent Dehydration (mean)	Peak Rectal Temp °C (mean)
Adult Hot	8.42 ± 1.96	10.07 ± 1.68	0.20 ± 0.3	37.9 ± 0.4
Boy Hot	10.15 ± 1.75	11.75 ± 1.91	0.11 ± 0.2	38.2 ± 0.3
Adult Cool	8.82 ± 1.94	9.98 ± 2.23	0.23 ± 0.3	38.1 ± 0.3
Boy Cool	9.79 ± 1.63	11.25 ± 2.13	0.28 ± 0.15	38.1 ± 0.2

CONCLUSIONS: These findings suggest that prepubertal and adult males tolerate exercise in the heat similarly, and that rise in core body temperature rather than circulatory insufficiency defines exercise capacity in conditions of elevated ambient temperature.

Neonatology I - Neonatal Pulmonology Platform Session

Saturday, March 10, 2007 **8:15 AM-10:30 AM**

33 8:15 AM

Angiopoietin 2 Is Increased in Tracheal Aspirates from Premature Infants Developing Bronchopulmonary Dysplasia

Zubair H. Aghai, Sosun Faqiri, Judy Saslow, Tarek Nakhla, Akanksha Kumar, Riva Eydelman, Louise Strande, Gary Stahl, Paola Leone, Vineet Bhandari. Pediatrics/Surgery, Cooper Univeristy Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ; Division of Perinatal Medicine, Yale University School of Medicine, New Haven, CT.

BACKGROUND: A recent study (Nature Med 2006;12:1286-93) has implicated angiopoietin 2 (Ang2) in hyperoxia-induced acute lung injury (HALI) in an adult animal model.

OBJECTIVE: To study the association between Ang2 in tracheal aspirtes (TA) and development of bronchopulmonary dysplasia (BPD) in premature infants.

DESIGN/METHODS: Serial TA samples were collected on days 1, 3, 5 and 7 from 60 mechanically ventilated premature neonates [gestational age (GA) <30 weeks (w), birth weight (BW) <1250 grams (g)]. The level of Ang2 was determined using a commercially available ELISA kit (R & D Systems, Inc. Minneapolis, MN). Total protein in TA was measured by Bradford assay to correct for sampling related dilution. BPD was defined as need for supplemental oxygen at 36 weeks postmenstrual age (PMA).

RESULTS: A total of 151 TA samples were collected from 60 premature neonates (mean±SD, GA 25.6±1.7w, BW 780±183g). Ang2 was detectable in 137/151 (90.7%) of TA samples. Twelve infants (GA 26.5±2.1w, BW 913±230g) had no BPD, 32 infants (GA 25.8±1.4w, BW 768±157g) developed BPD and 16 infants (GA 24.5±1.1w, BW 710±143g) died before 36 weeks PMA. There was no significant difference in the GA or number of samples collected from infants with No BPD (total 28, mean 2.4 samples per infant), BPD (total 85, mean 2.6) and infants who died (total 38, mean 2.4). Mean Ang2 level was lower in infants with no BPD (141±116 ng/mg of protein) compared to those who developed BPD (324±244, p=0.017) or died (290±168, p=0.014). The mean Ang2 was significantly lower on day 1 (220±194) and day 7 (64±55) in infants with No BPD compared to BPD (day1, 537±441, p=0.038: day 7, 264±219, p= 0.04).

CONCLUSIONS: Higher Ang2 level in TA samples is associated with development of BPD or death in premature infants. We speculate that Ang2 has an important role in HALI in the developing human lung.

34 8:30 AM

Dexamethasone Suppresses Angiopoietin 2 in Tracheal Aspirates of Ventilated Premature Infants

Zubair H. Aghai, Sosun Faqiri, Tarek Nakhla, Judy Saslow, Akanksha Kumar, Riva Eydelman, Louise Strande, Gary Stahl, Paola Leone, Vineet Bhandari. Pediatric/Surgery, Cooper Univeristy Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ; Division of Perinatal Medicine, Yale University School of Medicine, New Haven, CT.

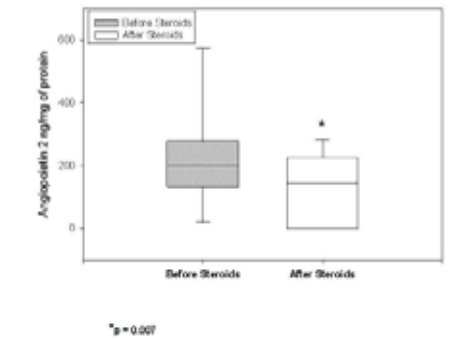
BACKGROUND: A recent study (Nature Med 2006;12:1286-93) has implicated high levels of angiopoietin 2 (Ang2) in hyperoxia-induced lung injury/inflammation. Since postnatal steroids are used in ventilated premature infants (VPI) in an attempt to decrease lung inflammation, we hypothesized that use of dexamethasone (DEXA) in VPI would decrease Ang2 levels.

OBJECTIVE: To study the effect of DEXA therapy on Ang2 in VPI.

DESIGN/METHODS: Tracheal aspirate (TA) samples were collected from VPI before and 48-72 hours after DEXA (0.3 mg/kg/day for 3 days then weaned over 6 days). The level of Ang2 was determined using a commercially available ELISA kit (R & D Systems, Inc. Minneapolis, MN). Total protein in TA was measured by Bradford assay to correct for a sampling related dilution.

RESULTS: Twenty six premature neonates (mean±SD: birth weight 719±136 grams, gestational age 25.1±1.3 weeks) received 27 courses of DEXA. Median age of starting the steroid was 24 days (range 13-60 days). The mean level of Ang2 before starting DEXA was 259±217 ng/mg of protein and significantly decreased to 138±135 ng/mg of protein after therapy with DEXA (p=0.007) (Figure 1).

Figure 1



CONCLUSIONS: DEXA suppressed Ang2 in TA samples from VPI. We speculate that DEXA-induced decrease in lung inflammation may occur via an Ang2-mediated pathway.

35 8:45 AM Fellow in Training

Adenosine Receptors Modulate Cytokine Production by Cord Blood Monocytes (CBM)

Raul Chavez-Valdez, Marsha Wills-Karp, Elizabeth A. Cristofalo, Amy Nathan, Estelle B. Gauda. Pediatrics, Johns Hopkins University, Baltimore, MD; Pediatrics, University of Cincinnati, Cincinnati, OH.

BACKGROUND: Caffeine citrate is an adenosine antagonist that is used to treat apnea of prematurity. Adenosine receptors (ARs) modulate cytokine production and inflammatory response in adult monocytes. Because inflammation contributes to chronic lung disease, it is crucial to understand the role of the adenosine in modulating inflammation in neonates.

OBJECTIVE: Using term newborn cord blood moncytes (CBM), we determined 1) the AR mRNA profile and 2) the effect of ARs in pro-inflammatory (TNF-α, IL-1, IL-6) and anti-inflammatory (IL-10) cytokine levels.

DESIGN/METHODS: CBM were split into 2 groups and exposed to AR antagonists and LPS immediately (CBM_0) or after 48 hrs in culture (CBM_{48}). Both groups were exposed to AR antagonist (table) for 1 hr and incubated with LPS (100ng/mL) for 24 hrs. Cytokine levels were determined by ELISA. AR (A1, A2a, A2b, A3) mRNAs were determined by real-time quantitative PCR.

RESULTS: Except for A1, AR mRNAs were found in CBM_0 and CBM_{48}. After 48 hrs in culture, mRNA increased by 9-fold (A2a) and 2-fold (A2b, A3). Control cytokine levels after LPS activation differed between CBM_0 and CBM_{48}. AR antagonists modified each of the cytokine levels

% difference from control in cytokine levels after treatment

	CBM (N=2) (hr)	Control levels (pg/dL)	A2a (ZM241385) 10nM	A2b (MRS1754) 10nM	A3 (MRS1220) 1nM	Non-specific (Caffeine) 50uM
TNF_α	0	756	-17	-22	-3	-37
	48	1771	-69	-68	-52	-73
IL-1	0	203				
	48	2.5				
IL-6	0	5688	+29	+34	+66	+3
	48	4247	-59	-54	-39	-57
IL-10	0	59	+44	+20	+38	-9
	48	2070	-15	-15	-19	-30

CONCLUSIONS: With the exception of A1R, ARs are present on CBM and up-regulated after 48 hrs in culture, likely contributing to the large changes in cytokine levels. After 48 hr in culture, a 35-fold increase in IL-10 and 81-fold decrease in IL-1 was observed. AR blockade at 48 hrs reduced TNF-α, IL-6 and IL-10 but did not affect IL-1. Adenosine may have unique immunomodulatory properties in CBM that differ from those in adults. The role of ARs on cytokine production by CBM from preterm infants is also being determined.

36 9:00 AM Fellow in Training

Heat Shock Protein (HSP) 70 Secretion by Tracheal Tissue during Mechanical Ventilation: Association with Indices of Tissue Function and Modeling

Euming Chong, Robert Locke, Kevin C. Dysart, Aaron S. Chidekel, Thomas H. Shaffer, Thomas L. Miller. Pediatrics, Jefferson Medical College, Philadelphia, PA; Neonatology, Christiana Care Hospital, Newark, DE; Nemours, Wilmington, DE; Temple University School of Medicine, Philadelphia, PA.

BACKGROUND: Mechanical ventilation (MV) of the neonatal airway results in physical trauma that alters mechanical properties and activates tissue modeling pathways. HSP70 is a molecular chaperone that has been identified as a marker of tissue injury and is known to modulate inflammation. Release of HSP70 by tracheal tissues during MV may influence subsequent pulmonary tissue modeling by impacting the secretion of matrix metalloproteinases (MMPs).

OBJECTIVE: To test the hypothesis that HSP70 secretion is upregulated in MV airway tissues and is associated with changes in airway elasticity and secretion of MMPs 2 and 9.

DESIGN/METHODS: Proximal tracheal segments were isolated in newborn lambs spontaneously breathing through the distal trachea. Both groups were stretched to 80 cm H2O to determine stress-strain relationship. Proximal segments were either MV (n=7; PIP/PEEP=30/5 cmH2O; 40 breaths/min) or not ventilated (SHAM; n=6) for 4 hr. At baseline and hourly, tracheal segments were flushed to collect secreted mediators and tracheal elasticity was determined by stress-strain analyses. Tracheal wash fluid was assayed for HSP70 by ELISA and for MMPs by substrate zymography to detect sequential changes.

RESULTS: HSP70 secretion increased from baseline to a peak at 1 hr in both groups ($p<0.01$), was greater in the MV group ($p<0.05$), and returned to baseline values by 2 hr. This response was in contrast to the progressive decrease in tracheal elasticity ($p<0.05$). The spike in HSP70 at 1 hr was associated with a change in the secretion of MMP-2. Beyond 1 hr, MMP-2 secretion in the MV group returned to baseline values, but remained elevated in SHAM ($p<0.05$). Changes in secretion of MMP-9 did not correlate with HSP70.

CONCLUSIONS: This study demonstrates the rapid impact of molecular response mechanisms during relatively brief periods of MV. Furthermore, HSP70 secretion is associated with the degree of biophysical tracheal injury, and is associated with the time course of MMP-2 secretion by tracheal tissues.

37 9:15 AM Fellow in Training

Variations in Surfactant Use among Infants 30-34 Weeks' Gestation with Respiratory Distress Syndrome (RDS)

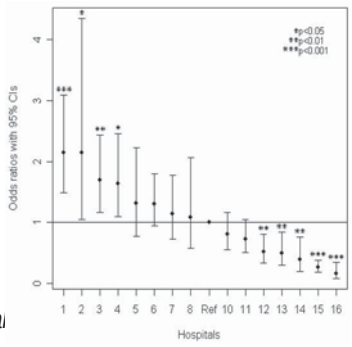
Heather C. Kaplan, Scott A. Lorch, Jennifer Pinto-Martin, Mary Putt, Jeffrey H. Silber. Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA; Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania, Philadelphia, PA; University of Pennsylvania School of Nursing, Philadelphia, PA; Center for Outcomes Research, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Rates of outcomes and care practices vary across neonatal intensive care units (NICUs). Though surfactant is a well-established therapy for RDS, there is variation in its use among VLBW neonates.

OBJECTIVE: To characterize variation in surfactant use in larger preterm infants across NICUs and identify patient and hospital factors associated with this variation.

DESIGN/METHODS: Retrospective cohort of infants 30-34 weeks' gestation with RDS admitted in the first 48 hours of life to a hospital participating in the Pediatric Health Information System Database from 2001-2006. Infants with anomalies and centers not submitting gestational age (GA) or with <40 infants in the study period were excluded. Logistic regression (accounting for clustering with fixed effects and robust variance estimates) was used to assess factors predicting surfactant use.

RESULTS: Among 3,777 infants at 16 centers, the overall rate of surfactant use was 44.4%. Patient factors associated with surfactant included GA, male sex (OR 1.33, 95% CI 1.15-1.55), white race (OR 1.22, 95% CI 1.02-1.46), and mechanical ventilation (OR 54.7, 95% CI 35.94-83.26). There was significant variation in hospitals' adjusted odds of surfactant use compared with the median hospital.



Among hospital factors studied, increasing annual ELBW admissions to the NICU was associated with surfactant use.

CONCLUSIONS: After adjustment, significant hospital variations exist in surfactant use among infants 30-34 weeks' gestation on respiratory support. Patient and hospital factors are associated with this variation.

38 9:30 AM

Availability of Trivalent Inactivated Influenza Vaccine (TIV) to Parents of Neonatal Intensive Unit Patients: Secondary Effect on Healthcare Worker Vaccination Rates

Shetal Shah, Martha Caprio. Neonatology, State University of New York at Stonybrook, Stony Brook, NY; Neonatology, New York University School of Medicine, New York, NY.

BACKGROUND: Infants < 6 months of age with influenza demonstrate significant morbidity. TIV is indicated for healthcare workers, parents & contacts of these infants. Yet, vaccination rates in these populations is 35+4%. We implemented NICU-based administration of TIV, targeted at parents & caretakers of NICU patients.

OBJECTIVE: To determine the effect of TIV availability in the NICU on neonatal healthcare worker immunization rates.

DESIGN/METHODS: For the 2005-06 influenza season, parents of NICU patients were screened & administered TIV. NICU healthcare workers were similarly screened & vaccination was available 20hrs/day to all staff. Data on previous immunization history, co-morbid conditions & risk factors for influenza were obtained. Reasons for refusal were also assessed.

RESULTS: 112 of 130 (86%) of healthcare workers were screened during the 2005-06 season with a 67% vaccination rate as compared to 41% prior to implementation (p<0.03, Student's T-test). 45% received TIV in the NICU, compared with 14.2% of this group the previous year. 46% of nursing staff was immunized in the NICU. Residents & staff demonstrated high rates of vaccination.(See table)

Nurses refused influenza vaccination based on fear of injection & belief in "never getting sick" while physicians cited side effects. Immunization rate did not correlate with number of risk factors requiring vaccination.

Percentages of Neonatal Healthcare Workers Immunized:

Staff Designation (N=112)	Immunized in NICU (N=51)	Refused Immunization (N=36)	Immunized Outside of NICU (N=25)
Attendings (7)	0%	85%	14%
Fellows (10)	20%	30%	50%
Residents (34)	44%	12%	44%
NNPs (3)	100%	0%	0%
Nurses (43)	46%	46%	7%
Staff (15)	73%	20%	6.6%
Overall	45%	32%	22%
Immunized Last Yr.	14%	8%	18%

CONCLUSIONS: Administration of TIV in the NICU effectively increases vaccination rates in neonatal healthcare workers.To increase compliance, educational efforts for nurses should emphasize the likelihood of viral transmission to motivate immunization. Physician-directed efforts should include tolerability of vaccine side-effects.Live-attenuated influenza vaccine may be useful in increasing immunization rates for healthcare workers concerned about injection or efficacy against unmatched viral strains.

39 9:45 AM

Lamellar Bodies in the Tracheal Aspirate of Neonates: Relationship with Gestational and Post-Partum Age

Avinash Purohit, Anna Petrova. Pediatrics, Jersey Shore University Medical Center, Neptune, NJ; Pediatrics, UMDNJ/Robert Wood Jounson Medical School, New Brunswick, NJ.

BACKGROUND: Respiratory distress syndrome (RDS) remains one of the leading causes of death in preterm infants, and insufficient surfactant production is one of the hallmarks of this disease The lamellar bodies (LB) are organelles from within the type II alveolar epithelial cell in which pulmonary surfactant is stored prior to release into the alveolar hypophase. It was reported that aminotic fluid LB count could be used to identify infants at risk for RDS. We hypothesized that the surfactant insuficiency can be estimated by counting the LBs in the tracheal aspirate.

OBJECTIVE: To quantify the tracheal aspirate LB levels in association with the infant's gestational age (GA) and post-partum age.

DESIGN/METHODS: The LBs were quantified (copies/μL) in tracheal aspirate obtained from 47 mechanically ventilated preterm neonates. The tracheal aspirate LBs were compared with respect to the GA (23-28 vs. 29-37 weeks) and post-partum age (day 1, 2-3, 4-5, 6-7). The LBs were analyzed using the platelet channel of the hematology analyzer. Because of the non-parametric distribution of data, the LB levels were compared using the Mann-Whitney U and Wilcoxon Matched Pairs Test. Data is presented as the median with 25th to 75th percentile.

RESULTS: Irrespective of GA, tracheal aspirate LBs did not change significantly during the first week of life. Moreover, on postpartum day 1 and 2-3, the tracheal aspirate LB levels were almost similar in newborns with GA 23-28 and 29-37 weeks. However, on day 4-5, the median tracheal aspirate LB levels were lower in neonates with GA 23-28 weeks as compared with infants of 29-37 week GA ($20x10^3$ vs. $105x10^3$, P<0.04). Spearman rank correlation confirmed the significant association between higher GA and tracheal aspirate LB levels on day 4-5 of the infant's life (r=0.59, P<0.03).

CONCLUSIONS: Lowering of tracheal aspirate LB levels on day 4-5 in infants with GA ≤28 weeks could be the result of both, depletion of exogenous surfactant administrated after birth and insufficient endogenous surfactant production during the first postpartum week. Further studies are required to identify new strategies for the prevention of surfactant deficiency following initial surfactant administration in very preterm born infants.

General Pediatrics I - Epidemiology & Outcomes Platform Session

Saturday, March 10, 2007 8:15 AM-10:30 AM

40 8:15 AM

Lead in Pregnancy: A Universal Screen – Is It Necessary

Tatyana Gabinsky, Asha Ittoop, Claudia Cosmineanu, Gospodin Stefanov, Melvin Gertner. Pediatrics, Elmhurst Hospital Center, Elmhurst, NY.

BACKGROUND: Environmental lead exposure in the United States continues to decline. However, recent immigrant women, especially during pregnancy, are more likely to have elevated lead level due to previous contacts with lead in their countries of origin.

OBJECTIVE: Compare the efficacy of the prenatal screening with blood lead level (BLL) only of the high risk population identified by the standard questionnaire recommended by CDC and universal screen with the BLL in the community with high prevalence of immigrant population.

DESIGN/METHODS: Women presented for the first prenatal visit to Elmhurst Medical Center were screened for the for the elevated serum lead level. Before 2004 only high risk population, identified by standard questionnaire, had BLL. Subsequently, BLL screen was a part of the routine prenatal evaluation. Data were collected by retrospective charts revue.

RESULTS: From January 2002 to October 2006 20,263 women were screened for elevated lead level. 18,378(90.7%) were foreign born. 35%, 21.1%, and 16.5% of the women from Bangladesh, Mexico, and Pakistan respectively had BLL ≥ 5 μg/dL. 4.9% of the women had BLL in the range of 5-≤ 10 μg/dL (mean 6.03 ± 1.12). 1.04% – had BLL in the range 11 – 56 μg/dL (mean 15.26 ± 6.12). With standard questionnaire 201(2.7%) women with BLL 5 - ≤ 10μg/dL and 26 (0.28%) with BLL > 10 μg/dL were identified.

With universal BLL screen 795 (6.96%) women were found to have BLL in the range 5 - ≤ 10 μg/dL and 185 (1.62%) - > than 10 μg/dL.

CONCLUSIONS: In the community with high prevalence of immigrant population universal BLL screen during pregnancy allows to identify more women with elevated lead level and provide them with appropriate education and recommendations.

41 8:30 AM Fellow in Training

Impact of Maternal Smoking on Auditory Behavior in Infants

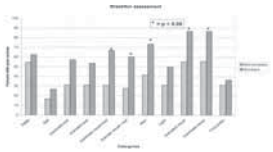
Shama Praveen, Naveed Hussain, Cheryl Oncken, Denise Ortiz, Vijayakumar Praveen, Anna Dongari Bagtzoglou, Jonathan Covault, Henry Kranzler, Stephen Walsh. Neonatal-Perinatal Medicine, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: Nicotine in tobacco smoke has effects on fetal development and influences IL-8 production in tissues.

OBJECTIVE: To examine whether maternal smoking is associated with altered developmental scores in newborns and whether auditory deficits are correlated with alteration in cord/serum IL-8 levels.

DESIGN/METHODS: Mothers admitted to the John Dempsey Hospital at ≥ 32 weeks gestational age(GA) were screened for tobacco use and recruited for the study.After IRB approval and informed consent was obtained,cord tissue/blood was obtained at delivery and used for IL-8 analysis.The Neonatal Behavioral Assessment (NBAS) exam was done on infants at 35-38 weeks GA.The 't test','F statistic' and logistic regression was used to analyse data.

RESULTS: 77 mothers were recruited,of which 44% were smokers(S) and 56% were non-smokers(NS).There was no difference in groups with regards to ethnicity, race and sex of the baby but a difference was noted with respect to maternal age(less in smokers-P= 0.02).The birth weight of babies in the 'S' group(2.48 kg ± 0.40) was< the 'NS' group'(3.31 kg ± 0.40); p <0.0001.IL8 protein in cord blood/tissue was higher in 'S' (125.03) vs 'NS' (43.12)(F statistic = 0.0006) which correlated with poor scores on the NBAS exam p<0.05.On logistic regression using NBAS scores and smoking status,controlling for birth weight,babies in the 'S' group had poor scores with regards to habituation items,with a worse performance in inanimate and animate auditory and visual(social-interactive) items.Quality of alertness was poor in babies of ' S' group,p = 0.01.



CONCLUSIONS: The birth weight of babies born to smokers was < that of non-smokers.The babies of mothers who smoked were found to have poor scores on the auditory and visual components of the NBAS exam which when combined with high IL8 levels may help in identifying babies with neurodevelopmental problems in the newborn period.

42 8:45 AM Fellow in Training

Under-Treatment of Minority Children with Attention Deficit Hyperactivity Disorder

Evelyn Berger, Mary McKay, Jeffrey Newcorn, William Bannon, Danielle Laraque. Pediatrics, Child & Adolescent Psychiatry, Mt Sinai School of Medicine, NY, NY.

BACKGROUND: Health disparities in the treatment of ADHD have been recognized, with minority children being treated at significantly lower rates compared to non-minority children. A few studies have explored the sources of this disparity by examining parental knowledge and perceptions of ADHD. However, there is a

paucity of research examining potential healthcare provider-level factors or causally linking these factors to under-treatment.

OBJECTIVE: This study examined parental and provider factors associated with under-treatment of ADHD in minority children.

DESIGN/METHODS: We utilized a longitudinal observational design. Validated surveys were administered to parents (in English or Spanish) and providers of children with ADHD in both Pediatrics and Outpatient Child Mental Health. The surveys included factors such as ADHD knowledge, concerns with treatment (i.e. concern about ineffectiveness, side effects and drug dependence), and issues with trust and stigma as outlined in the Gateway Provider Model for assessing mental health service use. The main outcome was children's treatment status and was collected at baseline and at a three month follow-up in order to assess causality. A lack of involvement in any psychological or pharmacologic treatment was considered no treatment. Predictors of ADHD treatment were analyzed using multivariable logistic regression.

RESULTS: Parents and providers of 106 children ages 5 – 18 years were enrolled in the study. Parents were Hispanic (59%) and African American (36%). Of the 106 children, 67% were un-treated for their ADHD at baseline. Of these, 77% remained un-treated at three month follow-up. Demographics and rates of treatment were similar in Pediatrics and Outpatient Mental Health. In the logistic regression model for parent data, greater treatment concern significantly predicted no treatment both at baseline (p=0.003) and three-month follow-up (p=0.01). None of the other parental factors assessed were significantly related to treatment status. Preliminary provider data revealed no significant association between provider factors and treatment status.

CONCLUSIONS: The results of this study highlight the importance of addressing concerns of parents of minority children with ADHD. Improving discussions with parents on the efficacy of treatment and the risk/benefit ratio may help diminish disparities in care.

43 9:00 AM House Officer

QI: HIV Testing of the Children of Adult Patients in a HIV Treatment Program

Jamal C. Harris, Janet Giddy, Monty Thomas. Social Pediatrics, Children's Hospital at Montefiore, Bronx, NY; McCord Hospital, Durban, KwaZulu-Natal, South Africa.

BACKGROUND: In KwaZuluNatal (KZN), South Africa, an estimated 2.9% of children 0-14 are HIV infected. Children of adult patients in HIV treatment programs may have a high number of unidentified HIV cases and have an indirect link to HIV treatment.

OBJECTIVE: To determine rates of testing, factors associated with testing, and the number of positive children identified among the children of adult patients at an HIV treatment program.

DESIGN/METHODS: As part of a quality improvement project, a retrospective chart review was conducted at the HIV treatment program at McCord Hospital in Durban, KZN. Using a structured abstraction form, the paper and electronic records of 263 adult patients enrolled from September 2005 to December 2005 were reviewed for the first six months they were in care. Chi squared and two tailed t-tests were used to test socio-demographic differences between children who were and were not tested. Influential variables were included in logistic regression analysis.

RESULTS: 181 children of adult patients were identified. 18 (10%) of these children had been tested prior to their parents entering care. Three were found to be positive (17%). Of the 163 untested children, 27 (15%) children were tested during the study period. Eight (30%) of these children tested HIV positive. Younger children were more likely to be tested than older children (OR=0.60, p=0.002). Disclosing to household members was negatively associated with testing of children (OR=0.11, p=0.009). Mothers, single parents, parents diagnosed earlier, parents who disclosed to others, employed parents, and parents residing with their children did not test their children more often.

CONCLUSIONS: After six months on ARV treatment, adult patients at McCord Hospital tested less than 1/3 of their children. Those tested had a HIV rate eight times the prevalence in KZN. HIV treatment programs in HIV high prevalence areas offering testing and treatment of adults and children should focus on testing the children of adult patients. McCord offers treatment for children and emphasizes the importance of testing of family members, but a minority of parents chooses to have their children tested. Interventions and future research should focus on understanding and minimizing factors that limit testing of children of HIV positive adults.

44 9:15 AM

Elemental Mercury Exposure in a New Jersey Daycare Center Located at a Former Mercury Thermometer Manufacturing Site

Maida P. Galvez, Damiris Perez, Nita Vangeepuram, Jacqueline Moline, Joel A. Forman, Philip J. Landrigan, Jerald Fagliano, Eddy A. Bresnitz. Community and Preventive Medicine and Pediatrics, Mount Sinai School of Medicine; Public Health Services Branch, New Jersey Department of Health & Senior Services.

BACKGROUND: A NJ daycare building that had formerly housed a mercury thermometer manufacturing company was closed when air testing revealed elevated mercury (Hg) levels. To assess potential effects on children's health, the NJ Department of Health and Senior Services, the Centers for Disease Control and Prevention, the Agency for Toxic Substances and Disease Registry, the Environmental Protection Agency, and the Mount Sinai Pediatric Environmental Health Specialty Unit collaborated in a medical and environmental investigation.

OBJECTIVE: (1) To assess children's exposure to Hg in a daycare and (2) to assess Hg-related risks to children's health with emphasis on neurological and dermatological effects.

DESIGN/METHODS: Air testing was performed to assess environmental Hg exposure. To assess individual exposures to Hg, initial urinary Hg screening was conducted in children who had attended the daycare within the previous 60 days; this time-frame is within the biological half-life of Hg. Children with urinary Hg levels >5μg/g creatinine were re-tested monthly. A NJDHSS/CDC led chart review of children attending the daycare is underway.

RESULTS: Air testing revealed Hg levels which exceeded recommended guidelines. Daycare records indicate that 162 persons occupied the building since 2004. The mean initial urinary level for 72 children ages 8 months to 13 years screened was 3.95 μg/g (range 0.3–17.5). At 1st follow up, 22 children with initial levels ≥5 μg/g were retested (mean 4.7 μg/g, range 0.8 -8.7). At 2nd follow-up, children with repeat levels ≥5 μg/g were retested again (mean 5.5 μg/g, range 2.7-9.4). Children attending the daycare within 2.5 weeks of the urinary testing had higher Hg levels (average 3.67 μg/g) than children who were last at the daycare >2.5 weeks from time of testing (average 1.87 μg/g).

CONCLUSIONS: Urine Hg tests indicate that children attending the day care were exposed to Hg though levels declined with time spent away from the daycare. Medical chart review is ongoing. Emergency regulation and state legislation requiring environmental evaluation of daycare buildings prior to licensure has subsequently been proposed in NJ.

45 9:30 AM

Hospitalizations for Ambulatory Care Sensitive Conditions among Children with Sickle Cell Disease

Suzette O. Oyeku, Andrew D. Racine. AECOM/Children's Hospital at Montefiore, Bronx, NY.

BACKGROUND: Hospitalizations for ambulatory care sensitive conditions (ACSC), diagnoses for which timely outpatient care could reduce hospitalizations, are considered markers of appropriate primary care. ACSC among children with sickle cell disease (SCD) has not been well studied.

OBJECTIVE: To determine 1) patterns of hospitalizations and 2) variation between states for ACSC among children with SCD.

DESIGN/METHODS: Cross-sectional analysis of patients ages 3 months to 20 yrs with a principal ICD-9 diagnosis code for SCD using hospital discharge data from 2000 Kids' Inpatient Database from 27 states. Multivariate logistic regressions were used to estimate odds ratios (OR) for discharge for an ACSC. Multivariate semi-log least squares regressions were used to estimate the association between discharge for an ACSC and length of stay (LOS) controlling for patient factors.

RESULTS: 6,833 discharges among children with SCD were analyzed. 90% were Black, 52% were males and median age was 7 yrs. 57% had a median household income < $35,000. 62% had Medicaid/Medicare. 36% of discharges were for an ACSC. The most frequent ACSC diagnoses were pneumonia (33%), asthma (18%), upper respiratory infection (11%), dehydration (10%), convulsions (6%), otitis media (6%), and urinary tract infection (4%). Children ages 1-4 yrs (OR=1.7, p<0.001) and admission from the ER (OR= 1.8, p<0.001) were associated with greater odds of discharge for an ACSC. Self pay status (OR=0.66, p=0.014) and teaching hospital status (OR=0.78, p=0.006) were associated with reduced odds of having an ACSC discharge. After controlling for patient factors, age 1-4 yrs was associated with a LOS 0.2 days shorter (p<0.001). Having Medicaid resulted in longer LOS by 0.1 days (p=0.033) and discharge for an ACSC was associated with a LOS 0.2 days longer (p<0.001). Across states, mean percentage of ACSC discharges was 36%. Several states including NY, TX, AZ, CO, MD, NJ, MO and Oregon had discharges for ACSC that were above the 75th percentile compared to other states.

CONCLUSIONS: ACSC account for more than 1/3 of hospitalizations among children with SCD and are associated with longer LOS. Discharges for ACSC vary across states. Many hospitalizations among SCD children might be avoided with enhanced access to quality primary care that addresses potentially preventable conditions.

46 9:45 AM Medical Student

Twenty-Eight Inner-City Youth in the Juvenile Justice System: A Close Look

Nancy M. Elbasty, Nancy L. Brodsky, Joan M. Giannetta, David Shera, Sabrina Ford, Hallam Hurt. Neonatology, Children's Hosp. of Phila., Philadelphia, PA; Div. of Biostats & Epi, Children's Hosp. of Phila., Philadelphia, PA; Univ. of Med. & Dentistry of NJ - NJ Med. Sch., Newark, NJ; Ctr for Cognitive Neuroscience, Univ. of PA, Philadelphia, PA.

BACKGROUND: Juvenile delinquency (JD) is a continuing problem in the US. Improved knowledge regarding predictors of delinquency can allow for design of appropriate early intervention.

OBJECTIVE: To identify factors associated with JD in a well-characterized, urban, African American, low SES cohort followed since birth (1989-1992).

DESIGN/METHODS: In this longitudinal study of 120 active participants, information regarding involvement with the juvenile justice system was obtained from the Juvenile Automated Computerized System for Philadelphia. From these data, 28 participants were identified as having been arrested (AR) at least once to date. Using cohort database, we compared 28 AR with 28 non-arrested (NAR) cohort peers, matched for gender and age, for: home environment (Home Observation for Measurement of the Environment [HOME]), foster care, depression (Children's Depression Inventory), post-traumatic stress disorder (PTSD), self-esteem (Culture-Free Self-Esteem Inventory), exposure to violence (Things I have Seen and Heard), gestational cocaine exposure, IQ, and grade retention.

RESULTS: The 28 AR (68% male, mean age at first arrest 13.7 yrs [range 6-16]) committed 122 infractions (6% status offenses such as incorrigibility and truancy, 61% misdemeanors, and 34% felonies such as aggravated assault and murder). AR were most commonly charged with reckless endangerment and simple assault. AR vs. NAR were similar in: foster care (p=0.10), depression (p=0.53), PTSD (p=0.24), self-esteem (p=0.58), exposure to violence (p=0.052), gestational cocaine exposure (p=0.79), IQ (p=0.17), and grade retention (p=0.09). AR vs. NAR did differ, however, in the home environment with lower Total HOME scores (p=0.02) and in a HOME subscale, Emotional and Verbal Responsivity (EVR) (e.g. parent praises child) (p=0.001). A logistic regression analysis with backwards selection showed that the EVR subscale remained significant (p=0.008) when entered with Total HOME, total exposure to violence, grade retention, foster care, and IQ.

CONCLUSIONS: In this inner-city cohort, among the factors evaluated, only lower Emotional and Verbal Responsivity in the home was significantly associated with increased risk of arrest.

47 10:00 AM

MRSA in Pediatrics; Bracing up for an Epidemic

Helen Kest, Edward D. Ziga, Yasir Alqaqaa, Beverly Nieves, Albert Sanz. Pediatrics, St Joseph Children Hospital, Paterson, NJ; Infection Control, St Joseph Children Hospital, Paterson, NJ.

BACKGROUND: With the evolving epidemiology and national geographic variation in the rates of community-acquired Staphylococcal aureus (*S. aureus*) and Methicillin-resistant *Staphylococcus aureus* (MRSA) colonization and infection in Children, studies are needed to determine local colonization rates and antibiotic susceptibility patterns.

OBJECTIVE: To describe the local epidemiology of *S. aureus* and MRSA nasal colonization (NC), compare

risk factors for colonization with methicillin-sensitive *S. aureus* (MSSA) versus MRSA, and compare antibiotic resistance patterns in colonizing strains.

DESIGN/METHODS: From September 2005 to May 2006, nasal swabs were collected after parental consent from 518 children between 0 to 18 years during well-child visits at an urban hospital-based community clinic in Paterson, New Jersey. Demographic/risk factor (RF) data were collected using a standardized 20-item form. Susceptibility testing was performed on all *S aureus* isolates using the Vitek legacy system (bioMrieux). Kirby-Bauer disk diffusion method and D-test were performed in accordance with Clinical and Laboratory Standards Institutes standards.

RESULTS: Median age = 4 years; 54% males. The rates of NC with S. aureus and MRSA were 142 (27%) and 23 (4.4%) respectively. A significant proportion of total MRSA colonization (35%) occurred in children <5 months old. Logistic regression modeling identified hospitalization within the recent six months as independently associated with MRSA colonization within our population group (odds, 4.9; p = 0.02); RF did not affect colonization with MSSA. MRSA isolates showed 100% sensitivities to Vancomycin, TMP/SMX, and Linezolid and variable sensitivities to Clindamycin (65%); erythromycin (4%); Levofloxacin (70%); Rifampin (96%); Tetracycline (96%). 39% of MRSA and 4% of MSSA isolates had a positive D-test.

CONCLUSIONS: Our study showed that about 1 out of 22 children are colonized with MRSA. Characteristics of persons with MSSA and MRSA seem to differ: these findings may be useful for differentiating those who may be at risk for MRSA related infections. In household with infants, heightened caregiver awareness and education is needed for infection control purposes. Physicians treating infections attributable to S. aureus in children who have been hospitalized < or = 6 months prior to symptoms should strongly consider MRSA.

48 10:15 AM

Central City Immunization Disparities, 2000-2004

Sally E. Findley, Matilde Irigoyen, Melissa S. Stockwell, Shaofu Chen. Mailman School of Public Health; Dept of General Pediatrics, Columbia University, New York, NY.

BACKGROUND: While childhood immunization disparities have narrowed in recent years for some groups, they have not disappeared. More research is needed to examine immunization disparities by focusing on city-specific disparities.

OBJECTIVE: Examine patterns in childhood immunization disparities between central cities and their respective states and the contextual factors associated with these disparities.

DESIGN/METHODS: We conducted secondary analyses of the National Immunization Survey 2000 and 2004 for 27 central cities and their respective states. We used three measures of childhood immunization disparities (absolute, difference, and ratio of change). Patterns of disparity change were examined with regard to selected contextual factors derived from the census.

RESULTS: In 2000, immunization coverage in central cities was 68.0% and 74.6% in rest of their states, a 7.4% disparity. Between 2000 and 2004, 89% of central cities and 100% of states improved coverage and the city/state disparity narrowed to 4.7%. However, changes in disparities were not uniform: one-third of cities narrowed disparities, one-third had minimal change, and one-third widened disparities. Cities in the South and those with higher Latino populations were significantly more likely to experience widening of disparities (p= .001, p= .038).

CONCLUSIONS: Despite overall progress in immunization coverage, most central cities still show significant disparities with respect to the rest of their states.

Cardiopulmonary Platform Session

Saturday, March 10, 2007 8:15 AM-10:30 AM

49 8:15 AM

Deletion of the Cardiac L-Type Calcium Channel (CaV1.2) Causes Embryonic Death

George A. Porter, Ashwani Sharma. Pediatrics, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Cardiac function depends upon calcium transients which are initiated by the sarcolemmal L-type calcium channel (LTCC). These cyclic changes in calcium levels also appear to regulate gene expression in the developing and mature heart. In addition, we have previously shown that blockade of the LTCC in cultured embryos leads to abnormalities of the cardiac outflow tract. This may be due to disruption of the anterior heart field.

OBJECTIVE: To determine whether LTCCs are required for normal cardiac morphogenesis and embryonic survival.

DESIGN/METHODS: Global deletion of the major cardiac LTCC isoform, CaV1.2, was obtained using floxed-CaV1.2 mice (LoxP sites flanking exons 14 and 15) mated to beta-actin-Cre mice. Mice were harvested at various stages of gestation and after birth and analyzed for genotype and survival. Specimens were also examined for changes in gross morphology and cardiac morphology by visual observation and histological methods.

RESULTS: Full term litters obtained from +/- CaV1.2 x +/- CaV1.2 pairings contain no knockout mice and about 33% wild type (+/+) and 66% heterozygote mice, indicating that CaV1.2 is required for survival to term. Preliminary experiments show that -/- mice survive until about embryonic day (E) 12-13. Litters harvested at E13.5 contain the normal mendelian ratio of the three possible genotypes, but -/- embryos are friable, do not have beating hearts, and have the gross morphology of E11.5-12 embryos, suggesting that they have arrested development, and/or death, at this age. Hearts of E13.5 -/- mice also appear to have a 1-2 day delay in development, but appear structurally normal by gross observation. Embryos harvested at earlier stages of development are viable, appear to have normal development, and contain beating hearts which are grossly normal. Further experiments are ongoing to examine the cause of embryonic demise and the effects of CaV1.2 deletion on cardiac structure, function, and gene expression.

CONCLUSIONS: Normal expression of the major cardiac LTCC isoforms is required for survival past the mid-embryonic period. Embryos lacking CaV1.2 die around E12 with grossly normal hearts and the reason for embryonic death is currently being investigated. We speculate that these embryos have abnormal cardiac function or internal cardiac structure.

50 8:30 AM House Officer

Sildenafil Mediated Angiogenesis Leads to Cardioprotection in Rat Myocardial Ischemia Reperfusion Model: Role of VEGF-1 and Ang-1 System

Ramesh Vidavalur, Suresh Varma Penumathsa, Srikanth Koneru, Mahesh Thirunavukkarasu, Nilanjana Maulik. Department of Pediatrics; Division of Neonatology, University of Connecticut Health Center, Farmington, CT; Cardiovascular Research Center, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: Sildenafil citrate (SC), a potent phosphodiesterase type 5 inhibitor, has revolutionized the treatment of erectile dysfunction and primary pulmonary hypertension. Studies suggest that SC exerts antihypertensive, anti thrombotic and cardioprotective effects through NO-$_c$GMP pathway by elevating intracellular $_c$GMP levels.

OBJECTIVE: Our study aimed to determine a novel role of SC on cardioprotection through angiogenesis at both capillary and arteriolar levels and role of VEGF and Ang-1 in this mechanistic effect. We also investigated the functional relevance of these effects by assessing degree of neovascularisation and left ventricular contractile reserve(LVCR) along with regional blood flow (RBF) during ischemia/reperfusion (I/R) injury.

DESIGN/METHODS: Rats were divided into 4 groups- Control sham, SC sham, Control +IR, SC+IR . Rats were given SC 0.7 mg/kg iv or saline, 30 min before left anterior descending artery occlusion, followed by 1,2,4 and 7 days of reperfusion(R).

RESULTS: Increased capillary and arteriolar density was observed in SC treated rats followed by increased RBF(2 fold). SC treatment also demonstrated increased VEGF and Ang-1 mRNA after 6,12 and 24 hrs of R, with reduced Ang-2 mRNA only after 6hrs of R as expected. Real time PCR data was validated by Western blot analysis. Significant reduction in infarct size (39% vs 20%) and cardiomyocyte apoptosis (304 vs 56) were observed after day 1. Increased expression of anti-apoptotic protein Bcl2 (2 fold) and thioredoxin (2.5 fold) were observed in SC treated rats. Echocardiography demonstrated significantly increased fractional shortening and ejection fraction following 3 weeks of R in SC treated rats. Stress testing with dobutamine infusion @5mcg/kg/min revealed significant difference in LVCR between SC treated and control rats.

CONCLUSIONS: In conclusion, our study demonstrated a strong additional therapeutic potential of SC in myocardial angiogenesis by upregulating VEGF-Ang-1 system, probably by stimulating a cascade of events leading to neovascularization and conferring myocardial protection in *in vivo* rat I/R model.

51 8:45 AM

Pressure-Flow Relationship: Relevance of Glenn Shunt with Right Ventricular Outflow Obstruction

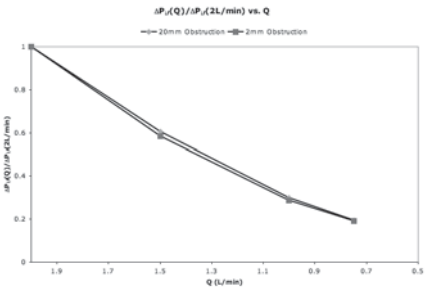
Joshua Wiesman, Nancy Ross-Ascuitto, Serafin DeLeon, Robert Ascuitto. Pediatrics, Tulane University, New Orleans, LA.

BACKGROUND: A bidirectional Glenn shunt was used as part of the surgical management of right ventricular (RV) outflow obstruction in 4 patients, 4 to 6 years of age. Pre-operative RV peak systolic pressure averaged 98 mmHg with aortic (Ao) 85 mmHg. Following repair, RV was 65 mmHg and Ao 90 mmHg. Incorporating a bidirectional Glenn shunt reduced RV to 30 mmHg with Ao 110 mmHg.

OBJECTIVE: To obtain insight into the utility of a bidirectional Glenn shunt to unload an obstructed right ventricle, we considered a computation-based model of fluid flow, taken to simulate blood traversing a tubular passage containing a circumferential obstruction (40% decrease in pathway cross sectional area).

DESIGN/METHODS: Using pressure distributions and velocity fields determined from numerical solutions (using finite element analysis) to the Navier-Stokes equations, the pressure-flow relationship was assessed. Pressure change ($\Delta P_{i,f}$) across the obstruction was described by balance equations: $\Delta P_{i,f}(Q) = (\langle P \rangle_i - \langle P \rangle_f)$ and $\Delta P_{i,f}(Q) = (\langle K \rangle_f - \langle K \rangle_i) + \Delta E_{i,f}$, where $\langle P \rangle$ and $\langle K \rangle$ represent flow-averaged pressure and kinetic energy, respectively, Q flow rate and ΔE flow energy loss. Subscripts (i) and (f) designate initial (i) and final (f) portions of the fluid pathway. Model parameters were: obstruction length 0.002m (valve-like), or 0.02m (elongated narrowing); pathway diameter 0.012m, fluid density 1050 Kg/m^3 and fluid viscosity 3.5x10^{-3} N-s/m^2. Flow rates of 1.0, 1.5 and 2.0 L/min were considered.

RESULTS: Fig shows the marked reduction in pressure change achieved by decreasing flow rate.



CONCLUSIONS: For flow crossing an obstruction, pressure change (and pressure head) is dramatically lowered by decreasing flow rate. This finding supports the hemodynamic merit of using a bidirectional Glenn shunt to further reduce RV systolic pressure, in the setting of residual outflow obstruction.

52 9:00 AM Fellow in Training

Near Infrared Spectroscopy Predicts Blood Lactate Level in Children Following Cardiac Surgery

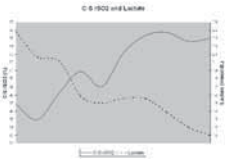
Sujata B. Chakravarti, Jason C. Katz, Alexander Mittnacht, Khanh Nguyen, Umesh Joashi, Barry A. Love, Shubhika Srivastava. Pediatrics, Mount Sinai Medical Center, New York, NY.

BACKGROUND: Blood lactate level is an invasive, intermittent monitor of global tissue perfusion. Near infrared spectroscopy (NIRS), a noninvasive, continuous monitoring tool, is a validated measure of regional tissue oxygenation.

OBJECTIVE: To determine if regional oxyhemoglobin saturation (rSO2) determined by NIRS predicts blood lactate level in children following cardiac surgery.

DESIGN/METHODS: Prospective study in children undergoing biventricular repair of congenital heart disease. Cerebral, splanchnic, renal, and skeletal muscle rSO2 were recorded every 30 seconds via NIRS (INVOS 5100, Somanetics Corp.) for 24 hours post-operatively. Blood lactate levels measured at 0, 2, 4, 6 and 24 hours post-operatively were correlated with rSO2 values derived by averaging all values recorded during the preceding 60 minutes.

RESULTS: N= 18. Mean age=1.5 ± 2.8 years. 28,000 observations were analyzed. Cerebral rSO2 had the strongest correlation with lactate level (r=-0.676, p<0.0001), followed by splanchnic rSO2 (r=-0.557, p<0.0001) and renal rSO2 (r=-0.245, p<0.0001). Muscle rSO2 was weakest (r=-0.159, p=0.0001). The strength of the correlation improved by averaging the cerebral and splanchnic rSO2 values (C-S rSO2) (r=-0.693, p<0.0001). C-S rSO2 ≤ 55% predicts lactate of ≥ 3.5 mmol/L, sensitivity=92%, specificity=99%(p<0.005). For the group as a whole, there was a strong inverse correlation between blood lactate level and C-S rSO2 (r=-0.773, p=0.0002 and changes in C-S rSO2 preceded corresponding changes in lactate level (figure 1).



CONCLUSIONS: C-S rSO2 accurately predicts hyperlactatemia in children following cardiac surgery and is an excellent indicator of trends in blood lactate level. NIRS is a reliable, noninvasive, continuous monitoring tool that enables the earlier recognition of global hypoperfusion.

53 9:15 AM Fellow in Training

Angiotensin II-Induced Calcium Changes in Pulmonary Artery Endothelial Cells

X.M. Li, X.M. Zhao, V. Gueorguiev, E. Sabban, K.M. Lerea, L.A. Parton, Susan C. Olson. Newborn Medicine, New York Medical College, Valhalla, NY; Biochemistry, New York Medical College, Valhalla, NY; Cell Biology, New York Medical College, Valhalla, NY.

BACKGROUND: Persistent Pulmonary Hypertension of Newborns (PPHN), is a progressive and often fatal disorder lacking curative therapies. Although there are multiple factors contributing to the pathogenesis of PPHN, it is generally accepted the nitric oxide (NO)-cGMP cascade.

Angiotensin II (Ang II) is a multifunctional hormone that regulates vascular tone and fluid volume.

We havedemonstrated the Ang II downregulates eNOS expression and NO in Bovine Pulmonary Artery Endothelial Cells (PAECs) via its type 1 receptor linked Phospholipase C/ Inositol triphosphate (IP_3)/Calcium pathway.(Reg Peptides 132:113-122, 2005).

This current study is designed to investigate Ang II induced calcium changes in PAECs.

OBJECTIVE: To determine Ang II induced changes in intracellular calcium in PAECs and characterize the source of calcium mobilization.

DESIGN/METHODS: Pulmonary Artery Endothelial Cells : All experiments were performed on the cells at passage 4 through 6.

Measurement of calcium mobilization: By analyzing the ratio of Fura-PE3 fluorescence (>480 nm) excited at 340 and 380 nm.

Measurement of superoxide: By monitoring reduction of nitroblue tetrazolium.

RESULTS: Ang II induced a transient increase in $[Ca^{2+}]i$ that was seen as early as three minutes, reached a plateau (80 nmol/L) at 10 min and returned to basal level (40nmol/L) at 40 min.

Treatment of PAECs with Candesartan, AT_1 receptor antagonist, prevented the Ang II _induced increase in $[Ca^{2+}]i$, while the AT_2 receptor blocker had no effect.

The Ang II-induced increase in $[Ca^{2+}]i$ was significantly decreased by inhibiting Phospholipase C with U73122 or blocking IP_3 receptor with 2-APB.

Pretreatment with the calcium ionophore (A23187) to deplete extracelullar calcium influx, this compound partially decreased the maximal level and significantly decreased the duration of the steady state of $[Ca^{2+}]i$ .Inhibition of the NAD(P)H oxidase with Apocynin, similar results were observed.

CONCLUSIONS: We conclude that Ang II increases in $[Ca^{2+}]i$ by releasing calcium from endoplasmic reticulum via the AT_1 receptor linked LC/IP_3 pathway. Furthermore, the sustained plateau of Ang II-induced $[Ca^{2+}]i$ is mediated via NAD(P)H oxidase and requires the influx of extracellular calcium.

54 9:30 AM Fellow in Training

Effect of Dopamine on Pulmonary and Systemic Pressures in Control and PPHN Neonatal Lambs

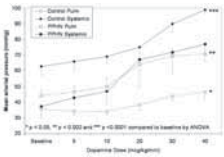
Khaver I. Kirmani, Rita M. Ryan, Frederick C. Morin III, James A. Russell, Daniel D. Swartz, Sylvia F. Gugino, Karen A. Wynn, Vasanth H. Kumar, Satyan Lakshminrusimha. Pediatrics & Physiology, SUNY / Women & Children's Hosp, Buffalo, NY.

BACKGROUND: Dopamine is used as an inotropic agent to increase systemic blood pressure (SBP) in sick hypotensive infants. Some of these infants have persistent pulmonary hypertension of the newborn (PPHN). The effects of dopamine on pulmonary arterial pressure (PAP) in infants with PPHN is unknown.

OBJECTIVE: To evaluate the effects of dopamine on the SBP, PAP, pulmonary blood flow (Q_p), pulmonary vascular resistance (PVR) and oxygenation in control and PPHN lambs.

DESIGN/METHODS: PPHN was induced in lambs by antenatal ductal ligation at 126d gestation. The lambs were delivered by C-section 9d later (n=3). Control lambs (n=6) were delivered by C-section at 140d gestation. A main PA flow transducer and PA, carotid, jugular, left atrial catheters were placed prior to delivery. Lambs were ventilated with 100%O_2. Dopamine was infused through the jugular vein at 5, 10, 20, 30 and 40μg/kg/min (30 min at each dose). Blood gases, PAP, Q_p and SBP were measured and PVR calculated.

RESULTS: In control lambs, the mean SBP was significantly higher than mean PAP. SBP increased more significantly ($p < 0.001$ by ANOVA) and at lower doses with dopamine compared to PAP ($p < 0.05$). In PPHN lambs SBP and PAP were similar and increased similarly in response to dopamine infusion. Q_p increased significantly (p=0.05) with dopamine in control lambs but not in PPHN lambs. PVR and oxygenation did not significantly change with dopamine infusion in either group.



CONCLUSIONS: Dopamine is fairly selective in increasing SBP in control lambs at 5 to 20 μg/kg/min range. In contrast, in sick neonatal lambs with PPHN, PAP and SBP increase similarly in response to dopamine. We recommend that caution be exercised and frequent echocardiograms performed to assess PAP while using dopamine in neonates with PPHN.

55 9:45 AM

CEACAM6: A Hormonally Regulated Surfactant-Associated Protein in Lung Type II Cells

Philip L. Ballard, Linda W. Gonzales, Venkat Kolla, Nicole Bailey. Pediatrics, University of California San Francisco, San Francisco, CA; Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA; Pediatrics, Case Western Reserve University, Cleveland, OH.

BACKGROUND: CEACAM6 (Carcinoembryonic Antigen Cell Adhesion Molecule 6) is a GPI-anchored membrane glycoprotein that is a tumor biomarker in adult lung and selected other tissues, where it has anti-microbial and anti-apoptotic activities, however expression and function in developing lung have not been characterized.

OBJECTIVE: We evaluated regulated expression and secretion of CEACAM6 in fetal lung.

DESIGN/METHODS: Epithelial cells were isolated from human fetal lung (16-21 wk gestation), and cultured 1-5 d with DCI (dexamethasone, 10 nM; 8-Br-cAMP, 0.1 mM; isobutylmethylxanthine, 0.1 mM) to promote type II cell differentiation. Some cells in control media were treated with adenovirus Ad12A2 (0.5-6 pfu/cell) to overexpress thyroid transcription factor-1 (TTF-1) or were transfected with siRNAs (200 nM) for TTF-1 or CEACAM6 to knockdown expression in the presence of DCI.

RESULTS: CEACAM6 mRNA content, transcription rate and protein content were up-regulated ~10-fold by exposure of fetal lung epithelial cells to DCI. Induction was similar with a dose of Ad12A2 that produced a level of recombinant TTF-1 comparable to endogenous TTF-1 in DCI-treated cells. By confocal immunofluorescence, CEACAM6 localized to both intracellular vesicles that costained with SP-B (i.e., lamellar bodies) and to the plasma membrane of type II cells. Knockdown of TTF-1 by 54% with siRNA in DCI-treated cells reduced CEACAM6 mRNA and protein by 80% (n=4). Knockdown of CEACAM6 expression with siRNA (by 88%, n=3) did not alter expression or staining patterns of TTF-1, SP-B or DC-LAMP (a lamellar body membrane protein). Secretion rates for CEACAM6 were similar for both DCI- and Ad12A2-treated cells, with no response to secretagogues that stimulate surfactant secretion. Treatment of cells with mannosamine blocked ~50% of CEACAM6 secretion, consistent with a role for protein glycosylation in the secretory mechanism.

CONCLUSIONS: We conclude that CEACAM6 expression in fetal lung epithelial cells is transcriptionally regulated by glucocorticoid plus cAMP and is dependent on TTF-1. CEACAM6 is associated with intracellular surfactant, but appears to be secreted primarily by a constitutive pathway independent of lamellar bodies.

56 10:00 AM

TACE Activity during Murine Lung Development

Sandy Murray, Lucia Pham, MaryAnn V. Volpe, Sujatha M. Ramadurai, Heber C. Nielsen. Newborn Medicine, New England Medical Center, Boston, MA.

BACKGROUND: Fibroblast-Type II epithelial cell communication in fetal lung development involves the ErbB receptor family (EGFR, ErbB2, ErbB3, ErbB4). The ErbB receptor ligand neuregulin (NRG) is secreted by fetal lung fibroblasts and activates ErbB3 and ErbB4 on Type II cells to stimulate surfactant synthesis. NRG is synthesized as a membrane-bound pro-protein whose release into the extracellular space requires cleavage by TACE, a membrane metalloprotease. ErbB and other receptors activate TACE via protein kinase C-stimulated Ca^{++} activity.

OBJECTIVE: We hypothesized that TACE activity is involved in fibroblast-Type II cell communication promoting surfactant synthesis.

DESIGN/METHODS: We studied developmental expression of TACE in fetal mouse lung (gestational d16 - d18) using immunohistochemistry (cell-specific expression), immunoblotting (inactive and active peptides) and DSPC assays (its effect on surfactant synthesis). We also measured TACE activity in fibroblasts via cleavage of a fluorochrome-labeled peptide substrate.

RESULTS: TACE is abundant in d16 lung mesenchyme and epithelia. Thereafter mesenchyme expression strongly localizes to areas underlying developing respiratory bronchioles and alveolar ducts; epithelial expression localizes to distal epithelium, consistent with developmental concentration of TACE at sites of fibroblast-Type II cell communication. Immunoblots from cultured fetal lung fibroblasts identified inactive 120kDa and active 75kDa TACE species. In females the ratio of active to inactive TACE at d16 was 2.7 and

decreased to 2.0 then 1.5 at d17 and d18. In contrast, ratios in males increased from 1.5 at d16 and d17 to 3.5 at d18. A different antibody directed against the enzyme active site also recognized 70kDa and 55kDa active peptides. In females the ratio of 55kDa/120kDa decreased from 4 at d16 to 2.7 at d17 and 2.4 at d18. Again males increased from 2.5 on d16 to 5 on d17 and 6 on d18. In d17 cells PMA stimulated TACE enzymatic activity by 30%. This was dose-dependently decreased by the TACE inhibitor IC-3 to 60% of the uninhibited condition. Media from PMA-treated d17 fibroblasts induced Type II cell DSPC synthesis dose-dependently, reaching 301±27% of control by 100ng/ml PMA.

CONCLUSIONS: These data support the role of TACE in the pathway of fibroblast-Type II cell communication. Funded by NIH HL37930; Peabody Foundation. IC-3 was a gift of Amgen (Seattle, WA).

57 10:15 AM

In Utero Androgen Exposure Affects Hoxb-5 Protein Levels and Spatial Localization in Developing Murine Lung

MaryAnn V. Volpe, Karen T. Wang, Lucia D. Pham, Heber C. Nielsen, Sujatha M. Ramadurai. Pediatrics, Tufts-New England Medical Center, Boston, MA.

BACKGROUND: Androgen exposure beginning in early lung development stimulates lung branching and cell proliferation but delays alveolar epithelial maturation contributing to the increased risk of respiratory morbidity in male newborns. In the human prostate dihydrotestosterone (DHT) cooperates with Hox genes to regulate branching morphogenesis and promote cell proliferation in prostate cancer. We and others have shown the importance of Hoxb-5 and Hoxa-5 to lung airway branching morphogenesis and lung maturation but an interaction between androgen and Hox gene control of lung development has not been investigated.

OBJECTIVE: We hypothesized that DHT treatment beginning early in lung development differentially regulates Hoxb-5 and Hoxa-5 protein expression coordinate with the known roles of these Hox genes in lung morphogenesis.

DESIGN/METHODS: Timed pregnant mice were implanted with DHT pellets (2mg/day) on d11 of gestation (term = 19 days). Animals were sacrificed on d18 of gestation, fetuses sexed and fetal lungs processed for either immunostaining or Western blot experiments. Coronal lung cryosections were immunostained for Hoxb-5 and Hoxa-5 using alkaline phosphatase detection methods. Western blot with densitometry was performed on whole lung lysates using the same Hoxb-5 or Hoxa-5 antibodies followed by re-probing of each membrane with GAPDH as an internal control.

RESULTS: Immunohistochemistry showed that DHT exposed Gd18 fetal lungs had less developed terminal saccular morphology, increased intensity of mesenchymal nuclear staining for Hoxb-5 protein and loss of the central < peripheral gradient of restricted Hoxb-5 expression around developing bronchioles and alveolar sacs. Conversely, Hoxa-5 protein localization did not change, although cuboidal epithelium appeared more intensely positive for Hoxa-5. Western blot with densitometry analysis showed that DHT treatment increased Hoxb-5 protein levels by 3 fold as compared to control in Gd18 female fetal mouse lungs but did not alter Hoxa-5 protein levels.

CONCLUSIONS: We conclude that androgen effects on fetal lung structural development and maturation may be in part mediated through modified protein levels and cellular localization of Hoxb-5 protein. Supported by HL044784, HL37930, Peabody Foundation.

Developmental Biology Platform Session

Saturday, March 10, 2007 **8:15 AM-10:30 AM**

58 8:15 AM

Differential Brain Tissue Expression of IL-6 and TNF-α in Newborn and Adult Mice after LPS Exposure

David Sorrentino, Andy Wen, Joel Cooper, Alex Kusnecov. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA; Dept of Psychology, Rutgers University, Piscataway, NJ; School of Medicine, University of Medicine and Dentistry of New Jersey, New Brunswick, NJ.

BACKGROUND: Previous studies have shown cellular apoptosis protects the central nervous system (CNS) from immune-mediated injury by eliminating inflammatory cells such as T cells, B cells, macrophages, and microglia. However, apoptosis may cause neuronal damage during CNS infections through the actions of regulatory cytokines that may account for some neurological defects associated with preterm birth. Also, studies have shown when compared with adult immune cells, neonatal immune cells secrete lower levels of cytokines TNF-α, IFN-γ, IL-1β, IL-6, IL-8, and IL-12.

OBJECTIVE: The present study aims to differentiate inflammatory cytokine expression by comparing adult and neonatal response to lipopolysaccharide (LPS) stimulation in newborn and adult mice.

DESIGN/METHODS: A total of 20 C57BL mice were exposed to either LPS or saline given intraperitoneally at 5 days (neonatal, n=10) or 30 days (adult, n=10) of life and killed 6 hrs later. Spleen and brain tissue were recovered and homogenized with 1mM phenylmethylsulfonylfluoride in phosphate buffer. Cell debris was removed by centrifugation. Protein concentration was determined using the BCA™ protein assay and cytokines were quantified using an enzyme-linked immunosorbent assay.

RESULTS: In response to LPS administration at 5 or 30 days of age there was no difference in splenic tissue IL-6 or TNF-α (ng/mg protein) 457±197 vs 398±80, p=0.77, and 17±2 vs 13±2, p=0.17, respectively, but a significant difference in both groups when compared to control. Brain tissue cytokine expression was markedly decreased in 5 day mice when compared to 30 day mice IL-6: 2.1±0.2 vs. 365±107, p<0.001, TNF-α: 0.9±0.6 vs. 79±14, p<0.001, in the adult mice samples there was a significant increase in CNS IL-6 expression after LPS exposure211±40 vs. 365±107, p=0.02.

CONCLUSIONS: CNS cytokine expression but not systemic expression (splenic) appears to be depressed in the immediate newborn period when compared to adults. We speculate that the altered immune function observed in the neonatal brain compared to the adult contributes to the injuries observed in preterm populations associated with perinatal inflammation. (Funded by NIH-MH60706).

59 8:30 AM Fellow in Training

ErbB4 Regulation in Fetal and Adult Rat Alveolar Type II Cells

Washa Liu, Katja Zscheppang, MaryAnn V. Volpe, Heber C. Nielsen, Christiane E.L. Dammann. Pediatrics, New England Medical Center, Boston, MA; Pediatrics, Hannover Medical School, Hannover, Germany.

BACKGROUND: ErbB receptors are active in fetal lung maturation and lung function later in life. ErbB receptors act as dimers after ligand binding. ErbB4 is the most active dimer partner in rat fetal lung cells, indicating a specific role in the lung. Neuregulin 1β (NRG), a ligand for ErbB3 and ErbB4, is present in fetal lung fibroblast conditioned media (FCM) and stimulates surfactant DSPC synthesis in type II cells.

OBJECTIVE: We hypothesize that ErbB4 downregulation in type II cells alters surfactant synthesis and cell proliferation, affecting fetal (T2) and adult (L2) cells differently.

DESIGN/METHODS: We used siRNA to specifically reduce ErbB4 protein in E19 fetal rat T2 cells and an adult rat type II cell line (L2) to study the role of ErbB4 in cell proliferation and surfactant synthesis. Both T2 and L2 cells were transfected 72 hrs with a combination of three ErbB4 siRNAs targeting three different regions in the rat ErbB4 transcript. In the last 24 hrs of culture either FCM or NRG was added, and ErbB4 phosphorylation, cell proliferation, and choline incorportion into DSPC studied.

RESULTS: T2 cells needed a higher siRNA concentration for maximum effectiveness. Compared to scrambled siRNA, ErbB4 siRNAs down regulated ErbB4 protein about 30% in both cell types. Baseline ErbB4 phosphorylation was downregulated more in L2 compared to T2 cells. ErbB4 downregulation reduced DSPC more in T2 than in L2 cells. Cell proliferation was affected differently in the two cell types. Thymidine incorporation was downregulated in T2 and upregulated in L2 cells. Downregulation reduced FCM- and NRG-induced ErbB4 phosphorylation and DSPC more in L2 than in T2 cells. FCM- and NRG-induced thymidine incorporation was reduced in T2 cells and stimulated in L2 cells.

		T2			L2	
	Baseline	FCM	NRG	Baseline	FCM	NRG
ErbB4 protein	74±3%			71±7%		
ErbB4 phosphorylation	81±8%	73±12%	80±10%	67±8%	35±6%	42±7%
choline incorporation	60±5%	75±9%	80±10%	81±10%	68±9%	47±7%
thymidine incorporation	70±8%	80±8%	90±15%	151±24%	301±60%	129±17%

CONCLUSIONS: ErbB4 downregulation reduced DSPC synthesis and cell proliferation in fetal type II cells. In adult type II cells ErbB4 downregulation decreased DSPC synthesis but increased cell proliferation. ErbB4 has important but seperate roles in fetal and adult lung.

60 8:45 AM Fellow in Training

Unique Pattern of NF-κB Activation Mediates Developmental Differences in Response to Hyperoxia in Lung Fibroblasts

Clyde J. Wright, Guang Yang, Phyllis A. Dennery. Pediatrics, Division of Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA; Pediatrics, University of Pennsylvania, Philadelphia, PA.

BACKGROUND: The transcription factor NF-κB regulates the cellular response to inflammatory and oxidant stress. Multiple studies have shown exaggerated NF-κB activation following oxidant and inflammatory insults in preterm and neonatal models when compared to adults. The cause of this increased activation, and whether it is protective or deleterious is unknown.

OBJECTIVE: To characterize differences in the timing, degree and mechanism of NF-κB activation following exposure to hyperoxia in fetal and adult lung fibroblasts.

DESIGN/METHODS: Fetal rat lung fibroblasts (RLF-6, ATCC) and adult rat lung fibroblasts (RLF, Cell Applications) were cultured to 75-80% confluency and exposed to hyperoxia (95% 02, 5% CO2) for 10-120 min. Protein levels of total IκB-α, pIκB-α ser 32 and tyr 42, and caspase-3 were determined by Western blot analysis. NF-κB consensus sequence binding was evaluated by electrophoretic mobility shift assay.

RESULTS: RLF-6 cells show a significantly lower level of endogenous total IκB ($p<0.02$), which was significantly reduced after 30 min of hyperoxia when compared to RLF cells ($p<0.01$). By 10 min of hyperoxia, pIκB-α tyr 42 levels were significantly increased in the RLF-6 compared to RLF cells ($p<0.05$). Both RLF and RLF-6 cells stimulated with TNF-α had increased pIκB-α ser 32, while hyperoxia resulted in no increase in either cell line. By 10 min of hyperoxia, RLF-6 showed significantly higher NF-κB binding. In addition, after 2 hours of hyperoxia, fetal cells showed a 33% decrease ($p<0.01$) in procapsase-3 whereas RLF did not.

CONCLUSIONS: RLF-6 demonstrate increased NF-κB activation following exposure to hyperoxia compared to RLF. These data indicate developmental differences in NF-κB activation in response to hyperoxia, mediated by lower levels of total IκB-α and enhanced total IκB-α degredation. This occured via early phosphorylation of IκB-α on tyr 42 rather than on ser 32 as with TNF-α. This distinct NF-κB pathway seen with hyperoxia may account for downstream events such as loss of procaspase-3, indicating activation of apoptotic pathways in the fetal cells.

61 9:00 AM

Interaction between Sox4 and the Wnt Signaling Pathway

Paul Anziano, Sarah Wehrli, Michele Scheerer, Kathryn Maschhoff. Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Sox4 is a member of the Sry family of transcription factors, which have been implicated in cell fate decisions during development. Mouse embryos homozygous for a null mutation of Sox4 die at ED 14.5 of cardiac failure. The hearts of Sox4 null embryos exhibit defects of septation of the outflow tract, resulting in persistent truncus arteriosus. These embryos also exhibit dysplasia of the aortic and pulmonary valves. In fact, it is likely this dysplasia, with the resultant valvular insufficiency, that results in the edema and death of these embryos at midgestation.

OBJECTIVE: Recently, a number of Sox proteins, including Sox7, Sox9, and Sox17 have been found to interact with beta catenin, a key component of the Wnt signaling pathway. Because Wnt signaling is thought to be required for cardiac valve formation, our objective was to determine whether Sox4 interacts with beta-catenin as well.

DESIGN/METHODS: We used two methods, GST pull downs and immunoprecipitation to show physical interaction of Sox4 with beta-catenin. We co-transfected EGFP-tagged Sox4 with beta-catenin to examine cellular colocalization of these proteins. We used site-directed mutagenesis to identify sequence motifs required for this interaction.

RESULTS: Using GST pull downs and immunoprecipitation, we showed that Sox4 and beta-catenin physically interact. Unexpectedly, we found that co-expression of Sox4 and beta-catenin leads to degradation of Sox4. This degradation is ameliorated by proteasome inhibitors, suggesting that Sox4 turnover is regulated by the ubiquitin proteasome pathway. Using the ScanSite motif search algorithm (MIT) we have identified putative GSK3 phosphorylation sites in all Sox4 proteins sequenced to date. Deletion of this motif leads to increased stability and transcriptional activity of Sox4.

CONCLUSIONS: We have shown that Sox4 turnover and activity are regulated by interaction with beta-catenin and by phosphorylation by GSK3. We therefore believe that Sox4 function may be modulated by Wnt signaling, and that interaction with the Wnt signaling pathway is crucial for its function during developmental processes, such as cardiac valve formation, that involve both Sox4 and Wnt signaling. Furthermore, because agents such as lithium that inhibit GSK3 activity can cause congenital malformations including cardiac valve defects, we hypothesize that Sox4 may be a target for teratogens.

62 9:15 AM Fellow in Training

Mechanism of Caspase-3 Activation and Nuclear DNA Fragmentation during Hypoxia in the Cerebral Cortex of Newborn Piglets

Ming-Chou Chiang, Jahan Ara, Saneyuki Yasuda, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Caspase-3, a caspase downstream of caspase-9, executes cell death by cleaving numerous intracellular proteins and enzymes such as caspase-activated DNase (CAD) that leads to DNA fragmentation. We have shown that hypoxia results in increased expression of caspase-9 and caspase-3, and increased fragmentation of nuclear DNA in the cerebral cortex of newborn piglets.

OBJECTIVE: The present study aims to investigate the mechanism of caspase-3 activation during hypoxia by testing the hypothesis that inhibition of caspase-9 prior to hypoxia will prevent the hypoxia-induced activation of caspase-3 and DNA fragmentation in the cerebral cortex of newborn piglets.

DESIGN/METHODS: 17 piglets were divided into normoxic (Nx, n=6), hypoxic (Hx, n=6), and hypoxic pretreated with a caspase-9 inhibitor, Leu-Glu-His-Asp-fluoromethyl ketone(Hx+LEHD, n=5). LEHD (10 μg/kg, IV) was administered 30 mins prior to hypoxia (FiO_2 of 0.06-0.08 for 1 hour). Hx was confirmed by measuring ATP and phosphocreatine (PCr). Proteins were separated on 12% SDS-PAGE and probed with active caspase-9 and active caspase-3 antibodies. Protein density was expressed as absorbance ($ODxmm^2$). Nuclear DNA was isolated and electrophoresed. DNA fragment was expressed as OD/mm^2.

RESULTS: ATP (μmoles/g of brain) was 5.2±1.0 in Nx, 0.7±0.1 in Hx ($p<0.05$ vs Nx), and 1.2±0.9 in Hx+LEHD ($p<0.05$ vs Nx). PCr (μmoles/g of brain) was 3.2±0.6 in Nx, 1.0±0.3 in Hx ($p<0.05$ vs Nx), and 0.9±0.2 in Hx+LEHD ($p<0.05$ vs Nx). Caspase-9 protein was 19.5±1.8 in Nx, 32.4±5.0 in Hx and 19.9±3.6 in Hx+LEHD ($p<0.05$ vs Hx). Caspase-3 protein was 20.8±2.5 in Nx, 33.0±3.9 in Hx and 21.6±4.7 in Hx+LEHD ($p<0.05$ vs Hx). DNA fragments density was 243.1±22.4 in Nx, 922.8±101.3 in Hx and 227.9±36.6 in Hx+LEHD ($p<0.05$ vs Hx). The data show that inhibition of caspase-9 prevents the hypoxia-induced increase in active caspase-9 and caspase-3, and DNA fragmentation.

CONCLUSIONS: We conclude that the mechanism of caspase-3 activation and DNA fragmentation during hypoxia are caspase-9 mediated. Since administration of LEHD-fmk inhibits caspase-9 and subsequently prevents the hypoxia-induced activation of caspase-3, we speculate that caspase-9 inhibition will prevent CAD activation and the hypoxia-induced programmed cell death. (NIH-HD 20337, NIH-HD 38079).

63 9:30 AM

Lung NF-κB Regulates HIFα Transcriptional Activation and Expression in the Late Prenatal Period

Guang Yang, Jessica Bordner, Angela Hu, Phyllis A. Dennery. Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA; Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, PA.

BACKGROUND: Lung maturation involves a complex series of coordinated events that occur at specific times in gestation. This delicate balance can be disrupted by a variety of stimuli such as inflammation and oxidative stress. A hallmark of inflammation is the activation of the transcription factor NF-κB resulting in wide-ranging downstream events. LPS, a well-known NF-κB activator also results in the activation of HIF, another important transcription factor involved in lung vessel formation and in the maturation of the surfactant system. However it is not clear how NF-κB regulates HIF during lung development.

OBJECTIVE: To investigate a temporal relationship of NF-κB and HIF transcriptional activity during lung development and to evaluate whether disruption of NF-κB modulates HIFα transcription.

DESIGN/METHODS: Time mated WT and p50 null mutant mice (with a c57BL/B6 background) were sacrificed and their lungs harvested at E15, E17 and E19. Similarly, lungs from newborn pups (<12 hours old) and day 3 of life (p3) as well as adults (2 month old) were also obtained after perfusion with PBS. The right lungs were homogenized and nuclear proteins were obtained for electrophoretic mobility shift assay and Western analysis. The left lungs were fixed with a 10% formalin solution. The paraffin imbedded tissue slides were evaluated for histology and immunohistochemistry.

RESULTS: NF-κB binding activity was developmentally regulated with a peak at E19 and the lowest value in adults whereas HIF binding activity gradually increased with development and peaked in adults. With disruption of NF-κB, HIF binding was decreased only in the perinatal stage between E19 and D0. This was correlated with decreased HIF-1α and HIF-2α immunostaining in the fetal lung. Additionally, in early gestation, p50 KO mice had markedly disorganized lung architecture with disrupted alveolar formation as compared to similarly time-mated WT mice.

CONCLUSIONS: NF-κB regulates HIF-1α and HIF-2α protein expression as well as HIF transcriptional activation during the late prenatal period of lung development. We speculate the coordination of HIF and NF-κB is essential for a proper lung development.

64 9:45 AM Fellow in Training

Inflammation-Induced Disruption of Oligodendrocytes and Its Link to Periventricular Leukomalacia in Preterm Infants

Heather M. French, Michal Elovitz, Judy Grinspan, Rebecca A. Simmons. Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA; Ob-Gyn, University Pennsylvania, Philadelphia, PA.

BACKGROUND: Chorioamnionitis is a risk factor for periventricular leukomalacia. Inflammation-induced disruption of maturation and injury to oligodendrocytes are believed to contribute to the pathogenesis of periventricular leukomalacia. Oligodendrocytes undergo a defined lineage progression from neural stem cell to mature oligodendrocyte and display a maturation-dependent vulnerability to oxidative damage, inflammation and infection during the late oligodendrocyte progenitor stage. The mechanism by which oligodendrocyte injury occurs is still unclear but it is thought that alteration in the regulation of proinflammatory cytokines, reactive oxygen species and key genes (Sox10, Shh, HDAC1-3) in the program of oligodendrocyte development disrupts precursor cell maturation.

OBJECTIVE: To determine if abnormal development of oligodendrocytes in the presence of intrauterine inflammation is due to changes in expression of key genes regulating maturation.

DESIGN/METHODS: Pregnant CD-1 mice were injected with LPS (250 _g/mouse in 100_L) or sterile saline (100 _L) into the right uterine horn at E15 (term =20 days). Six hours after injection, fetuses were harvested from the left uterine horn and brain tissue was collected. Mixed glial cultures were prepared from newborn rat brain (P1). After 7 days, oligodendrocyte precursors were isolated by immunopanning with RAN2 and A2B5. Oligodendrocytes were treated with BSO 100μM for 24 hours to induce oxidative stress. RNA was extracted from tissue (n=6 each treatment) and from cultured oligodendrocytes (n=3) and expression of Sox10, Shh, and HDAC 1-3 was measured by real-time PCR.

RESULTS: HDAC1 expression was signficantly reduced in brain of LPS exposed d15 fetuses ($p<0.01$). However, expression of Sox10, Shh, and HDAC3 did not differ between LPS exposed mice and sham mice. In contrast, oligodendrocyte precursor cells exposed to BSO had significantly decreased expression of Sox10 and HDAC3, but there was no difference in expression of HDAC 1 and Shh.

CONCLUSIONS: The inflammatory and oxidative stress states, both in vivo and in vitro, lead to decreased expression of Sox10, indicating that disrupted regulation of this gene may be causative in the pathogenesis of periventricular leukomalacia.

65 10:00 AM

Differential Effects of Metalloporphyrins on the Toll-Like Receptor Signaling Pathway

Sylvie M. Noordermeer, Frank A. Wagener, Guang Yang, Frans G. Russel, Phyllis A. Dennery. Molecular Pharmacology & Toxicology, Nijmegen Center for Molecular Life Sciences, Radboud University Nijmegen Medical Center, Nijmegen, Netherlands; Pediatrics, University of Pennsylvania School of Medicine, the Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Toll-like Receptors (TLRs) play an important role as sensors in the innate immune system and they mediate defenses against invading pathogens. Recently, it has been shown that some endogenous compounds, such as heat shock proteins, can also activate the TLR-pathway. Metalloporphyrines are a group of versatile molecules, including endogenous heme and ZnPP, which are crucial for life.

OBJECTIVE: To determine whether metalloporphyrines (MP) alter the Toll-like Receptor signaling pathway and by which mechanisms.

DESIGN/METHODS: Chinese Hamster Ovary (CHO) cell lines containing an NF-κB reporter gene, leading to cell surface CD25 expression following NF-κB activation were used, as well as CHO cell lines which express, in addition, either TLR-2 (CHO-TLR2) or TLR-4 (CHO-TLR4). All cell lines were treated with heme, ZnMP, CoPP or SnMP (all 10μM) in combination with known ligands for TLR-2 (Pam3Cys) or TLR-4 (LPS) for 30 minutes, 2 hours or 24 hours. Cells were then harvested and cell surface CD25 expression was measured using flow cytometry and CD25 mRNA levels were determined using real time PCR. NF-κB activation as well as differential subunit activation were evaluated using electrophoretic mobility shift assay (EMSA) and supershift gel retardation experiments.

RESULTS: Incubation with LPS or Pam3Cys lead to membrane expression of CD25 in CHO-TLR4 and CHO-TLR2. Interestingly, addition of heme or ZnMP blocked this TLR-ligand-induced CD25 expression, whereas CoPP and SnMP did not.

TLR-ligand-induced total NF-κB activation was no different between the various MPs. However, heme resulted in supershift retardation with p50 and p65 antibodies whereas only p65 gel retardation was observed with the other MPs. In addition, heme blocked TLR-ligand-induced CD25 mRNA synthesis, whereas ZnMP, SnMP and CoPP did not.

CONCLUSIONS: Metalloporphyrins can modulate the TLR pathway, but they do so differentially. Whereas heme inhibits the transcription of effector genes, ZnMP inhibits translation and CoPP and SnMP demonstrate no effect. Regulation of TLR-signaling using different porphyrins may provide a novel therapeutic target for immunomodulation.

66 10:15 AM

Cardiotrophin-1 Prevents Neuronal Death In Vivo and In Vitro

Tongchun Wen, Augusto Sola, Hui Peng, James Moore, Marta Rogido. Division of Neonatal-Perinatal Medicine, Department of Pediatrics, Emory University, Atlanta, GA; Neonatology, MANA and Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: Recently, cardiotrophin-1 (CT-1) has been shown to be neuroprotective for motor, sensory and sympathetic neurons in the peripheral nervous system. Our recent data showed that CT-1 protects neurons from the central nervous system against oxidative injury, and that CT-1 expression is significantly increased within the cortex of the post day-7 (P7) rat brain following focal cerebral ischemia (FCI).

OBJECTIVE: To determine if exogenous CT-1 has a neuroprotective effect on neonatal brain injury caused by FCI in vivo and on neuronal death induced by sodium nitroprusside (SNP, a nitric oxide donor) in vitro.

DESIGN/METHODS: FCI was induced by an intraluminal catheter technique causing middle cerebral artery occlusion in P7 rats as previously described. The pups received a single intraperitoneal injection of 70 ng/kg

of CT-1 or vehicle at 15 min after FCI, which was repeated at 1 and 2 days after FCI. The effects of CT-1 on the infarct volume were evaluated on 1 day (2,3,5-triphenyltetrazolium chloride staining, TTC) and 7 days (cresyl violet staining) after FCI. In the in vitro experiment, neurons from the cerebral cortex of 17-day-old rat embryos were cultured and treated with CT-1. Apoptotic cell death was induced by SNP at 24 h after CT-1 treatment. Then, an ApopTag® peroxidase in situ apoptosis detection kit (Tunel staining) was used to evaluate the cell death, and monoclonal anti-microtubule associated protein 2 (MAP2) was used to detect the neuronal survival.

RESULTS: Exogenous treatment of CT-1 significantly reduced the extent of FCI in the neonatal brain. The infarct volume in the CT-1-treated group was smaller than that in the vehicle-treated group at 1 day (46.7 ± 6.8 vs. 119.8 ± 11.5, $p < 0.01$) and 7 days (54.5 ± 4.8 vs. 145.2 ± 10.5, $p < 0.01$). In the in-vitro experiment, the number of Tunel-positive cells was significantly less and the number of MAP2-positive neurons was significantly increased in the SNP-treated cultures in the presence of CT-1 ($p < 0.01$).

CONCLUSIONS: This is the first study that demonstrates that exogenous CT-1 treatment significantly reduces ischemic injury to the developing brain in vivo after FCI and apoptotic cell death caused by SNP in vitro. These findings provide support for the possible application of CT-1 after stroke in neonates.

Infectious Diseases Platform Session

Saturday, March 10, 2007 **8:15 AM-10:30 AM**

67 8:15 AM Fellow in Training

The Role of Paneth Cells in Neonatal Gastrointestinal and Invasive Candidiasis

Christina M. Long, Lamia M. Soghier, David L. Goldman. Neonatology, Children's Hospital at Montefiore-AECOM, Bronx, NY; Infectious Disease, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Invasive fungal infection occurs in 10% of extremely low birth weight infants and is associated with a high mortality. The gastrointestinal tract is an important entry site for *C. albicans* infection and gastrointestinal colonization often precedes symptomatic disease. Paneth cells have been implicated as important effectors of the innate response for gastrointestinal infections. We hypothesize that Paneth cells play a role in the defense against gastrointestinal candidiasis and that alterations in Paneth cell biology contribute to the enhanced susceptibility of neonates to invasive candidiasis.

OBJECTIVE: To use a neonatal rat model of candidiasis to compare gastrointestinal candidiasis between neonatal and adult rats. To explore Paneth cell – *C. albicans* interactions, and compare the differences between adult and neonatal rats.

DESIGN/METHODS: Adult and neonatal rat pups were intragastrically inoculated with *C. albicans*. Rats were sacrificed and organ fungal burden and histopathologic examinations were performed. The interactions between *C. albicans* and Paneth cells were studied *in vitro*. Crypts containing Paneth cells were isolated from the small bowel of adult rats and rat pups. *C. albicans* was added to cells *in vitro* and the effects on *C. albicans* viability were determined.

RESULTS: Rat pups, not adult rats, developed systemic disease following intragastric inoculation of *C. albicans*. Rat pups exhibited persistent gastrointestinal involvement with prolonged shedding of *C. albicans* within the stool. Intestinal crypt cells (including Paneth cells) isolated from adult rats limited *C. albicans* growth *in vitro*. At 24 and 70 h, growth of *C. albicans* in the presence of adult crypt cells was 14 and 19%, of that observed for *C. albicans* in media alone. In contrast, crypt cells isolated from rat pups were less effective in inhibiting *C. albicans* growth.

CONCLUSIONS: Like premature neonates, rat pups exhibit enhanced susceptibility to *C. albicans* infection. In rat pups, *C. albicans* disseminates outside the gastrointestinal tract following intragastric inoculation. Alterations in the anti-fungal activity of crypt cells in the rat pup appear to contribute to the enhanced susceptibility of pups to gastrointestinal candidiasis.

68 8:30 AM Fellow in Training

Production and Application of Recombinant Human Bocavirus Virus-Like Particles

Deniz Kesebir, Susan Cotmore, Peter Tattersall, Anthony D'Abramo, Jr, Carla Weibel, Jeffrey S. Kahn. Pediatrics, Yale University, New Haven, CT; Laboratory Medicine, Yale University, New Haven, CT.

BACKGROUND: Human bocavirus (HBoV) is a newly identified human pathogen discovered by researchers in Sweden. We have recently demonstrated in a case-control study that this parvovirus is associated with both upper and lower respiratory tract infection in infants and young children. However, the prevalence of this virus in the human population is not known. To date, HBoV cannot be propagated in cell culture and therefore the study of the seroepidemiology and biology of HBoV must rely on recombinant techniques.

OBJECTIVE: To produce HBoV virus-like particles (VLPs) that can be used for both antibody detection assays (e.g. ELISA) and the production of HBoV-specific antibodies.

DESIGN/METHODS: Sequence analysis and comparison of the HBoV genome with other parvoviruses was used to identified the viral protein (VP)2 gene. The VP2 gene was cloned into a baculovirus vector, expressed in insect cells and self-assembled VLPs were isolated on density gradients.

RESULTS: The putative translational start codon of the VP2 gene was identified by sequence analysis of the HBoV genome and comparison with the genomes of other parvoviruses, specifically minute virus of mice and bovine parvovirus. The VP2 gene was amplified by PCR from a clinical isolate of HBoV identified in a child in New Haven and was cloned into a baculovirus vector. Like other parvoviruses, it was assumed that the VP2 protein would self-assemble when expressed in a recombinant system. Extracts of recombinant baculovirus-infected insect cells were subjected to sedimentation-to-equilibrium analysis on iodixanol gradients. Fractions across the gradient were analyzed by SDS-PAGE. A protein band, corresponding to the predicted molecular weight of VP2, was detected exclusively at the position of the 70s particles, demonstrating the production of VLPs. These VLPs were used for both antibody production in an experimental animal and an ELISA to detect HBoV-specific antibodies in human serum. A seroepidemiological investigation of HBoV in children is underway.

CONCLUSIONS: HBoV VLPs, based on the putative VP2 gene, were generated from recombinant baculovirus. Because the means of propagating HBoV have not yet been established, the HBoV VLPs will be invaluable tools to define the seroepidemiology of this newly identified human pathogen.

69 8:45 AM Fellow in Training

Chlorhexidine Disinfection of Central Venous Catheters' Access Ports Decreases Line Sepsis

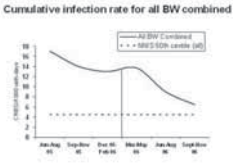
Sulaiman Sannoh, Barbara Clones, Maria Montecalvo, Jose Munoz, Boriana Parvez. Div. Newborn Med., MFCH @ WMC, NYMC, Valhalla, NY.

BACKGROUND: Central venous catheters (CVC) are essential in providing TPN, medications and blood products to neonates with poor venous access but have increased risk of complications with high attributable mortality and cost. CVC-related sepsis (CRBSI) is considered a marker for quality of care and its reporting is mandatory. The annual ICUs' CRBSI rate in USA is higher in NICU (11.3/1000 vs 5.3/1000 catheter-days in all ICU).

OBJECTIVE: To decrease CRBSI in neonates by implementing sequential evidence based CVC interventions.

DESIGN/METHODS: This is a prospective interventional study. Data of all neonates with CVC is entered in the NICU CVC database. Our first interevention was the implementation of a new protocol for access of CVC hub using 2% chlorhexidine instead of alcohol. Audio-visual DVD presentation was used for education of medical staff. We are reporting the incidence of CRBSI before (6/05-2/06) and after (3/06-11/06) the first intervention and comparing it with 50% NNIS.

RESULTS: Data on all 324 patients with CVC out of 946 admissions is presented (164 pre- and 160 post-intervention). The demographic and clinical characteristics of the patients were similar in the two periods with 40% and 37% being <1000g respectively. The overall catheter infection rate decreased from 27% to 16%($p<0.05$); and by 30% in ELBW to 9.2/1000 cath-days in Sept-Nov/06 period. PICC sepsis rates significantly decreased from 23/1000 to 10/1000 catheter-days post intervention ($p<0.05$). There were no CRBSI in the neonates >1500g for 6 months. Device utilization improved in all BW categories. Sepsis caused by Gram negative bacteria was decreased.



CONCLUSIONS: In this ongoing prospective interventional study we have shown significant decrease in CRBSI for all catheter types and BW categories by a single intervention. Audio-visual material was an effective educational tool.

70 9:00 AM Fellow in Training

A Cluster of Transfusion Associated *Babesia microti* Infections in Very Low Birth Weight Infants

Kari A. Simonsen, Joseph I. Harwell, Fatima R. Muriel, Shabnam Lainwala. Pediatric Infectious Diseases/Epidemiology, Brown Medical School, Providence, RI; Neonatology, Brown Medical School, Providence, RI.

BACKGROUND: *Babesia microti,* an erythrocyte parasite, is not removed from red cells through current blood banking practices. No effective screening exists for this organism. The young, old, and immunocompromised are at increased risk for severe disease. We report 4 cases of transfusion associated babesiosis in VLBW infants resulting from a single unit of infected blood.

OBJECTIVE: To report a cluster of transfusion associated *Babesia microti* infections in the NICU.

DESIGN/METHODS: A retrospective chart review of 4 cases.

RESULTS: Case 1, the index case, presented with apnea, fever, edema, hepatosplenomegaly, elevated liver enzymes, direct hyperbilirubinemia, hemolytic anemia, and thrombocytopenia at 33 days after transfusion. A peripheral blood smear revealed *Babesia microti* with 17% parasitemia. Double volume exchange transfusion and treatment with clindamycin and quinine were initiated. The parasitemia decreased to 3.3%. Five days post-treatment when parasitemia rose to 5.8%, another double volume exchange transfusion was done, and azithromycin and atovaquone were added. The infant received 28 days of antibiotics, until 2 consecutive peripheral smears were negative for parasites. Three additional infants were infected from the same unit of transfused blood and all were parasitemic. These infants had mild or no symptoms, and responded well to antibiotic therapy alone.

Babesiosis Cases

Case	EGA (weeks)	Birth Weight (g)	Age at Transfusion (days)	Parasitemia (%)	Medical Treatment	Outcome
1	25	760	2	17	Double volume exchange transfusion x2, Clindamycin, Quinine, Atovaquone, Azithromycin x 28 d	Smear negative after 22 days of treatment
2	24	520	41	single organism on smear	Clindamycin, Quinine x 7 d	Smear negative after 1 day of treatment
3	27	1220	1	0.9	Clindamycin, Quinine x 14 d	Smear negative after 12 days Of treatment
4	27	750	57	1.5	C	Smear negative after 2 days of treatment

CONCLUSIONS: We report 4 cases of babesiosis in VLBW infants of similar gestational ages with markedly variable symptomatology. Antibiotics may be effective for mildly ill patients, however, exchange transfusion may be required for severe illness. There is a need for blood product screening to prevent babesiosis in this high risk population.

71 9:15 AM Fellow in Training

Deciphering the Checkpoints for B Cell Selection in Neonatal Cord Blood

Kavita Kasat, Jie Xu, Karen Hendricks-Munoz, Amy Reichlin. Pediatrics, Division of Neonatology, New York University Medical Center, New York, NY.

BACKGROUND: Autoimmune diseases, such as systemic lupus erythematosus, are caused by dysfunction in the immune system leading to the production of self-reactive antibodies. These antibodies cause damage to the body resulting in debilitating illness. In healthy adults, 50% of immature B cells in the bone marrow are polyreactive and most of these are removed at various "checkpoints." Failure of this immunologic self tolerance can lead to autoimmunity. Previous studies have shown that polyreactive B cells are a major constituent of the cord blood B cell repertoire. However the different types of B cells in neonatal cord blood have not yet been evaluated, including the checkpoints at which the polyreactive or self-reactive cells are removed from the repertoire.

OBJECTIVE: 1. To phenotype neonatal cord blood B cell subsets

2. To evaluate the checkpoints for B cell selection in the neonate.

DESIGN/METHODS: Twenty-two cord blood samples and 8 adult samples were analyzed for B cell subsets using multichannel flow cytometry. Eighteen cord blood serum samples were tested for reactivity to antinuclear antibody (ANA), via immunofluorescent microscopy. These samples were also evaluated by enzyme-linked immunosorbent assay (ELISA) for insulin and lipopolysaccharide (LPS) IgG and IgM.

RESULTS: Neonatal cord blood contains fewer IgG and IgM memory B cells, naïve B cells and naïve resting B cells than adult controls. Cord blood has more transitional B cells and B1 like cells. Sixteen out of 18 cord blood samples were ANA positive. Cord blood had low concentrations of insulin and LPS IgM when compared to adult samples.

CONCLUSIONS: Neonatal cord blood B cell subsets are significantly different from adult cells. This may imply that there is a different signaling pathway leading to selection away from mature B cell phenotypes and to more of an immature autoimmune phenotype. Furthermore, neonatal cord blood contains antinuclear antibody in 89% of specimens which is higher than the presence of ANA in healthy adult females (3-30%). This suggests that neonatal cord blood is reactive to more antigens than adults. However, there is less reactivity leading to IgM antibody production to common antigens than in adults. Therefore, there must be another checkpoint in the neonate which removes polyreactive and self-reactive antibodies from the repertoire.

72 9:30 AM Fellow in Training

Differential Inflammatory Response (IR) to LPS Is Affected by Mode of Delivery (MOD)

Danthanh Hoang, Jeffrey Perlman, Hong Lin, Reshma Narula, Yin Xu, Diane Applegate, Susana Cunningham-Rundles. Peds, NYPH WCMC, NY, NY.

BACKGROUND: The postnatal period places a major challenge on the neonate's immune system, due to direct exposure to neo-antigens, including potential pathogens in the microenvironment. Although clinical illness is rare, signs of IR are relatively common.Hypothesis:The balance between pro and anti-IR is affected by MOD and influences the development of immune response (IR).

OBJECTIVE: Characterize and compare pro- and anti-IR to bacterial lipopolysaccharide, LPS, ex vivo in cord blood (CB) following normal vaginal (VAG) or cesarean section (CS) delivery and to compare differences to infants from febrile mothers (FEB).

DESIGN/METHODS: CB from VAG, CS infants, and those from mothers with temp >38oF were studied ex vivo using whole blood culture with low (1ng/ml) and high dose (HD) (1mcg/ml) LPS for 4 hrs. Intracellular levels of pro- (TNFα, IL-8, IL-12,), anti-inflammatory cytokines (IL-10) and cell surface expression of CD69 were assessed amongst stimulated, unstimulated and control samples in CD14+ monocytes by flow cytometry. Analysis included paired and unpaired t tests.

RESULTS: CD69 $\uparrow$- is a marker of early response to activation; response to HD LPS was observed in VAG and CS* but not in FEB infants. Only CS infants showed a dose dependent response (DR) to LPS; VAG responded only to HD. Subgroup analysis revealed a significant difference between weak and strong responders (mean cells activated 2-9.7 vs. 9.7- 40%) in all groups, even in refractory FEB group. TNFα production was observed for VAG * and CS * but not for FEB infants. A graded DR effect was apparent only in VAG group. TNF αresponse to HD LPS was > in VAG vs CS infants*. IL-10 response to LPS in VAG infants was < vs TNFα response*. Among FEB infants, IL-10 response paralleled that of TNFα- a trend not seen in CS group. No infant required resuscitation, nor developed clinical sepsis.

CONCLUSIONS: These novel, preliminary results suggest the MOD is associated with a differential pattern of cytokine response. FEB infants showed no response to stimulation, which may indicate anergy. However, this group does appear to attempt to grade an anti-IR with a pro-IR. The varied response (weak vs. strong) observed amongst all groups may be revealing of the neonate's vulnerability to potential pathogens. Finally, among VAG infants, the balance is shifted towards a proinflammatory phenotype.* p <0.05.

73 9:45 AM

Polymerase Chain Reaction Technique in the Diagnosis of Neonatal Sepsis: Future Gold Standard?

Victoria Lima, Angel Alpuche, Daniel Noyola, Ruth Soria, Karla Nieto. Neonatology, Hospital Central -Universidad Autonoma de San Luis Potosi, Mexico City, San Luis Potosi, Mexico; Biologia Molecular, IPICyT, San Luis Potosi, Mexico; Microbiology, Universidad Autonoma de San Luis Potosi, San Luis Potosi, Mexico.

BACKGROUND: Sepsis is one of the main causes of morbidity and mortality in neonates. Current gold standard for diagnosis is the blood culture (BC) but it may produce negative results. It is necessary to develop more sensitive methods for the diagnosis of sepsis.

OBJECTIVE: To compare the quantitative real-time polymerase chain reaction (rt-PCR) amplification of bacterial nucleic acids to BC in the diagnosis of neonatal sepsis

DESIGN/METHODS: In neonates with suspected sepsis (December 2004-June 2005), we obtained an aliquot for rt-PCR when a sample for BC was drawn. Rt-PCR was performed using universal primers for bacteria 16S rRNA genes and, when positive, we used genus/species specific primers. We compared the sensibility to detect pathogens in BC vs molecular methods. This study was approved by ethics and research committee and informed consent was obtained.

RESULTS: Samples from 93 suspected sepsis episodes were analyzed and 8 were positive by BC. 17 were positive by rt-PCR using universal primers and 9 were also positive with pathogen specific primers. The remaining samples were identified by sequencing the 16S rRNA PCR products, resulting in: *Klebisella sp* (3), *P. aeuruginosa* (1) and human chromosomes (4). Therefore, 13 samples were considered as positive for bacteria by molecular methods. 10 samples were positive by molecular methods only, 5 by BC only and 3 by both methods. In addition to the bacteria above mentioned *L. monocytogenes, Streptococcus sp., E. cloacae, Streptococcus group D,* coagulase negative staphylococci,and *Enterococcus sp.* were also detected. To determine the diagnostic performance of BC and pathogen detection by molecular methods we used the detection of specific organism by any method (BC, specific primer rt-PCR, or 16S rRNA sequence) as diagnosis for sepsis (18 cases). The sensitivity, specificity, NPV and PPV were 44.4%, 100%, 88.2%, 100% and 72.2%, 100%, 93.75%, 100%, for BC and molecular methods, respectively.

CONCLUSIONS: Rt-PCR offers a high specificity and sensitivity for the diagnosis of neonatal sepsis for bacterial identification. This could ensure a full course of well guided therapy, avoiding incorrect and incomplete treatment.

Metabolism & Obesity Platform Session

Saturday, March 10, 2007 8:15 AM-10:30 AM

74 8:15 AM Fellow in Training

What Is the Critical Age for Obesity Development in Early Childhood?

Melissa E. Glassman, Matilde Irigoyen, Sally E. Findley, Shaofu Chen. Pediatrics, Columbia University, New York, NY; Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND: Children are becoming obese at younger ages. To reverse this trend, interventions should focus on children before obesity develops. Research is needed to identify the critical age at which childhood obesity develops, particularly among inner city children.

OBJECTIVE: To quantify rates of obesity among inner city boys and girls ages 1-5 years and determine the critical age at which obesity rates rise.

DESIGN/METHODS: We conducted a retrospective chart review of randomly selected children ages 1-5 years at a primary care network during Sept. 2004-Jan. 2005 in New York City. Sampling was stratified based on gender and age. Weight and height were abstracted from the patients' medical records. Outcome measures were weight-for-length percentiles for 12-23 month olds and BMI percentiles for age and gender for 2-5 y/o. Based on CDC growth charts, overweight was defined as weight-for-length or BMI percentiles $\geq$85-<95%, and obese as $\geq$95%. Analysis included chi-square, logistic regression, and z tests.

RESULTS: Of the 1,713 children sampled, 52% were boys, 78% Latino, 17% African American, and 85% Medicaid recipients. By age 5, 50.6% of the children were overweight or obese. Overweight increased from 3.7% in 1 y/o to 20.8% in 5 y/o and obesity increased from 7.5% in 1 y/o to 29.8% in 5 y/o (p<.01). The risk of being overweight or obese significantly increased with each successive year of age: compared with 1 y/o, 2 y/o were 3.7 times as likely (95%CI=2.53-5.48); 3 y/o 7.2 (95%CI=4.87-10.63); 4 y/o 7.9 (95%CI=5.28-11.68); and 5 y/o were 8.2 times as likely (95%CI=5.5-12.21). Independent of age and ethnicity, boys were slightly more likely to be obese than girls (AOR=1.3; 95%CI=1-1.64). Significant increases in overweight and obesity occurred between the ages of 2 and 3 years (overweight: 7.5% in 1-2 y/o to 18.4% in 3-5 y/o, p<.01; obesity: 13.7% to 30%, p<.01).

CONCLUSIONS: Among inner city 1-5 year old children, rates of overweight and obesity were significantly above national averages and increased dramatically between the ages of 2 and 3 years. Pediatric interventions aimed at this critical age may have the greatest impact at preventing childhood obesity.

75 8:30 AM House Officer

Obesity Perception in Adolescents and Their Guardians in an Inner City, Minority Population

Vimla P. Bhagwandin, Candace J. Erickson, David H. Rubin. Pediatrics, St Barnabas Hospital/Weill Med Col Cornell Univ, Bronx, NY.

BACKGROUND: Adolescent obesity has risen dramatically from 5% in 1980 to 28% in 2005. Rates may be even higher among inner city, minority populations. Effective intervention depends on both the teen and guardian perceiving overweight status and seeing it as a problem. Limited data exist on teen and parental perception of teen body size in this population.

OBJECTIVE: To assess whether teens and their guardians accurately perceive teens' body size and overweight status.

DESIGN/METHODS: A convenience sample of 12-17 yr olds seen at an inner city general pediatric clinic and their guardians were interviewed separately by bilingual interviewers. A structured interview assessed demographics and perception of the teens' body size (BS) using the Stunkard Figure Rating Scale (SFRS) For each sex, SRFS has 9 line drawings of BS that have been correlated with BMIs. Subjects' heights and weights were measured. BMI percentiles for age and sex were determined and categorized (BMICAT) as: underweight (UNWT) <5%, healthy weight (NLWT) 5-84%, at risk for overweight (ARWT) 85-94%, and overweight (OVWT) $\geq$95%. SRFS pictures were assigned to similar categories (BSCAT) based on their correlated BMIs.

RESULTS: 55 teens and their guardians (91% mothers) were interviewed. Teens were 49% male, age 14.1$\pm$1.6 yrs (mean$\pm$SD), 91% Hispanic, 98% receiving Medicaid, 100% in school.

50.9% teens were ARWT (20%) or OVWT (30.9%), comparable to data from a chart review of 560 well child visits done at an affiliated clinic(ARWT=20%, OVWT=28%).

Teen BSCAT correlated highly with BMICAT (Spearman(SP)=.72, p<.00). All NLWT teens chose pictures that accurately reflected their BS; only 36.4% ARWT and 35.3% OVWT did so, with the others selecting pictures smaller than their BS (Chi^2=33, p<.00).

Guardian perception of teen BS was also highly correlated with BMICAT (SP=.64, p<.00). 96.3% guardians of NLWT teens chose pictures that accurately reflected teen BS: only 18.2% of ARWT and 23.5% of OVWT did so, with the others selecting pictures smaller than the teen BS (Chi^2=26, p<.00).

CONCLUSIONS: Prevalence of ARWT and OVWT in inner city Hispanic 12-17 yr olds is nearly twice the national rate. These overweight teens and their guardians underestimate their BS, failing to recognize their overweight status. This has significant implications for public health and clinical interventions aimed at decreasing obesity among this population.

76 8:45 AM Undergraduate Student

Compulsive Eating and Body Dissatisfaction in Inner-City Obese Adolescents

Douglas Kugel, Jessica Rieder, Carmen R. Isasi. Pediatrics / Division of Adolescent Medicine, Montefiore Medical Center / Albert Einstein College of Medicine, Bronx, NY; Epidemiology, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Compulsive eating, body dissatisfaction, disturbances in self-esteem, and depression have been associated with obesity in adolescents. There is a paucity of data on the effects of obesity and weight change on the psychological health of ethnic minority inner-city adolescents.

OBJECTIVE: To assess the effect of a comprehensive weight loss program on measures of psychological health in a cohort of obese inner-city youth.

DESIGN/METHODS: At entry into a comprehensive weight loss program, 96 subjects underwent a physical exam including height and weight measurements. Subjects completed the Rosenberg Self-Esteem Scale (RSES), the Compulsive Eating Scale (CES), the Depression Self-Rating scale (DSRS), and the Body Dissatisfaction Subscale of Eating Disorders Inventory (BDS). At 6-months, follow-up evaluations were completed by a subset of subjects (N=50). At baseline, mean age was 15.0± 1.99 years (range 12-21), 55/96 (57%) girls vs. 41/96 (43%) boys; 61 % Hispanic (H), 24% African-American (AA); mean BMI 42.10 ± 7.6.

RESULTS: The overall mean BMI at 6-month follow-up was not significantly different from baseline mean BMI (42.0 ± 7.6 vs 42.2 ± 7.3, p=0.60). Of those returning for follow-up, (31/50) 62 % gained weight (mean BMI increase = 1.8 ± 1.50) and (19/50) 38 % lost weight (mean BMI decrease = 2.4 ± 1.69). There were no significant differences in mean baseline RSES, DSRS, CES, and BDS scores by sex, ethnicity, age, or weight change (gain vs. loss) and baseline scores did not differ significantly from follow-up scores. Increase in BMI (6-month BMI-baseline BMI) was positively associated with CES (r=0.38, p=0.01). CES was positively associated with DSRS and BDS (r=0.48, p<0.01, r=0.26, p=0.05, respectively), and negatively associated with RSES (r =-0.42, p<0.01). In subjects that lost weight, BDS scores were significantly lower after the 6 month intervention (36.7 vs 30.2, p=0.01).

CONCLUSIONS: Compulsive eating behaviors are associated with depression, body dissatisfaction and lower self-esteem and may promote further weight gain in obese inner-city youth. The improvements in body satisfaction associated with weight loss have important implications for the development of weight management interventions targeting obese inner-city youth.

77 9:00 AM Fellow in Training

The Role of a Child's Gender on Latino Parental Attitudes towards Obesity

Melissa E. Glassman, Marilyn Figueroa, Linda Cushman, Patricia Hametz, Matilde Irigoyen. Pediatrics, Columbia Univ., NY, NY; Head Start, Columbia Univ., NY, NY; Mailman Sch of Pub Health, Columbia Univ., NY, NY.

BACKGROUND: Parental attitudes towards a child's ideal body size (IBS) influence how they approach weight issues in their children. Few studies have focused on IBS in terms of child's gender, particularly among inner city Latino families.

OBJECTIVE: To investigate how a child's gender shapes Latino parents' attitudes towards IBS.

DESIGN/METHODS: We conducted a qualitative study of a convenience sample of parents of 2-5 y/o children enrolled in a New York City Head Start Program. Focus groups were conducted in Spanish. Audiotapes were transcribed, translated, and coded/analyzed to identify common themes. Parents chose their IBS for girls and boys using a 7-figure graphic scale of drawings of children's bodies (middle figure=50th BMI percentile).

RESULTS: 26 parents (22 women, 4 men) participated in 3 focus groups. Parents were 19-54 y/o (mean=32 y), 100% Latino, and 96% (n=25) immigrants (majority from Mexico and Dominican Republic). IBS results were collected from 23 parents. 14 chose the same IBS for girls and boys; the majority (n=10) chose 1 size less than the middle figure. A theme of gender equality in obesity-associated medical outcomes was elicited as an explanation for this preference. 8 parents chose larger IBS for girls (middle figure for girls and 1 less than the middle for boys). Reasons for this included themes of fashion and "looking good" for girls and of gender inequality in physical activity (boys required thinner bodies in order to maximally engage in physical activities). 1 parent selected a larger IBS for boys than girls. All groups agreed that obesity was a major problem in the community, yet they perceived that girls were more affected than boys. The theme of gender inequality in physical activity emerged again as a possible explanation: parents stated that boys were more active than girls resulting in less male obesity.

CONCLUSIONS: A child's gender plays a role in parental perceptions of obesity and IBS among Latino parents in our sample. This suggests that gender influences how willing a parent may be to recognize and counteract obesity in their child. Themes such as fashion for girls, gender inequality in physical activity, and gender equality in medical outcomes deserve particular attention when counseling patients and their families.

78 9:15 AM

Relationship between Obesity and Grade Level in Bronx Elementary School Children

Marina Reznik, Arthur E. Blank, David Appel, Philip O. Ozuah. Pediatrics, Children's Hospital at Montefiore, Bronx, NY; Family Medicine and Social Medicine, Montefiore Medical Center, Bronx, NY.

BACKGROUND: Childhood obesity is a growing epidemic that disproportionately affects minority and poor children. The full extent and ramifications of this problem remain unknown. We were interested in quantifying the magnitude of obesity in Bronx elementary schools as a prelude to developing targeted interventions. We wondered whether there was a relationship between obesity and advancing grade level.

OBJECTIVE: To examine the relationship between obesity and advancing grade level in Bronx elementary school children.

DESIGN/METHODS: Cross-sectional cohort study of 3,064 children in four Bronx elementary schools in the spring of 2006. All children from kindergarten through grade 5 were enrolled. We obtained height, weight and demographic data on all subjects. Body mass index (BMI) was calculated by using each child's weight, height, age, and gender. In accordance with national guidelines, we used a BMI score ≥85% as a cut off for being "overweight" (BMI 85%-95% defined as "at risk of overweight"; BMI ≥95% as "frankly overweight"). We used spearman correlation analysis to measure the relationship between grade level and overweight status.

RESULTS: 3,064 students participated. 52% were male, 64% Hispanic and 31% African American. Overall, more than 40% of students were "overweight" (23.6% "frankly overweight", 16.7% "at risk of overweight"). We found a positive linear association between advancing grade level and "risk of overweight" (Spearman's rho 0.83, p=.042). Additionally, there was a trend toward a positive linear relationship between increasing grade level and being "frankly overweight" (Spearman's rho 0.66, p=.156) (See Table).

Relationship of obesity to grade level

Grades	Risk of overweight, N (%)	Frankly Overweight, N (%)
Kindergarten	60 (15.4)	68 (17.5)
Grade 1	85 (16.3)	109 (21.0)
Grade 2	71 (14.4)	116 (23.5)
Grade 3	97 (16.4)	160 (27.0)
Grade 4	84 (18.3)	139 (30.2)
Grade 5	126 (20.7)	142 (23.3)

Spearman's rho for "risk of overweight" 0.83, p=.042; Spearman's rho for "frankly overweight" 0.66, p=.156

CONCLUSIONS: A high prevalence of being overweight was observed among Bronx elementary school students. Our findings reveal a positive linear association between increasing grade and "risk of overweight". This association may have implications for targeting obesity prevention efforts.

79 9:30 AM Fellow in Training

Prevalence of Obesity and Metabolic Syndrome in 7th Grade Urban Children

Sunil K. Sinha, Amrit Bhangoo, Viral Gala, Margarita Smotkin−Tangorra, Irina Kazachkova, Jessica Hileman, Neesha Ramchandani, Joyce Munga, Deborah DeSantis, Debbie Perez, Steven Shelov, Michael Rosenbaum, Lisa Altshuler and Svetlana Ten.. Department of Pediatrics, Infant's and Children's Hospital of Brooklyn at Maimonides, Brooklyn, NY and 2Department of Pediatrics, New York Presbyterian Medical Center, NYC, NY.

OBJECTIVE: This study was designed to examine the prevalence of obesity and its complication in 7th grade urban school children.

DESIGN/METHODS: We evaluated 95 healthy students in the 7th grade (12.2 0.57 yrs, 49 girls; 55.8% Hispanics, 21% Asian, 10.5 % Caucasian, 12.6 % African−American). Metabolic syndrome was defined by the presence of any of the 3 components: central obesity (waist circumference (WC) in girls 88 cm, in boys 102 cm); triglyceride (TG) (110 mg/dl); 3) HDL 40 mg/dl; 4) blood pressure (BP) (95th precentile); fasting glucose levels (>100 mg/dl). Insulin, glucose, lipid profiles and anthropometric measurements were done after overnight fasting. QUICKI, acute insulin response (AIR), glucose disposition index (GDI) were measured from rapid IV glucose tolerance test. Children were divided into 3 groups on the basis of the BMI: lean with BMI < 85th%, overweight with BMI 85%, obese with BMI > 95th%.

RESULTS: Obesity and overweight were present in 52.7 % of children. Obesity was present in 32.6 % (31 of 95), overweight in 20 % (19 of 95) and 47.3 (45 of 95) % were lean. WC, % Body fat, SBP, DBP, Insulin, TG, LDL, AIR was higher in obese comparing to lean and overweight, while QUICKI was lower (p < 0.05). Overweight had higher WC, % of body fat, SBP comparing to lean, but no difference in biochemical parameters. 38.7 % (12 of 31, 8 girls) of obese had metabolic syndrome, 10.5 % (2 of 19, 1 girl) and none in the lean group.

CONCLUSIONS: Complications of obesity such as dyslipidemia, HBP, increased WC, elevated fasting glucose were highly prevalent in obese children already at 12 yrs of age with fully developed metabolic syndrome in more than 1/3 of obese children. Early intervention is quintessential to stop complications of obesity.

80 9:45 AM

Why Do Some Adolescents Lose Weight and Others Not?: A Qualitative Study

Diana Harris, Alexis Lieberman, Jessica Robbins. Dept of Pediatrics, Albert Einstein Medical Center, Philadelphia, PA; Epidemiology, City of Philadelphia, Public Health Department, Philadelphia, PA.

BACKGROUND: The experiences of overweight adolescents who have lost weight may be useful in the creation of effective weight loss programs.

OBJECTIVE: To identify qualitative differences between the experiences of overweight, inner city adolescents who lost weight compared to those who gained weight over time.

DESIGN/METHODS: A qualitative study of a convenience sample of 10 at-risk and overweight inner-city teens who decreased BMI-for-age, compared to 12 who increased, over 2 or more years. Audio-taped and transcribed focus groups and in-depth interviews were subjected to the constant comparative method among researchers to identify themes re: eating patterns, habits, school and home, the experience of being overweight. Thematic responses were noted by the number of interviews in which they appeared; frequencies for each group were compared.

RESULTS: Multiple similarities and several important differences were found. Adolescents in both groups had poor diets, similar rates of eating with parents, complex effects of monetary constraints, "mixed" dislike but acceptance of being overweight, and similarly unsafe neighborhoods. "Decreasing" adolescents were more likely to describe a "transformative experience" which changed their view of themselves in the world with regard to weight and activity, i.e. being recruited to a city-wide basketball team, being sent to boot camp or noticing other basketball players had more stamina: *They sweat a lot, but they don't get tired, and I get tired.* Other transformative experiences were medical: *She (doctor) said I had a chance… I don't want to have diabetes.*

8/10 of those who lost weight engaged in intense, daily exercise, only 1 who gained weight did. Weight-losers had family members who educate them in healthy dietary behavior: *My grandmother tells me… don't just grab soda, cake. Grab… a piece of fruit.* In contrast, weight gainers often had family members who supported them to accept their weights: *My mom will say, I don't think you-all are fat, I just think you are thick.*

CONCLUSIONS: Overweight adolescents who lose weight were more likely to have transformative experiences, engage in intense daily exercise, and have family members who support them in healthy eating. This may guide the development of new weight loss strategies.

81 10:00 AM House Officer

Improved Access to Physical Activity Facilities: Impact on Overweight, Inner-City, Minority Adolescents

Juli Tomaino, Unab Khan, Jessica Rieder, Carmen Isasi. Dept. of Peds., Div. of Adol. Med., Children's Hospital at Montefiore, NY; Dept. of Epidemiology, Albert Einstein College of Medicine, NY.

BACKGROUND: Rising rates of adolescent overweight have been associated with decreases in physical activity and increases in sedentary behaviors, especially in low socioeconomic areas with limited access to physical activity (PA) facilities. The impact of improved access to PA facilities has not been extensively studied in severely overweight inner city adolescents.

OBJECTIVE: To assess the effect of a multidisciplinary weight loss program at an inner city children's hospital on physical fitness, levels of PA and sedentary behaviors in severely overweight inner-city adolescents.

DESIGN/METHODS: Forty-nine overweight adolescents completed the Modifiable Activity Questionnaire for Adolescents (MAQ) and the Canadian Home Fitness Step Test (CHFT). Participants received weekly one-hour group education and one-hour physical activity sessions. Of the 30 subjects seen at 6-month follow up, 26 completed the MAQ and CHFT. At entry, mean age of participants was 14.8 years (range 12 – 19 years); 67% girls; 61% Hispanic and 37% Black. Mean BMI was 41.8 ± 8.5. Pre and post-intervention comparisons were made using non - parametric tests.

RESULTS: At entry, 25 (61%) subjects watched >4 hours of television (TV) daily, 24 (58%) participated in light physical activity < 2 times per week and 27 (66%) participated in vigorous physical activity < 2 times per week. Post intervention, the mean BMI did not change significantly; 8/30 (27%) adolescents lost weight and 22/30 (73%) gained weight. CHFT duration increased (181 ± 90 sec. vs. 216 ± 95 sec; p= 0.04) with no significant change in pulse. Leisure time PA participation increased in baseball, basketball, cheerleading, dancing, football, jumping rope, hockey, volleyball and weight training (p=<0.05 for each activity). Of those who lost weight, the proportion participating in light PA increased significantly (26.9% vs. 36.8%; p= 0.04). There was no significant change in vigorous PA or hours of TV viewing.

CONCLUSIONS: Increased access to PA facilities can improve aerobic fitness, participation in light PA and leisure time PA in predominantly sedentary, severely overweight inner city, minority adolescents. Sustained access to PA facilities may contribute to improving fitness and decrease in BMI.

82 10:15 AM

Projecting the Burden of Childhood Obesity in America to 2030: Demographics and Disparities

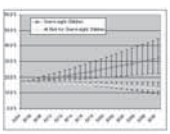
Leonardo Trasande, Clyde B. Schechter, Matthew W. Gillman, Trudy L. Burns, David A. Savitz, Philip J. Landrigan. Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY; Family Medicine, Albert Einstein College of Medicine, Bronx, NY; Ambulatory Care and Prevention, Harvard Medical School and Harvard Pilgrim Health Care, Boston, MA; Public Health Genetics and Epidemiology, College of Public Health, University of Iowa, Iowa City, IA.

BACKGROUND: The prevalence of childhood obesity continues to increase rapidly, especially among minority groups. Rapid population growth, especially in Hispanic and Black children, is likely to occur over the next 25 years. To date, no study has analyzed the combined impact of continued increases in childhood obesity with population changes in America.

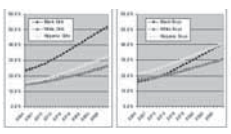
OBJECTIVE: To forecast burden, prevalence and demographics of childhood obesity through 2030, and assess the impact of a range of possible increases in prevalence/rates of population growth.

DESIGN/METHODS: We developed mathematical models that use data from the National Health and Nutrition Examination Survey, the National Longitudinal Survey of Youth, and the US Census Bureau.

RESULTS: If present trends continue unchecked, 38.3 million (45.0%) of US children will be overweight or at risk for overweight in 2030. The number of overweight Hispanic children will triple to 8.0 million, while the number of overweight Black children will increase from 2.2 to 6.1 million. Increases among whites will be modest (69.4%, from 7.1 to 12.0 million). A majority of overweight girls and boys will be Black/Hispanic (51.3% in 2030 versus 37.4% in 2004).



Projected Changes in Overweight and At Risk for Overweight Prevalence in America, 2004-2030, Base Case Estimate (Error Bars Show Bounds of Sensitivity Analysis)



Projected Changes in Overweight Prevalence in America, by Race/Ethnicity and Gender, 2004-2030, Base Case Estimate

CONCLUSIONS: The number with childhood obesity will likely continue to increase dramatically over the next 25 years. Disproportionately increasing rates among racial/ethnic minorities, combined with increases in the numbers of children in these groups, portend widening disparities in childhood overweight and its consequences.

Plenary #2
Platform Session

Saturday, March 10, 2007 **1:10 PM-4:00 PM**

83 2:00 PM

Cosmetic Outcomes of Absorbable Versus Nonabsorbable Sutures in Pediatric Facial Lacerations

Raemma P. Luck, Robert E. Flood, Dalit Eyal, John Saludades, John Gaughan. Pediatrics, Temple University Children's Medical Center, Philadelphia, PA.

BACKGROUND: Recent studies, involving mostly adult patients, suggest that lacerations repaired with absorbable sutures and non-absorbable sutures have similar cosmetic outcomes.

OBJECTIVE: 1) To compare the long-term cosmetic outcomes of absorbable versus non-absorbable sutures for facial lacerations in children 2) To compare the complication rates and parental satisfaction in the two groups.

DESIGN/METHODS: Healthy patients, 1-18 years in age, presenting to a pediatric emergency department with facial lacerations, 1-5 cm in length, were randomized to repair using fast-absorbing catgut (FAC) or Nylon (NYL) suture. Patients were excluded if the laceration could be repaired with a tissue adhesive, had irregular boarders, were the result of a mammalian bite, were significantly contaminated, or were > 8 hours old. Patients were followed up at 5-7 days and at 3 months, at which time photographs were taken and parental satisfaction questionnaires were given. Using a 100 mm cosmesis Visual Analogue Scale (VAS), a non-inferiority design was applied with a difference of $\leq$15 mm considered to be clinically equivalent (Minimal Clinically Important Difference = MCID). Three blinded observers rated the wounds at 3 months as did the parents; an intra-class correlation coefficient (ICCC) was calculated and $p < 0.05$ was considered significant.

RESULTS: Of the 88 patients initially enrolled, 47 patients completed the study: 23 in the FAC group and 24 in the NYL group. There were no significant differences in age, race, sex, wound length, number of sutures, and layered repair rates in the two groups. The observers mean VAS for the FAC group was 92.3(CI: 89.1, 95.4) and for the NYL group was 93.7(CI: 91.4, 96.0), with a mean difference of 1.4, which was less than the MCID of 15 mm ($p < 0.01$, power >95%, ICCC = 0.45). The Mean Parental VAS score for the FAC group was 86.3 (CI: 78.4, 94.1) and for the Nylon group was 91.2 (CI: 86.9, 95.4), with a mean difference of 4.9, also less than the MCID ($p < 0.02$). There were no significant differences in the rates of infection, wound dehiscence, keloid formation, and parental satisfaction.

CONCLUSIONS: The use of fast absorbing catgut suture is a viable alternative to non-absorbable suture in the repair of facial lacerations in children.

84 2:15 PM

Effect of Human Single Chain Variable Fragments (scFv) Specific to the *Candida albicans* Adhesin, Als3, on Adherence to Endothelial Cells

Joseph M. Bliss, Sonia S. Laforce-Nesbitt. Pediatrics, Women & Infants Hospital of Rhode Island, Brown Medical School, Providence, RI.

BACKGROUND: *Candida albicans* is an important pathogen of the immune compromised, including the premature infant. This fungus converts from a yeast to a hyphal growth morphology in disease states, and this transition has been linked to its virulence. We have previously reported isolation via phage display of human antibody fragments (scFv) specific to the hyphal form of this organism. Despite initial characterization of these scFv, the cognate antigen(s) have remained elusive. We identified the *C. albicans* adhesin, Als3, as a potential cognate antigen for these scFv based on similarity of the binding pattern of the scFv to the distribution of this protein on the hyphal surface.

OBJECTIVE: The objectives of this study were to identify the cognate antigen(s) recognized by these scFv and evaluate effects of the scFv on biological properties associated with the antigen(s). These studies are an important first step in the identification of potential immunotherapeutic roles for these reagents.

DESIGN/METHODS: *C. albicans* strain 1843 (generously provided by L. Hoyer) contains a homozygous deletion of the *ALS3* gene (*als3*Δ/*als3*Δ). Immunofluorescence assays (IFA) were conducted to determine binding patterns of each scFv to mutant 1843 and a related wild-type strain. To assess the ability of scFv to interfere with adhesion, assays of adhesion to human umbilical vein endothelial cells (HUVEC) were conducted with wild-type and mutant strains, in the presence and absence of scFv.

RESULTS: All scFv bound avidly to wild-type. Three scFv (2, 3, and 6) showed no detectable binding by IFA to the *als3*Δ/*als3*Δ mutant, 1843, confirming that Als3 was their cognate antigen, while binding with two scFv (5 and 12) to the mutant persisted. In adhesion assays using HUVEC, the mutant strain showed approximately 50% of wild-type adherence. In preliminary experiments, pretreatment of the wild-type strain with Als3-specific scFv interfered, reducing adherence to levels similar to the *ALS3* mutant.

CONCLUSIONS: These experiments confirm that human scFv have been isolated that are specific to an antigen implicated in virulence of *C. albicans*, and suggest that they may have a role in interference with adhesion to human cells. These observations support the notion that this approach may lead to novel agents that can be applied as immunotherapy for patients at risk.

85 2:30 PM

VEGF Attenuates Hyperoxic Injury through Decreased Apoptosis in Explanted Embryonic Rat Lung

Americo Esquibies, Alia Bazzy-Asaad, Farshid Ghassemi, Hitoshi Nishio, Anil Karihaloo, Lloyd Cantley. Pediatrics; Internal Medicine, Yale University, New Haven, CT.

BACKGROUND: O2 tension modulates physiologic and structural properties of lung morphogenesis, a process that is regulated by numerous cytokines and factors. Among the latter is vascular endothelial growth factor (VEGF) which is present in rodent airway epithelium by embryonic day 11.5 (E11.5) and plays a role in lung development. Hypoxia stimulates VEGF production and hyperoxia reduces it.

OBJECTIVE: Hypoxia-induced VEGF expression is critical for normal airway development, and VEGF down regulation in hyperoxia may play a significant role in failure of this process.

DESIGN/METHODS: A quantitative model of in vitro lung development was utilized to examine the effects of hyperoxia on embryonic lung morphogenesis and VEGF expression. E12 lung explants were cultured at 37ºC with 3%O2 (to mimic in utero lung oxygenation) and 50%O2 (hyperoxia) for 2 and 4 days.

RESULTS: Total number of terminal bud branches and total branch length were quantitated at 0, 2 and 4 days and found to be moderately reduced after 2 days in 50%O2, and significantly reduced after 4 days as compared to 3%O2 (19±2 vs 51±7 and 5.9±0.6mm vs 14.6±1.9mm $p<0.05$). We asked whether these hyperoxic findings were related to changes in cell proliferation or apoptosis. We found that after 2 days there was an increase in cell apoptosis and a decrease in cell proliferation rate in 50%O2 as compared to 3%O2. (10.7±3% vs 3.2±1.7% and 1.9±0.2% vs 10±4% $p<0.05$). Real time PCR showed that mRNA for VEGF164 and VEGF188 was significantly reduced by exposure to 50%O2 as compared to 3%O2; the addition of recombinant VEGF165 (50ng/ml) to explants grown for 4 days in 50%O2 resulted in partial reversal of the decrease in bud branching and total branch length (3%O2: 51±7 and 14.6±1.9mm; 50%O2: 19±2 and 5.9±0.6mm; 50%O2+VEGF: 24±0.5 and 8.8±1.1mm $p<0.05$ vs 50%O2 alone). Finally, the partial reversal of lung growth retardation after 2 days in 50%O2+VEGF was associated with a decrease in apoptosis (5.9±3% vs 10.7±3% in 50%O2 alone $p<0.05$).

CONCLUSIONS: Hyperoxia suppresses VEGF expression and inhibits airway growth and branching. Our findings suggest that manipulation of the apoptotic pathway might provide a therapeutic approach for the prevention of hyperoxic airway toxicity.

86 3:00 PM

Functional Ischemia and Phosphodiesterase-5 Inhibitor Therapy in a Mouse Model of Muscular Dystrophy

Akihiro Asai, Jeevendra Martyn, Shingo E. Yasuhara. Department of Anesthesiology and Surgery, Massachusetts General Hospital, Shriners Burns Hospital, Boston, MA.

BACKGROUND: Duchenne Muscular Dystrophy (DMD) is characterized by muscle wasting. The precise pathophysiology is not clear. Previous studies suggested that lack of dystrophin causes a defect in muscular blood flow response after contraction, a pathological state called “functional ischemia”.The cause-effect relationship between functional ischemia and the induction of the disease has not been clearly elucidated.

OBJECTIVE: In this study the role of blood flow regulation in the pathogenesis of muscular dystrophy was evaluated using *in vivo* microscopic assays: We examined how blood flow responds to muscle contraction in *mdx* and control mice, whether NO/EDHF production is attenuated in *mdx* mice, and whether augmenting the nitric oxide pathway can prevent functional ischemia and the myofiber damage. Next, the phosphodiestease-5 inhibitor, tadalafil, was evaluated for its potential as a therapeutic agent to reduce muscle damage.

DESIGN/METHODS: The sternomastoid muscle of 3-6 month-old live male *mdx* mice was observed by *in vivo* microscopy. Stained RBCs were injected and the numbers of RBCs passing per unit time at primary arterioles were counted with/without tetanic contraction (50Hz) or local administration of pharmacological reagents. NO/ EDHF production was measured with detection dyes, DAF-FM /H2-DCFDA. The numbers of damaged myofibers were counted by morphological analyses with DiOC6 staining. As a therapeutic study, *mdx* mice were treated with tadalafil (2mg/day/kg) for 4 weeks and damaged myofibers quantified histologically with Evans Blue dye assay.

RESULTS: In *mdx* mice, contraction-induced increase in RBC flux and NO/EDHF production was completely deficient as compared to control mice (-4.0% vs. 65.3% increase for RBC flux, -5.0%/4.4% vs. 69.9%/110.2% for NO/EDHF). SNAP and 8-CPT-cGMP reverted the dysfunctional blood flow response in *mdx* mice (96.8%, 58.7% increase). Replenishing NO or bypassing its lack by 8-CPT-cGMP prevented exercise-induced cell death in *mdx* mice. This finding was supported by an experiment with tadalafil treatment of *mdx* mice showing decreased amount of dying fibers in the hindlimbs (Gluteus 8.1%, Gastrocnemius 26.3%, Quadriceps 49.3% of non-treatment group).

CONCLUSIONS: Impaired blood flow (functional ischemia) plays a primary role in the myofiber damage in DMD. Tadalafil prevents the progress of the disease.

87 3:15 PM Undergraduate Student

In Vivo Functions of Heme Oxygenase-1 in Postnatal Lung Development

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BACKGROUND: Postnatal maturation of the lung requires proper alveolar development. In neonatal mice, previous studies have shown that daily injection of Dexamethasone (DEX) resulted in severe disruption of lung septation, whereas injection with Retinoic Acid (RA) showed more numerous and smaller alveoli. Heme oxygenase-1 (HO-1) is expressed at high levels in the lung during the neonatal stage. HO-1 also protects against oxidative stress and can increase cell proliferation.

OBJECTIVE: We hypothesize that HO-1 is involved in postnatal lung alveolar development and that alteration of HO-1 expression will contribute to the protection against lung injury.

DESIGN/METHODS: To determine whether DEX and/or RA can regulate HO-1 via transcriptional control, DEX and/or RA was injected into transgenic mice expressing an HO-1 promoter-driven luciferase reporter (HO-1-luc). These mice were injected daily with either DEX (1μg/pup) and/or RA (500μg/kg), while control groups included no injection, saline, cottonseed oil (CSO), and saline with CSO, the delivery vehicles for DEX and RA, respectively. The mice were monitored every day for 14 days after birth with the In Vitro Imaging System. This method allows us to monitor the photon emission imaging, which directly represents the HO-1 promoter activity in the same animal during the entire experiment. Lung samples were harvested at 1, 3, 5, 10, 15 and 30 days after birth for histology and protein analysis.

RESULTS: HO-1 promoter activity and protein expression were down-regulated in the lungs of DEX-injected neonatal mice. Furthermore, HO-1 deficient mice displayed disrupted lung development with disorganized and simplified alveolar structures. Postnatal DEX treatment further disrupted lung histology in HO-1 mutants. As with previous studies, DEX resulted in disruption of lung septation and RA improved the DEX phenotype.

CONCLUSIONS: These results suggest that DEX and RA may mediate their effects on postnatal alveolar development in part through HO-1. This suggests that DEX modifies other pathways as well as HO-1. Overall, these results suggest that HO-1 plays an important role in postnatal alveolar development.

88 3:30 PM Medical Student

Phosphatase-Defective *PTPN11* Mutations Causing LEOPARD Syndrome Have Gain-of-Function Effects during *Drosophila* Development

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BACKGROUND: LEOPARD syndrome (LS) is an autosomal dominant disorder with pleiomorphic features including lentigines, pulmonary stenosis, short stature, and deafness. LS resembles Noonan syndrome (NS) and, like NS, can be caused by missense *PTPN11* mutations. *PTPN11* encodes the protein tyrosine phosphatase, SHP-2. In vitro biochemical analyses indicated that LS alleles engender loss of phosphatase activity and have dominant negative effects on signal transduction, while NS mutations result in gain of function (GOF). Our transgenic *Drosophila* model of NS expressing the commonest mutation, N308D, in *corkscrew (csw)*, the fly homologue of *PTPN11*, has ectopic wing veins due to increased EGFR/Ras/MAPK signaling. It remains unclear what effects LS mutants have in a developmental context and how mutations with opposite effects elicit overlapping phenotypes.

OBJECTIVE: To characterize the effects of LS mutant CSW during *Drosophila* development.

DESIGN/METHODS: Site-directed mutagenesis was performed to introduce two recurrent LS mutations, Y279C and T468M, into the *csw* cDNA. LS transgenic flies were generated using P-element transposition. Mutant transgene expression was driven using the UAS/GAL4 system. Immunohistochemistry was performed with anti-dpERK antibody.

RESULTS: Expression of the LS alleles with eye-specific drivers rescued the rough eye phenotype of a hypomorphic *csw* allele (csw^{ts}), documenting at least residual function. Ubiquitous expression of the LS transgenes at 25°C did not induce a detectible phenotype. Increased transgene expression at 29°C resulted in ectopic wing veins as observed in the GOF NS allele, N308D. The wing vein phenotype was more severe in Y279C than T468M. Immunostaining of embryos ubiquitously expressing the LS transgenes revealed levels of ERK activation that were higher than in wild type embryos but lower than in embryos overexpressing wild type CSW.

CONCLUSIONS: Expression of the LS alleles rescued a *csw* hypomorphic phenotype, induced a GOF phenotype and increased ERK activation, effects that are inconsistent with the previously posited dominant negative behavior. Future work will be directed at determining whether this is attributable to the minimal residual phosphatase activity of these mutants or GOF effects on docking with other signal transducers.

89 3:45 PM Fellow in Training

Mechanisms by Which Maternal Obesity Induce Obesity in the Offspring

Sarbattama Sen, Lisa A. Salvador, Rebecca A. Simmons. Pediatrics, The Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Maternal obesity increases fetal and neonatal adiposity and offspring of obese mothers are at risk for obesity in later life. Adipose cells are derived from pluripotential stem cells and adipogenesis is controlled by a network of genes which play an important role in the genesis of obesity in the offspring. Two genes, HoxA5 and Gpc4 are differentially expressed in visceral fat of obese humans and rodents.

OBJECTIVE: Determine if offspring born to dams fed a cafeteria diet are phenotypically different from offspring of those fed regular chow and if obesity in pregnancy alters expression of genes critical to adipogenesis (HoxA5, Gpc4).

DESIGN/METHODS: Three groups were studied: (1) fed a cafeteria diet (high calorie, high carbohydrate, high fat) from the time of weaning until the time of breeding-10 weeks of age-Prepreg; (2) fed a cafeteria diet before and throughout pregnancy (Pre+Preg); (3) Controls fed regular rat chow. There was no significant difference in food intake between groups after approximately 2-3 weeks. Pups in all three groups were cross-fostered to normal female rats. Data shown for offspring are for females only. Data were analyzed by ANOVA. RNA was isolated from fat of 2 wk and 2 mo offspring and analyzed by real-time PCR.

RESULTS: Birth weights of the pups from the 3 groups did not differ and averaged 5.09 ± 0.05, 5.08 ± 0.05, and 5.10 ± 0.04 (Con, PrePreg, and Pre+Preg; n= 10 litters from each group). Despite no difference in body weight, offspring of cafeteria fed rats had increased % fat mass at 2 weeks (via DEXA): Con:11.1±0.5%; PrePreg:15.3±0.5*; Pre+Preg:15.7±0.6*(*$p<0.05$ vs. Con, n=5 each group). At 6 months of age, adiposity was further increased in the offspring of cafeteria fed dams and was nearly 2-fold higher in both treatment groups ($p<0.05$, n=5 each group). GTT’s and ITT’s at 6 months demonstrated mild glucose intolerance and insulin resistance in offspring of cafeteria fed dams ($p<0.05$, n=5 each group). HoxA5 and Gpc4 expression were significantly increased in offspring of cafeteria fed rats: Hox A5 Con 300±200; PrePreg: 600±20*; Pre+Preg:900±100* arbitrary units (*$p<0.05$ vs. Con, n=3 each group). Gpc4: Con 30±5; PrePreg: 90 ± 10*; Pre+Preg: 60±5* arbitrary units (*$p<0.05$ vs. Con, n=3 each group).

CONCLUSIONS: Exposure to the in utero environment of maternal obesity leads to both phenotypic and genotypic changes related to adipogenesis in offspring.

90 4:15 PM

Treatment-by-Gender Effect When Aiming To Avoid Hyperoxia in Preterm Infants in the NICU

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BACKGROUND: Exposure to hyperoxia can impact the developing brain. Studies advocate avoiding hyperoxia during resuscitation; we showed that SpO_2 targets of 85-93% are associated with ROP and BPD reduction and improved outcomes. We and others have reported gender specific differences to therapies for central nervous system injury. No study has analyzed the treatment-by-gender effect of practices related to neonatal oxygenation.

OBJECTIVE: To examine if gender gender specific differences exist in the response to SpO_2 targets aimed at avoiding hyperoxia in newborns (NB) <1250 g.

DESIGN/METHODS: Prospectively collected database of NB <1250 g in two centers in 2000-2004. Prior to a change in practice (Period I, 1/2000-12/ 2002) SpO_2 limits were 92% and 100%. After 1/2003 (Period II), limits of SpO_2 were 93% and 85%. Main outcome variables compared between the two periods: mortality, length of stay (LOS), ROP, BPD, IVH and PVL. We compared gender specific effect size, relative risk reduction (RRR) and number needed to treat (NNT). Regression analyses was done to adjust for confounders. SPSS (version 13.0); p <0.05 considered significant.

RESULTS: A total of 692 NB admitted;195 were excluded (17% outborn, 4% major congenital anomaly and 8% received comfort care until early demise). Of the 497 NB with enrollment criteria, 297 (60%) were born in Period I; 140 (47%) were male. Of the 200 NB in Period II, 101 (50%) were male. In Period II females had a significantly shorter LOS than males (p<0.01), a lower rate of BPD (48% vs 56%) with a more significant RRR (45% vs 21%) and NNT (4.5 vs 8); p=0.02. The reduction of ROP in Period II was also significantly better in females (RRR 40% vs. only 6% in males, p=0.004). In order to prevent one case of severe ROP one would need to treat 5 females compared to 20 males. Mortality, IVH and PVL were similar between the periods with no gender specific detrimental effect in response to therapy.

CONCLUSIONS: The implementation of a practice aimed at avoiding high SpO_2 in NB < 1250 g produces different treatment-by-gender effects, with females having a more robust improvement in outcome variables. Future studies may elucidate the basis for the different effect size found; gender specific effects of perinatal-neonatal interventions may be more prevalent than previously acknowledged.

91 4:30 PM House Officer

Gender Modifies the Neurodevelopmental Effects of Perinatal Stressors

Jiliu Xu, Bernie Z. Karmel, Judy M. Gardner, Michael J. Flory, Anantham Harin, Anthony Barone, Simon S. Rabinowitz. Pediatrics, St Vincent Catholic Medical Center, Staten Island, NY; Infant Development, Institute for Basic Research, Staten Island, NY.

BACKGROUND: Males require special education and chronic institutionalization more frequently than females, but no proven hypothesis has explained this disparity. The authors have conducted serial NIH funded longitudinal neurodevelopmental investigations in a cohort of at risk infants admitted to a single NICU.

OBJECTIVE: To determine if perinatal stressors yield any differences in their effect on cognitive and motor neurodevelopmental outcomes in male versus female infants.

DESIGN/METHODS: 583 infants (≤34 weeks (wks) gestation age (GA) and ≤2100g birth weight (BW)) were administered Mental and Psychomotor Development Indices (MDI, PDI) of the Bayley Scales of Infant Development (BSID-II) every 3 months from 4-25 months (M=5.6 tests/infant). 52% of the infants were boys. GAs were: 34-33wks (17%); 32-30wks (43%); 29-27wks (28%); and 26-23wks (12%). IUGR was defined as ≤10% BW for GA. The cohort contained 34% moderate and 14% severe CNS injury based on radiographic imaging. Statistical analyses employed generalized estimating equations.

RESULTS: Overall, boys had lower developmental scores than girls (MDI: $\chi^2_{(1)}$= 5.8, p<.02; PDI: $\chi^2_{(1)}$=6.4 ,p<.02). The entire cohort had more apparent decline from normal scores with increasing age. However, there was a greater decline noted for boys than girls (MDI: $\chi^{2(1)}$= 19.1, p<.001; PDI: $\chi^{2(1)}$= 5.2 , p<.03). IUGR boys showed faster declines over age than did IUGR girls for MDI ($\chi^2_{(1)}$ = 5.7, p<.03) but not for PDI. While both boys' and girls' scores were lowered by CNS injury, boys were more affected than girls across age (MDI: $\chi^{2(1)}$=12.4, p<.001; PDI: $\chi^2_{(1)}$=7.2, p<.01). Among those infants with severe CNS injury, boys declined more in MDI than girls (MDI: $\chi^2_{(1)}$=19.5, p<.001) but similarly in PDI.

CONCLUSIONS: Perinatal stressors cause a greater declining trajectory of cognitive and motor BSID-II scores in boys than girls. This suggests an intrinsic protective mechanism that allows newborn females to tolerate various perinatal insults better than males. This mechanism may contribute to the overrepresentation of males in various cohorts of developmentally delayed and special needs children and adults.

92 4:45 PM House Officer

Effect of Tocolytic Dose of Magnesium Sulfate for the Treatment of Preterm Labor on Neonatal Mortality and Morbidity among Preterm Infants

Mayoor S. Bhatt, Lourdes M. Cohen, Susana Rapaport. Pediatrics, Flushing Hospital Medical Center, Flushing, NY.

BACKGROUND: Magnesium sulfate is the most commonly used first-line tocolytic agent among obstetricians. Its safety and efficacy in preterms have not been evaluated rigorously. Recently various studies of neonatal mortality associated with its use were reported adding to the growing disquiet in regard to the question of a neuroprotective effect and tocolytic safety.

OBJECTIVE: To determine the association of various tocolytic doses of magnesium sulfate and neonatal morbidity as measured by presence of IVH (Intraventricular hemorrhage), PVL (periventricular leukomalacia) detected by head sonogram in preterm infants and neonatal mortality defined by death in first 28 days of life.

DESIGN/METHODS: Retrospective study of 63 preterm babies < 34 weeks gestation born to mother who had received magnesium sulfate as a tocolytic agent for preterm labor at Flushing Hospital Medical Center from January 2003 to November 2006. Neonates were divided into two groups. Group one (n=33) received high dose of magnesium sulfate (> 40 grams) and group two(n=30) received low dose of magnesium sulfate (< 40 grams). We excluded mother who received magnesium sulfate for preeclampsia or preeclampsia superimposed on chronic hypertension, and neonates with major congenital anomalies. Comparisons were made for incidence of IVH, and its severity (Grade I, II=mild , Gr III,IV=severe), PVL and neonatal mortality . The data were analyzed using SPSS statistical software.

RESULTS: Controlling for birth weight, sex, gestational age, maternal age, maternal race, administration of prenatal steroid and surfactant, ventilation therapy in a multivariable model, we found that exposure of high doses of tocolytic magnesium sulfate was significantly (p<0.05) associated with increased incidence of mild IVH in group 1 (12/33) vs. group 2 (0/30). Furthermore, babies in group 1 had statistical significant (p<0.05) lower Apgar score at 1 and 5 minutes, required CPR at birth and higher incidence of sepsis and RDS as compared to group 2. No statistical significant differences in the two groups were found in terms of PVL and mortality (p>0.05).

CONCLUSIONS: Our findings support the hypothesis that high doses of tocolytic magnesium sulfate are associated with increased incidence of mild IVH among preterms babies. Hence, use of high dose tocolytics magnesium sulfate should be use judiciously.

93 5:00 PM Fellow in Training

Comparison of Utilization of Interventional Therapies between Moderately Preterm and Very Preterm Infants at 12 Months Corrected Age

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BACKGROUND: Moderately preterm infants (MP; 32-36 wks gestation) comprise the majority of preterm infants. Their morbidity and mortality rates are higher than full term babies, yet there is scant literature regarding their developmental outcomes and therapeutic needs.

OBJECTIVE: To determine the requirement for therapeutic services in MP infants compared to their very preterm (VP; <32 weeks gestation) counterparts, at 12 months corrected age (CA).

DESIGN/METHODS: Preterms seen at the Regional Neonatal Follow-up Clinic at 12 mo corrected age (CA) were stratified into MP and VP groups. Logistic regression was used to compare odds ratios (ORs) for enrollment into early intervention (EI) and use of physical therapy (PT), occupational therapy (OT), speech therapy (ST) and special education (SE). Adjustments were made for antenatal, demographic, and neonatal factors.

RESULTS: The dataset contains 497 preterm (< 37 wks gestation) infants. Those evaluated at 12 ± 2 mo CA were included in the analysis (n=169). VP infants (n=77) and MP infants (n=92) had a mean CA of 12.1 mo and 11.9 mo respectively at 12 mo CA. In the MP, 36% were enrolled in EI, 28% received PT, 17% OT, 16% ST, and 8% SE. In the VP, 70% were enrolled in EI, 66% received PT, 32% OT, 32% ST, and 21% SE. VP patients were more likely to be enrolled in EI (OR 4.2, 95% CI 2.2-8.0) and receive PT (OR 5.0, 95% CI 2.6-9.6), OT (OR 2.3, 95% CI 1.1-4.7), ST (OR 2.5, 95% CI 1.2-5.1), and SE (OR 3.2, 95% CI 1.2-8.2). Of the 9 factors used to adjust this relationship, RDS and the receipt of caffeine for apnea of prematurity were the only confounders.

CONCLUSIONS: VP had a higher rate of EI enrollment and increased PT, OT, and ST use compared to MP infants. However, 36% of MP were enrolled in EI and 28% utilized PT. With over 70% of singleton preterm births being MP, this represents a large proportion of the population requiring these services. While some institutions do not routinely follow moderately preterm infants in neonatal follow up clinics, it is imperative that this group of at risk infants be screened and referred for interventional therapies.

94 5:15 PM

Transport of Premature Infants Increases the Risk for Intraventricular Hemorrhage: Myth or True?

Mohamed A. Mohamed, Hany Z. Aly. The Newborn Services, The George Washington University Hospital, Washington, DC.

BACKGROUND: Intraventricular hemorrhages (IVH) greatly impact the outcomes of premature neonates. It occurs almost exclusively during the first week of life and has been recently correlated with the level of escalation in intervention. The relation of IVH with neonatal transport has not been studied.

OBJECTIVE: To examine the association of neonatal transport with the incidence and severity of IVH in preterm neonates.

DESIGN/METHODS: The National Inpatient Sample Database was analyzed for the years 2000-2003. This data uses The International Classification of Disease-0 (ICD-9) for all diagnoses and procedures. Infants with gestational age <35 weeks were included in the study. Infants were classified into 2 groups based on whether they were transported during the first week of life (Group 1), or were not transported at all (Group 2). The diagnosis of IVH and its severity (Grade I to Grade IV), were compared between groups. Other variables were also compared include; gender, race, gestational age, and length of hospital stay. Chi Square and Pearson's ^{x2} tests were used to compare groups. Analyses were repeated after stratifying the population into ≤28 weeks and >28 weeks of gestation.

RESULTS: A total of 39,828 premature babies less than 35 week of gestation were identified; of them 3,521 (10.3%) were in Group 1. Race and gender did not differ between the 2 groups. The overall incidence of IVH was 6.4%. Group 1 had more IVH compared to Group 2 (14.4% vs. 5.6%); OR=2.83 (95% CI 2.54 - 3.14, P<0.0001). Severe IVH (Grades III & IV) was more diagnosed in Grp 1 compared to Grp 2 (33.6% vs. 27.7 % respectively); OR= 1.32 (95% CI 1.10 - 1.66, P= 0.002). In the subgroup analyses; IVH incidence in infants ≤28 was 16.8%, with more IVH in Grp 1 compare to Grp 2 (34.6% vs. 16%), OR= 2.78 (95%CI 2.37 – 3.26, P<0.0001). In the subgroup >28 weeks, the incidence of IVH was (3.74%), with more IVH in Grp 1 compared to Grp 2 (7.9% vs. 3.4% respectively), OR= 2.42 (95%CI 2.07 – 2.83, P<0.0001).

CONCLUSIONS: Transport of premature newborns may be associated with incidence and severity of IVH in transferred babies compared to those who were born and stayed in the same hospital.

95 5:30 PM

Outcomes in Macrosomic Newborns of Non-Diabetic Mothers

Srikant Das, Marybeth Patterson, David Schutzman, Agnes Salvador. Pediatrics, Division of Neonatology, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: While macrosomia is well studied in infants of diabetic women, outcomes of macrosomic neonates born to diabetic and non-diabetic women have not been compared.

OBJECTIVE: 1. To describe the characteristics and compare outcomes of macrosomic infants born to diabetic and non-diabetic women.

2. To evaluate morbidities in big infants according to birth weight categories.

DESIGN/METHODS: Maternal and neonatal records of all infants with birth weights ≥4000 g from 2003 through 2005 were reviewed. Outcome variables included neonatal complications in relation to maternal diabetic status, mode of delivery and birth weight categories.

RESULTS: We reviewed 262 macrosomic infants of non-diabetic mothers (non-IDM) and 41 macrosomic infants of diabetic mothers (IDM). Nearly half of the non-IDM group (130/262) had at least one complication.

Hypoglycemia was the most common complication in non-IDM (75/262, 29%) and IDM (23/41, 56%). When controlled for gestational age and birth weight, there was statistically no difference in the incidence of hypoglycemia between IDM and non-IDM (p>0.05). Among macrosomics, infants with birth weights ≥4500 g developed hypoglycemia significantly more often (50% vs 30%, p=0.004) and had a significantly higher rate of complications (p<0.03).

Birth related injuries were significantly reduced in infants delivered by cesarean section (p=0.01), when controlled for weight and maternal diabetic status. Notably, 35 cases of birth related injuries (4 brachial plexus injuries, 17 fractures and 14 cephalhematomas) occurred in the non-IDM group delivered by the vaginal route in contrast with only one case of clavicle fracture and cephalhematoma in a macrosomic IDM. This appears to be related to a significantly higher rate of cesarean delivery in diabetic women compared with non-diabetics (66% vs 30%, p=0.001), even after controlling for gestational age and fetal weight. Of note, 19 of the 20 macrosomic infants with fractures and brachial plexus injuries were in the non-IDM group. They were all delivered vaginally and had birth weights of <4500 g.

CONCLUSIONS: Complications among macrosomic neonates correlate with higher birth weights. Increased birth trauma in non-IDM macrosomic infants supports a similar approach for perinatal management and cesarean delivery as for macrosomic IDM based on fetal weight.

Nutrition & Growth Platform Session

Saturday, March 10, 2007 **4:15 PM-5:45 PM**

96 4:15 PM Fellow in Training

The Effects of a Revised Total Parenteral Nutrition Strategy on Neonatal Outcomes

Dalbir Singh, Pradeep Mally, Karen Hendricks-Munoz, Linda Kao, Deborah Machalow. Neonatology, NYU Medical Center, New York City, NY.

BACKGROUND: Increasingly, neonatologists are realizing that current feeding practices for preterm infants are insufficient to produce reasonable rates of growth. Unfortunately, there is very little outcome data to recommend a specific nutritional strategy to achieve better growth in these preterm neonates.

OBJECTIVE: To determine the effects of a revised TPN strategy vs. standard TPN strategy in very low birth weight neonates on: Growth & Development, Feeding tolerance, clinical outcomes, TPN complications and length of hospital stay.

DESIGN/METHODS: Retrospective chart review for all patients with BW ≤1500gm from January '04 to May '06. Neonates were divided into 2 groups for comparison

1) Standard TPN group: Received standard TPN solution by 48° of life containing 0.5gm/kg/d protein & lipids on DOL #2. Protein and lipids ↑ at rate of 0.5g/kg/day; max 3.5g/kg/d

2) Starter TPN group: Received initial starter TPN solution by 12hrs of life containing 2g protein/kg/d, then Standard TPN given at 24hrs of life with 1gm/kg/d lipids by DOL #2. Protein & lipids ↑ at rate of 0.5 and 1gm/kg/d respectively; max 3.5g/kg/d.

RESULTS: There were 97 infants ≤ 1.5 kg during this study period. Fifty-four infants received standard TPN and 43 infants received starter TPN.

For the first 7 days of life, the starter group had greater mean average of protein and lipid intake when compared to the standard TPN group. The starter group also did achieve higher caloric intake from PO, lipid and carbohydrates from days 3 to 21. There was no difference in renal function, liver function or respiratory morbidity.

Parameter	Standard	Starter	p value
N	54	43	
GA	29.7 ± 2.4	28.8 ± 2.6	0.09
BW	1158 ± 234	1104 ± 241	0.26
Wk 1 avg wt gain/d	-7.7 ± 14.7	-4.7 ± 9.8	0.02
Total avg wt gain/wk	96.5 ± 40.3	118 ± 68.9	0.04
Lgth avg gain/wk	1.0 ± 0.8	0.7 ± 0.5	0.09
HC abg gain/wk	0.9 ± 0.9	0.8 ± 0.4	0.53
D/C wt	1895 ± 349	2046 ± 4.7	0.03

mean ± SD

CONCLUSIONS: Starter TPN group received higher levels of protein and lipids during the first week of life when compared to the standard TPN group. The starter group achieved better weight gain during the first 5 weeks of life, total average weight gain per week & were discharged with a higher weight. A larger sample may verify our results & examine the long term outcomes of the starter TPN regimen.

97 4:30 PM

G6PD Deficiency – Yet Another Association with Necrotizing Enterocolitis?

David L. Schutzman, Rachel Porat. Pediatrics, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: Known risk factors for NEC include prematurity, ischemia of the gut wall, intestinal immaturity with rapid advancement of feedings, and infection. In our unit, NEC is a relatively uncommon occurrence with an incidence of 2.2% in infants under 2000 grams (2.9% in infants under 1500 grams). Over the past 3 years we have encountered 4 babies with NEC who were found to be G6PD deficient.

OBJECTIVE: To describe our infants with G6PD deficiency and NEC.

To examine whether G6PD deficiency might be an additional risk factor for NEC.

DESIGN/METHODS: This study was a retrospective chart review of all infants in our NICU with Bell's stage II NEC over the period 2003-2006. Clinical data were collected including G6PD status. For reference we determined the G6PD status (via universal newborn screening) of 2 cohorts: a) All babies <2000 gms. admitted to our NICU 11/05-10/06; b) The entire cohort of babies born in our hospital 7-9/06.

RESULTS: Thirteen infants had NEC in the past 3 years (Bell's stage II or greater). Of them 4 were G6PD deficient (30.8%). These infants had a mean birth weight 1.46+/- 0.52 kg, mean GA 31.2+/-3.5 wks, median Apgar score 8/9 and did not have any of the risk factors for NEC other than one infant with a moderate PDA. 2 of these infants were fed breast milk. Mean age at diagnosis of NEC was 14.5 days. G6PD deficiency was identified in 6 of 115 babies (5.2%) with birth weight <2000 gm admitted to the NICU and in 29 of 675 (4.3%) infants of our entire birth cohort for a 3 month period. The incidence of G6PD deficiency among those babies with NEC was significantly greater than the incidence of G6PD deficiency among all infants <2000 gm admitted to the NICU (OR 8.1, 95% CI 1.9-34.1).

CONCLUSIONS: There appears to be an association between G6PD deficiency and NEC that needs to be further delineated with a larger, multicenter study. A possible explanation for the relationship might be decreased antioxidant capacity and deformability of G6PD deficient cells contributing to an increased inflammatory response as has been postulated in adult G6PD deficient trauma victims. In addition RBC dysfunction has been postulated to aggravate microcirculatory disturbances in the G6PD deficient mouse model.

98 4:45 PM Fellow in Training

Hypercalcemia among Very Low Birth Weight (VLBW) Infants on Full Enteral Nutrition

Daniel T. Robinson, Richard A. Ehrenkranz, Sharon Arrigoni, Thomas Carpenter, Patrick G. Gallagher. Neonatology, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Hypercalcemia occurs in VLBW infants fed fortified breast milk or preterm formula in the absence of known disorders of calcium metabolism. The incidence and clinical risk factors for hypercalcemia in this population are unknown.

OBJECTIVE: To determine the incidence and clinical correlates of hypercalcemia among VLBW infants on full enteral nutrition.

DESIGN/METHODS: In an ongoing prospective cohort study, VLBW infants admitted to Yale New Haven Children's Hospital NICU were followed when they achieved full enteral nutrition (FEN). Serum calcium, phosphorous and alkaline phosphatase levels were collected every two weeks as standard of care in the NICU. Diet and medication histories for the 48 hours preceding blood work were recorded. The primary outcome was the incidence of hypercalcemia (calcium >10.5mg/dL). Analysis was by Student's t-test and Fisher's exact test; p<0.05 was considered significant.

RESULTS: Twenty six consecutive VLBW infants have been studied to date. Three were hypercalcemic and 23 were normocalcemic for an incidence of 11.5%. Gestational age was similar in normo- and hypercalcemic infants, but the birthweight tended to be smaller in hypercalcemic infants. Two of the hypercalcemic infants were small for gestational age (SGA), compared to only one of those without hypercalcemia (p=0.027, Fisher's exact test). Forty five calcium levels were obtained (range 1-6/patient). In the 3 hypercalcemic infants, 12 calcium levels were high, with a range of 10.7-11.3mg/dL. Hypercalcemia was detected on a mean day of life 42.7 and at a mean postmenstrual age of 31.7 wks. The most common source of nutrition for both groups was a standard preterm formula. Whether normo- or hypercalcemic, there were no differences in calcium intake (144.4±39 v 151.3±29 mg/kg/d), total fluid intake (145±17 v 142±9 cc/kg/d) or caloric intake (117±11 v 118±10 kcal/kg/d). Sodium intake was greater in hypercalcemic infants (10.7±3.3 v 7.5±4.9 mEq/kg/d). Hypercalcemic infants were exposed to lower doses of chlorothiazide (30.8±3.4 v 35.1±5.2 mg/kg/d).

CONCLUSIONS: We observed an incidence of hypercalcemia of 11.5% in VLBW infants fed fortified breast milk or preterm formula. Hypercalcemia may be more common if these infants are SGA. VLBW infants on FEN should be monitored for hypercalcemia, which may be associated with significant complications.

99 5:00 PM Fellow in Training

The Effects of Enteral Protein Type on Feeding Tolerance and Growth Rate in VLBW Infants

R. Vembenil, M. Dejhalla, S. Ward, M. Mercado, S. Haram, M. Katzenstein, H. Brumberg, E.F. LaGamma, B. Parvez. Div of Newborn Med, Maria Fareri Children's Hospital at WMC, NYMC, Valhalla, NY; Dept of Neonatology, OLMMC, Bronx, NY.

BACKGROUND: Hydrolyzed casein formulas (HCF) are often used in feeding intolerance & after NEC, but they have never been used for gut priming in VLBW infants and are not designed to meet the calcium and phosphorus needs of premies.

OBJECTIVE: To determine whether feeding VLBW infants with HCF as compared to intact protein feeds such as human milk in the first 4 postnatal wks has an effect on: 1.Feeding tolerance & somatic growth. 2. Incidence of sepsis, NEC & cholestasis. 3. Serum calcium levels & biochemical rickets.

DESIGN/METHODS: Prospective, controlled, unblinded trial. Inclusion criteria: BW ≤ 1250g, < 7 d of age, NPO. Exclusion criteria: Congenital and chromosomal anomalies, death < 96h of age. Demographics, outcomes &nutrition data for the first 4 postnatal wks were collected in 3 groups: HCF (>80% of feeds as HCF), EBM (>80% of feeds as expressed breast milk) & mixed groups (>20% of HCF or EBM). Both EBM & HCF were fortified with human milk fortifier to 24 cal/oz when feeding 100ml/kg/d.

RESULTS: 33 infants enrolled: 14 in EBM, 12 in HCF & 7 in mixed groups. Mixed group not included in this interim analysis.

Demographics, Outcomes and Results

	EBM Group (n=14)	HCF Group (n=12)
GA (wks)	26 ± 1	27 ± 2
BW (g)	807 ± 187	850 ± 278
Apgar <6 @ 5 min	2/14	1/12
Culture Positive Sepsis	4/14	1/12
NEC (Bell stage II III)	0/14	2/12
Biochemical Rickets (Alk. Phos >500 IU)	1/14	1/12
TPN cholestasis	0/14	0/12
Days to regain BW (d)	12 ± 5	8 ± 5 *
Postnatal age at full feeds (150 ml/kg/d) (d)	24 ± 5	22 ± 6
Days to reach full feeds (d)	23 ± 6	19 ± 7 *

Mean ± SD * p < 0.05

The growth of EBM & HCF groups was: 13 ± 9 & 16 ± 10 g/kg/d from 2nd wk and 15 ± 7 & 15 ± 9 g/kg/d by 4th wk respectively (p = NS);similar to the *reference fetus*. No significant difference in number of NPO days, gastric residuals and stooling. Daily caloric intake, weekly serum calcium, alk phos, albumin levels, days on vent, PDA, IVH, BPD, ROP were not statistically different.

CONCLUSIONS: HCF group regained BW and reached full feeds faster than EBM group. HCF did not lead to increased incidence of biochemical rickets or other morbidities. Hydrolyzed casein formulas can be used in VLBW infants for gut priming when EBM is unavailable since similar growth rates can be achieved.

100 5:15 PM

The Prevalence of Hypercholesterolemia in Overweight and Obese Adolescents in the South Bronx

Umang Gupta, Kartika Khanna, Mirian Lugo, Thanakorn Jirasevijinda, Ronald Bainbridge, Ayoade O. Adeniyi, Richard Neugebauer. Pediatrics, Bronx Lebanon Hospital Center, NYC, NY.

BACKGROUND: Obesity has reached epidemic proportions in the USA, and has been strongly associated with hypercholesterolemia. Changes leading to coronary arterial disease have been shown to begin at an early age. Approaches to cholesterol screening in pediatric populations should be informed by the prevalence of hypercholesterolemia in the at-risk population.

OBJECTIVE: To measure the prevalence of hypercholesterolemia in overweight and obese adolescents attending 2 clinics in the South Bronx.

DESIGN/METHODS: Clinical electronic database at the Bronx-Lebanon Hospital Center was searched between Jan 1, 2002 and Dec 31, 2005 for children ages 12-19 yrs with a diagnosis of overweight and obesity (BMI ≥ 85 percentile). A retrospective review of retrievable charts was done. Exclusion criteria were: 1) diabetes 2) familial hyperlipidemia 3) thyroid disorders 4) renal disorders 5) OCP use. Cholesterol levels were recorded and were classified as per NCEP guidelines: <170 mg/dl considered normal, 170-199 mg/dl borderline high, and ≥ 200mg/dl high.

RESULTS: Two-hundred and ten (210) patients with BMI ≥ 85 percentile were identified in the database. One-hundred and one (101) charts were retrieved and reviewed. 16.5% of all the children without any other associated risk factors were found to have high cholesterol levels. This percentage was similar to previously published prevalence data for all children irrespective of BMI (NHANES III data). 22.8% of the children were found to have borderline high cholesterol levels. No association between gender and cholesterol level was found (14.3% for boys vs17.3% for girls).

CONCLUSIONS: Almost 1 out of every six overweight and obese adolescent attending the two clinics in the South Bronx had hypercholesterolemia. Previously published data by NHANES III demonstrated that 10% of all children ages 12-19 yrs have hypercholesterolemia. In view of these findings we suggest that cholesterol level should be measured in all children irrespective of their BMI and other associated risk factors, instead of the selective screening recommended by the American Academy of Pediatrics guidelines.

101 5:30 PM Medical Student

Macrocephaly in Former Preterm Infants: A 'Growing' Concern?

Frances Orlando, Noah Cook, Nancy Brodsky, David Shera, Hallam Hurt. Sch. of Medicine, Univ. of PA, Philadelphia, PA; Neonatology, Univ. of PA, Philadelphia, PA; Epi & Biostat, Children's Hosp. of Phila, Philadelphia, PA.

BACKGROUND: Because of increased risk of brain injury in preterm (<32 wks) and very low birth weight (<1500 gm) (PT/VLBW) infants, monitoring head circumference (HC) is critical. Between follow-up clinic initiation (2003) and 2006 we noted more infants than expected to have macrocephaly.

OBJECTIVE: 1) Determine the prevalence of macrocephaly in PT/VLBW infants in our clinic; 2) Identify factors associated with macrocephaly; 3) Examine the neurodevelopmental outcomes.

DESIGN/METHODS: Charts of all PT/VLBW infants seen 2003-2006 were reviewed. Using growth percentiles from Infant Health and Development Program charts, all macrocephalic infants (M, [HC≥ 95% for adjusted age]) were identified along with normocephalic (HC<95%) controls (CON) matched for GA, BW, and sex. M infants were divided into those with macrosomia (MM[HC, weight, and length ≥95%]) and those without macrosomia. Exclusion criteria: congenital hydrocephalus, IVH III/IV, or genetic abnormalities. Prenatal, natal, and follow-up variables were compared among groups. Outcomes were Bayley Scales of Infant Development (BSID) scores and neurologic examinations.

RESULTS: 54 of 237 (23%) subjects had HC≥95%. M and CON (GA: 29.6 vs. 29.8 wks (p=0.6); BW: 1388 vs. 1337 gm (p=0.5)) were similar in delivery method, multiple gestations, IUGR, Apgar, BPD, IVH I/II, PVL, ROP and LOS (all p>.07). M were more likely than CON to be conceived via IVF (p=.002) and have hypocalcemia (p=.016). Macrocephlic infants without macrosomia (n=36), but not MM (n=18), were more likely than CON to be conceived via IVF (p=0.014), have hypocalcemia (p=.055) or exposure to chlorothiazide (p=.042). Logistic regression with backward selection, accounting for correlation among multiple gestations, showed continued positive associations between M and IVF (p=.01) and chlorothiazide (p=.028). To date, no differences in BSID or neurologic examination have been found among groups.

CONCLUSIONS: In this cohort, the prevalence of macrocephaly (23%) was higher than expected (5%). A strong and novel association of macrocephaly with IVF conception and chlorothiazide exposure was found. Larger prospective studies are necessary to confirm the finding of increased prevalence of macrocephaly in PT/VLBW as well as to explore the association of macrocephaly with IVF and chlorothiazide exposure.

General Pediatrics II - Medical Education Platform Session

Saturday, March 10, 2007 4:15 PM-5:45 PM

102 4:15 PM House Officer

Impact of Training Pediatric Residents in Domestic Violence Screening

Maria D. McColgan, Collen Fitzpatrick, Monique Dalvi, Sandra H. Dempsey, Martha B. Davis, Corinne Lagermasini, Jessica McKee, Angelo Giardino. Pediatrics, St. Christopher's Hospital for Children, Philadelphia, PA; Institute for Safe Families, Philadelphia, PA; Health Federation of Philadelphia, Philadelphia, PA; Texas Children's Health Plan, Houston, TX.

BACKGROUND: Every year 3.3-10 million children are exposed to domestic violence (DV). Child abuse occurs in up to 77% of homes with DV. In addition to physical and emotional damage, these children are at risk for poor adult health outcomes. Previous studies have shown that office screening for DV may be the best way to prevent child abuse and its detrimental effects. The American Academy of Pediatrics (AAP) has issued guidelines recommending pediatricians screen for DV. However, studies have also shown that current rates of screening for DV are low because pediatricians feel they lack training in screening and intervention skills.

OBJECTIVE: We hypothesize that formal domestic violence training will directly increase rates of screening for DV in the pediatric office setting.

DESIGN/METHODS: Pediatric residents at St. Christopher's Hospital for Children received formal training in DV screening using the RADAR tool and methods of intervention. A retrospective chart review to assess screening practices and documentation was performed for the 1 year period prior to training. At 3-months post DV training a prospective chart review once again assessed screening practices and documentation.

RESULTS: Chart review at baseline revealed screening for past or present DV in 4 of 439 patient charts. At 3-months post training, 217 of 599 charts had documented screening for DV. This demonstrates a significant increase (0.9% charts at baseline to 36.2% at 3-month). The mean number of times patients were screened for DV significantly increased from 0.01 at baseline to 0.41 at 3-months, with a difference between means from baseline to 3-months of -0.39 [95%CI(-0.40,-0.31)]. Presence of DV was revealed in two of four charts screened at baseline compared with nine of 217 in 3-months post- training. In addition, at baseline no charts contained documentation explaining lack of screening compared with four at 3-months post DV training.

CONCLUSIONS: We conclude that current rates of DV screening do not meet AAP guidelines. However, formal training directly increases the rates of domestic violence screening in the pediatric office setting.

103 4:30 PM

Knowledge of Shaken Baby Syndrome among Caregivers of Young Infants in an Urban Primary Care Center

Kirsten A. Bechtel, Kim Le, John M. Leventhal, Eve Colson. Pediatrics, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Shaken Baby Syndrome (SBS) is the leading cause of traumatic death in infancy. Previous studies have evaluated the usefulness of parent education programs in reducing the incidence of SBS, but none have evaluated pre-existing parental attitudes regarding crying or previous knowledge of Shaken Baby Syndrome.

OBJECTIVE: To determine attitudes of infant crying and knowledge of SBS among caregivers of young infants in an urban primary care center.

DESIGN/METHODS: A convenience sample of caregivers of young infants presenting to the Primary Care Center of Yale New Haven Hospital for the first well child appointment were enrolled. Caregivers were interviewed in their native language about their attitudes regarding infant crying and knowledge of SBS.

RESULTS: 116 caregivers of 99 infants were enrolled. Of the caregivers, 73% were mothers, 20% were fathers, and 5% were grandmothers. Mothers' mean age was 25.5 years (range 17-45 years) and of fathers was 24.9 years (range 13-33 years). The mean age of infants was 3.5 weeks (range 3 days-16 weeks). Forty-seven percent of infants were Hispanic, 42% were African-American, and 6% were Caucasian. Seventy-three percent of caregivers had previous knowledge of SBS; 57% received this knowledge from a television program, 24% from a health care provider, 10% from a parenting program and 6% from family members. Forty-six percent reported that shaking causes brain damage, and 39% stated it would cause death. Thirty-six percent reported that caregiver frustration and 20% reported the caregiver's mental health problems were the cause of shaking an infant. Of those reporting caregiver frustration, 61% stated that infant crying was the source. Thirty-eight percent stated they would call someone for help and 23% reported they would take a break and walk away when frustrated with infant crying.

CONCLUSIONS: The majority of urban caregivers have knowledge of SBS, its sequelae, and the information source was frequently a television program. Of those who reported that caregiver frustration as the cause of infant shaking, the majority reported that infant crying was the source. The majority of caregivers reported reasonable coping methods when frustrated with infant crying. Educational programs to prevent SBS need to consider these attitudes and knowledge and not assume that parents have no knowledge of this serious form of child abuse.

104 4:45 PM House Officer

Resident Knowledge and Comfort with Pediatric Pain Management

Kathryn Scharbach, Iman Sharif, Catherine C. Skae. Pediatrics, Children's Hospital at Montefiore/AECOM, Bronx, NY.

BACKGROUND: Undertreatment of pediatric pain remains a significant issue, suggesting a need for specific curricula to teach pain management during residency. As training programs begin to develop such curricula, research is needed to define the gaps in knowledge and comfort around pediatric pain management.

OBJECTIVE: To evaluate resident knowledge and comfort with managing pain in children.

DESIGN/METHODS: All 69 residents at a children's hospital were asked to complete an anonymous cross-sectional survey about pain management. In addition to demographic data, there were 35 knowledge and 36 comfort (5-point likert scale) questions.

We summed responses to create a knowledge score (0-35 correct) and a comfort score (36-180, with 36=most comfort). Bivariate and multivariate linear regression analyses were performed to test the relationship between knowledge, comfort, and demographics.

RESULTS: Sixty-one(88%) subjects participated. Mean knowledge score was 25(range 6-35). Examples: most recognized the side effects of opioids: constipation(95%) - pruritis(89%), but few recognized that anxiolytics cannot be used instead of analgesics(48%).

Mean knowledge score increased with level of training (22 vs. 26 vs. 27, p<0.01 for PGY1's, 2's, 3's). After adjusting for confounders, higher knowledge was associated with female gender (B=3.3, p=0.05), years of residency (B=2.1, p=0.05) and having had surgery (B=2.8, p=0.04).

Mean comfort score was 104 (range 69-143). Highest scores were for "basic pain assessment"(mean score 1.8 out of 5) and managing PCA pumps (mean 2.0-2.5). Subjects were less comfortable with pain in neonates/infants (3.0) and the cognitively/psychiatrically impaired(3.2-3.4). Comfort was lowest for managing withdrawal(3.4), pain at end-of-life(3.5), and nonpharmacologic approaches to pain management(3.4-3.9).

Comfort increased with training (113 vs. 102 vs. 93, p < 0.001 for PGY 1's, 2's, and 3's), parenthood (90 vs. 105, p = 0.03), and having given birth (85 vs. 105, p = 0.03). Comfort and knowledge were weakly associated (r=0.32, p=0.09). After adjusting for confounders, including knowledge, only level of training was significantly associated with comfort (B=11.7, p<0.0001).

CONCLUSIONS: We have identified major gaps in knowledge of and comfort with pain management in specific areas. These findings may guide pediatric residency programs designing educational curricula around pain management.

105 5:00 PM

Pediatric Residency Call and Night Float Trends after Implementation of ACGME Work Hour Regulations

Jodi K. Wenger, Stuart N. Karon. General Academic Pediatrics, Dartmouth-Hitchcock Medical Center, Lebanon, NH.

BACKGROUND: Long work hours have been linked with adverse events prompting mandated reductions of resident work hours by the Accreditation Council on Graduate Medical Education (ACGME) in 2003.

OBJECTIVE: To look at changes in pediatric call and night float schedules in the first 3 years after the implementation of ACGME work hour regulations.

DESIGN/METHODS: A secondary dataset analysis of a commercial web-based call management system was performed to determine the number of call (any name that appeared in the call schedule) and night float (the number of times the same name appeared in the call schedule at least 4 days in a row in any given week) assignments in pediatric residency programs for the three years after implementation of ACGME work hour regulations.

Programs were excluded if they had incomplete data for the 3-year study period. Differences in the number of call and night float assignments during the three years were assessed by year of training and by size of program using Stata 8.2 to calculate the Cuzick test of trend.

RESULTS: Nationally, there are 52 large, 71 medium, and 75 small-sized pediatric residency programs, of which 100 (51%) use this web-based call management system. Complete data for the three study years was available for 29 of 38 (76%) large, 25 of 43 (58%) medium, and 9 of 19 (47%) small-sized programs. There was a significant mean increase in calls/year by interns in small programs from 50 to 62 (p=.023) during the 3-year study period, but not in medium or large-sized programs. In all programs combined, the use of night float assignments increased significantly (p=.008), including each of the 3 postgraduate levels (p=.0001). Stratifying by program size, a significant trend by year for night float assignments was only found in large programs (p=.008).

CONCLUSIONS: Pediatric residency training programs have responded to ACGME work hour regulations by increasing the number of calls and night float assignments since 2003. Small programs increased call among interns, while large programs increased their use of night float assignments for all postgraduate years. Examination of the clinical and educational implications of these coverage changes is warranted.

106 5:15 PM House Officer

Resident Knowledge and Confidence about Breastfeeding in a Poor Urban Community

Melissa Tesher, Sarah Siegel, Iman Sharif, Deborah Campbell. Pediatrics, Children's Hospital at Montefiore/Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Breastfeeding rates, defined as any breastfeeding at 6mos of age, are significantly lower in low-income women versus high-income women, 30% vs. 46%. To improve these rates, physicians serving poor communities must have strong knowledge and confidence in counseling the breastfeeding dyad.

OBJECTIVE: To evaluate knowledge and confidence with breastfeeding guidance amongst resident physicians serving a poor urban community.

DESIGN/METHODS: Anonymous cross-sectional survey of residents (Pediatrics, Family Medicine, and Obstetrics and Gynecology) at an academic medical center serving a poor urban community. The self-completion survey consisted of 7 true/false questions to evaluate knowledge about breastfeeding and 7 questions to evaluate confidence with breastfeeding counseling, using a 5-point likert scale.

Descriptive statistics were performed. We created an overall knowledge score ranging from 0-100% correct, and a confidence score ranging from 7-35. Bivariate analyses were used to test the relationship between breastfeeding knowledge and confidence and various demographic factors.

RESULTS: Eighty-four subjects participated (29 PGY-1, 24 PGY-2, 20 PGY-3, 6 PGY-4, 5 unknown). The average score on the knowledge survey was 76%. 95% knew that infants receiving phototherapy for hyperbilirubinemia should continue breastfeeding. 88% knew that early pacifier use should be discouraged in the breastfeeding baby. Subjects were least likely to know (46%) that a mother who is Hepatitis B surface antigen positive may safely breastfeed. Knowledge about breastfeeding increased over years of training (70% vs. 76% vs. 79% vs. 90% for PGY1-4, respectively, p=0.05). The mean confidence score was 19(SD=6). Residents had the lowest confidence in counseling the mother of premature infant. Resident confidence in counseling breastfeeding mothers increased over years of training. Mean confidence scores were 16 (SD=4), 20 (SD=5), 21 (SD=5), and 27 (SD=6) with p=0.000 for PGY1-4. Overall, knowledge and confidence were highly associated (r=0.42, p=0.001).

CONCLUSIONS: Similar to previous studies, resident breastfeeding knowledge and confidence improves over time. However, significant gaps exist at the completion of residency training. Interventions to improve resident knowledge and confidence about breastfeeding, especially in a poor urban community, are warranted.

107 5:30 PM

Education in Neonatal Oxygenation Has Been Insufficient: A Need for Darning

Augusto Sola. Neonatology, Mid Atlantic Neonatology Associates and Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: Newborns around the world receive O_2 more than any other therapy. However, there is no evidence if care providers at the bedside have been adequately educated on neonatal oxygenation and saturation monitors (SpO_2).We and others have reported neonatal morbidities associated with hyperoxia and oxidant stress. While investigators currently debate issues looking for further improvements, O_2 is given at fickle doses and SpO_2 is interpreted erroneoulsy in many newborns (NB).

OBJECTIVE: To investigate if the education of bedside care providers has been satisfactory in neonatal oxygenation and SpO_2 monitoring.

DESIGN/METHODS: Bedside neonatal care providers (residents, fellows, neonatologists, RN's, NNP's and RT's) were surveyed in North America, Latin America, Spain, Japan, over 3 years (2004-06) by written questions or in lectures and conferences at national and international meetings. In the latter, the answers were collected electronically by Active Learning System (ALS) or "manually". The questions included: 1) Do you consider you have received complete education in (a) neonatal oxygenation? (b) In SpO_2 monitors and their functioning? 2) Do you measure FiO_2 *every* time a NB receives O_2, including delivery room? 3) Do you use humidified and blended gas every time a NB is on CPAP or intubated? 4) (Questions on alveolar gas equation, shunting and Hb-O_2 curve): Do you know what the PaO_2 can be when SpO_2 is 100% in a NB breathing $Fi0_2$ 0.4; 0.6 and 1.0? And others.

RESULTS: In 40 regions of the world [15 states in USA and Canada, 20 regions of 10 Latin American countries, 3 Spain and 2 Japan] 4453 responses were collected (1348; 2684; 296; 125, respectively). Residents and fellows 25%, NNP's 10%, RN's and RT's 39%, neonatologists 26%. Only 25% answered YES to question (1a) and 8% to question (1b). Questions (2) and (3) were answered YES by 8% and 4%. Answers to questions in (4) were correct in only 18%. There were no statistical differences between countries, regions, or degree.

CONCLUSIONS: Despite O_2 being the most common neonatal treatment and SpO_2 being considered the "fifth vital sign", the results of this wide survey reveal that education in neonatal oxygenation and in the understading of how SpO2 monitors work has been insufficient for bed side neonatal care providers. The process of education needs to be darned if hyperoxia and neonatal injury due to oxidant stress is to be improved in the future.

Adolescent Medicine Platform Session

Saturday, March 10, 2007 **4:15 PM-5:45 PM**

108 4:15 PM Fellow in Training

Addressing Health-Risk Behaviors in Pre-Adolescent Children

Evelyn Berger, Wing Wah Ho, Susan Zylbert, Mary Rojas, Danielle Laraque. Pediatrics, Mt Sinai School of Medicine, NY, NY.

BACKGROUND: Health-risk behaviors such as poor nutrition, lack of exercise, substance use and early sexual activity are increasingly prevalent in children of younger ages such as pre-adolescents. However, this younger group is seldom included in studies of these behaviors or interventions compared to older children.

OBJECTIVE: This study aimed to capture rates of risk behaviors in pre-adolescents, and systematically evaluate the effectiveness of a health education program at changing knowledge, perceptions and participation in these behaviors.

DESIGN/METHODS: We utilized a controlled experimental design. A cohort of 25 pre-adolescents selected by middle-school staff received a comprehensive health education program from pediatric healthcare providers. These children, as well as their grade-matched controls (N=56), were surveyed before and after the ten-week intervention period utilizing the Centers for Disease Control Youth Risk Behavior Surveillance System (YRBSS) Middle School Survey. Descriptive statistics were used to compare the groups to each other and to the YRBSS national middle-school sample at baseline. T-tests were used to compare the two groups on the main outcomes, which were a change in knowledge & perceptions and change in risk behavior from pre- to post- surveys.

RESULTS: Eighty-one 7th graders (mean age 12.5 years) participated in the study. 77% were Hispanic and 22% were African American. There was no significant difference between the intervention group and controls with

respect to demographics or any risk behaviors at baseline. The entire 7th grade sample was more overweight, exercised less and watched more TV than the national sample. However they also reported less smoking, drugs, alcohol and sexual activity than the national sample. Over the ten-week period 64% of the intervention group had an improvement in their knowledge & perceptions compared to only 45% of the controls. Similarly, 44% of the intervention group reported less risk behaviors after the ten-week period compared to only 29% of the controls. These changes from pre- to post- survey were significantly better for the intervention group compared to the controls ($p < 0.05$).

CONCLUSIONS: These results reveal that health-risk behaviors are prevalent in this pre-adolescent population. Interventions such as this one are effective at improving knowledge & perceptions without increasing rates of participation in these behaviors.

109 4:30 PM

Childhood Witnessing and Subsequent Experiences with Interpersonal Violence among College Students

Christine M. Forke, Rachel K. Myers, Marina Catallozzi, Donald F. Schwarz. Craig-Dalsimer Division of Adolescent Medicine, Children's Hospital of Philadelphia, PA; Campus Violence Task Force, Institute for Safe Families, Philadelphia, PA; Pediatrics, Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND: Children who witness adult interpersonal violence (IPV) at home are more likely to experience violence later in life. Little is known about whether childhood witnesses are predisposed to certain types of violence during adolescence.

OBJECTIVE: To explore the relationship between childhood witnessing of adult IPV in the home and adolescent victimization and perpetration of physical, sexual, and emotional IPV.

DESIGN/METHODS: Students in randomly-selected classes from 3 urban colleges were surveyed on childhood witnessing of adult IPV in the home and victimization and perpetration of physical, sexual and emotional IPV before and during college. Childhood witnesses (CW) and non-witnesses (NW) were compared for adolescent victimization and perpetration using chi-squared and t-tests. Surveys analyzed had complete witnessing data (901/910).

RESULTS: Students (aged 17-22 yrs) were mostly female (57%) and White (59%). Of the 215 (24%) witnesses, two-thirds experienced adolescent IPV. CW were more likely than NW to be female (67% vs 54%) and to be adolescent victims of physical (29% vs 14%), sexual (30% vs 20%), and emotional (38% vs 22%) IPV ($p<0.01$). CW were more likely than NW to be victims earlier in adolescence (15.1±3.8 vs 16.0±2.4 yrs, $p=0.04$), to be victims of multiple IPV types (29% vs 14%, $p<0.001$), and to be victims of repeated physical, sexual and emotional IPV ($p<0.03$). Similarly, CW were more likely than NW to be adolescent perpetrators of physical (24% vs 8%), sexual (7% vs 3%) and emotional (12% vs 5%) IPV ($p<0.01$). CW were more likely than NW to perpetrate multiple IPV types (9% vs 3%) and to repeatedly perpetrate physical and emotional IPV ($p<0.001$). Individuals who experienced IPV both as a victim and a perpetrator were more likely to be CW than NW (30% vs 11%, $p<0.001$).

CONCLUSIONS: Childhood witnessing of adult IPV in the home is a strong indicator of adolescent exposure to IPV. During adolescence, childhood witnesses are at increased risk of earlier victimization, victimization for all types of IPV, repeated victimization and perpetration, and being both victims and perpetrators. Interventions for childhood witnesses of IPV may significantly reduce adolescent IPV.

110 4:45 PM

Improving Access to Behavioral Health Care in an Inner City Teen Clinic

Alexis S. Lieberman, Michael DeStefano. Department of Pediatrics, Albert Einstein Medical Center, Philadelphia, PA; Child and Teen Service, Belmont Center for Comprehensive Treatment, Philadelphia, PA.

BACKGROUND: Innovative approaches are needed to enhance teen completion of behavioral health referrals. In our previous study, only 3% of teens referred for off-site behavioral health care kept a first appointment, and none a second.

OBJECTIVE: To describe an innovative, interdisciplinary project linking inner-city teens to behavioral health care.

DESIGN/METHODS: We implemented a collaborative psychiatric/pediatric program linking Teen clinic patients to outpatient behavioral health care, an expansion of an existing psychiatric inpatient discharge program, the Bridge. Patients, 13-21 years, from November 2004 to July 2006, were screened by clinicians using the HEADSS screen. Those deemed to need behavioral health care met immediately with Bridge staff, co-located at the clinic, for education, support and referral to community behavioral health services. Primary outcome was attendance at a first and second behavioral health appointment.

RESULTS: This inner-city Teen clinic had 4748 visits last year. Providers screen all patients for psychosocial issues. 321 teens were deemed in need of referral for behavioral health care. 252 (92%) agreed to meet the Bridge staff and, of these, 85% enrolled. 73% of enrollees were female, 91% were AA, median age was 16, 62% were enrolled in school, and 79% had Medicaid, 9% no insurance. 25% had a history of rape or sexual abuse; 17% previous mental health care. Of 252 enrollees, 154 needed psychiatric care (150 outpatient, 4 inpatient), 5 drug treatment, 16 academic-related referrals, 8 teen parent support, 69 other community agencies. Referrals were made to over 40 agencies.

22% (n=55) of those who enrolled attended a first behavioral health services appointment, and half of these (n=27) attended a second appointment.

Difficulties encountered were timely access to agency appointments; disconnected telephones; discomfort with the idea of behavioral health care, and concerns with being labeled as mentally ill.

CONCLUSIONS: An interdisciplinary collaboration between primary care pediatrics and psychiatry linking teens to outpatient behavioral health care services led to improved rates of attendance to behavioral health care. However, the majority of teens needing services still did not receive them. Other approaches, such as on-site mental health care, may be more successful.

111 5:00 PM House Officer

Physician Assessment of Menorrhagia in Adolescents

Nicole E. Kucine, Barbara M. Ostfeld, Lisa A. Michaels. Pediatrics, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ.

BACKGROUND: Abnormal menses is a significant health concern in women. Studies of women with menorrhagia reveal up to 50% may have an underlying bleeding disorder.Many of these women report that their menstrual problems began at menarche.We are interested in how pediatricians screen patients for menstrual problems, and what their referral patterns are when faced with a complaint of abnormal menses.

OBJECTIVE: To survey the practice of pediatricians in identifying abnormal menstruation in adolescents and how often the diagnosis of a bleeding disorder is considered.

DESIGN/METHODS: Surveys were sent to randomly selected members of the AAP-NJ. Respondents were asked how many adolescent female patients they see, if they routinely screen for abnormal menses, and which screening questions are asked.They were also asked how often referrals are made to a specialist.Physicians were then asked to estimate the percentage of patients with menorrhagia who have a bleeding disorder.

RESULTS: 400 surveys were mailed.Response rate is currently 25% with repeated mailings in process. 79% of respondents routinely screen adolescents for menorrhagia.Duration of menses was most frequently asked, followed by questions regarding school absence/missed activities and number of pads used. Less than 50% asked about easy bruising or bleeding. Only18% asked questions quantifying menstrual blood loss. One physician reported never referring to a specialist.59% reported referring some patients, and 41% referred all patients.Physicians most commonly refer to gynecology (80%) with approximately 25% referring to hematology or adolescent medicine. 8% refer to endocrinology. When asked to estimate the percentage of adolescents with menorrhagia with a bleeding disorder, the mean was 13% (range 0.5-90%). Physicians who underestimate the prevalence of bleeding disorders were less likely to refer to a hematologist.

CONCLUSIONS: Our study shows that pediatricians do screen for abnormal menses, but may not effectively identify those with menorrhagia. Many pediatricians are uncomfortable with the evaluation and treatment of menorrhagia and frequently refer for management.The data indicates most pediatricians underestimate the frequency of bleeding disorders, which may result in delay in appropriate treatment.These results highlight a need for increased awareness and education on the importance of evaluating menstrual cycles in adolescents.

112 5:15 PM

Incidence and Risk Factors for Sexually Transmitted Infections (STIs) in an Urban Adolescent HIV Positive Population

Natalie Neu, Alwyn Cohall, John Nelson, Christina Gagliardo, Andrea Nye.

BACKGROUND: Review of the literature suggests that sexual risk-taking behaviors persist among adults living with HIV, with resultant acquisition of new STI's. Less is known about behavioral patterns for youth living with HIV.

OBJECTIVE: To assess the incidence and risk factors for STIs in an HIV+ population seen at Project STAY, a New York City clinic providing comprehensive health care to adolescents and young adults with HIV.

DESIGN/METHODS: Retrospective chart review was performed on 45 HIV+ patients enrolled in STAY as of November 2006. Data included information on demographics, HIV/STI transmission risk factors, and STI diagnosis pre- and post-program enrollment. Only bacterial STIs were included in the analysis.

RESULTS: A total of 45 patient charts were reviewed, ages 17-26, with a mean of age 22 years old. 69% (31) were male and 4% (14) were female. 44% (20) were Hispanic, 53% (24) were black, and 2% (1) were mixed Hispanic/black. 36% (16) had less than high school education, 39% (17) completed high school, and 25% (11) completed some college or more. 44% (20) of the 45 study patients had prior STIs. After enrollment in STAY, 44% (20/45) acquired a total of 36 new STIs, and 60% (12/20) of these patients had previous STIs. Of the 36 STIs, 39 % were GC (14), 25% CT (9), 33% syphilis (12), and 8 % LGV (1). 51% (19) of the 36 new STIs were asymptomatic and diagnosed through screening, 38% (14) were diagnosed due to symptoms, and 4 for reason unknown. Incidence of new STIs was higher in the MSMs when compared to heterosexuals, 75% versus 25%, respectively. In the 20 patients with new STIs, 45% (9) had greater than 10 lifetime partners, of these, 67% (6) had greater than 20 partners. 35% (7) patients reporting condom use "always" or "most of the time" had a new STI, while 45% (8) reporting "sometimes", and 5% (1) reporting "never" had a new STI, and 4 were unknown.

CONCLUSIONS: Adolescent HIV patients continue to acquire STIs even after enrollment in a comprehensive health program. No trends in STI acquisition between different demographic groups were noted. Risk factors for acquiring new STIs are history of previous STI, > 10 lifetime partners, and MSM status. Condom use is an unreliable variable in determining risk factor for STI. Routine screening is an effective tool to detect new STIs, however interventions need to be more rigorous to further prevent STI and HIV transmission.

113 5:30 PM House Officer

Should Inner-City Adolescents Be Seen Every 6 Months for Well-Visits?

Jerico Alvaran, Alexis S. Lieberman. Department of Pediatrics, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: There is scant evidence to support the periodicity for health supervision visits for inner-city adolescents. While national guidelines recommend annual visits, our clinic offers health supervision visits every 6 months, instead.

OBJECTIVE: To determine the usefulness of semi-annual health supervision for inner-city adolescents.

DESIGN/METHODS: We conducted a systematic chart review of 301 6-month-visits made by 231 adolescents at an inner-city adolescent clinic between 2003 and 2006. Data collected included assessments by the clinician and health educator, and themes identified through HEADSS screening. Outcomes included new or relevant diagnoses that merited medical attention. The quantitative data were analyzed by univariate analysis. The summary notes on each visit were independently reviewed for the usefulness of the visit by the two authors.

RESULTS: Patients age was 13- 21 years, mean 16.8, 82% female, 60% Medicaid capitated to our clinic and 40% seen through a Federal family planning grant. The reviewers agreed on the usefulness of the visit in 88% of the visits. 77% of visits yielded a relevant diagnosis, such as 56 visits (19% of all visits) in which a sexually transmitted infection was diagnosed, 24 visits (8%) in which contraception was provided, 12 visits (4%) in which asthma was managed, 3 visits (1%) in which substance use was diagnosed, and 5 visits (2%) in which depression or other mental health diagnoses were made. Sexual health and family planning issues were addressed in 47% of visits, medical issues in 40%, and psychiatric issues in 3%.

CONCLUSIONS: The semi-annual health supervision visit often identifies important diagnoses that need attention or management, and provides a venue for preventive health counseling. More frequent periodicity for well-visits should be considered for inner-city adolescents.

Endocrinology & Metabolism Platform Session

Saturday, March 10, 2007 **4:15 PM-5:45 PM**

114 4:15 PM Fellow in Training

Hypoglycemia Associated Autonomic Failure (HAAF): A Hypothesis on a Molecular Mechanism

Amrita S. Nayak, Bistra B. Nankova, Eylem Onem, Edmund F. LaGamma. Div of Newborn Med, Maria Fareri Children's Hospital, Valhalla, NY.

BACKGROUND: HAAF is an iatrogenic complication of diabetes control. Infants of diabetic mothers suffer from glucose counter-regulatory failure. The hallmark signs of HAAF are a shift in glycemic threshold to lower plasma glucose values prior to the release of epinephrine and lower circulating levels of epinephrine. Tyrosine hydroxylase (TH; rate-limiting enzyme in catecholamine biosynthesis) controls adrenal epinephrine production via cholinergic sympathetic transsynaptic activity. Hypoglycemia induces TH mRNA through this mechanism but repetitive events suppress the response (Inouye, 2005). We showed that PC12 cells (rat pheochromocytoma) exhibit a bimodal, dose-dependent regulation of TH gene expression when exposed to free fatty acids (FFA) by increasing TH mRNA transcription in a cAMP-dependent fashion yet enhancing its degradation only at high FFA levels (Nankova, 2003; Parab, 2006). Since changes in FFA metabolism occurs as part of the counter-regulatory response to hypoglycemia, it is possible that similar effects may exist *in vivo.*

OBJECTIVE: To determine whether: 1) cholinergic (nicotinic/muscarinic) stimulation of butyrate differentiated PC12 cells will result in dose- dependent bimodal changes in TH mRNA. 2) cAMP-dependent mechanisms are required for the degradation effects of butyrate.

DESIGN/METHODS: PC12 cells differentiated with low and high doses of butyrate were treated with nicotine or carbachol (muscarinic agonist). Total RNA was analyzed by northern blots.

RESULTS: Addition of nicotine to low dose butyrate-differentiated PC12 cells resulted in further increases in TH mRNA. Combined nicotinic + high dose butyrate treated PC12 cells caused a more pronounced decrease in TH mRNA levels than high butyrate alone. Prior inhibition of adenylate cyclase did not prevent the degradation of TH mRNA elicited by high dose butyrate. Carbachol failed to significantly alter the responses to different doses of butyrate.

CONCLUSIONS: 1) Nicotinic-cholinergic treatment of butyrate- differentiated PC12 cells acts via independent mechanisms to either increase or decrease TH mRNA levels. 2) Butyrate effects on TH mRNA *stability* occurs via a muscarinic and cAMP-independent mechanism. Speculation: Modification of FFA blood levels and uptake either by diet or pharmacologically may preserve the epinephrine responses during hypoglycemia.

115 4:30 PM Fellow in Training

Nutrient Regulation of Chondrocyte Proliferation and Differentiation

Mimi S. Kim, Ke-Ying Wu, Philip A. Gruppuso, Chanika Phornphutkul. Pediatric Endocrinology and Metabolism, Brown University/Rhode Island Hospital, Providence, RI.

BACKGROUND: Linear growth in children is sensitive to nutritional status. Amino acids, in particular leucine, have been shown to regulate cell growth, proliferation, and differentiation through mTOR (mammalian Target of Rapamycin), a nutrient-sensing protein kinase.

OBJECTIVE: We hypothesized that restricted availability of leucine, acting through mTOR, could inhibit chondrocyte proliferation and differentiation at the growth plate, perhaps accounting for the sensitivity of linear bone growth to nutritional status. In order to test this hypothesis, we compared the effect of leucine deprivation to that of the specific inhibitor of mTOR, rapamycin.

DESIGN/METHODS: We utilized an *in vitro* fetal (E19) rat metatarsal model, culturing explants in condition-specific α-MEM media for 24 or 72 hours. Insulin (1600 nM) was added as a growth-enhancing factor to all media. Experimental conditions included varied leucine concentrations of 100% (1.6 mM), 25%, 10% and 5%, or +/- 50 nM rapamycin. Metatarsal length was measured daily. Chondrocyte zones within growth plates were examined on H&E sections. Paraffin-embedded sections were stained for BrdU (indicating cell proliferation), ribosomal protein S6 phosphorylation (PS6, a readout of mTOR activity), and expression of two markers of chondrocytes differentiation, Indian Hedgehog (IHH) and Collagen X.

RESULTS: Leucine restriction produced a dose-dependent growth inhibitory effect, detected as decreased explant length (P values <0.001). This effect was confirmed in a repeat experiment. This was accounted for by an inhibition of proliferation (P values <0.001) and decreased length and area of the hypertrophic zone (all statistically significant). Rapamycin-exposed metatarsals showed only limited growth inhibition ((P values <0.05). While the PS6 inhibition was complete in the metatarsals exposed to rapamycin, S6 phosphorylation was only partially inhibited by leucine restriction (all statistically significant). Immunohistochemistry for IHH and Collagen X, markers for early and late differentiation, were unaffected by leucine restriction or rapamycin.

CONCLUSIONS: Bone growth was sensitive to leucine deprivation, which inhibited both chondrocyte proliferation and hypertrophy. This was accompanied by only partial inhibition of mTOR signaling, suggesting a role for an alternate amino acid-responsive pathway.

116 4:45 PM

Adaptive Beta Cell Proliferation Is Greatly Limited with Advanced Age

Matthew M. Rankin, Jake A. Kushner. Division of Endocrinology, Department of Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Insulin requirements dramatically increase throughout life due to somatic growth and changes in peripheral insulin sensitivity. In young mammals beta cell replication is highly dynamic and can be greatly stimulated by measures such as partial pancreatectomy. However, beta cell replication must have limits, as insufficient beta cell mass is observed in type 2 diabetes.

OBJECTIVE: Although beta-cell turnover has generally been widely assumed to occur throughout adult life, we have recently observed that beta-cell replication rates greatly decrease in old mice, which suggests that beta-cell growth capacity could be limited at some ages.

DESIGN/METHODS: To directly test our hypothesis, we performed a comprehensive study of adaptive beta cell replication in young, middle aged, and very old F1 B6/sv129 intercross mice. To minimize confounding hyperglycemia we performed only a mild partial pancreatectomy (50%) or a sham operation, followed by two weeks of recovery.

RESULTS: Remarkably, we find that adaptive beta cell replication is greatly limited by advanced age. While partial pancreatectomy greatly stimulated beta cell replication in 2 and 8 month old mice, almost no adaptive beta cell replication was observed in14 and 20-month-old mice following pancreatectomy. Moreover, treatment with the glucagon like peptide (GLP-1) agonist exendin-4 stimulated beta cell replication in young but not old mice. In addition, we find that basal beta cell replication progressively decreases in aged mice, dropping to below 0.1% per day in sham operated 600-day-old mice, confirming our previous observations regarding basal proliferation.

CONCLUSIONS: Our studies reveal that beta cell replication is highly limited in old age, which restricts the ability to adapt and increase beta cell mass in response to physiological stimuli. If similar mechanisms limit beta cell replication in humans, beta cell mass might not be able to compensate for age-dependent increases in peripheral insulin resistance, and diabetes could result. Thus, our results provide a potential unifying explanation for the high incidence of beta cell failure occurring in the most common forms of type 2 diabetes.

117 5:00 PM Fellow in Training

Study of Glycemic Profiles with Continuous Glucose Monitoring System (CGMS) in Poorly Controlled Type 2 Diabetes Mellitus (DM) Adolescents

Haiyan Lu, Jose B. Quintos, Dawn Hagerty Hagerty, Salvador Castells. Pediatric Endocrine Division, Department of Pediatric, Children's Hospital at SUNY Downstate Medical Center, Brooklyn, NY.

BACKGROUND: The achievement of tight glycemic control needs frequent blood glucose monitoring. Although CGMS research have been reported in adult DM or children with Type 1 DM, CGMS data in Type 2 DM children is very limited.

OBJECTIVE: To study glycemic profiles with CGMS in poorly controlled Type 2 DM children.

DESIGN/METHODS: In this prospective pilot study, 17 adolescents (12 males and 5 females) with poorly controlled Type 2 DM underwent CGMS for 3 days. Average age was 16.1 years. Serial glucose measurements were divided into periods of euglycemia (70-150 mg/dL), hyperglycemia (>150 mg/dL), and hypoglycemia (<70 mg/dL). The proportions of each time periods were determined. Average glucose concentration per 24h, day and night, number of excursions, and area under the curve (AUC) of glucose value above 150mg/dL and below 70mg/dL were calculated. The correlation between CGMS profiles and HbA1c or fructosamine were analyzed.

RESULTS: CGMS glucose level correlated well with finger stick reading ($p< 0.0001$). The 24h average CGMS glucose was 217 ± 75.9 mg/dL with diurnal average slightly higher than nocturnal average ($p = 0.27$). Subjects remained in the range of euglycemia, hyperglycemia and hypoglycemia for 28 ± 30.6 %, 70 ± 31.4% and 1.3 ± 2.4% of the total day respectively. Hyperglycemic excursions were more frequent during the day than during the night ($p = 0.005$). Hypoglycemic events were more frequent during the night than during the day ($p = 0.059$). The mean AUC>150mg/dL and AUC<70mg/dL was 79.0 ± 64.5 and 0.3 ± 0.45 mg/dLxDay respectively. The degree of correlation is stronger between HbA1c and duration of glucose above 150 mg/dL or AUC>150mg/dL ($p = 0.001$) than that between HbA1c and 24h average glucose level ($p = 0.01$). Similar pattern was observed between CGMS profile and Fructosamine. No correlation was detected between AUC<70mg/dL and HbA1c or Fructosamine. More asymptomatic hypoglycemia were detected via CGMS than via finger stick (13 vs.1).

CONCLUSIONS: CGMS provides detailed information of glycemic excursion, as well as, postprandial hyperglycemia and asymptomatic hypoglycemia. This study will assist in future investigation of CGM in Type 2 diabetic children and also provide important quantitative information for therapeutic interventions.

118 5:15 PM Fellow in Training

Decreased Free T4 in Term and near Term Infants Requiring Inhaled NO

Erika M. Yencha, Amy Mackley, David A. Paul. Department of Pediatrics, Thomas Jefferson University, Philadelphia, PA; Section of Neonatology, Department of Pediatrics, Christiana Care Health System, Newark, DE.

BACKGROUND: We have previously shown that total T4 levels are diminished in term infants who die or require ECMO. However, levels of other hormones such as free T4 (fT4) and cortisol have not been extensively studied in this population.

OBJECTIVE: To investigate the association of thyroid function, including fT4, with illness severity and need for inhaled nitric oxide (iNO) in term/near term infants with respiratory distress.

DESIGN/METHODS: The study sample included infant ≥35 weeks who required mechanical ventilation or NCPAP following birth. After informed consent, thyroid function (TSH, T4, free T4, free T3) and cortisol levels were collected at birth, 48, 72, and 120 hours. Hormone levels were compared with severity of illness as measured by Score for Neonatal Acute Physiology (SNAP). Elevated illness was considered a SNAP ≥

10 based on previous studies. The need for rescue therapies such as iNO, high frequency ventilation, and ECMO were determined by medical team. Power analysis showed 20 patients needed to detect a 50% difference in fT4 with elevated illness severity, with β of .8 and α .05. Statistical analysis included repeated measures ANOVA.

RESULTS: 20 patients were enrolled with a gestational age 37.0 ± 1.7 wks, and birth weight 2814 ± 583 grams. Of the study sample, 45% had increased illness severity based on SNAP, 75% required mechanical ventilation and 15% required iNO, none of the infants died or required ECMO. Infants with increased illness had similar fT4, total T4, free T3 and cortisol levels at all study intervals but had lower TSH at birth compared to infants without elevated illness severity (6.6 ± 3.3 vs. 11.7 ± 4.8 μU/mL, p=0.02.) In addition, fT4 levels in infants requiring iNO were lower at 120 hours (1.1 ± .14 vs. 1.9 ± .4 μg/dL, p=0.02) compared to those infants who did not require iNO.

CONCLUSIONS: In our population of term/near term infant with respiratory distress, those infants requiring iNO had decreased fT4 compared to infants not requiring iNO. There was no association between severity of illness and fT4 levels. Term/near term infants with a higher level of illness severity did have a decreased TSH surge at birth. We can not determine if the decreased fT4 in infants requiring iNO is a marker for illness severity, treatment effect, or part of the causal pathway.

119 5:30 PM House Officer

Body Mass Index in Central Brooklyn: Relation to Birthweight and Rate of Growth in the 1st Six Months of Life

Tawana Winkfield-Royster, Leo Amoruso, Steven Todman, Jeremy Weedon, Robert J. Karp. Pediatrics, SUNY-Downstate Medical Center, Brooklyn, NY.

BACKGROUND: Children in central Brooklyn have a median for Body Mass Index (BMI) that suggests a predominance of overweight and obesity in the community. Both low birth weight (BW) and rapid early weight gain have been considered pivotal events in the lives of children who become obese later in life. Gender and season of measurement may affect BMI.

OBJECTIVE: To determine whether BW, change in BMI (ΔBMI) in the first six months of age, gender, age, and season of measurement affected BMI at 2 to 5 years of age in central Brooklyn.

DESIGN/METHODS: Charts were reviewed for 157 sequential children to determine gender, age, BW, weight and height at each visit. Mixed linear modeling was used to predict BMI at 2 to 5 years of age, from BW, ΔBMI in 1st 6 months of life, gender, season (defined as Winter=Jan-Mar, Spring=Apr-Jun, Summer=Jul-Sep, Autumn=Oct-Dec) and age as predictors.

RESULTS: Children whose ΔBMI in the first 6 months of life was at or below the median value of 3.25 kg/ m^2 had geometric mean BMI of 16.14 kg/ m^2 at ages 2 to 5 years, compared with 16.87 kg/ m^2 for those whose ÄBMI was above the median (p=0.028). When BW was added to the model, the effect of ΔBMI remained significant (p=0.035). Birth weight did not directly affect BMI at ages 2 to 5 years when controlling for age, gender, season, and change in BMI in first 6 months. No significant differences were seen between genders. Children had significantly higher geometric mean BMI in spring (16.45 kg/ m^2) and in autumn (16.49 kg/ m^2) than in winter (16.24 kg/ m^2) or summer (16.15 kg/ m^2) (p=0.001).

CONCLUSIONS: Babies who grow faster in first 6months of life are larger at 2 to 5 years of age. This phenomenon is apparent for both small and large infants. This finding suggests the importance of appropriate weight gain for all infants during the period from birth to six months of age in the prevention of childhood obesity in communities with increased prevalence of obesity. Seasonal variability suggests that environmental factors external to the family influence BMI in childhood.

Pulmonary & Asthma Platform Session

Saturday, March 10, 2007 4:15 PM-5:45 PM

120 4:15 PM Fellow in Training

Efficacy of Prophylaxis in a Home Setting in Reducing the Incidence of RSV Hospitalization

Caroline O. Chua, Vanessa V. Mercado, Marvin Siegel, Sergio G. Golombek. Pediatrics, New York Medical College, Maria Fareri Children's Hospital at Westchester Medical Center, 95 Grasslands Road, Valhalla, NY; Town Total Health, New York, NY.

BACKGROUND: Respiratory Syncytial Virus (RSV) infection,which manifests primarily as bronchiolitis and/or viral pneumonia,is the leading cause of lower respiratory tract infection in infants and young children. RSV intramuscular monoclonal Ab, Palivizumab,has been shown to decrease risk of severe RSV disease in infants with underlying conditions such as premature birth,hemodynamically significant congenital heart disease,chronic lung disease,congenital anomalies of the airway and severe neuromuscular disorders.

OBJECTIVE: To compare the efficacy of a home health care agency dosing-compliance program vs treatment in a private office setting during a single RSV season from 11/05 to 04/06.

DESIGN/METHODS: AAP guidelines were used to identify neonates who were eligible for RSV prophylaxis before discharge from a NICU setting. Demographic data were extracted including gestational age,birthweight,multiple births,number of siblings and enrollment in a daycare center. Unidentified home health care and Pediatrician's office records were reviewed for number and timing of Palivizumab doses received,RSV infection and hospitalization rates.Compliance data were calculated based on actual monthly injections given during the RSV season. Groups were compared using t-test and chi-square.

RESULTS: Our study included 1,204 infants who received Palivizumab during a single RSV season from 11/05 through 04/06. Of these infants, 292(24%)were <28 wks,356(30%)were 28-31 wks,369(31%)were 32-35 wks,and 190(15%) were >35 wks. 579 infants(48%) received their monthly injections in the home setting where 96% of the doses were given on schedule. In contrast, 625 infants(52%)received their monthly injections in the office setting with a compliance rate of only 79%.(p <0.001). There were 11 hospitalizations in the office setting group with 3 cases due to RSV infection, while there was only 1 cardiac admission reported in the home setting group with no RSV cases.

CONCLUSIONS: Infants receiving Palivizumab at home are still more likely to receive all scheduled doses on time. There is a trend towards less RSV hospitalization in infants who received RSV immunoprophylaxis at home. These results have been consistent with our previous data analysis for the past 6 RSV seasons.

121 4:30 PM

In Vitro IL-8 Promoter Activity Following Engineered Peptide Exposure

Shruti M. Paranjape, Neeraj Vij, Steven Mazur, Pamela L. Zeitlin. Eudowood Division of Pediatric Respiratory Sciences, Johns Hopkins University, Baltimore, MD.

BACKGROUND: Host-derived cationic antimicrobial peptides (CAPs) are important mediators for immune modulation and antibacterial killing activity. Previous *in vitro* and *in vivo* work has established the antimicrobial activity of engineered CAPs (eCAPs) against typical cystic fibrosis (CF) pathogens, as well as their effects on proinflammatory cytokines such as IL-8. NFκB is a major IL-8 transcription regulator in CF. We recently reported the involvement of C/EBP homologous protein (CHOP) in IL-8 regulation and have also shown that the eCAP WLBU-2 stimulates less of a proinflammatory cytokine response compared to a host-derived airway CAP.

OBJECTIVE: The purpose of this study was to determine if WLBU-2 influenced IL-8 promoter activity in CF IB3-1 cells.

DESIGN/METHODS: These studies used CF IB3-1 (ΔF508/W1282X) cells, transiently transfected with a 5' firefly luciferase gene flanking a 200bp wild type- or NFκB mutant-IL-8 promoter, using Lipofectamine 2000 for 24h. The IL-8 promoter constructs were transfected alone or in combination with CHOP shRNA (ΔCHOP). The cells were cultured in LHC-8 media with supplements and induced overnight with positive controls PGE-2 (10μM), IL1-β (1ng/mL) or TNF-α (1ng/mL) to stimulate proinflammatory signaling. The eCAP WLBU-2 (50μM) was added to the media for 30min. The Dual-Luciferase® Reporter (DLRTM) Assay System was used to measure IL-8 reporter activity in IB3-1 cells. Renilla luciferase was used as an internal control to normalize changes in IL-8 promoter-driven firefly luciferase activity across the samples.

RESULTS: The eCAP WLBU-2 showed less IL-8 promoter activity compared to TNF-α, IL1-β, and PGE-2, and no difference compared to the untreated control. In the NFκB mutant IL-8 promoter, there was no effect on IL-8 promoter activity following WLBU-2 exposure compared to control. WLBU-2 had no additional inhibitory effect in the absence or presence of the NFκB site on IL-8 promoter activity by inhibition of ΔCHOP compared to untreated control.

CONCLUSIONS: These results demonstrate that *de novo* eCAPs, previously established to have potent antibacterial activity, do not have an effect on the major transcription regulators of IL-8 signaling in IB3-1 cells and may be useful for development as novel antibiotic agents in CF. (Acknowledgments: This work was supported by ALA and CFF.)

122 4:45 PM Undergraduate Student

Does Ethnicity Affect Pediatric Asthma Admissions?

Whitney Young, Todd Lyons, Georgine S. Burke, Christopher L. Carroll, James F. Wiley, Sharon R. Smith. Pediatrics, Connecticut Children's Medical Center, Hartford, CT; School of Medicine, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: Many factors influence pediatric asthma admissions from the emergency department (ED). Some have suggested that urban minority children are admitted more frequently regardless of socioeconomic factors.

OBJECTIVE: To determine if ethnicity contributes to hospital admissions in children presenting to the ED with asthma.

DESIGN/METHODS: This retrospective review of registration database and medical charts included all children presenting to the ED from January 2000 to December 2004 with acute asthma requiring treatment. Demographic data, including ethnicity, age, gender, distance from ED, and asthma severity was analyzed. Ethnicity was self-reported by parents. Straight line distance between geocoded home and hospital address was determined using ArcGIS. A random sample of children's records, stratified by year, were reviewed for Modified Pulmonary Index Score (MPIS), to quantify severity of illness: mild (MPIS<7), moderate (7≤MPIS≤10) or severe (MPIS>10). All odds ratios were adjusted for race/ethnicity, primary payer and year of visit, and where appropriate are presented as (OR; 95%CI).

RESULTS: 2972 children with asthma received bronchodilators. The children had mean age of 6.5 years ± 5; 39% were female; ethnicity was Black (21%), Latino (43%), White (30%), other (5%); payer status was Medicaid (57%), private (37%), or self (6%). Admission rate was 36%. Children lived an average of 11 miles ± 40 from the ED (range <1 to 103 miles). Mean MPIS (n=490) was 9.5 ± 3. Without MPIS, Latino children (OR 0.68; 0.5,0.9, p=0.01) and children living less than 15 miles from ED (OR 0.54; 0.5, 0.7, p<0.0001) were less likely to be admitted than others. Children with Medicaid (OR 2.4; 1.7, 3.5) and private insurance (OR 2.4; 1.7, 3.6) were more likely to be admitted than children with self-pay (p<0.0001). Children presenting with severe exacerbations (MPIS ≥ 10) were admitted more than others (p<0.0001) (n=490). Multivariate logistic regression models demonstrated that payer status and distance to the ED accounted for all differences in admission rates among ethnic groups.

CONCLUSIONS: Children with no insurance and those living near the ED were less likely to be admitted for asthma than others. Ethnicity did not appear to be an independent factor in asthma disposition.

123 5:00 PM Ph.D. Student

Effect of Perfluorchemical (PFC) Liquids and Superoxide Dismutase (SOD) on Protein Oxidation and Mechanics in the Hyperoxic Lung

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BACKGROUND: Hyperoxia causes lung damage by the generation of reactive oxygen species. Treatment with SOD ameliorates the effects of hyperoxia in cell culture and in vivo. PFC liquids are useful vehicles to deliver biological agents to the lung. Studies from our laboratory have illustrated that a PFC combination of PP2/PP9 have anti-inflammatory properties in acute lung injury models.

OBJECTIVE: To assess effects of PFC, SOD protein and SOD delivered in a viral vector on protein oxidation and lung compliance in the hyperoxic mouse lung.

DESIGN/METHODS: C57/BL6 mice received normal saline (NS, 2ml/kg), PFC (PP2/PP9, 25/75 v/v ratio, 10ml/kg), rhSOD (5 mg/kg) or rAd.MnSOD in NS or PFC by minitracheal puncture, and were then exposed to 100% O_2 for up to 3d. Lung pressure-volume curves were constructed and compliance was calculated. Lungs were harvested and protein oxidation was assessed by protein carbonyl (PC) formation by dot blot using a chemiluminescence based kit (OxyBlot). Blots were quantified using the IVIS50 imaging system and associated software (Xenogen Corp).

RESULTS: In animals exposed to 1d O_2, PFC+rhSOD resulted in a 68% reduction of PCs ($p < 0.01$) relative to NS. rAd.MnSOD reduced PC by 89% ($p < 0.05$) when instilled in NS and 86% ($p< 0.05$) when instilled by PFC. The PFC+rAd.MnSOD was more efficacious than the PFC+rhSOD. By 3d O_2, PC increased in all groups. All groups that utilized PFC, either alone or with SOD, had reduced (45 - 58%; $p < 0.05$) PCs relative to NS. In contrast to 1d groups, neither rhSOD or rAd.MnSOD in NS reduced PC relative to the corresponding NS controls. Similarly, relative to NS control, compliance increased in all PFC groups ($p < 0.05$) either alone or comparably with rhSOD or rAd.MnSOD. Compliance following rhSOD in NS was greater ($p < 0.06$) than NS alone but rAd.MnSOD in NS was comparable.

CONCLUSIONS: These studies demonstrate cytoprotective and mechanoprotective benefits of using PFC to deliver antioxidants either as proteins or in a viral vector for acute lung injury. Waning effects of this therapy over time suggests that multiple dosing would be beneficial in prolonged hyperoxia exposure.

(HL-64158;1P20RR020173).

124 5:15 PM Fellow in Training

Use of Furosemide in Preterm Infants – Are the Effects Related to the Maturity of the Infant?

Clarice M. Staves, John A. Casey, Naveed Hussain, Ted S. Rosenkrantz. Pediatrics, University of Connecticut School of Medicine, Farmington, CT.

BACKGROUND: Furosemide (F) is commonly used to reduce total body and lung water in infants with respiratory complications such as evolving chronic lung disease and established bronchopulmonary dysplasia. However, little is known about the effects of this therapy on infants of different gestational(GA) and post-menstual age (PMA).

OBJECTIVE: The objective of this study was to examine fluid retention, weight gain, and pulmonary function before and after the initiation of F therapy and determine if these changes were related to PMA at the time the therapy was initiated.

DESIGN/METHODS: Data was collected retrospectively from preterm infants (26-30 wk GA at birth) who received F between the years 2000 - 2005. Demographic and clinical data collected included birth weight, race, gender, date of birth, hospital day of first F dose. Other clinical data was collected for a 4 day period before and 4 day period after the initiation of F therapy (fluid intake, sensible fluid balance, FiO2, pCO2, respiratory support. Respiratory support was graded (none to mechanical ventilation on a scale of 1-5). Data were analyzed by t-test, chi-square test and ANOVA.

RESULTS: 239 infants were studied with GA at birth 26-30 completed weeks. The PMA at the time of F administration was 26 to 35 wks. Infants 26 wk GA at birth were started on F earlier than infants of ≥27 wk GA (8.9 d vs. 13.3 d, $p < 0.001$). Infants continued to have increased fluid intake with increasing PCA irrespective of the initiation of F. Fluid retention increased with increasing PMA and was not different after initiation of F for any GA group. F decreased rate of weight accretion for infants >=30 wk post-menstrual age but no effect on infants < 30 wk PCA ($p< 0.001$). 41% of infants <30 wks PMA had a decrease in FiO2 vs 54% for ≥30 wks ($p=0.09$). 11% of those <30 wks had a decrease in respiratory support vs 19% of those ≥30 wks ($p=0.06$). 18% of those <30 wks had a decrease pCO2 vs 36% of those ≥30 wks ($p<0.006$).

CONCLUSIONS: The effects of F as a diuretic appear to be related to the maturity of the infant. F had no effect on fluid retention, fluid balance, or weight gain in the infants <30 wks. Improvement in respiratory function was primarily observed in the older infants. The use of other modalities may be more appropriate in eliminating lung and body water and improving respiratory mechanics in infants <30 wks PMA.

125 5:30 PM Fellow in Training

Pepsin, a Marker of Gastric Content Is Increased in Tracheal Aspirates from Premature Infants Developing Bronchopulmonary Dysplasia

Sabeena Farhath, Zubair Aghai, Judy Saslow, Tarek Nakhla, Jeanett Camacho, Sam Sounder, Zhaoping He, Dev Mehta. Pediatric Gastroenterology, Alfred I duPont Hospital for Children-Thomas Jefferson University, Wilmington, DE; Pediatrics/Pathology, Cooper Hospital-Robert Wood Johnson Medical School, Camden, NJ.

BACKGROUND: Detection of pepsin in tracheal aspirates (TA) is a new reliable marker of gastric contents. In a recent study {Farhath, JPGEN 2006, 43(3):336-341}, we have shown that pepsin was detectable in more than 92% of TA samples from ventilated premature infants.

OBJECTIVE: To study the association between pepsin in TA and development of BPD in premature infants.

DESIGN/METHODS: Serial TA samples were collected during the first 28 days from 59 premature neonates. BPD was defined by a recent consensus statement from the NICHD workshop. An enzymatic assay with a fluorescent substrate was used to detect pepsin. Total protein was measured by Bradford assay. Pepsin was also measured in 10 serum samples from 8 neonates. Immunohistochemistry (IHC) using antibody against human pepsinogen was performed in 10 lung tissues from premature infants.

RESULTS: A total of 256 TA samples were collected from 59 premature neonates {birth weight (BW) 762±166 g, gestational age (GA) 25.5±1.5 w}. 12 infants had no BPD (GA 26.4±1.4 w, BW 927±185 g), 31 infants developed BPD (GA 25.4±1.6 w, BW 696±107 g) and 16 infants died before 36 weeks PCA (GA 24.7±1.1 w, BW 737±146 g). Pepsin was detectable in 205/227(90.3%) of TA samples and none of the serum samples. Pepsinogen was not localized in the lung tissues by IHC. The mean pepsin level was significantly lower in infants with no BPD (425±451 ng/mg of protein) compared to those who developed BPD (606±349 ng/mg, $P=0.03$) or died (1370±1550 ng/mg, $P=0.03$). Moreover, mean pepsin was significantly higher in infants with severe BPD (856±431 ng/mg, n=11) compared to moderate BPD (469±197 ng/ml, $P=0.02$, n=20). The mean pepsin level in TA samples from first 7 days was also lower in infants with no BPD (269±197 ng/mg) compared to those who developed BPD (684±440 ng/mg, $P=0.003$) or died (1205±1767 ng/mg, $P=0.01$).

CONCLUSIONS: The level of pepsin is increased in TA from premature infants developing BPD. The source of pepsin in TA samples is gastric aspiration, not hematogenous spread or local synthesis in the lungs. Chronic aspiration of gastric contents is likely to be important in the pathophysiology of BPD.

Poster Session II

Saturday, March 10, 2007 **6:00 PM-7:30 PM**

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Legal Needs Assessment of Families Accessing Care at an Inner-City Community Health Center

Jamal Harris, Katherine O'Connor, Iman Sharif. Residency Program in Social Pediatrics, Children's Hospital at Montefiore, AECOM, Bronx, NY.

BACKGROUND: Medical-legal collaboration has emerged as a mechanism to better advocate for the well-being of children across the country. In preparation for a medical-legal collaboration at an inner-city community health center, we conducted a needs assessment of families attending the pediatric clinic. Because of the high proportion of Spanish-speaking immigrants in our setting, we also sought to determine whether needs were different for immigrants versus non-immigrants.

OBJECTIVE: To compare the legal needs of Spanish-speaking versus English-speaking families accessing care at an inner-city community health center.

DESIGN/METHODS: Anonymous cross-sectional self-completion survey of a convenience sample of parents of children attending a community health center in the South Bronx. Located in the nation's poorest congressional district, >80% of the children served are Medicaid recipients. Parents were asked to complete the survey in the lobby while waiting to see their pediatrician or in the exam room following their visit. Adapted from the screening tool developed by the Family Advocates of Central Massachusetts, the survey asked about family needs in areas such as housing, child-care, money, and safety, using a four point Likert scale. The survey was available in both English and Spanish.

RESULTS: 292 subjects participated. 37 (13%) completed Spanish surveys. Subjects most commonly identified concerns about schooling (43%), housing (37%), money (32%), and safety (32%). Overall, 24% indicated, "it would help to talk to a lawyer about any of your problems." Spanish speakers were more likely to indicate needing legal help (40% vs. 22%, $p=0.02$). Those completing surveys in Spanish reported significantly more housing (85% vs. 31%, $p<0.001$), child-care (47% vs. 23%, $p=0.002$), money (49% vs. 30%, $p=0.028$), education (71% vs. 40%, $p<0.001$), social service benefits (31% vs. 17%, $p=0.046$), safety (91% vs. 24%, $p<0.001$), food (17% vs. 3%, $p<0.001$), foster or legal guardian care (54% vs. 22%, $p<0.001$), immigration (24% vs. 3%, $p<0.001$) needs.

CONCLUSIONS: In this setting, 1 in 4 respondents indicated a need for legal assistance. Spanish-speaking respondents were even more likely to need legal assistance, primarily with regard to housing issues. These findings may have implications for the implementation of medical-legal collaborations in similar poor urban settings.

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Improving Asthma Care by Primary Care Pediatricians: An Interactive Approach

Tyra Bryant-Stephens. General Pediatric/Primary Care, The Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Asthma affects over 8 million children in the United States alone. Studies have consistently shown that asthma specialists deliver better quality care with better outcomes than pediatricians. Given pediatricians busy practices, interventions to change behavior in asthma management require interventions that include interactive education, training and systems supports.

OBJECTIVE: This paper describes the preliminary results of an inner city multi-level site specific program implemented to improve best care practices of asthma management in pediatric offices. Three levels of intensity are offered to practices: general continuing education, continuing education combined with on-site staff training, and continuing education combined with on-site staff training and systems support. Each practice has to commit to identifying a physician and nurse staff asthma champion. The asthma champions are responsible for leading the interventions in their offices.

DESIGN/METHODS: Inner-city pediatric practices voluntarily enrolled in one of three intensity levels of asthma training. This training included physician, nurse and office staff training with weekly support by a masters trained nurse.

Chart audits were done at baseline, then repeated six months after intevention completed. Outcomes include severity classification, controller medicine use, asthma care plan use, spirometry use, system changes and satisfaction with program.

RESULTS: 18 pediatric practices have enrolled. Five inner-city practices results are reported. All practices show significant improvement in severity classification and spirometry use. Fifty percent of the practices show a significant improvement in prescription of controller medications and asthma action plan use. All practices report high satisfaction with training and interaction with asthma nurse coordinator.

CONCLUSIONS: On-site interactive training for pediatric practices and their staff improves best care asthma management. Identification of committed asthma champions is important to overall success of training.

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An Innovative Model for the PBLI Competency in a Pediatric Residency

Barbara A. Kelly, Alexis S. Lieberman, Alan M. Schindler, Anna Marie Carr. Pediatrics, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: The practice-based learning and improvement (PBLI) competency focuses on clinical quality assessment and improvement (QA/QI) and residents' development of evidence-based medicine skills and self-reflective practices. Most residents and many faculty lack both experience and comfort with the PBLI competencies. Thus, integrating PBLI into pediatric residency training has created exciting new challenges.

OBJECTIVE: We describe an innovative model for integrating the PBLI competency into a pediatric residency program.

DESIGN/METHODS: We developed a PBLI model that included didactic presentations, experiential team learning, and evaluation. The program began with a lecture series on QA/QI and development of a Resident QA/QI Manual. We then organized PBLI teams of 3-4 residents with a faculty mentor. Teams were assigned the task of developing a QA/QI project of their choice. QA/QI data and outcomes were assessed by comparison to evidence-based practice. Each team worked over a period of 1-4 months and reported on their project at a departmental grand rounds. Residents completed self-evaluation forms and were evaluated by faculty mentors.

RESULTS: During the 2005-2006 academic year, six PBLI teams developed and presented QA/QI projects, with 19/35 (54%) residents participating. After completion of their projects, most residents (72%) felt they were more able to implement meaningful strategies to continually improve fund of knowledge and processes of care. Faculty expressed increased ability to mentor in the PBLI competency and high satisfaction with resident participation. Faculty perceived changes in the culture of the residency program: residents now incorporate principles of evidence-based medicine more thoroughly into their clinical practice and they are more proactive in identifying processes of patient care and developing strategies for improving outcomes. In addition, this PBLI project led to two award-winning poster presentations at a local meeting; one was of such high quality that it was submitted for publication.

CONCLUSIONS: An innovative PBLI model led to broad faculty and resident participation in QA/QI, improved QA/QI skills for both faculty and residents, helped residents to become more proactive in QA/QI activities, and enhanced scholarly activity.

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Provider Self-Efficacy in the Recognition and Management of Suspected Child Abuse before and after an Educational Intervention in Grenada, West Indies

Linda D. Arnold, Andrea G. Asnes, Kimberly Martin, Karen A. Santucci. Pediatrics, Yale University, New Haven, CT; Epidemiology and Public Health, Yale University, New Haven, CT.

BACKGROUND: The effects of child abuse education are difficult to quantify. High pediatrician self-efficacy, or confidence, is associated with an increased likelihood to screen or counsel on health measures such as smoking, suggesting that factors other than knowledge predict behavior. Given the sensitive nature of an evaluation of suspected abuse, provider self-efficacy in assessing possible abuse is likely to be an important predictor of provider behavior.

OBJECTIVE: To identify baseline provider factors associated with higher self-efficacy for skills associated with child abuse recognition and management. To determine whether self-efficacy increases following child abuse education.

DESIGN/METHODS: Self-administered questionnaire before and after a week-long workshop on child maltreatment in Grenada, West Indies.

RESULTS: Of 39 course participants, 29 (73%) completed both the pre- and post-course questionnaires. They were asked to rate, on a scale of 1-5, their confidence in their ability to inquire about and recognize neglect, physical and sexual abuse; and in counseling and managing affected children. High baseline scores for confidence in managing child abuse were associated with previous formal child abuse training (OR: 10.5 (1.62,68.07)).The data also suggest that high self-efficacy in inquiring about and recognizing abuse may be associated with formal training and higher self-estimates of number of cases seen. Self-efficacy increased significantly in all eight areas measured following the workshop ($p<0.0001$). While participants who lacked previous training showed the greatest gains in self-efficacy ($p<.0001$), those with formal training also reported overall increases ($p=0.02$). Scores of participants who had managed moderate numbers (11-50) of abused children increased with respect to inquiring, counseling, and management ($p= 0.002-0.02$). Those who had managed 51-100 cases reported greater confidence inquiring about sexual abuse ($p=0.03$).

CONCLUSIONS: Experience and formal training have a significant impact on self-efficacy related to inquiry about, recognition and management of child abuse. Although gains in self-efficacy following child abuse education are greatest for those without previous formal training, experienced practitioners also benefit.

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Gaps in Communication: Comparison of Attitudes, Perceptions and Acceptance between Parents and Pediatric Residents Regarding Complementary & Alternative Medicine

Mimi McEvoy, Thanakorn Jirasevijinda, Maria Marzan, Mariko Koya, Elaine Hsieh, Elizabeth Alderman. Office of Education, Albert Einstein College of Medicine, Bronx, NY; Department of Pediatrics, Bronx Lebanon Hospital, Bronx, NY; Children's Hospital at Montefiore, Bronx, NY.

BACKGROUND: Pediatric providers are aware that parents may use complementary & alternative medicine (CAM) to treat their children. Yet, differences in attitudes, perceptions and acceptance of CAM between pediatric providers and parents are not well understood. These differences may cause communication gaps resulting in misinformation, mistrust and sub-optimal care.

OBJECTIVE: Compare attitudes, perceptions and acceptance of CAM between parents of hospitalized children and pediatric residents.

DESIGN/METHODS: We asked 62 pediatric residents (44 agreed) and 55 parents of hospitalized children (32 agreed) to complete an 8-item Likert-type survey and 9 open-ended questions at 2 separate hospitals in New York. We dichotomized scorings of the Likert-type items into "agree" or "other" using Fisher's exact tests. We audio-taped and transcribed parents' responses to open-ended questions; residents' written responses were typed verbatim. All were analyzed for emergent themes.

RESULTS: We found discordance between residents (50% foreign-born) and parents (53% foreign-born) on 4/8 items: 70% parents are comfortable disclosing CAM use; only 32% residents think parents are comfortable ($p=.002$). 55% parents report CAM use safe for themselves, but not their children; 23% residents are aware that parents make this distinction ($p=.004$). Fewer parents (51%) than residents (86%) perceive a link between spirituality and CAM ($p=.002$). 58% parents and 25% residents think discussions of spirituality are outside doctors' roles ($p=.005$). While not significant, 36% parents agree it's normal for doctors to make CAM recommendations; yet only 14% residents routinely make such recommendations. 73% parents and 66% residents agree that CAM should be part of medical training.

Parents' responses to open-ended questions showed wide definitions of CAM and variety of modalities, often different than residents' responses.

CONCLUSIONS: Specific gaps in communication about CAM exist between parents and pediatric residents. Medical schools and pediatric residency programs should include skills training to address these communication gaps.

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Fellow in Training

High Levels of Rotavirus Vaccine Ineligibility among Philadelphia Children: Narrowly Defined Age Group Recommendations Meet the Reality of Vaccination Implementation

Irini Daskalaki, C. Victor Spain, Michael G. Eberhart, Sarah S. Long, Barbara Watson. Pediatrics, St Chirstopher's Hospital for Children, Philadelphia, PA; Drexel University College of Medicine, Philadelphia, PA; Division for Disease Control, Philadelphia Department of Public Health, Philadelphia, PA.

BACKGROUND: The large pre-licensure safety study of pentavalent human-bovine rotavirus vaccine (PRV) was performed within strictly defined ages. Licensure and recommendation mirrored the safety study's age group, i.e. age $\leq$84d for series initiation, $\leq$224d for series completion. Limited data suggest that administration of 2 doses of PRV is associated with inferior efficacy compared with 3 doses, although 2 doses substantially reduce healthcare utilization due to rotavirus disease.

OBJECTIVE: To predict, using delayed vaccination with DTaP as an indicator, whether the currently defined narrow age limits for PRV administration exclude a substantial proportion of children from complete immunization and protection against rotavirus.

DESIGN/METHODS: The Philadelphia Department of Public Health, through its Division of Disease Control, operates a computerized population-based children's immunization registry (KIDS), which captures data on immunizations given to all Philadelphia residents <6y old.We analyzed demographics and age at immunization with 1st, 2nd and 3rd dose of DTaP or DTaP-containing vaccines for children born and living in Philadelphia from 2001 to 2005.

RESULTS: During the 5-year period, of 112,778 recipients of 1st DTaP, 23% were >84d. Of 101,899 recipients of 2nd DTaP and of 93,235 recipients of 3rd DTaP, 10% and 34% were >224d, respectively. The percentage of children delayed in immunization in the first 6 months of life decreased from 2001 to 2005, but still was substantial. In 2001, the percentage of 1st, 2nd and 3rd DTaP recipients older than the PRV age limits was 29, 14 and 40, respectively; in 2005 the percentage was 17, 6 and 25, respectively.

CONCLUSIONS: With current level of vaccine implementation and current narrowly defined PRV recommendations for series' initiation, 23% of children are expected to be excluded from receiving any vaccination against rotavirus and 34% of children will be eligible for only 2 instead of 3 PRV doses.

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Emotional Experiences in Fathers of Medical NICU Babies: A Pilot Study over Time

Amy B. Mackley, Robert G. Locke, Rachel Joseph, Michael L. Spear. Neonatology, Christiana Hospital, Newark, DE; Neonatology, A.I. duPont Hospital for Children, Wilmington, DE; Pediatrics, Thomas Jefferson University, Philadelphia, PA.

BACKGROUND: Birth and hospitalization of a preterm infant in the NICU is associated with increased maternal stress levels. Paternal emotional response has received much less attention.

OBJECTIVE: To determine the presence of stress and depressive symptomatology in fathers of medical NICU infants over time.

DESIGN/METHODS: This prospective study is part of a larger pilot study evaluating emotional responses in fathers of medical and surgical NICU infants over time. Consenting fathers with infants <30 weeks gestation were given a survey comprised of two tools: 1)Parent Stressor Scale: Infant Hospitalization (PSS:IH), a 22-item scale measuring perceived parental stress via 3 subscales(separation, appearance of infant, sights/sounds of unit); 2)Center for Epidemiologic Studies Depression Scale (CES-D), a 20-item scale measuring depressive symptomatology. Surveys administered on infants' day of life 7, 21, and 35(±3 days). Illness severity, measured by SNAP score, at birth and each day the survey was completed. Statistical analyses included parametric and non-parametric tests.

RESULTS: N=13. Mean paternal age=30(±6);mean gest.age=27 (±1). Mean PSS subscale-separation at $Time_{1,2,3}$ were 25±6,28±7,and 25±9 respectively. Mean PSS subscale-appearance at $Time_{1,2,3}$ were 29±7,29±7, and 28±8. Mean PSS subscale-sights/sounds at $Time_{1,2,3}$ were 15±5,14±7, and 15±7. PSS scores for each subscale were related at $Time_{1,2,3}$. PSS total at $Time_{2,3}$ were related($p<0.001$), but not between $Time_1$ and $Time_{2,3}$($p>0.05$). CESD scores $\geq$16 at $Time_{1,2,3}$ were 53%,60%,and 46%. CESD scores at $Time_{1,2,3}$ were consistent for each father($p<0.05$). CESD scores at $Time_{1,2}$ showed a trend towards the PSS separation subscale at $Time_{1,2}$($p=.06$ CESD1, $p=.04$ CESD2). Degree of illness severity was not related to PSS at any time.

CONCLUSIONS: In our pilot study, fathers of medical NICU infants demonstrated clinically meaningful levels of stress and depressive symptomatology. Little variation exists in total PSS and CESD scores over time indicating that fathers remain significantly stressed. Level of stress was not related to infant illness severity. Further research is needed to provide proper support for fathers of NICU infants.

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Fellow in Training

Use of Event-Related Potentials To Assess Language and Developmental Outcome in Extremely-Low-Birth Weight Infants

Aimee C. Knorr, Richard A. Ehrenkranz, Dennis L. Molfese, Eric Langlois, Linda Mayes. Neonatology, Yale New Haven Children's Hospital, New Haven, CT; Birth Defects Center, University of Louisville, Louisville, KY.

BACKGROUND: Auditory event-related potentials (ERPs) obtained from term infants and toddlers may be predictive of future language problems. Molfese (1992) compared neonatal ERPs to scores on the McCarthy Verbal Index at 3 year old infants and found that a region of the ERP varied as a function of language performance.

OBJECTIVE: This study seeks to use auditory ERPs to evaluate language and cognitive development in extremely-low-birth-weight (ELBW, <1000g at birth) infants.

DESIGN/METHODS: A case-control study design was used. Four ELBW infants at 18 to 24 months corrected age were age-matched with nine 18-24 month old full term infants. ERPs were recorded using 128-electrode high-density arrays while children responded to a series of speech syllables. The ERP recordings were then clustered into 10 regions by averaging the data from electrodes within five anatomical regions over the right and left hemispheres (frontal, central, parietal, temporal, and occipital). The analysis of the clustered ERP data is termed principle component analysis (PCA). Statistical analysis was performed by ANOVA.

RESULTS: PCA identified 4 factors (based on the averaged ERP data) which accounted for 84% of total variance across subjects. One of these factors, factor 2 which accounts for the variance in the wave-form from 300 to 564 ms with a peak of 400 ms, showed a strong trend towards a difference between the groups, p=0.081.

CONCLUSIONS: Preliminary analysis suggests that ELBW and full term infants may process speech sounds differently at 18-24 months after birth, a factor which is likely to be relevant to later language development.

134 Fellow in Training

Neurobehavioral Assessment Predicts Motor Outcome in Preterm Infants

Bonnie E. Stephens, Jing Liu, Barry Lester, Linda Lagasse, Seetha Shankaran, Henrietta Bada, Charles Bauer, Abhik Das, Rosemary Higgins. Pediatrics, Rhode Island Hospital, Providence, RI; Maternal Lifestyle Study of the NICHD Neonatal Research Network and NIDA, Bethesda, MD.

BACKGROUND: Though survival of infants born ≤1250g has improved, incidence of disability has increased. Up to 20% have cerebral palsy (CP) and 29-40% have Bayley PDI <70 at 18 months CA. Yet there is no reliable predictor of poor motor outcomes. The NNNS is a standardized neurobehavioral assessment of the high-risk neonate. In cocaine exposed neonates scores correlate with PDI at 12 mo. In preterm infants scores may correlate with outcome. Currently no conclusive data exists correlating NNNS and motor outcome in infants born ≤1250g.

OBJECTIVE: To determine if NNNS Summary Scores at 44 wks are predictive of CP at 12-36 mo or low PDI at 24 mo CA, in infants born ≤1250g from the MLS Study.

DESIGN/METHODS: We analyzed data collected on all preterm infants in the MLS Study who had an NNNS performed at 44 wks and a neurologic exam at 12-36 mo CA (n=395) or a Bayley PDI performed at 24 mo CA (n=270). Logisitic regression analyzed NNNS summary scores associated with CP at 12-36 mo CA, or PDI <70 at 24 mo CA, while controlling for birth weight ≤1250g. Summary scores were entered into the model as z scores. Criteria for entry into the model was p<0.05.

RESULTS: 18/395 infants (5%) had CP, and 24/270 infants (9%) had PDI <70 (2 sd below mean). CP was associated with low quality of movement, (OR 1.95, 95% CI 1.24-3.06, p=0.004), and high lethargy (OR 1.67, 95% CI 1.01-2.76, p=0.045). This model contributed 19% of the variance in diagnosis of CP at 12-36 mos (R^2=0.19, p=0.000). Bayley PDI <70 at 24 mo was associated with low handling (OR 1.83; 95% CI 1.12-2.99, p=0.017), low quality of movement (OR 2.16; 95%CI 1.38-3.38, p=0.001), and hypotonia (OR 1.63; 95% CI 1.14-2.32, p=0.007). This model contributed 26% of the variance in PDI <70 at 24 mo (R^2=0.26, p=0.000).

CONCLUSIONS: Findings suggest that the neurobehavioral profile of underarousal in the 44 week preterm infant may be a harbinger of poor motor outcome.

135 Fellow in Training

Hematologic Effects of Preeclampsia on Very Low Birthweight (VLBW) Infants with Evidence of Placental Pathology

Kelly J. Zook, Jennifer L. Kern, Amy B. Mackley, David A. Paul. Pediatrics and Neonatology, Christiana Care Health System, Newark, DE; Pediatrics, Thomas Jefferson University, Philadelphia, PA.

BACKGROUND: Preeclampsia is known to cause neonatal thrombocytopenia and neutropenia. Preeclampsia associated neutropenia and thrombocytopenia is likely secondary to placental insufficiency.

OBJECTIVE: To investigate the effect of placental pathology on neonatal white blood cells (wbc), platelets (plt), hematocrit (hct) and nucleated red blood cells (nrbc) in VLBW infants born to mothers with preeclampsia.

DESIGN/METHODS: Retrospective cohort study of infants with birthweight <1500g born to mothers with preeclampsia from 6/2002-6/2006 at a single level 3 NICU. Placental pathology was reviewed for presence placental infarction and vasculopathy. Hematologic parameters from day of life 0, 1, and 2 also obtained. Thrombocytopenia was defined as plt count <100K/mm^3. Neutropenia was defined by Mouzhino criteria. Statistical analysis included repeated measures ANOVA and multivariable analysis using logistic regression.

RESULTS: The study sample included 203 infants with EGA of 28 ± 3 weeks, 45% had placental infarctions and 26% placental vasculopathy. Infants with neutropenia and thrombocytopenia did not have an increased occurrence of placental infarction or maternal vasculopathy but were more likely to be IUGR and of lower gestational age. There was no association with placental pathology and hct or nrbc in the 1st 48 hours of life.

	Neutropenia present,n=33	Neutropenia absent,n=170	p	Thrombocytopenia present, n=38	Thrombocytopenia absent, n=165	p
Gestational Age (weeks)	27.9 ± 2.1	29.3 ± 2.4	.02	28.3 ± 3.0	29.2 ± 2.3	.04
Placental Infarction	33%	46%	.2	50%	44%	.47
Placental Vasculoptahy	33%	25%	.41	25%	28%	.73
IUGR	37%	15%	.01	43%	17%	.01

After multivariable analysis, gestational age and IUGR remained associated with both neutropenia and thrombocytopenia while placental infarction and vasculopathy did not remain in the models.

CONCLUSIONS: In our population of VLBW infants born to mothers with preeclampsia placental pathology was common. There was however no association of placental infarction or vasculopathy with neonatal neutropenia, thrombocytopenia, or other hematologic parameters. The data suggest that neonatal hematologic effects of maternal preeclampsia, if related to placental insufficiency, are associated with factors other than placental histology.

136 Fellow in Training

Neonatal Blood Transfusions: Do Our Guidelines Need To Be Revised?

Kavita Kasat, Pradeep Mally, Karen Hendricks-Munoz. Pediatrics, Division of Neonatology, New York University Medical Center, New York, NY.

BACKGROUND: Tissue oxygenation depends on cardiac output and oxygen carrying capacity. To optimize oxygenation, the critically ill newborn is often given red blood cell (RBC)transfusions. However, a transfusion is not a benign procedure. It can lead to arrhythmias, changes in cerebral blood flow, transfusion reactions, infections, and has been associated with necrotizing enterocolitis (P Mally et al AJP Vol 23 Nov 06).

Guidelines for blood transfusion are in place in the NYU Neonatal Intensive Care Units (NICU). However, often the decision to transfuse is based on the patient's clinical status. At times, several interventions are attempted at once. It can be unclear which intervention worked and if the transfusion was necessary.

OBJECTIVE: To assess if RBC transfusion guidelines were followed in the NICU.

To determine the effectiveness of each transfusion by evaluating patients for improvement in symptoms.

To evaluate doctor/nurse perceptions regarding the indications for and efficacy of transfusions.

DESIGN/METHODS: Medical staff completed a survey with RBC transfusions given in the NICU. Pertinent data on patients was collected after the transfusion.

Analysis of the effectiveness of blood transfusion, guidelines used and doctor/nurse perceptions was done.

Improvement in symptoms was defined by a 10% decrease in FiO_2, heart rate if patient was tachycardic, or apnea/bradycardias/desaturations (ABD's).

RESULTS:

Transfusion Data

	Improvement N=21	No Improvement N=12	P value
Guideline	6	8	.05
Symptom	8	3	1
Guideline Symptom	7	1	.2
Average in hematocrit	8	5.6	.19
Caregiver impression	17	4	.01

CONCLUSIONS: In an effort to decrease the number of transfusions, RBC transfusions are commonly given in the NICU based on strict guidelines rather than the patient's clinical status. In this survey, we showed that in only 42% of cases were transfusion guidelines strictly adhered to. In 58% of cases, blood was given based on clinical symptoms alone or with guidelines. When guidelines were part of the decision, 9/22 cases (41%) had no clinical improvement. Caregiver impression of symptoms was highly predictive of infant improvement. These results demonstrate that caregiver assessment used in conjunction with transfusion guidelines, more favorably predicts improvement. Given the potential side effects of a RBC transfusion, our guidelines for transfusions should be reassessed to include additional caregiver judgements.

137 Fellow in Training

Chronic Exposure to Dopamine Stimulates Na-K-ATPase Pump in Proximal Tubule Cells

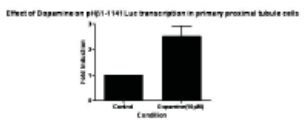
Sudha Garimella-Krovi, Triv Rajkhowa, James Springate, Mary Taub. Nephrology, Childrens Hospital, Buffalo, NY; Biochemistry, SUNY, Buffalo, NY.

BACKGROUND: Dopamine (DA) is produced locally in proximal tubule cells & regulates sodium excretion via dopaminergic receptors. Studies of the renal DA system provide evidence that its dysregulation plays a role in hypertension. Na-K-ATPase is a transmembrane protein that maintains electrochemical gradients across mammalian cell plasma membranes, a process subject to regulation at transcriptional & post-transcriptional levels. DA has been shown to inhibit Na-K-ATPase as an acute effect.

OBJECTIVE: To study the effect of chronic DA exposure on Na-K-ATPase using transient transfection studies.

DESIGN/METHODS: Studies were conducted on primary cultures of rabbit proximal tubule cells using cotransfection with pH1-1141-Luc bacterial DNA containing β1 subunit promoter sequence. β-galactosidase expression vector pSVβ gal was used as control for transfection efficiency. Cells were transfected on day 3 of growth, incubated with DA for 4 h & luciferase DNA activity measured. Each tubule isolation procedure & culture preparation represented 1 experiment. Studies were performed on 4 separate dishes & averaged for each experiment. Results were calculated as % induction, dividing each DA experiment by its corresponding control & expressed as μ±SEM of 3 experiments.

RESULTS: Luciferase activity [corrected for galactosidase] was higher (P<0.05) in DA exposed cultures than controls . Thus, Na-K-ATPase β1subunit transcription was significantly stimulated by chronic exposure to DA.



CONCLUSIONS: As DA is produced in proximal tubule cells locally, upregulation of the sodium pump with prolonged DA exposure, as opposed to down regulation during acute exposure [30 min] shown in previous studies, has important implications for hypertension mechanisms. Studies are being conducted to elucidate the role of dopaminergic receptors in this process.

138 Fellow in Training

Elevated IL-6 Expression in the Placental Microenvironment of the Extremely Low Birth Weight (ELBW) Infant: Is There an Association with Bronchopulmonary Dysplasia (BPD)?

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BACKGROUND: BPD is associated with chorioamnionitis (CA), and cytokines may be a putative link. Little is known regarding placental cytokines and BPD.

OBJECTIVE: ELBW (BW≤1 kg) infants with BPD have greater expression of the pro-inflammatory cytokine IL-6 and less expression of the anti-inflammatory cytokine IL-10 in specific placental compartments compared to infants without BPD.

DESIGN/METHODS: Retrospective, case controlled study of ELBW infants (n=52, projected n=100)inborn between 2003-05 and with archived placental tissue. Infants with BPD (O_2 use at 36 weeks post conception, cases) were matched for gender, BW and year of birth with infants without BPD (controls). Immmunohistochemistry for IL-6 and IL-10 was performed on membrane roll, umbilical cord and placenta. Sections were graded 0-2 for cytokine expression (0=no staining, 1=mild, 2=intense) by 2 independent reviewers, blinded to outcome. Charts were reviewed for clinical data.

RESULTS: Mothers of infants with (n=26) and without BPD (n=26) had similar betamethasone use (70 vs 62%), clinical (12 vs 15%) and histologic (46 vs 54%) CA, but differed for preeclampsia (24 vs 3%*). Cases had similar BW (787 ± 123 vs. 844 ± 130g), identical gender (46% male) but were lower gestation (25.9 ± 1.2 vs 27 ± 1.8 wks*). Cases had more white and less black infants vs controls (white/black, 88/0 vs 46/24%*). Cases received more surfactant (100 vs 80%*), had more ventilator days (median, range; 36,7-109 vs 6,0-53 days*), and received more postnatal steroids (35 vs 0%*). IL-6 staining in membrane, cord and placenta was similar among groups. Cord stroma IL-6 Grade 1 and 2 staining was present in 50 and 39% of cases respectively, and in 62 and 27% of controls respectively. Membrane amnion of both cases and controls showed more Grade 1 (65 and 52%) than Grade 2 staining (23 and 30%). Membrane chorion of cases and controls had similar Grade 1 (42 and 44%) and Grade 2 (50 and 48%) staining. IL-10 staining was none or mild in all placental compartments of both groups. *p≤.05

CONCLUSIONS: Placental inflammation evidenced histologically and by expression of IL-6 with little IL-10 is prevalent among ELBW infants. Preliminary results do not support a link with BPD. Additional infants are being studied.

139 House Officer

Early Discharge of Newborns and Readmissions for Hyperbilirubinemia – A Continued Dilemma

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BACKGROUND: Early newborn discharge may result in delayed diagnosis of hyperbilirubinemia, and possible kernicterus. Following the sentinel event alert in 2001, new policy was instituted at our hospital to do serum bilirubin in all clinically jaundiced babies before discharge.

OBJECTIVE: To evaluate if this new policy resulted in decreased readmission rate for neonatal jaundice.

DESIGN/METHODS: A retrospective chart review from January 2003 to December 2005 was conducted for all newborns with the admitting diagnosis of hyperbilirubinemia and compared with our previous data from years 1998-2001.

RESULTS: Of the 10,515 babies born during the study period 68 (0.65%) infants were readmitted for severe hyperbilirubinemia. The readmission rate after the new policy was slightly but not significantly lower than our baseline valueof 0.75% .In the current cohort of 68 infants, 58 were full term and 10 were near term (>35 wks). The proportion of vaginally delivered babies was 91%. Timing of discharge was mainly decided by type of delivery: Four infants were discharge at <48 hrs, 50 between 48-72 hrs, and 14 at 72 -96 hrs. During their stay in the newborn nursery, 25 infants had bilirubins measured for clinical jaundice,and 4 received phototherapy. Bilirubin at discharge was >12 in 6 infants. The readmission rate was maximum on day 4 of life (38%), followed by day 5 (20%) and day 3(16%). The remaining 26% of admissions took place between 6 to 10 days of life. Among the readmitted babies 26% were exclusively breast-fed. Bilirubin >20 was noted in 7 babies and the remainder had serum bilirubin >17. None of the babies had evidence of bilirubin induced encephalopathy. All the babies responded to phototherapy and none needed exchange transfusion. It is significant to note that 43 (63%) of the 68 readmitted infants had not had bilirubin checked before discharge. None of the 43 had clinical jaundice prior to discharge nor did they have a major risk factor.

CONCLUSIONS: A marginal reduction in readmission rate was seen following the new clinical practice .Serum bilirubin can peak at 3 to 6 days. The fact that 63% infants did not have jaundice at discharge but required readmission strongly suggest that maternal education and close follw up by a pediatrician is essential for prompt detection and treatment of hyperbilirubinemia irrespective of risk factors or jaundice at the time of discharge.

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Does Race Impact Hemoglobin Level in Pregnant Women

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BACKGROUND: Anemia is associated with maternal and fetal morbidities. In men and non-pregnant women, hemoglobin levels differ between Caucasians (C) and African-Americans (AA). However, it is not clear whether these racial differences exist in pregnant women.

OBJECTIVE: To examine the effect of racial and maternal age interaction on the hemoglobin levels in pregnant women.

DESIGN/METHODS: Retrospective analysis of the perinatal data set of mothers delivering at the George Washington University Medical Center between 1990 and 2004 was conducted. Data was classified into 2 groups according to maternal race (C and AA). Each group was further stratified into 3 categories based on maternal age; Early (<25 year old), Middle (25-34 years) and Advanced (≥ 35 years) Means of hemoglobin levels were compared using *Student t-test.* Multiple regression analysis was conducted to control for the effect of possible confounders associated with pregnancy such as body mass index, hypertension, diabetes mellitus and thyroid disorders.

RESULTS: A total of 15138 pregnant singleton women presented for delivery after full term pregnancy (37 weeks of gestation) In bivariate analysis, hemoglobin levels differed between the 2 race groups and in all maternal age sub-categories.

Comparison of Hemoglobin Levels Between Different Groups

	All Ages	Early Maternal Age	Middle Age Maternal Age	Advanced Maternal Age
African American	11.68±1.32	11.48±1.36	11.84±1.28	11.95±1.26
White Caucasian	12.55±1.1	12.16±1.37	12.69±1.08	12.57±1.01
P value	P=0.0001	P=0.01	P=0.0001	P=0.0001

In multiple regression model, the difference in hemoglobin between the groups continued to be the same. Other factors that significantly impacted hemoglobin were; BMI on both groups, and maternal age and DM in the African American group.[table1]

CONCLUSIONS: Hemoglobin levels differ between C and AA mothers during the third trimester of their pregnancy similar to those seen in non pregnant females of the same ethnic groups. These differences are sustainable controlling for other factors associated with pregnancy such differences need to be considered during clinical management of these pregnant mothers. Possible mechanisms for racial effect on hemoglobin during pregnancy need to be explored.

141 Fellow in Training

Maternal Factors and Risk of Late Preterm Delivery

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BACKGROUND: Late preterm infants (34-36 wks gestation) account for 70% of all premature infants and are the fastest growing subgroup of preterm infants. However, little is known about why the birth rate in this group continues to rise.

OBJECTIVE: To determine if there are maternal risk factors associated with delivery of late preterm infants.

DESIGN/METHODS: Data were obtained from NY Vital Statistics on late preterm and term (≥37 wks gestation) infants born in Westchester County, NY from 2004-2005. Data included delivery characteristics, receipt of prenatal care, and maternal demographics. Poisson regression was used for analysis of relative risks (RR).

RESULTS: There were 2320 late preterm births and 20936 term births with a total birth population of 25165. There was a significantly increased risk of c-section (c/s) delivery in late preterm infants compared to terms (RR 1.05, 95% CI 1.02-1.07). There was no difference in the risk of having an elective c/s between the late preterms and terms (RR 1.11, 95% CI 0.97-1.27). Risk of c/s for a non-pregnancy related maternal condition was not different between the 2 groups (RR 1.08, 95% CI 0.85-1.39). The risk of having a c/s for maternal conditions related to pregnancy or fetal risk was significantly increased in the late preterm vs. term infants (RR 1.55, 95% CI 1.39-1.72; RR 1.16, 95% CI 1.08-1.24). Prenatal care did not differ between the late preterms and terms (RR 0.95, 95% CI 0.87-1.02). There was a significantly increased risk of late preterm delivery in mothers < 17 and > 35 yrs old (RR 1.14, 95% CI 1.02-1.28; RR 1.04, 95% CI 1.02-1.06). There was no difference in Medicaid use in the late preterms vs. terms (RR 1.01, 95% CI 0.99-1.04).

CONCLUSIONS: Late preterm infants are more likely than terms to be delivered via c/s for a maternal condition related to pregnancy and fetal risk. They are also more likely to be born to mothers at the extremes of age, those <17 and >35 yrs old. Interestingly there was no difference in risk of elective c/s in late preterm vs. term infants suggesting an unexpectedly high rate of elective preterm delivery. This study allows us to begin to identify and target mothers at risk for late preterm delivery.

142 Medical Student

A Comparison of Broviac Lines Inserted at Bedside vs. in the Operating Room

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BACKGROUND: Surgically inserted central venous lines (e.g.Broviac) provide secure intravenous access in critically ill neonates. The procedure is done at the bedside (NICU) or in the operating room (OR) depending on the surgeon's preference and the patient's status. OR placement is often combined with abdominal surgery but may increase the risk for bacterial contamination. NICU insertions may have complications related to fewer resources and the surgeon's unfamiliarity with NICU.

OBJECTIVE: To determine whether NICU Broviac insertions are as safe as OR insertions.

DESIGN/METHODS: A retrospective, non-randomized, observational study of NICU vs OR Broviacs in all neonates admitted from 6/2005 to 6/2006. Vital signs (HR, BP, T°, Sats), serum glucose, the incidence and the causative organisms of line sepsis were compared.

RESULTS: We studied 22 neonates with 26 Broviac lines, 18 NICU and 8 OR. BW and GA were 1344 ± 916g; 30 ± 6 weeks and 1892 ± 719g; 32 ± 4 weeks respectively (Mean ± SD) *(p=ns).* The duration of NICU vs OR Broviac lines was similar, 42 ± 34 vs 42 ± 32 (Mean ± SD)*(p=ns).* The procedure was well tolerated in both groups with no difference in T°, HR, BP, ventilatory support, FiO_2, accucheck and oxygen saturations before and after Broviac placement. The catheter infection rate (# of infected patients/1000 catheter days) in the NICU and OR groups was similar at 5.9/1000 vs 1.8/1000 *(p=ns)* or 7.7/1000 for all patients. However, the causative organisms in each group were different. The NICU group had mostly CoNS and other Gram-positive bacteria. The OR group had mostly Gram-negative bacteria, fungus and yeast. All OR Broviac placements were done during abdominal surgery. In the NICU group, 40% had intestinal pathology, 40% had multiple congenital malformations and 20% had difficult venous access. The mortality rate in the NICU group was significantly lower than the OR group (20% vs 43%), (p<0.05).

CONCLUSIONS: NICU and OR Broviac insertions were well tolerated and not associated with immediate adverse events. However OR inserted Broviac lines, in conjunction with abdominal surgery had higher mortality and higher Gram-negative and fungal sepsis. Abdominal surgery may lead to intestinal bacterial translocation, transient bacteremia and Broviac line contamination. Therefore, to minimize the risk for line related sepsis, if feasible, it may be prudent to delay Broviac placement until after surgery.

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Risk Factors for Primary-Series Immunization Delay of Very Low Birthweight (VLBW) Preterm Infants in the Neonatal Intensive Care Unit (NICU)

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BACKGROUND: Prematurity is a risk factor for delay of the primary immunization series. Catch-up vaccination can take up to three years. Specific, neonatal-based risk factors associated with immunization delay in the NICU have not been described.

OBJECTIVE: To assess risk factors correlated with immunization delay amongst VLBW in three tertiary care NICUs.

DESIGN/METHODS: Retrospective analysis and chart review of all infants with a birthweight ≤1500 grams and a length of stay of ≥60 days. Demographic data as well as CRIB score, day of immunization completion, medical status on day of life 60 were analyzed using Student's T-test, Fisher's Exact Test in univariate analysis.

RESULTS: Of 108 patients who met inclusion criteria, 46.3% began vaccination between 60 and 70 days of life. 19.4% of patients were delayed beyond 90 days. Prenatal steroid exposure was significantly greater in the "delayed" cohort than in those immunized on time (37.0% vs 11.1%; p <0.03, Fisher's Exact Test). Surfactant administration was associated with timely immunization (27.7% vs 16.1%; p < 0.05) as was a lower CRIB score upon NICU admission (p<0.04), though 1 and 5 minute Apgar scores were not predictive of immunization delay.

Patients at the public hospital were more likely to receive timely vaccination (66 days vs 76 days, p <0.03) than those at private hospitals despite weighing significantly less at two months of age.

Gestational age, birth weight, illness severity at 2 months of age, number of ventilator days, weight at 60 days, admission pH, admission base deficit, maternal age, service physician and percentage-change in birthweight were not associative.

CONCLUSIONS: Delay in initiation of the primary immunization series continues to persist in the NICU. Prenatal steroid exposure, absence of surfactant administration and higher CRIB score were associated with immunization delay, suggesting disease severity at birth plays a role in the decision to immunize 2 months later.

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Relationship of Ambulance Sirens during Neonatal Transport, Decibel Level and Quantified Impulse as Measured by Biophysical Accelerometery

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BACKGROUND: Transport of newborns incurs transfer-related morbidity, including intraventricular hemorrhage -- a harbinger of cerebral palsy in later childhood.Changes in velocity transmitted to the neonate during transport due to road conditions may be implicated in the increased morbidity of this population.These accelerations, measured per unit time (impulse), are significantly increased during routine inter-hospital transport. But the relationship of ambulance sirens, which lead to aggressive driving techniques, to impulse has not been well characterized.Further, noise levels in excess of 50-60 decibels are considered detrimental to developmental outcome of premature infants.

OBJECTIVE: To quantify the magnitude of impulse experienced by neonates using biophysical accelerometry, measure decibel levels of transport & determine if sirens reduce biophysical impulse during emergent transport.

DESIGN/METHODS: 5 randomized roundtrip trials were conducted (mean route distance 4 miles) for a transferred neonate into our institution using a standard medical ambulance & transport isolette.During the trials, 5 acceleration measurements were made per second in the X (front-to-back), Y (side-to-side), and Z (up-and-down) planes using a computerized accelerometer attached to a neonatal resuscitation mannequin. Decibels levels were obtained at the start & end of each trial and 3x per trial at random intervals. Vector summations were integrated over the trial time in each dimension to yield biophysical impulse (accelerations-per-unit-time).Total impulse for the trial was also calculated.

RESULTS: Data for 32,150 points is shown in the following table.

	Mean Impulse + Standard Deviation (m/sec2/min)		
Direction	**Siren**	**Non-Siren**	**P-Value (t-test)**
X (Front-to-back)	15.2+/-0.8	17.4+/-1.9	0.02*
Y (Side-to-side)	12.1+/-0.5	14.0+/-1.3	0.007*
Z (Up-and-down)	13.2+/-0.7	16.8+/-2.7	0.009*
Total	26.9+/-1.2	32.0+/-3.3	0.005*
Mean Noise Level (dBA)	98.1+/-4.4	91.5+/-5.1	0.003*
Time (min.)	7.5+/-0.6	13.9+/-3.2	0.001*

(*Statistically Significant)

CONCLUSIONS: Neonates transported with sirens experienced less impulse were transported 84% faster, but with increased noise exposure.

145 Fellow in Training

Neonatal Endotracheal Intubation (ETI) Performance Survey: Impact of a Neonatology Fellowship Program on Resident Training

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BACKGROUND: ETI of the newborn is an important skill that is difficult to acquire and improves with experience. Gaining knowledge and experience in ETI and acquiring proficiency are important expectations for pediatric residents. With RRC duty hour regulations, it has been shown that residents do not have adequate opportunity to achieve competency in ETI prior to completion of training. No previous research has prospectively evaluated the impact of a neonatology fellowship program on resident's experience with ETI.

OBJECTIVE: 1) To determine exposure and successful ETI by pediatric residents and neonatal fellows in the Delivery Room (DR) and NICU at University of Maryland Medical Center(UMMS) as compared to other practitioners (neonatal nurse practitioners(NNPs), attending neonatologists) and 2) to determine resident's subjective perception of ETI competency.

DESIGN/METHODS: All ETI performed during July 2006 to November 2006 were observed by the nurse present for the procedure who recorded the type of practitioner, reason for ETI, number of attempts, duration of attempts and outcome of ETI. Pediatric resident's subjective perception of competence with ETI was assessed at the end of each NICU rotation.

RESULTS: During the study period, there were 199 ETI attempts in NICU and DR at UMMS. 63 attempts (32%) were performed by residents, 73 attempts (37%) by fellows, 19 attempts (10%) by attending neonatologists and 25 attempts (13%) by NNPs. ETI was successfully performed by 31.5% of PGY-1 residents, 50% of PGY-2 residents and 35% of PGY-3 residents. (Table1). 13 of 16 residents surveyed after completion of their NICU rotation felt that they did not get adequate opportunity to perform ETI during their month in the NICU.

	No. of ETI attempts (%)	**No. of Successful attempts (%)**
Residents	63 (32%)	25 (40%)
PGY-1	19 (30%)	6 (31.5%)
PGY-2	24(38%)	12 (50%)
PGY-3	20 (32%)	7 (35%)
Fellows	73 (37%)	65 (71%)
NNPs	25 (13%)	19 (76%)
Attendings	19 (10%)	12 (63%)
Total	199	121(61%)

CONCLUSIONS: A neonatology fellowship training program provides an additional obstacle for pediatric residents to acquire sufficient experience with ETI. This factor should be emphasized when developing a curriculum aimed at improving resident's skills in performing ETI.

146 Fellow in Training

Do the Clinical Outcomes in ELBW Babies Vary According to the Type of Surfactant Being Used?

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BACKGROUND: Natural surfactants such as Curosurf® and Survanta® have been demonstrated to be superior to their synthetic counter parts. Recent studies have looked to compare these 2 natural surfactants in infants (avg birth weights 1.3-1.4 kg) with RDS for their rapidity of clinical response, safety, and outcome. Consistently, decreased FiO_2 requirements were noted in most studies. One study showed a survival advantage in patients who received Curosurf®. We have investigated whether anti-inflammatory properties of surfactant may have played roles in this advantage, but have seen no significant difference in pulmonary inflammatory markers. We sought to determine if the type of surfactant given to ELBW babies would affect their clinical outcomes.

OBJECTIVE: We tested the hypothesis that the type of surfactant causes a difference in the outcome of ELBW babies.

DESIGN/METHODS: Infants<30 weeks gestational age (GA) and weighing <1 kg at birth were randomly assigned to receive either Curosurf® (N=10) or Survanta® (N=10) following parental consent. Clinical chorioamnionitis, rupture of membranes greater than 6h, neonatal sepsis, Apgar <3 (at 5 min), the need for epinephrine in the DR, and multiple congenital anomalies were exclusionary criteria.

RESULTS: There were no significant differences in birth weight (Curosurf® 792+145; Survanta® 679+180) or GA (Curosurf® 25.6+1.6; Survanta® 25.2+1.8).While there were no differences in the FiO_2 requirements between the 2 groups, MAP requirements were decreased in the Curosurf® group on days 1, 2 and 3.There were no statistically signficant differences in BPD, PDA that required treatment, bacteremia, NEC, ROP, death or the length of hospital stay.

	Clinical Outcomes	
	Curosurf®(N=10)	**Survanta®(N=10)**
SNAP II Score†	22(15,35)	36(30,43)
Total Intubated Days†	18(7,25)	24(8,48)
Length of Stay	80±19	88±26
BPD	3(37%)	5(55%)
Pulm bleed	1 (11%)	2(20%)
PDA	7(70%)	5(50%)
ROP	3(33%)	3(33%)
Bacteremia	6(60%)	3(30%)
NEC	3(33%)	0
Deaths	2(20%)	1(10%)

†median(25,75%)

CONCLUSIONS: As seen with other natural surfactant comparison trials, the type of surfactant given to ELBW babies results in a significant difference in MAP (Curosurf® less than Survanta®), but did not affect their ultimate clinical outcomes.

147 Fellow in Training

Changing Use of Surfactant over 6 Years and Its Relationship to Chronic Lung Disease

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BACKGROUND: It is established that surfactant reduces the risk of chronic lung disease (CLD). Recent studies have suggested that early use of nasal continuous positive airway pressure (NCPAP) may be beneficial in preventing ventilator induced lung injury and hence, CLD. In an effort to reduce CLD many clinicians now seek to avoid mechanical ventilation for infants <1,000g. We hypothesize that this management strategy has resulted in a decreased use of surfactant and may be negatively impacting CLD rates.

OBJECTIVE: To identify the trend of surfactant use over a 6-year period and determine if a relationship exists between the incidence of chronic lung disease in infants born <1,000g who receive surfactant and those who do not.

DESIGN/METHODS: Data regarding surfactant use, incidence of chronic lung disease, NCPAP use and duration and standard demographic data was collected from the ParadigmHealth database from 2001 to 2006, n=3,209. Groups were compared using chi square, ANOVA or student's t-test.

RESULTS:

Surfactant group compared to no surfactant group

	No Surfactant	Surfactant	p value
GA(weeks)	26.2	25.7	<0.01
BW(g)	789.9	770.5	<0.01
LOS(days)	91.2	95.9	<0.01
Ventilator Days	21.3	29.2	<0.01
NCPAP Days	20.8	21.6	0.29

Use of surfactant has decreased over time from 67% in 2001 to 52.9% in 2006, p<0.05. Infants that receive surfactant are more likely to develop CLD, p<0.01. Infants receiving more than one dose of surfactant are more likely to develop chronic lung disease then infants receiving one dose, p<0.05. CLD rates have risen over time from 47.8% in 2001 to 53.7% in 2006, p=0.05. There was no difference in survival between groups. CLD rates have not changed significantly over the study period in infants not receiving surfactant, 50%.

CONCLUSIONS: Despite the findings that surfactant use has decreased over the study period and the rate of CLD has risen, the data do not support a connection. Infants that receive surfactant are more likely to develop CLD and CLD rates are stable in those infants not receiving surfactant. It is, however, concerning that 50% of infants not receiving surfactant are developing CLD.

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The Relationship between Congenital Malformations and Preterm Birth

Jordan S. Kase, Paul Visintainer. Pediatrics, New York Medical College, Valhalla, NY; School of Epidemiology and Biostatistics, School of Public Health at NYMC, Valhalla, NY.

BACKGROUND: Preterm birth (PT; <37 weeks) and congenital malformations (CM) are the most common causes for neonatal and infant death. CM in fetuses are known contributors to the incidence of PT birth,as well as morbidity in the newborn.

OBJECTIVE: To investigate CM in a 5 county region of NY State and its relationship with PT delivery during a four year span.

DESIGN/METHODS: Aggregate data from the NY State Department of Health Vital Statistics and Congenital Malformations Registry were utilized regarding CM, classified by gestational age (GA). Individual ICD9 codes were collected for the same time period (2000-2003) categorized by GA from 5 counties in the Lower Hudson Valley Region (Putnam, Orange, Rockland, Sullivan, and Westchester). Live-birth cases of CM diagnosed up to 2 years of age were included. Poisson regression analysis was used to establish relative risk (RR) of having a CM and PT delivery. A second analysis compared CM in moderately PT (MP; 32-36 wks) and very PT (VP; <32 wks). The RR of whether CM would increase the rate of PT delivery was categorized by disease process. Odds ratio (OR) was used to analyze if having a single vs multiple CM influenced the rate of PT delivery.

RESULTS: In this time period, there were 97,848 births, 10,261 PT deliveries resulting in a PT rate of 10.8%; 3,043 children were born with some type of CM (CM rate=3.1%), 631 of which were preterm. Children with CM were more likely to be born PT (RR: 2.4; CI: 2.2-2.6), MP (RR: 2.0; CI: 1.9-2.3), or VP (RR: 3.8; CI: 3.4-4.4) than term. Children with CM were more likely to be born VP than MP (RR: 1.8; CI: 1.5-2.2). Poisson regression analysis was used to evaluate 13 individual categories of CM, 11 of 13 were statistically more prevalent to be born PT. Relative to children with 1 CM, children with multiple CM were more likely to be born PT (OR: 1.7; CI: 1.4-2.1).

CONCLUSIONS: Children who are born with CM, are twice as likely to be born PT, and 4 times more likely to be VP. Most subgroups of CM (such as cardiac, CNS, or genetic) are more likely to be born PT, and children with >1 CM are at significantly higher risk of being delivered PT. This association between CM and PT delivery has public health implications due to their increased morbidity/mortality and need for further therapeutic interventions.

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Fellow in Training

Varied Light Wavelength Dectectioin of Bruising

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BACKGROUND: Alternate light sources (ALS) are routinely used to detect bruising in forensic investigation. Case reports have shown that ultraviolet light can reveal bruising months after an injury, using film photography to document findings. Since these early reports the use of digital photography has become commonly used to document injuries. Digital photos present new challenges to the clarity of images using ALS. There have been no prospectively designed studies to evaluate the ability of ALS to detect latent bruising using digital photography.

OBJECTIVE: To describe the ability of ultraviolet (UV), blue, and infrared (IR) light sources to detect latent bruising over time. To demonstrate the ability of digital photography to capture bruising with various ALS.

DESIGN/METHODS: A prospective cohort study was conducted. Subjects were recruited during medical school blood drives. Photos were taken of the subjects' arms at the blood draw site under visible, UV, blue, and IR light after the venipuncture. Photos of the opposite arm were used as a control. Subjects returned for follow-up photos at regular intervals up to 90 days after the day of blood draw. Photos were converted to grayscale images and reviewed by three physicians blinded to the day of each photo and the ALS being used. Agreement between reviewers regarding the presence of bruising were recorded. The proportions of subjects with bruising present in visible light versus each ALS for each day of follow-up were compared.

RESULTS: To date, data collection has been completed for 2 subjects enrolled during the first blood drive of the year. Bruising under visible light was not detectable by day 14 for both subjects. Both subjects showed detection of latent bruising up to 90 days after venipuncture using UV and blue light. Both subjects showed detection of latent bruising up to 14 days after venipuncture using IR light. Digital photography has captured images of latent bruising using ALS with clarity.

CONCLUSIONS: Latent bruising may be detectable up to 90 days after the time of initial injury using UV and blue light sources, and up to 14 days using IR light. Digital photography demonstrates the ability to capture images using alternate light sources. Full enrollment of subjects and completion of the blinded review of photos will be needed to obtain data to further support these early conclusions.

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Fellow in Training

Nosocomial Infections in the Mount Sinai NICU in an Era of Restricted Antibiotic Use

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BACKGROUND: Nosocomial bloodstream infections (BSI) are a significant cause of morbidity and mortality in the NICU, with a wide variation in reported incidence.

OBJECTIVE: To review pathogens and clinical characteristics associated with late onset sepsis (LOS) in NICU admissions during a period when an antibiotic restriction policy including vancomycin was in place.

DESIGN/METHODS: Retrospective chart review of infants with positive blood/CSF cultures at ≥48 hours of life and uninfected controls. Infected infants were identified from a microbiology database. 2 controls per case were randomly matched by birthweight from a database of NICU admissions. Data collected included demographics, underlying diagnoses/comorbidities, therapeutic interventions, antibiotic exposure, and clinical presentation at the time of infection. Interim analysis on data collected on half of the expected control subjects is presented. Significant differences between the cohorts were analyzed by t-test.

RESULTS: There were 235 infections in 183 infants from a total population of 4063 admissions during the study period. The overall incidence was 5.7% and 30% in the VLBW population. 72% of pathogens were gram-positive organisms; the majority were coagulase-negative staphylococci. 19% were gram-negatives (GN), and 9% of the organisms were identified as yeasts. There was a low incidence of resistant organisms. There were 4 cases of MRSA. The predominant GN organisms were Klebsiella (n=20) and E. coli (n = 10); 21 expressed either SHV or TEM b-lactamases, 7 an inducible Amp C b-lactamase and one a KPC carbapenamase. β-lactam resistance mechanisms were characterized among the GN isolates to assess commonality. 30% of study subjects had multiple BSIs (range 1-7). The mean time to first BSI was 29 days. Significant (p <.05) risk factors included lower birthweight, gestational age, mechanical ventilation, central catheter days, TPN, and time to full feeds. Mortality was 17% in the infected group vs 2% in controls (p<.05); 37% of deaths in the infected group were attributed to sepsis.

CONCLUSIONS: Fungal infection and highly resistant organism incidence is low in our NICU which may reflect antibiotic restriction. A complete analysis will further assess the impact of therapeutic interventions and antibiotic exposure on the pathogens and risk factors associated with nosocomial sepsis.

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Characterization of Incidence and Natural History of Systemic Hypertension in Premature Infants

Swathanthra Melekote, Naveed Hussain, Vijayakumar Praveen. Pediatrics, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: The problem of systemic hypertension (HTN) in premature infants has been poorly characterized.

OBJECTIVE: To study the incidence of systemic HTN in premature infants and to characterize its natural history and associated risk factors.

DESIGN/METHODS: A retrospective cohort study was performed with all premature infants admitted to John Dempsey Hospital NICU between Jan 1991-Jun 2006. All infants with complete data were included. The diagnoses of systemic HTN was based on systolic BP>80 mm of Hg or diastolic BP>50 mm of Hg sustained for more than 24 hours duration. Demographic variables along with putative risk factors and outcome parameters were extracted from prospectively collected data. For univariate analyses t-test or chi-square test were done as appropriate. Statistically significant variables were subjected to multiple logistic regression analyses.

RESULTS: Systemic HTN was diagnosed in 2.7% (136/4953) infants studied during their stay in NICU. 2.6% (130) infants had transient HTN and 0.12%(6) infants had persistent HTN at discharge. Median age of onset and resolution of transient HTN were 14 and 24 days respectively. All 6 infants with persistent HTN had a renal cause. Conditions associated with transient HTN were systemic steroid use 53 (40%), cardiovascular 94 (72.3%), renal 22 (16.2%) and metabolic/endocrine 10 (7.4%). The use of synthroid, antenatal steroids, illicit drug use, alcohol or tobacco smoking during pregnancy were not significantly associated with HTN. Risk factors significantly associated with HTN on univariate analyses were gestational age, birth weight, black race, PDA, APGAR scores at 1 and 5 min., UAC insertion and BPD. However, on multiple logistic regression analyses only 1 min. APGAR score < 3, history of PDA and BPD remained significant risk factors for HTN even after correcting for gestational age at birth and steroid use. Systemic HTN was treated with hydralazine alone (102/136) or with labetolol (3), or captopril (1) or enalapril (1).

CONCLUSIONS: The current incidence of HTN in premature infants in the NICU is 2.7% which is similar to older reports in the literature. In a majority of infants the systemic hypertension is transitory lasting for a median of 10 days most commonly associated with 1 min. APGAR score < 3, post-natal steroid use, history of PDA or BPD. The most common associated factor for persistent hypertension was renal pathology.

152

The Use of Dexamethasone (DEXA) in Very Low Birth Weight (VLBW) Infants before and after the 2002 AAP Recommendations

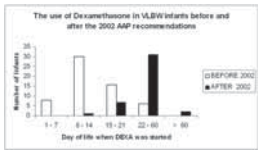
Tarek Nakhla, Zubair Aghai, Judy Saslow, Nosrat Razi, Sonia Imaizumi, Gary Stahl. Pediatrics/Neonatology, Cooper University Hospital, Camden, NJ.

BACKGROUND: In 2002, the AAP discouraged the use of DEXA for chronic lung disease (CLD) in VLBW infants. In our NICU, when there is no alternative, DEXA is prescribed in some VLBW infants after the parents are made aware of both the AAP recommendations and the possibility of long-term side effects.

OBJECTIVE: To evaluate the effect of the 2002 recommendations on the frequency and timing of DEXA treatment in VLBW infants.

DESIGN/METHODS: The medical records of inborn VLBW infants (500-1500grams) admitted to the NICU between 1999-2005 were reviewed. Infants born 1999-2001 (BEFORE) were compared to those born 2003-2005 (AFTER) with regard to the frequency and timing of DEXA treatment.

RESULTS: The BEFORE and AFTER groups had similar birth weight, gestational age, survival to discharge, use of diuretics and number of infants who received DEXA. In the BEFORE group, 60/192 (31.4%) VLBW infants received DEXA, 39 infants received one course, 13 received 2 courses and 8 received 3 or more courses. The total number of days of DEXA treatment was 985 days and 47/60 (78%) survived to discharge . In the AFTER group 41/177 (23.1%) VLBW received DEXA, 27 received one course, 7 received 2 courses and 7 received 3 or more courses. The total number of days of DEXA treatment was 697 days and 30/41 (73%) survived to discharge.



The figure illustrates that DEXA treatment started at a later day of life in the AFTER group compared to the BEFORE group.

CONCLUSIONS: DEXA continues to play a role in the management of VLBW infants. It's now rarely used before the third week of life.This continued use indicates a great need for a safer and effective alternative to DEXA.

153 Fellow in Training

Umbilical Cord Arterial and Venous Unbound Free Fatty Acid Concentrations in Term Infants

Vasudha Tulsyan, Alan Kleinfeld, Swetha Sama, Edward Battista, Michael Graff, James P. Kampf, Andrew H. Huber, Thomas Kwan, Baolong Zhu, Thomas Hegyi. Pediatrics, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ; Torrey Pines Institute for Molecular Studies, San Diego, CA; Pediatrics, Jersey Shore University Medical Center, Neptune, NJ; FFA Sciences LLC, San Diego, CA.

BACKGROUND: Unbound free fatty acid (FFAu) levels have been recently examined as indicators of tissue hypoxia. Previous investigations in adult populations with cardiac disease have shown that FFAu is rapidly elevated after an ischemic insult.

OBJECTIVE: The goal of this investigation was to examine the concentration of FFAu in umbilical vein (vFFAu) and umbilical artery (aFFAu) after delivery of healthy term infants and determine the factors that control these levels.

DESIGN/METHODS: Infants born at or near term were eligible for inclusion into the project. The umbilical cord was double clamped, cut and blood samples were obtained from the vein and artery. Plasma was prepared, frozen and analyzed for FFAu by a newly developed fluorescent probe that is specific for FFAu which involves adding the FFAu probe to diluted plasma and measuring the resulting fluorescence intensity. Univariate analyses were done to examine factors related to FFAu levels.

RESULTS: Thirty three infants (BW 3168+/-673g; GA 37.7+/-2.4 wks) comprised the study population. Levels of aFFAu were 2.21+/-0.49 nM and vFFAu 2.37+/-0.47 nM (p>0.05). Significant correlation was seen between aFFAu and vFFAu (r=0.75, p<0.05). PIH, smoking, alcohol ingestion, placenta previa, mode of delivery and sex did not affect aFFAu and vFFAu levels. However, the presence of labor and meconium resulted in a significant increase of aFFAu. vFFAu was greater than aFFAu in 23 infants and aFFA was greater than vFFAu in ten infants. The groups were similar with respect to BW, GA, and Apgar scores, but the latter group contained the infants born after labor and after meconium passage.

CONCLUSIONS: In unstressed delivery, vFFAu levels are higher than aFFAu suggesting a placental source for this difference, but stress such as labor and the passage of meconium can reverse this relationship. These observations are consistent with the conclusion that hypoxic stresses occur during delivery and FFAu levels are sensitive indicators of their presence even among infants with normal Apgar scores.

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The Effect of Gestational Age, Postnatal Age and Inhaled Nitric Oxide (iNO) on Lung Interleukin (IL)-6 and IL-8 mRNA in Newborn Lambs

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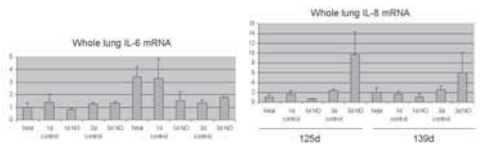
BACKGROUND: Elevation in proinflammatory cytokines is predictive of later development of bronchopulmonary dysplasia (BPD). Little is known about changes in whole lung cytokines as a function of nitric oxide therapy (iNO), gestational age or postnatal age.

OBJECTIVE: To compare IL-6 and IL-8 mRNA in preterm and term neonatal sheep treated with or without iNO.

DESIGN/METHODS: Preterm (125d, n=22) and term (139d, n=24) lambs were delivered and received mechanical ventilation (MV) for 1 or 3 days ± 15ppm iNO starting at birth. Some fetuses were sacrificed ("fetal" controls). We used ribonuclease protection assay (RPA) to measure mRNA for IL-6 and IL-8 in isolated whole lung RNA. Sheep plasmids were a kind gift from Dr. Suhas Kallapur. RPA results were normalized to L32. The fetal 125d group was assigned a value of 1 for each cytokine and the remaining groups corrected accordingly. Data were analyzed using multifactorial ANOVA using STATA.

RESULTS: Data are presented as mean ±SEM.



IL-6 was greater in the animals born at 139d as compared to 125d (p=0.011). IL-8 increased with postnatal day of age (p=0.038). There was no statistically significant effect of continuous iNO on IL-6 or IL-8 mRNA levels, despite a suggestion that IL-8 mRNA was increased by iNO at day 3 in both preterm and term lambs.

CONCLUSIONS: Short term exposure to iNO at 15ppm in preterm or term lambs did not significantly affect expression of IL-6 or IL-8. IL-8 increased postnatally in both preterm and term animals exposed to mechanical ventilation. IL-6 was higher in near-term lambs as compared to more immature lambs.

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Influence of Gender on Work of Breathing (WOB) in Preterm Infants on Nasal Continuous Positive Airway Pressure (NCPAP)

Kee H. Pyon, Zubair Aghai, Robert H. Habib, Judy G. Saslow, Sherry E. Courtney. Pediatrics, Cooper University Hospital, Camden, NJ; Pediatrics, Mercy Children's Hospital-Medical College of Ohio, Toledo, OH; Pediatrics, Schneider Children's Hospital/Albert Einstein College of Medicine, New Hyde Park, NY.

BACKGROUND: NCPAP is often used in preterm neonates with respiratory distress syndrome (RDS). Follow up studies on premature infants have found that male compared with female children may be disadvantaged with poorer respiratory function and more respiratory illnesses during their infancy. Reduced WOB with NCPAP therapy has been well documented in preterm infants but the effect of gender on WOB in infants on NCPAP is not known.

OBJECTIVE: To determine the effect of gender on WOB in preterm infants on NCPAP.

DESIGN/METHODS: Sixty preterm infants with mild RDS receiving variable flow NCPAP were studied [Females (mean ± SD): n=22, study weight (SW) 1124 ± 254 g, corrected gestational age (CGA) 30.3 ± 2.2 weeks, and respiratory support severity score at study (NCPAP x FiO_2) 1.19 ± 0.40; Males: n=38, SW 1059 ± 216 g, CGA 29.2 ± 1.8 weeks, and NCPAP x FiO_2 1.61 ± 0.71]. Infants were studied at four NCPAP levels (Infant Flow: 0, 4, 6, 8 cmH_2O). We measured tidal ventilation (VT) by calibrated respiratory inductance plethysmography as well as esophageal pressures to estimate transpulmonary pressure, Ptp. Resistive, inspiratory, and elastic WOB (RWOB, Winsp, Wel) were calculated from the Ptp and VT data.

RESULTS: WOB decreased with increase in NCPAP levels (see table) for the female and male infants. Although not significant at all NCPAP levels, both genders benefited from the NCPAP support.

WOB at NCPAP Levels

Female (n=22)			
NCPAP	**Winsp**	**Wel**	**RWOB**
0	3.03±3.02	2.15±2.37	1.14±1.27
4	1.79±1.95*	1.24±1.50*	0.70±1.24*
6	1.61±1.55#	1.31±1.58#	0.48±1.21#
8	2.22±3.37	1.61±2.33	0.54±1.49**
Male (n=38)			
0	2.11±1.39	1.54±1.08	1.05±0.93
4	1.28±1.41*	0.94±0.92*	0.48±0.77
6	1.60±2.21	1.27±1.83	0.48±0.97#
8	1.37±1.27**	1.17±1.26	0.43±0.60**

WOB: mean ± SD, cmH2O/ml; One way RM ANOVA: * p<0.05 NCPAP 0 vs 4; # p<0.05 NCPAP 0 vs 6; ** p<0.05 NCPAP 0 vs 8

CONCLUSIONS: In this study population, gender was not a significant factor in the measured WOB for infants on Infant Flow NCPAP. We speculate that the relatively mild disease state of the infants may have contributed to their response to the NCPAP therapy.

156 Fellow in Training

SNAP II™ Index: An Alternative to the COMFORT Scale in Assessing the Level of Sedation in Mechanically Ventilated Pediatric Patients

Federico I. Fernandez-Nievas, Kenneth J. Banasiak, Clifford W. Bogue. Department of Pediatrics, Section of Critical Care, Yale School of Medicine, New Haven, CT.

BACKGROUND: Sedation monitoring is essential in critically ill pediatric patients. The COMFORT scale uses behavioral and physiologic parameters to assess the level of sedation in intubated pediatric patients. This method was designed and validated to assess level of sedation, however it cannot be used in pharmacologically paralyzed patients. The SNAP II™ electroencephalogram monitor uses an algorithm based on low and high frequency spectral components to generate an index indicating level of sedation. No previous study has evaluated the correlation between the COMFORT scale and the SNAP II™ index.

OBJECTIVE: To determine the correlation between the COMFORT scale and SNAP II™ index.

DESIGN/METHODS: This prospective observational study was conducted in a multidisciplinary pediatric intensive care unit. A convenience sample of intubated, sedated patients aged 1 month to 17 years was enrolled. Patients receiving ketamine or paralytic agents and patients with central nervous system disease were excluded. Simultaneous paired measurements of sedation were recorded using the COMFORT scale and the SNAP II™ index.

RESULTS: A total of 11 patients were enrolled resulting in 113 paired observations. Linear regression analysis showed a significant correlation (r^2=0.62, p<0.001) between the COMFORT score and SNAP II™ index.

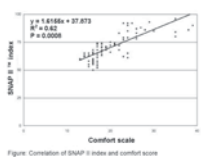


Figure: Correlation of SNAP II index and comfort score

CONCLUSIONS: This pilot study is the first to demonstrate a significant correlation between the COMFORT scale and SNAP II™ index for measuring level of sedation in the intubated, sedated pediatric patient. The SNAP II™ index could be used in pharmacologically paralyzed patients for whom the COMFORT scale cannot be calculated.

157 Fellow in Training

Diabetes in Pediatric Liver Transplant Recipients: Not Rare and Often Persistent

Genna W. Klein, Arti A. Patel, Fenella Greig, Sharon J. Hyman, Nanda Kerkar, Benjamin Shneider, Sukru Emre, Elizabeth Wallach, Robert Rapaport. Pediatrics, Mount Sinai School of Medicine, NY, NY; Surgery, Mount Sinai School of Medicine, NY, NY.

BACKGROUND: Transplant-related diabetes (TD) in liver transplant (LT) from limited pediatric reports is rare and usually transient while adult LT series report up to 30% with TD. Immunosuppressive regimens including tacrolimus (TAC) and glucocorticoids (GC) with known diabetogenic potential are widely used in pediatric LT patients (PLT).

OBJECTIVE: To describe the occurrence and course of TD in PLT at our institution.

DESIGN/METHODS: A retrospective chart review was performed for all 26 PLT with endocrine consultation for 'hyperglycemia' from 3/30/99 to 6/1/06. PLT excluded were pre-existing diabetes with cystic fibrosis (1) and insufficient data (3). The remaining 22 (15 with LT within the study period of 212 total LT and 7 with earlier LT) were analyzed for patient demographics, LT indication, family history of diabetes (FH), physical and laboratory data. Hyperglycemia was defined as random blood glucose (RBG) >140 mg/dL. TD was defined as ≥2 RBG >200 and requiring insulin therapy. All PLT were treated with a standard protocol including TAC and GC.

RESULTS: Of 22 patients, 3 had hyperglycemia without TD. The remaining 19 are summarized in table. LT indication: congenital (anatomical and metabolic) 47.4% (9/19) autoimmune hepatitis 15.8% (3/19), hepatitis C 5.3% (1/19). Diabetes-related antibodies done in 11 PLT were all negative. Incidence of TD based on LT patients in study period was 5.7% (12/212).

PLT characteristics at TD onset divided by duration of TD

	< 6mo (n=8)*	> 6mo (n=11)**
Age, yr	11.2 (0.75-16.0)	14.4 (5.1-23.4)
Male gender, %	62.5	36.4
BMI SDS	0.63 (-1 - 1.5)	-0.11 (-2.0 - 1.3)
RBG mg/dL	291 (203-399)	439 (177-980)
A1C %	5.1 (4.0-6.2)	6.0 (4.0-10.6)
FH, %	57.1	54.5
Puberty T(IV-V), %	75.0	45.5
Ethnicity (Afr. Am. or Hisp.), %	62.5	100
Onset:Time from LT to TD, mo	41.6 (0-167)	16.2 (0-107)

Data expressed as percent or mean (range); * 7/8 <3mo; **10/11>12mo (53% of total)

CONCLUSIONS: TD in PLT is more common than previously reported with onset at variable times after LT. Duration of TD is >1 year in 53%. TD in PLT lacks features of type 1 (negative antibodies) or type 2 diabetes (without obesity). Prospective studies are needed to identify risk factors for TD in PLT.

Neurobiology Platform Session

Sunday, March 11, 2007 **9:45 AM-12:00 PM**

158 9:45 AM

Hypothermia Increases Erythropoietin Receptor Expression in Neurons through an Adenosine and ATP Signaling Pathway

James Moore, Hui Peng, Tong Wen, Marta Rogido, Augusto Sola. Pediatrics, Emory University, Atlanta, GA; MANA and, Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: Previous studies have shown that hypothermia improves the outcome of perinatal hypoxia-ischemia and that EPO induces neuroprotection after experimental hypoxic-ischemic (HI) insult. Recent work from our lab has demonstrated that hypothermia alone can increase erythropoietin (EPO) receptor expression in isolated rat cortical neurons. However, how hypothermia increases EPO receptor expression and leads to neuroprotection after HI is not clear.

OBJECTIVE: To determine if the hypothermia induced EPO receptor up-regulation is associated with the adenosine and ATP receptors in isolated cortical neurons.

DESIGN/METHODS: Freshly isolated cultures of E18 rat cortical neurons were obtained from Genlantis (San Diego CA). Cells were allowed to fully differentiate for 5 days and then were exposed to pharmacological inhibitors including Suramin (ATP R antagonist), CGS-15943 (purine receptor antagonist), Wortmanin (PI3K inhibitor), and U0126 (ERK1+2 inhibitor). The cells were then exposed to hypothermic conditions (32°C) for 6 hours and EPO receptor expression was determined using immunofluorescence. Cellular calcium measurements were made using the indicator dye Fluo-4.

RESULTS: EPO receptor expression was increased by more than 3 fold in hypothermic neurons compared to control cells. The pharmacological inhibitors for PI3K and ERK 1+2 did not affect the hypothermia induced EPO receptor up regulation. However, the ATP and Adenosine receptor antagonists markedly reduced the hypothermia induced EPO receptor up-regulation by nearly 75%. Finally, EPO-induced intracellular calcium spikes, which are markedly increased after exposure to hypothermia, were reduced by 85% in the presence of the ATP and Adenosine receptor inhibitors, coinciding with the decreased EPO receptor expression.

CONCLUSIONS: Our study demonstrates that the hypothermia induced EPO receptor up-regulation is at least in part due to changes in signaling of ATP and Adenosine in neurons after exposure to hypothermia. Follow up studies on the second messenger signaling mechanisms that are responsible for this effect may lead to overlapping signaling pathways that are also involved in preventing apoptosis.

159 10:00 AM Fellow in Training

Caspase-9 and Caspase-3 Activity and Expression in Cerebral Cortical Tissue Following Acute Reduction in the Circulating Red Cell Mass in Newborn Piglet

Michelle Kelly, Alan B. Zubrow, Joanna Kubin, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Previous studies in newborn piglets have shown that cerebral hypoxia (Hx) results in increased expression and activity of cerebral cortical caspase-9 and -3. Studies in several animal models have also shown that a decrease in circulating red cell mass, despite a normoxic environment, results in tissue hypoxia.

OBJECTIVE: The present study tests the hypothesis that a severe acute decrease in red cell mass (RCM) results in increased activity and expression of caspase-9 and -3 similar to that observed during hypoxia.

DESIGN/METHODS: RCM was decreased by removing 40% or 60% of circulating blood volume (weight x 80cc/kg), and replacing it with either plasma or colloid. Piglets were divided into: control (Nx, n=4), 40% reduction for 1hr (40R-1, n=4), 40% reduction for 4hr (40R-4, n=4), 60% reduction for 4hr (60R-4, n=4) and hypoxia, $Fi0_2$ 0.07 for 1hr (Hx, n=4). Cytosolic activity (nmoles/mg protein/hr) of caspase-9 and -3 were determined. Caspase activity was measured spectrofluorometrically. Caspase expression was determined by Western blot. Protein bands were analyzed by imaging densitometry and expressed as optical density (ODxmm^2).

RESULTS: Caspase-9 activity was 3.57±0.47 in Nx, 4.38±0.67 in 40R-1, 4.36±0.22 in 40R-4, 4.00±0.57 in 60R-4 and 6.84±0.46 in Hx ($p<0.05$). Caspase-3 activity was 7.26±1.42 in Nx, 10.76±1.23 in 40R-1 ($p<0.05$), 11.42±0.94 in 40R-4, 11.14±1.84 in 60R-4 ($p<0.05$), and 13.56±0.91 in Hx ($p<0.05$). Caspase-9 expression was 24.2±1.7 in Nx, 37.6±6.7 in 40R-1 (p0000), 33.5±2.2 in 40R-4 ($p<0.05$), 29.3±0.7 in 60R-4 ($p<0.05$), and 51.4±2.5 in Hx ($p<0.05$). Caspase-3 expression was 39.7±2.0 in Nx, 44.0±4.4 in 40R-1 (p=ns), 36.8±5.3 in 40R-4 (p=ns), 40.6±0.8 in 60R-4 (p=ns), and 98.0±6.9 in Hx ($p<0.05$). The data show that decreasing circulating red cell mass resulted in significant increase in caspase-3 activity. Caspase-9 activity increased in all groups but did not reach significance.

CONCLUSIONS: We conclude that a severe acute decrease in red cell mass results in activation of caspase-3 in the cerebral cortex of newborn piglets. We speculate that severe acute anemia induces cerebral tissue hypoxia and activation of the apoptosis cascade in the cerebral cortex of newborn piglets. (NIH-HD 20337, NIH-HD 38079).

160 10:15 AM Fellow in Training

Effect of Hyperoxia on Serine Phosphorylation of Apoptotic Proteins in the Mitochondrial Membranes of the Cerebral Cortex of Newborn Piglets

Nadege A. Brutus, Qazi M. Ashraf, Eddie Chang, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Previous studies have shown that hyperoxia results in cerebral cortical neuronal death. We have also shown that phosphorylation of anti-apoptotic proteins Bcl-2 and Bcl-xl results in loss of their anti-apoptotic potential leading to alteration in mitochondrial membrane permeability and the release of apoptogenic proteins.

OBJECTIVE: The present study tests the hypothesis that cerebral hyperoxia will result in increased serine phosphorylation of apoptotic proteins Bcl-2, Bcl-xl, Bax and Bad in the mitochondrial membranes of the cerebral cortex of newborn piglets.

DESIGN/METHODS: Twelve newborn piglets were divided into normoxic [Nx, n=6] exposed to an FiO_2 of 0.21 for 1 hr and hyperoxic [Hyx, n=6] exposed to FiO_2 of 1.0 for 1 hr. In the Hyx group, PaO_2 was maintained above 400 mmHg while the Nx group was kept at 80 to 100 mm Hg. Cerebral cortical tissue was harvested and mitochondrial fractions were isolated. Mitochondrial membrane proteins were separated using 12% SDS-PAGE, probed with anti-serine phosphorylated Bcl-2, Bcl-xl, Bax, and Bad antibodies. Protein bands were detected, analyzed by densitometry and expressed as absorbance [OD× mm^2].

RESULTS: Phosphorylated Bcl-2 (p-Bcl-2) protein density (OD x mm^2) was 81.81±9.24 in Nx and 158.34±10.66 ($p<0.05$) in Hyx. Phosphorylated Bcl-xl (p-Bcl-xl) protein density was 52.98±3.59 in Nx and 99.62±18.22 ($p<0.05$) in Hyx. Phosphorylated Bax (p-Bax) protein was 161.13±6.27 in Nx and 174.21±15.95 in Hyx (p=NS). Phosphorylated Bad (p-Bad) protein was 166.24±9.47 in Nx 155.38±12.32 in Hyx (p=NS). The data show that there is a significant increase in phosphorylation of Bcl-2 and Bcl-xl while phosphorylation of Bad and Bax was not altered during hyperoxia in the mitochondrial fractions of the cerebral cortex of newborn piglets.

CONCLUSIONS: We conclude that hyperoxia leads to post-translational modification of anti-apoptotic proteins Bcl-2 and Bcl-xl in mitochondrial membrane. We speculate that phosphorylation of Bcl-2 and Bcl-xl will result in loss of their anti-apoptotic potential by preventing dimerization with Bax leading to activation of caspase pathway resulting in neuronal death in the cerebral cortex of the newborn piglets. (NIH-HD 20337, NIH-HD 38079, St. Christopher's Foundation).

161 10:30 AM Fellow in Training

Inflammatory Changes in Germinal Matrix Hemorrhage in a Premature Rabbit Pup Model

Paraskevi Georgiadis, H. Xu, C. Chua, F. Hu, L. Collins, C. Huynh, E.F. LaGamma, P. Ballabh. Pediatrics, New York Medical College, Valhalla, NY; Radiology, Westchester Medical Center, Valhalla, NY.

BACKGROUND: In adults, brain hemorrhage induces an inflammatory brain injury attended by infiltration of neutrophils and microglia as well as upregulation of TNF-α with an increase in apoptosis.

OBJECTIVE: To evaluate the inflammatory response including cellular infiltration, programmed cell death and TNF-α expression in the periventricular area, white matter (WM) and cerebral cortex of premature rabbit pups with germinal matrix hemorrhage-intraventricular hemorrhage (IVH) compared to controls.

DESIGN/METHODS: We delivered rabbit pups prematurely at 29 day gestation by C-section and induced IVH with the use of intraperitoneal glycerol at 2h postnatal age. IVH was classified as mild (microscopic), moderate (no ventricular dilation) and severe (ventricular dilation or intraparenchymal). Brains of pups with IVH were evaluated for neutrophil and microglia infiltration, free radicals (oxidized dehydroethidine) as well as apoptosis (TUNEL) using immunofluorescent staining at 24, 48 and 72h postnatal age compared to controls. In addition, we assayed TNF-α gene expression in brain of pups with and without IVH (n = 12, each) at 24 and 48h age by real-time PCR.

RESULTS: In pups with IVH, we found greater oxidative stress, neutrophil and microglia infiltration in the periventricular area compared to the cortex or WM at 24-72h age. No such inflammatory response was noted in pups without IVH. Apoptosis (TUNEL+ nuclei) was more in the cortex, WM and periventricular area of pups with severe IVH than pups with moderate ($P<0.001$ each, n=3) and no IVH ($P<0.001$, 0.026 and 0.001, n=5). Among pups with severe IVH, there was more apoptosis in the periventricular area than the cortex or WM ($P<0.001$ each, n=5). The apoptosis was the highest at 24h and then it progressively decreased at 48h and

72h age in all the three areas (P< 0.001, 0.04 and 0.001, ANOVA). TNF-a mRNA expression was increased in pups with IVH than pups without IVH (P<0.05), but was comparable between 24 and 48h age.

CONCLUSIONS: There is a histological evidence of periventricular inflammation in IVH associated with an up-regulation of TNF-a as well as an increase in apoptosis. Evaluating neuroprotection with the use of inhibitors of inflammation, anti-TNF-a in particular, may lead to new strategies to protect the brain of premature infants with IVH.

162 10:45 AM Fellow in Training

Effect of Post-Hypoxic Administration of leu-glu-his-asp-fluoromethylketone (LEHD-fmk) on the Activity of Caspase-9 and Caspase-3 in the Cerebral Cortex of Newborn Piglets

Purvi Jethva, Ming-Chou Chiang, Alan B. Zubrow, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Previously we have shown that cerebral hypoxia results in increased caspase-9 and caspase-3 activity in the cerebral cortex of newborn piglets. We have also shown that administration of LEHD-fmk, a selective caspase-9 inhibitor, prior to hypoxia prevented the hypoxia-induced increase in caspase-3 activity.

OBJECTIVE: The present study aims to investigate the effect of post hypoxic inhibition of caspase-9 on the activity of caspase-3 during post-hypoxic reoxygenation and tests the hypothesis that post-hypoxic administration of LEHD-fmk will attenuate the activity of caspase-3 in the cerebral cortex of newborn piglets.

DESIGN/METHODS: 2-3 day old piglets were assigned to normoxic (Nx, n=6), hypoxic (Hx, n=6) and LEHD-fmk treated post-hypoxic group (Hx-LEHD-fmk, n=6). After 1 hour of hypoxia (FiO_2 5-8%), LEHD-fmk (10μg/kg) was given IV. Hypoxic piglets were reoxygenated for 90 minutes then the brain was harvested. Cortical tissue was homogenized and cytosolic fraction was isolated. Activities of caspase-9 and caspase-3 were determined using specific substrates for caspase-9 (Ac-Leu-Glu-His-Asp-amino-4-methyl-coumarin); and caspase-3 (Ac-Asp-Glu-Val-Asp-amino-4-methyl coumarin). The enzyme activity was continuously monitored by measuring the fluorescence at 460 nm using a 380 nm excitation wavelength at 37°C. Caspase-9 and Caspase-3 activity was expressed as nmoles/mg protein/hr. Data are expressed as mean ± SD and analyzed using one-way ANOVA. A p value <0.05 was considered statistically significant.

RESULTS: Caspase- 9 activity was 3.696 ±0.513 in Nx , 6.837 ±0.456 in Hx (p<0.05 vs. Nx), 5.616 ±0.416 in Hx-LEHD-fmk (p<0.05 vs. Nx, Hx). Caspase-3 activity was 7.402±1.276 in Nx , 13.567 ±0.908 in Hx (p<0.05 vs. Nx), 11.255 ± 1.122 in Hx-LEHD-fmk (p<0.05 vs. Nx, Hx). The data show that post hypoxic administration of a caspase-9 inhibitor, attenuates the hypoxia induced increase in caspase-9 and -3 activity.

CONCLUSIONS: We conclude that the mechanism of caspase -3 activation during hypoxic reoxygenation is caspase-9 mediated. Since caspase-9 inhibitor attenuates the activation of caspase-3, we speculate that caspase-9 inhibition will attenuate the hypoxia induced programmed neuronal cell death. (NIH-HD-20337, NIH-HD-38079).

163 11:00 AM Fellow in Training

Mechanism of Hypoxia-Induced Post-Translational Modification (Tyrosine Phosphorylation) of Apoptotic Proteins in the Cytosol of the Cerebral Cortex of Newborn Piglets

Saneyuki Yasuda, Jahan Ara, Qazi M. Ashraf, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Previously we have shown that hypoxia results in increased expression of pro-apoptotic proteins Bax and Bad in the cerebral cortex of newborn piglets. We have also shown that inhibition of nuclear membrane Ca^{++}-ATPase prevents the hypoxia-induced increase in nuclear Ca^{++}-influx and Bax and Bad expression.

OBJECTIVE: The present study aims to investigate the mechanism of apoptotic protein phosphorylation during hypoxia and tests the hypothesis that the hypoxia-induced increased phosphorylation of apoptotic proteins Bcl-2 and Bcl-xl is Ca^{++}-influx dependent in the cytosolic fraction of the cerebral cortex of newborn piglets.

DESIGN/METHODS: Newborn piglets were divided into normoxic (Nx, n=5) and hypoxic (Hx, n=5) and hypoxic-pretreated with clonidine (Clo+Hx, n=4) groups. Hypoxia was induced by exposing the animals to an FiO_2 of 0.06 for 1hr. Clonidine (12.5 μg/kg, IV) was administered to piglets prior to hypoxia. Tissue hypoxia was confirmed biochemically by determing ATP and phosphocreatinine (PCr) levels. Cerebral cortical tissue was harvested and cytosol fraction isolated by density gradient centrifugation. Proteins were separated by SDS-PAGE and probed with anti-phosphotyrosine antibodies.

RESULTS: The ATP values in the Nx, Hx, Clo+Hx were 4.28±1.01 (p<0.05 vs Hx, Clo-Hx), 0.95±0.85, 1.50±0.28μmol/g brain, respectively. The PCr values in the Nx, Hx, Clo+Hx were 2.73±0.76 (p<0.05 vs Hx, Clo-Hx), 0.95±0.17, 0.97±0.95 μmol/g brain, respectively. Phosphorylated Bcl-2 (p-Bcl-2) density was in 21.1±1.1 Nx, 58.9±9.6 Hx and 29.5±6.4 Clo+Hx (p<0.05 vs Hx). Phosphorylated Bcl-xl (p-Bcl-xl) density was 29.6±1.5 Nx, 50.6±7.4 Hx and 32.1±0.1 Clo+Hx (p<0.05 vs Hx). Phosphorylated Bax (p-Bax) density was 38.6±16.2 Nx, 46.1±5.5 Hx and 41.6±1.9 Clo+Hx groups (p=NS). Phosphorylated Bad (p-Bad) density was 66.7±12.8 Nx, 71.2±6.8 Hx and 78.7±22.5 Clo+Hx groups (p=NS).

CONCLUSIONS: We conclude that hypoxia-induced increased tyrosine phosphorylation of anti-apoptotic proteins in the cerebral cortex of newborn piglet is Ca^{++}-dependent. We speculate that increased p-Bcl-2 and p-Bcl-xl will prevent the heterodimerization of Bax leading to activation of pro-caspase-9 resulting in neuronal death. (NIH-HD-20337, NIH-HD-38079).

164 11:15 AM Fellow in Training

Tyrosine Phosphorylation of Apoptotic Proteins during Hyperoxia in Mitochondria of the Cerebral Cortex of Newborn Piglets

Manjula Mudduluru, Alan B. Zubrow, Eddie Chang, Om P. Mishra, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher's Hospital for Children, Philadelphia, PA.

BACKGROUND: Previous studies have shown that hyperoxia results in cerebral cortical neuronal cell death. We have also shown that phosphorylation of antiapoptotic proteins Bcl_2 and Bcl-xl results in alteration of their antiapoptotic function yielding in loss of mitochondrial membrane integrity and the release of apoptogenic proteins.

OBJECTIVE: The present study aims to determine the mechanism of hyperoxic neuronal death by testing the hypothesis that cerebral hyperoxia results in increased tyrosine phosphorylation of apoptotic proteins Bcl_2, Bcl-xl, Bax and Bad in the mitochondrial fraction of the cerebral cortex of newborn piglets.

DESIGN/METHODS: Twelve newborn piglets were divided into normoxic [Nx, n=6] exposed to an FiO_2 of 0.21 for 1 hr and hyperoxic [Hyx, n=6] exposed to FiO_2 of 1.0 for 1 hr. PaO_2 in Hyx group was maintained above 400 mmHg while the Nx group was kept at 80 to100 mmHg. Cerebral cortical tissue was harvested and mitochondrial fractions were isolated. Proteins were immunoprecipitated with anti-phosphotyrosine antibody separated using 12% SDS-PAGE, and probed with anti-Bcl_2, anti-Bcl-xl, anti-Bax and anti-Bad antibodies. Protein bands were detected, analyzed by densitometry and expressed as absorbance [O.D. × mm^2].

RESULTS: Phosphorylated Bcl_2 (p-Bcl_2) protein density (O.D. x mm^2) was 19.34±3.66 in Nx and 41.57±18.30 in Hyx, (p<0.05). Phosphorylated Bcl-xl (p-Bcl-xl) protein density was 26.94±7.04 in Nx and 47.90±2.57 in Hyx, (p<0.05). Phosphorylated Bax (p-Bax) was 43.51±5.07 in Nx and 43.31±5.25 in Hyx, (p=NS). Phosphorylated Bad (p-Bad) was 23.69±3.92 in Nx, 24.45±4.72 in Hyx (p=NS). The data show that during hyperoxia there is a significant increase in tyrosine phosphorylation of Bcl_2 and Bcl-xl, while the phosphorylation of Bax and Bad does not alter in mitochondria of the cerebral cortex of newborn piglets.

CONCLUSIONS: We conclude that hyperoxia leads to post translational modification of anti apoptotic proteins Bcl_2 and Bcl-xl in cerebral cortical mitochondria. We speculate that phosphorylation of Bcl_2 will result in loss of its antiapoptotic potential by preventing its dimerization with Bax leading to activation of caspase pathway resulting in neuronal death in the cerebral cortex of the newborn piglet. (NIH-HD 20337, NIH-HD 38079).

Pulmonary Development & Injury Platform Session

Sunday, March 11, 2007 9:45 AM-12:00 PM

165 9:45 AM Fellow in Training

***In Utero* Treatment with Antisense-CFTR Decreases Surfactant Protein A and B mRNA in the Lung but Increases Phospholipid Secretion in Alveolar Type II Cells in Adult Rats**

Ashraf Gad, Delon Callender, Erin Killeen, Janet E. Larson, J. Craig Cohen, Avinash Chander. Pediatrics/Neonatology, Stony Brook University Medical Center, Stony Brook, NY.

BACKGROUND: Fetal gene therapy is one approach to correct defective gene expression in the lung. Previous studies showed that *in utero* treatment of fetal mice with CFTR over-expressing constructs accelerated the maturation of fetal alveolar type I and type II (T-2) cells (Larson, Am. J. Physiol. 279, L333, 2000). The fetal T-2 cells also showed increased volume density of lamellar bodies and decreased glycogen pool indicating increased surfactant production.

OBJECTIVE: We hypothesized that *in utero* knockdown of CFTR would interfere with lung maturation that could reflect in altered alveolar surfactant level and T-2 cell function in adult life.

DESIGN/METHODS: Rat fetuses at 16 days of gestation were treated with adenovirus vector containing a control gene, or a 900bp antisense-CFTR construct (ASCFTR). The newborn rats from two groups were housed under similar conditions. At 2-3 months of age, rat lungs were harvested and processed for RNA extraction, bronchoalveolar lavage, and for isolation of alveolar T-2 cells.

RESULTS: Compared to controls, the ASCFTR rats showed higher levels of phosphatidylcholine (PC) in large aggregates of alveolar surfactant. The lung mRNA levels for SP-A, and SP-B were lower by 2 folds in the ASCFTR rats. In freshly isolated T-2 cells, only the SP-B mRNA levels were decreased by > 2 folds in the ASCFTR cells. The basal PC secretion was similar in the control and ASCFTR T-2 cells (control, 1.05 ± 0.19% and ASCFTR, 0.82 ± 0.11%, n = 5, P > 0.05). Treatment of cells with 1 mM ATP increased the secretion to 405 ± 42% and 471 ± 39% of the basal secretion in the control and ASCFTR cells, respectively. Direct activation of PKC with phorbol myristate acetate (PMA) increased the secretion by 350 ± 53 and 478 ± 34% in the control and ASCFTR cells, respectively. The equilibrium labeling of cell PC, which is a measure of cell PC pool, was 30% higher in the ASCFTR cells. Thus, higher absolute secretion of PC can explain the increased pool of alveolar surfactant PC in the ASCFTR rats.

CONCLUSIONS: These knockdown studies support a role for CFTR in lung maturation and suggest that transient changes in CFTR expression could alter T-2 cell and surfactant characteristics that persist in the adult life.

166 10:00 AM

Azithromycin Suppresses Activation of Nuclear Factor-kappaB and Production of Pro-Inflammatory Cytokines in Tracheal Aspirate Cells from Premature Infants

Zubair H. Aghai, Aruna Kode, Riva Eydelamn, Judy Saslow, Tarek Nakhla, Gary Stahl, Louise Starnde, Paola Leone, Irfan Rahman. Pediatrics/Surgery, Cooper University Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ; Environmental Medicine, University of Rochester Medical Center, Rochester, NY.

BACKGROUND: Nuclear factor- kappaB (NF-κB) plays a central role in regulating key inflammatory mediators. Activation of NF-κB is increased in tracheal aspirate (TA) cells from premature infants developing bronchopulmonary dysplasia (BPD).

OBJECTIVE: To study the effect of azithromycin (AZM) on the activation of NF-κB and production of cytokines (IL-6 and IL-8) in TA cells from premature infants.

DESIGN/METHODS: TA cells obtained from ventilated preterm infants (n=10) were incubated *in vitro* in 4 groups (C=control, TNF=TNF-α 2ng/ml, AZM4=TNF-α 2ng/ml + AZM 4ug/ml and AZM8= TNF-α 2ng/ml + AZM 8ug/ml). After 18 hours of incubation nuclear protein was extracted from cell pellets and the activation of NF-κB was measured by electrophoretic mobility shift assay (EMSA). IL-6 and IL-8 were measured in cell culture media by commercially available ELISA kits.

RESULTS: Stimulation of TA cells by TNF-α increased the activation of NF-κB (Table 1, p<0.001). Addition of

4 ug/ml of AZM did not reduce TNF-α stimulated activation of NF-κB. However, increasing the concentration of AZM to 8 ug/ml suppressed the activation of NF-κB (p<0.001). Increased activation of NF-κB after TNF-α stimulation was also associated with increased levels of IL-6 and IL-8 (p<0.001). Addition of higher concentration of AZM (8 ug/ml) significantly reduced the IL-6 and IL-8 production (p<0.001) to levels similar to control.

	Control	TNF	AZM4	AZM8
NF-□B (RI)†	1.0±0.0	3.1±0.2*	2.8±0.2*	1.4±0.0**
IL-8 (pg/ml)	177±5	352±21*	296±18*	192±6**
IL-6 (pg/ml)	120±7	316±18*	256±15*	150±6**

†n=7, RI=relative intensity *p<0.001 compared with Control **p<0.001 compared with TNF

CONCLUSIONS: TNF-a stimulation increased the activation of NF-κB and production of NF-κB dependant pro-inflammatory cytokines (IL-6 and IL-8) in TA cells from preterm infants. Higher concentrations of AZM suppressed TNF-a stimulated activation of NF-κB and IL-6 and IL-8 production. We speculate that high doses of AZM may be an effective strategy in decreasing the severity of BPD in premature infants.

167 10:15 AM

Increased Expression/Activation of Matrix Metalloprotease-9 (MMP-9) in Hyperoxic Injury in Developing Lung

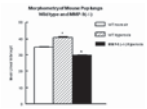
Anne Chetty, Gong-jee Cao, Heber C. Nielsen. Pediatric Pulmonary, Tufts-New England Medical Center, Boston, MA; Newborn Medicine, Tufts-New England Medical Center, Boston, MA.

BACKGROUND: Bronchopulmonary dysplasia (BPD) annually affects >10,000 VLBW infants. A major morbidity component of BPD is oxidant injury-induced remodeling of extracellular matrix (ECM).

OBJECTIVE: Hyperoxia promotes MMP-9 expression/activation causing abnormal ECM remodeling and altered lung morphometry.

DESIGN/METHODS: 3-day-old wild type (WT) and MMP-9 (-/-) mice were exposed to 95% oxygen and room air for 1 week. Lungs were isolated and inflation fixed with 4% paraformaldehyde at 20cm H_2O pressure. Paraffin embedded 5-micron sections were stained with hematoxylin for morphometric analysis. Images of 5 non-overlapping fields were grabbed at 20X magnification eliminating airway and vascular structures from the analysis and processed with Scion image analysis software (Scion Corp). Mean linear intercept (MLI; a measure of alveolar diameter which is inversely proportional to the alveolar surface area), radial alveolar count (a measure of acinar alveolarization), and the RAC/MLI ratio were studied. MMP-9 expression in room air and hyperoxia-exposed WT mice was examined by Western blot and immunohistochemostry.

RESULTS: MMP-9 was significantly increased in lungs of WT mice exposed to hyperoxia compared to controls. Immunohistochemistry showed increased MMP-9 in the mesenchyme and alveolar epithelium of hyperoxia-exposed lungs. Hyperoxia-exposed WT mice had less gas exchange surface area compared to room air-exposed mice. Lungs from hyperoxic MMP-9 (-/-) mice had a larger gas exchange surface area compared to the lungs from hyperoxic WT mice.



CONCLUSIONS: MMP-9 plays an important role in oxygen-induced lung injury. Blocking MMP-9 activity may lead to novel therapeutic approaches to prevent BPD. Supported by HL67089 and HL37930.

168 10:30 AM

Role of Interferon-γ (IFN-γ) in Murine Lung Development

Anantha Harijith, Rayman Choo-Wing, Robert Homer, Vineet Bhandari. Pediatrics, Yale University School of Medicine, New Haven, CT; Pathology, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Exposure to hyperoxia led to improved early survival of adult C57Bl6/J IFN-γ null mutant mice, compared to controls (Am J Physiol Lung Cell Mol Physiol 2004;287:L1042-7). We have noted a marked increase in IFN-γ mRNA expression in the lungs of wild type (WT) C57Bl6/J newborn (NB) mice pups exposed to hyperoxia.

OBJECTIVE: To study the effect of increased IFN-γ during murine lung development in the immediate postnatal (PN) period in room air.

DESIGN/METHODS: We used C57Bl6/J triple transgenic (TTG) IFN-γ mice: dual TG CC10-rtTA-IFN-γ (J Exp Med 2000;192:1587-1600) mice having the tTS repressor (J Biol Chem 2001;273:25222-9) to eliminate TG leak, with WT litter-mates as controls. Lactating dams were given doxycycline (dox) water to activate IFN-γ in the lungs of TTG NB mice via the transmammary route. IFN-γ levels were measured by ELISA (R&D systems). RT-PCR was performed and mRNA expression was quantified by densitometry. Lung morphometry was done using the public domain NIH Image program.

RESULTS: On activation of IFN-γ in the NB mice lungs by dox, there was increased IFN-γ levels in the broncholaveolar lavage (BAL) fluid at PN7, versus WT litter-mate controls (mean±sem, TTG vs. WT, 201.9±47.6 vs. 1.3±1.3 pg/mL, p=0.004). On histology, there was marked thinning of the alveolar walls and increase in alveolar size in the TTG mice lungs, which was confirmed on lung morphometry (chord length, 63.6±6.3 vs. 39.5±4.9μm, p=0.02). RT-PCR showed significantly increased cysteine proteinases [cathepsins B, H, K, L, S], matrix metalloproteinases (MMPs) [MMP 2, 9, 12, 14], apoptosis effector caspases 3, 6, 8, 9, and angiogenic agents [Angiopoietin (Ang)2, and endoglin] mRNA expression (all p<0.05), with no differences in Ang1, in the TTG mice, compared to controls.

CONCLUSIONS: Increased IFN- γ in the developing murine lung in the immediate PN period can lead to significant alterations in alveolar architecture, associated with increased cathepsins, MMPs, caspases and angiogenic agents. We speculate that increased production of IFN- γ may be responsible, at least in part, for the effects noted secondary to hyperoxia-induced injury in the developing lung.

169 10:45 AM

Heme Oxygenase-1 (HO-1) Localizes to the Nucleus in Hyperoxia

Sacha Kassovska-Bratinova, Guang Yang, Phyllis Dennery. Neonatology, Children's Hospital, Philadelphia, PA.

BACKGROUND: Heme oxygenase-1, an integral membrane protein of the smooth endoplasmic reticulum and the rate limiting enzyme in heme degradation, is inducible in response to oxidative stress. However, it may have detrimental effects if overexpressed beyond a certain threshold (Suttner et al, FASEB, 1999), therefore tight regulation of HO-1 levels may need to be maintained.

OBJECTIVE: Our objective is to investigate the mechanisms of HO-1 regulation in hyperoxia using in vivo and in vitro models.

DESIGN/METHODS: Cultured fibroblasts and RAW 264.7 cells were exposed to hyperoxia (95%O2/5%CO2) or normoxia (21% O2) for 24 hours. C57Bl and FVB newborn and adult mice were exposed to more than 95% oxygen for 24, 48 and 72 h. Intact nuclei were isolated on sucrose gradient. Nuclear extracts were then obtained from the intact nuclei using a commercially available kit (Pierce). Nuclear extracts and whole cell lysates were resolved on gradient gels. HO-1 antibody (SPA-896, Stressgen) was used to detect immunoreactive proteins using Western blot as well as for fluorescent immunostaining.

RESULTS: In cultured fibroblasts, RAW 264.7 cells and in the mouse lung, after hyperoxic exposure, two immunoreactive bands were observed: the native HO-1 (32 kDa) and another band with molecular weight of ~28kDa. Immunohistochemistry and Western blot analysis using nuclear extracts confirmed nuclear localization of the HO-1 signal. In addition, in vivo, the truncated nuclear HO-1 was predominant in the newborn lungs after hyperoxic exposure as compared to similarly exposed adult mice, suggesting maturational differences. To understand whether nuclear localization of HO-1 may be related to oxidative stress, cultured cells were incubated with N-acetyl cysteine (NAC) prior to hyperoxic exposure. This prevented the nuclear localization of HO-1.

CONCLUSIONS: These data suggest that there may be an oxidant sensitive cleavage of HO-1 protein with resultant nuclear migration. We speculate that nuclear HO-1 serves an important function in cell signaling during oxidative stress.

170 11:00 AM

Chronic Hypercapnia Accelerates Alveolar Formation and Maturation in the Neonatal Mouse

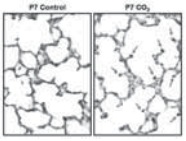
Alfin G. Vicencio, Zhongfang Du, Bernice Morrow. Pediatrics and Molecular Genetics, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Permissive hypercapnia is increasingly utilized in the care of premature infants to prevent bronchopulmonary dysplasia. Traditionally, the proposed benefit of permissive hypercapnia was thought to be the reduction of stretch injury and volutrauma from mechanical ventilation. We recently described gene expression changes in the neonatal mouse lung exposed to chronic hypercapnia that might contribute to lung protection and accelerated maturation. However, little is known about whether CO_2 may have independent effects on lung protection and/or lung development.

OBJECTIVE: To determine whether exposure to chronic hypercapnia accelerates alveolar formation and lung maturation in the neonatal mouse.

DESIGN/METHODS: Mouse pups were exposed to 8% CO_2 + 21% O_2 starting at postnatal day (P) 2 for up to two weeks. Control animals were maintained in room air. Animals were sacrificed at P4, P7 and P14, and lungs were excised and processed for immunohistochemistry and western blot analysis for expression of α-smooth muscle actin (α-sma) and surfactant proteins.

RESULTS: Exposure to 8% CO_2 resulted in advanced organization of interstitial myofibroblasts and their early localization to the tips of developing alveolar buds. As demonstrated, α-sma is expressed throughout the developing lung tissue in control animals. In comparison, α-sma is expressed predominately in the rounded tips of mature buds (red arrows) in CO_2-exposed animals. Accelerated lung maturation is also suggested by increased expression of surfactant proteins with CO_2 exposure.



CONCLUSIONS: Exposure to chronic hypercapnia accelerates alveolar development and lung maturation in the neonatal mouse. We speculate that similar changes in premature humans might improve gas exchange and minimize the need for mechanical ventilation.

This work was funded by the Parker B. Francis fellowship to AGV.

171 11:15 AM House Officer

Toll like Receptor-4 Is Expressed in the Fetal and Neonatal Lungs: Implication in Hyperoxia Induced Lung Injury

Kamran Husain, Jeanette Camacho, Judy Saslow, Maitreyee Maheshwari, Tarek Nakhla, Riva Eydelman, Louise Strande, Robin Perry, Gary Stahl, Zubair Aghai. Pediatrics/Surgery/Pathology/Ob Gyn, Cooper University Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ.

BACKGROUND: Toll like receptor 4 (TLR-4) is critical in endotoxin recognition and cellular immune response. A recent study (The Journal of Immunology 2006, 106:4950-4958) suggests that the activation of TLR-4 by lung epithelial cells may be protective against hyperoxia induced acute lung injury (HALI).

OBJECTIVE: To study the expression of TLR-4 in the lung tissues from nonviable fetuses and premature infants.

DESIGN/METHODS: Stored blocks of lung tissues from nonviable fetuses and premature infants were obtained. The immunoreactive TLR-4 was localized by immunohistochemistry using polyclonal goat anti-TLR-4 antibodies (Santa Cruz Biotechnology, Inc, Santa Cruz, CA). Localization of TLR-4 was quantified on a score of 0-4 in air-sac and/or alveolar epithelial cells (AEC), bronchial epithelial cells (BEC) and interstitial cells (IC) (0=no staining, 1=scattered staining, 3= diffuse staining, 4=diffuse staining with increased intensity).

RESULTS: A total of 22 lung tissues were obtained, 12 from nonviable fetuses {birth weight (BW) 446±243 g, gestational age (GA) 21.4±2.3 w), 1 from a preterm infant not exposed to oxygen (BW 1330 g, GA 30 w) and 9 from preterm infants exposed to oxygen (GA 29.8±5.2 w, BW 1620±1083 g). The median duration of oxygen exposure was 5 days (range 1-63 days). TLR-4 was localized in most of the lung tissues in AEC and

BEC; but identified in IC in only one infant's lung tissue. Localization was significantly higher in BEC (median, range) (2, 1-3) compared to AEC (1, 0-2, p=0.004). There was no significant difference in the localization of TLR-4 in AEC and BEC in infants exposed to oxygen {2 (0-3) & 2 (1-3) respectively} compared to nonviable fetuses and the preterm infant not exposed to oxygen {1 (0-2) & 2 (1-3); p=0.4 & 0.5 respectively).

CONCLUSIONS: TLR-4 is expressed in AEC and BEC in fetal and premature lung epithelial cells and its expression was more pronounced in BEC compared to AEC. There was no significant change in the expression of TLR-4 in the lungs of premature infants exposed to oxygen. We speculate that inability to increase the activation of TLR-4 after exposure to hyperoxia may aggravate HALI in premature infants.

Genetic Basis of Disease Platform Session

Sunday, March 11, 2007 9:45 AM-12:00 PM

172 9:45 AM

Tbx1, DiGeorge Syndrome and Ash2l: A New Interacting Cofactor

Jason Z. Stoller, Jonathan A. Epstein. Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA; Cardiovascular Institute, University of Pennsylvania, Philadelphia, PA.

BACKGROUND: DiGeorge syndrome (DGS) is a common syndrome associated with 22q11 deletions. Most patients with DGS are born with severe heart defects. Congenital heart disease is the most commonly occurring birth defect and relatively little is known about the molecular basis of these defects. Mouse models have implicated Tbx1 as a critical gene within the commonly deleted region. TBX1 encodes a nuclear transcription factor that binds DNA and regulates downstream genes. Tbx1 direct targets and its transcriptional complex are largely unknown. We have identified a potential transcriptional cofactor, Ash2l. Ash2l is known to be part of a histone methyltransferase complex involved in epigenetic transcriptional regulation.

OBJECTIVE: To identify the molecular mechanisms of Ash2l function and characterize the interaction of Ash2l with Tbx1.

DESIGN/METHODS: Novel Tbx1 interacting proteins were discovered in a yeast two-hybrid screen. To generate Ash2l knockout mice, we performed blastocyst injections of Ash2l gene trap mouse embryonic stem cells. Germline transmission was confirmed by PCR genotyping. Expression pattern was determined by in situ hybridization and immunohistochemistry. For genetic interaction studies, heterozygous Tbx1 and Ash2l mice were crossed and offspring were analyzed for aortic arch patterning defects.

RESULTS: Two non-overlapping interacting Ash2l domains were independently found to interact with Tbx1 in our unbiased yeast two-hybrid screen. These interactions were confirmed in mammalian cells. Ash2l mRNA and protein is widely expressed in the mid-gestation mouse embryo, including in Tbx1 expression domains. While Ash2l+/- mice are normal, complete loss of Ash2l is lethal early in embryogenesis. There is no genetic interaction between Tbx1 and Ash2l relevant to aortic arch artery remodeling.

CONCLUSIONS: Ash2l physically interacts with Tbx1. Very early embryonic lethality of Ash2l null mice suggests this protein is critically important for the earliest steps in embryonic development. Pediatric Scientist Development Program NICHD K12-HD00850.

173 10:00 AM Fellow in Training

Phenotypical Relevance of the Y402H Mutation of Factor H in Children with Complement Based MPGN II/DDD and aHUS

Rajesh G. Krishnan, Christina Gerth, Thomas Dietlein, Bernd Hoppe, Elise Heon, Peter F. Zipfel, Christoph Licht. Division of Nephrology, The Hospital for Sick Children, Toronto, ON, Canada; Division of Ophthalmology, The Hospital for Sick Children, Toronto, ON, Canada; Department of Ophthalmology, University of Cologne, Cologne, Germany; Department of Pediatric Nephrology, University of Cologne, Cologne, Germany; Leibniz Institute for Natural Products Research and Infection Biology, Jena, Germany.

BACKGROUND: Patients with MPGN Type II / dense deposit disease (DDD) and atypical haemolytic uremic syndrome (aHUS) secondary to defective complement control are known to have a high prevalence of the Y402H polymorphism of Factor H gene (CFH), which is linked to age-related macular degeneration (AMD).

OBJECTIVE: To study the prevalence of the Y402H polymorphism and its ocular phenotype in children with complement based renal diseases.

DESIGN/METHODS: In two Pediatric Nephrology Centres all Patients with MPGN II / DDD and aHUS were identified and screened prospectively for the presence of Y402H polymorphism and drusen maculopathy. All patients have been on immunomodulatory therapy at the time of screening.

RESULTS: • Four children were identified (male:female = 3:1) with MPGN II / DDD and aHUS. There were two children in either group.

• The median (range) age at examination was 8.6 years (3.5 to 13.3 years).

• Of the four patients, all were found to have the Y402H polymorphism.

• None of the patients had evidence of drusen at the time of examination.

• Two patients with MPGN II / DDD and one patient with aHUS had additional Factor H mutations, which were thought to be responsible for the renal disease (MPGN II / DDD).

CONCLUSIONS: In our study of children with MPGN II / DDD and aHUS we found a 100% prevalence of the Y402H polymorphism of Factor H gene, which puts these patients at higher risk for drusen maculopathy. Therefore, all children with either MPGN II / DDD or aHUS should be screened for Y402H polymorphism; and if found positive have regular ophthalmologic examination.

In the future, should Y402H be proven to be of functional significance with respect to complement control, there will be a role for plasma infusion or replacement of pure Factor H for the treatment of both the renal and the ocular phenotype.

174 10:15 AM Fellow in Training

Single Nucleotide Polymorphisms (SNPs) of Interleukin-8 (IL8) and BPD in ELBW Infants

Joie Fisher, Esther Koai, Chauchau Pham, Nora Ali, Hima Maramreddy, Sonya Strassberg, Lance A. Parton. Pediatrics, Maria Fareri Children's Hospital, Valhalla, NY.

BACKGROUND: Airway secretions from preterm infants destined to progress to BPD yield increased expression of the potent neutrophil chemotactic factor IL8 within the first 24 hours of life. This occurs even in the absence of clinical or histologic chorioamnionitis or PPROM. This altered expression pattern found with BPD may be a consequence of genetic variations in IL8 SNPs-which have been associated with the predisposition to asthma and severity of innate responsiveness to RSV.

OBJECTIVE: We tested the hypothesis that SNPs of IL8 contribute to the development of BPD in ELBW infants.

DESIGN/METHODS: This is an ongoing prospective cohort study currently involving 71 ELBW infants from 2002 to present, weighing < 1 kg, without congenital or chromosomal anomalies. BPD is defined as oxygen requirement at 28 days of life; those with mild BPD do not require oxygen at 36 weeks PMA; those with moderate BPD require FiO_2 of < 0.3 at 36 weeks PMA; and those with severe BPD require pressure and/or a FiO_2 > 0.3 at 36 weeks PMA. Buccal mucosal swabs were collected from each infant after informed parental consent was obtained. DNA was isolated from these samples. Probes specific for IL8 (-251, 396, 781, 1633 and 2767) were used with Real-time PCR for allelic discrimination. Statistical analysis utilized chi square and ANOVA, with $P<0.05$ indicating statistical significance.

RESULTS: As expected, lower gestational age ($P<0.001$) and birth weight ($P<0.001$) place ELBW infants at higher risk for more severe BPD. No differences in racial distribution were found between the groups. Infants with more severe BPD were more likely to have received surfactant. There was an association between the severity of BPD and the incidence of PDA requiring treatment, as well as the presence of ROP. SNPs of -251 and 396 were also associated with the incidence of IVH $\geq$3 ($P=0.009$, 0.003, respectively). Most significantly, genotype and allele frequencies for IL8 -251 and 396 were associated with severity of BPD ($P=0.03$, 0.01 respectively).

CONCLUSIONS: SNPs for IL8 (-251, 396) were associated with BPD severity in ELBW infants.

175 10:30 AM Medical Student

Noonan Syndrome/Leukemia Causative Gain-of-Function *PTPN11* Mutations Induce Apoptosis during *Drosophila* Hematopoiesis

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BACKGROUND: Germline gain-of-function (GOF) mutations in *PTPN11*, encoding the protein tyrosine phosphatase SHP-2, cause Noonan syndrome (NS), a pleiomorphic developmental disorder with dysregulated hematopoiesis. Somatic *PTPN11* mutations, comprised of different amino acid substitutions, cause several leukemias including juvenile myelomonocytic leukemia (JMML). JMML-related SHP-2 mutants have higher phosphatase activities than NS ones. We previously generated transgenic flies expressing mutations of varying GOF (weakest to strongest: N308D (NS), A72S (NS), E76K (JMML)) in corkscrew (CSW), the *Drosophila* SHP-2 homologue. Ubiquitous transgene expression caused ectopic wing vein (N308D) or lethality (A72S, E76K) due to increased Egfr/Ras/Mapk signaling.

OBJECTIVE: To understand the effects of NS and leukemia-causative SHP-2 mutations on hematopoiesis using fly models.

DESIGN/METHODS: Transgenic flies expressing A72S, E76K, N308D, and wild type *csw* driven by a hemocyte-specific driver, *hemolectin-GAL4*, were analyzed. Transgenic Ras^{G12V} flies were a positive control. The total number of hemocytes from late third instar larvae were counted using fluorescent microscopy. TUNEL assays were performed to analyze apoptosis.

RESULTS: The NS model larvae (N308D, A72S) showed two-fold increases in hemocyte numbers compared to wild type transgenics, while the leukemic model E76K caused minimal increase. Since this was the inverse of GOF strength, apoptosis levels were determined. E76K and A72S larvae showed significantly increased apoptosis compared to wild type while NS larvae were intermediate (E76K: 6.33±3.85, A72S: 5.61±1.95, N308D: 2.89±1.30, wild type: 1.24±1.33 %). Of note, expression of the oncogenic G12V Ras increased hemocyte numbers 20 fold but did not increase apoptosis.

CONCLUSIONS: GOF *csw* mutations induce proliferation and apoptosis during hemocyte development. The highest apoptosis rate is seen in the leukemic mutant, which also causes the greatest Ras/Mapk signaling activation. These effects contrast to that of oncogenic Ras, which induces proliferation without increased apoptosis. This difference suggests a novel mechanism of tumorigenesis associated with SHP-2 mutations, perhaps requiring second hits suppressing apoptosis. Future work will be directed to confirming the effects in a mouse model with Shp-2 GOF.

176 10:45 AM Fellow in Training

Single Nucleotide Polymorphisms (SNPs) of Fas and Fas Ligand (FasL) and BPD in ELBW Infants

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BACKGROUND: Apoptosis mediated by the Fas/Fas ligand system is involved in normal lung development as well as the lung pathology seen in RDS, the requisite antecedent to BPD. BPD results from interactions of environmental stressors with susceptible genetic foundations. Hypoalveolarization-which is a hallmark of BPD-may result from a dysregulation of apoptosis. This dysregulated apoptosis may be a product of genetic variations caused by single nucleotide polymorphisms (SNPs) of apoptotic genes such as Fas and FasL.

OBJECTIVE: We tested the hypothesis that SNPs of Fas and FasL contribute to the development of BPD in ELBW infants.

DESIGN/METHODS: This is an ongoing prospective cohort study that has enrolled 74 infants from 2002 to present, weighing less than 1 kg at birth, without congenital or chromosomal anomalies. BPD is defined as oxygen requirement at 28d. Those with Mild BPD do not require oxygen at 36 weeks PMA; Moderate BPD require an FiO2<0.3 at 36 weeks PMA; Severe BPD require pressure and/or an FiO2>0.3 at 36 weeks PMA. Following informed parental consent, buccal mucosal swabs were collected from each infant, and DNA was isolated. Allelic discrimination was performed using specific probes for Fas (-1377,-691,-670) and FasL (-844,1174,2777) with Real-time PCR. Chi square analyses and ANOVA were performed, with $P<0.05$ denoting statistical significance.

RESULTS: As expected, lower gestational age and birthweight place ELBW infants at risk for more severe BPD. Infants with more severe BPD were more likely to have received antenatal steroids and surfactant. There was a significant association between the presence of a PDA requiring treatment and between culture-positive sepsis and BPD severity. We also found an association between genotypes of FasL -844, 1174 and 2777 and PVL; and between genotypes of FasL 1174 and the presence of severe ROP (≥stage 3). For FasL -844, the c allele was less prevalent in infants with PVL. There were no significant differences in racial distribution or genotype frequency of the studied SNPs for Fas and FasL when stratified for BPD severity.

CONCLUSIONS: While some complications of prematurity were correlated with FasL SNPs, BPD severity was not associated with the studied SNPs of Fas or Fas ligand.

177 11:00 AM Ph.D. Student

A Mutation in the CXCR2 Chemokine Receptor Results in an Isolated Myelokathexis Phenotype Observed in WHIM Syndrome

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BACKGROUND: Chemokine receptors CXCR4 and CXCR2, members of the seven-pass transmembrane G-protein coupled receptor family, play an important role in neutrophils trafficking. Mutations in CXCR4 have been genetically linked to WHIM Syndrome, a rare congenital disorder characterized by warts, hypogammaglobulinemia, infections, and myelokathexis - an unusually severe form of neutropenia. A putative WHIM cohort exhibiting isolated myelokathexis was shown to contain wild-type copies of CXCR4. Subsequent genetic analysis of other candidate genes identified a frame shift mutation in the region encoding the c-terminal portion of CXCR2 (CXCR2-H323fs329X). The CXCR2 mutation is inherited in an autosomal recessive manner.

OBJECTIVE: We will characterize the function of the putative loss-of-function mutation in CXCR2, including the relationship between CXCR2 and CXCR4 in neutrophil maturation and trafficking and the associated dysregulation detected in WHIM patients.

DESIGN/METHODS: Expression constructs containing epitope-tagged CXCR2wt, CXCR2-H323fs329X and CXCR4 proteins were transfected into HeLa and HEK293 cells. HeLa cells were fixed and stained using fluorescent antibodies to observe CXCR2 localization in serum-starved, full serum and/or IL-8 stimulated cultures. HEK293 cells were harvested, lysed and analyzed by co-immunoprecipitation and SDS-PAGE. Functional assays measuring cAMP levels will show the loss-of-function generated by the mutation.

RESULTS: Transfected HEK293 cells showed normal expression of both the wild-type and mutant proteins. Transfected HeLa cells show peripheral plasma membrane staining for the CXCR2wt. CXCR2-H323fs329X protein colocalizes with calnexin staining suggesting ER entrapment. Co-IP expreiments show that CXCR2 will dimerize in the absence of ligand. Wild-type and mutant receptors heterodimerize when cotransfected.

CONCLUSIONS: We propose that the mutation detected in CXCR2 leads to a loss-of-function of the receptor. Trafficking of the mutant CXCR2 protein is disrupted leading to ER entrapment. The CXCR2 mutation phenotype mimics the neutropenic phenotype exhibited in previously characterized WHIM Syndrome patients. This would make CXCR2 the second chemokine receptor defect found to cause a disease phenotype.

178 11:15 AM Fellow in Training

Transient in Utero Knockout (TIUKO) of CFTR Results in Permanent Physiologic and Histologic Changes in the Lungs of Sprague-Dawley Rats

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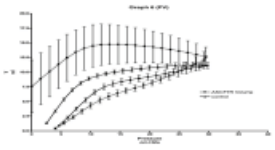
BACKGROUND: In previous studies transient in utero knockout of the cystic fibrosis transmembrane conductance regulator, (TIUKO CFTR), gene resulted in short term physiologic and histologic changes in the lungs of Sprague-Dawley, (SD), rats. The transient nature of the knockout model, (72 hours), as well as 75 fold greater expression of the CFTR gene in fetal lung tissue suggest a significant developmental role of CFTR in the fetal lung. Respiratory function testing can assess physiologic performance and detect changes in disease models in rat pups.

OBJECTIVE: To determine if TIUKO CFTR results in permanent pathologic changes in lung morphometry, histologic appearance, and physiologic performance in SD rats.

DESIGN/METHODS: Time pregnant SD rats underwent TIUKO CFTR by anti-sense CFTR, (ASCFTR), gene using an adenovirus vector at 16 days gestation. The dames delivered natrually and the pups were raised until 18 months. Evaluation of lung physiologic performance was performed by forced oscillation respiratory function testing. Histologic examination of lung tissue was performed including quantification of collagen. Morphometric analysis of lung tissue is ongoing.

RESULTS: TIUKO CFTR resulted in decreased static compliance, increased conducting airway resistance, tissue dampening, and elastance at all levels of PEEP. Hysterisivity trended toward a decrease, especially at lower levels of PEEP. TIUKO CFTR resulted in altered PV curves. Histologically, TIUKO CFTR resulted in abnormal abnormal lung parenchyma including increased cellularity and collagen content.



CONCLUSIONS: TIUKO CFTR at 16 days gestation causes alteration of lung organogenesis in the SD rat. This alteration results in permanent pathologic changes in both histologic appearance and physiologic performance of the lungs.

Neonatalogy III - Clinical Studies Platform Session

Sunday, March 11, 2007 9:45 AM-12:00 PM

179 9:45 AM Fellow in Training

Clinical Practice and SpO_2 Technology in the Prevention of ROP in ELBW Infants

Armando R. Castillo, Richard Deulofeut, Augusto Sola. Neonatal-Perinatal Medicine, Emory University, Atlanta, GA; Pediatrix Medical Group, North Dallas Practice, Dallas, TX; Mid Atlantic Neonatology, Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: Retinopathy of prematurity (ROP) can be a devastating disease. Efforts to lower ROP rates include education and commitment of bed side care providers, guidelines to decrease hyperoxemic periods and wide changes in oxygenation and the advances in SpO_2 technology. The impact of each in reducing ROP is not easy to discriminate. Infants under our care were exposed to a unique situation, where a universal change in clinical practice was implemented by the same health care team members but SpO_2 technology after the clinical change was not uniform.

OBJECTIVE: To identify if treatment effect and relative risk reduction (RRR) of aiming for lower SpO_2 are associated to the SpO_2 technology utilized.

DESIGN/METHODS: Two centers (CLH: Center 1 and GMH: Center 2). Period I (2000-2002) when SpO_2>95%, with Nellcor monitors. Period II (2003-2004): SpO_2 88-93%, same education, health care team members & guidelines. Center 1 changed to Masimo SET®; Center 2 did not. Inborn infants <1,250 gm with ROP examination were the denominator to calculate ROP incidence in both periods and centers. Eye exams were performed by same criteria (AAP & AAO) & ophthalmology department. Stats: Chi, RRR, NNT.

RESULTS: 366 NB <1,250 gm had ROP exams; 152 in Center 1 and 214 in Center 2. BW and GA were similar (895±190 & 27±2). Treatment effect, RRR and NNT for ROP III-IV and laser treatment were significantly more favorable in Center 1 compared to Center 2. In Center 1 in period I, rates for ROP III-IV and laser were 11.1% & 4%; decreasing in period II to 6% and 2.5% [RRR 40% (p= 0.02)]. In center II ROP III-IV rates were 13% and laser 5% in period I but they did not decrease in period II.

CONCLUSIONS: In a large group of examined inborn infants <1,250 gm treated by the same neonatologists, MD's and NNP's using the same clinical guideline to decrease hyperoxemia and wide changes in oxygenation, the RRR of severe ROP and laser therapy are associated with SpO_2 technology utilized. This further supports the significance of adequate SpO_2 monitors in managing critically ill infants.

180 10:00 AM

Cost-Effectiveness of Early Treatment for Retinopathy of Prematurity (ETROP)

Karen L. Kamholz, Cynthia H. Cole, John A.F. Zupancic. Dept of Pediatrics, Boston Medical Center, Boston, MA; Newborn Medicine, Harvard Medical School, Boston, MA.

BACKGROUND: The ETROP trial demonstrated that treatment of eyes with high-risk prethreshold ROP (early treatment, ET) versus conventional treatment at threshold ROP improved visual outcomes at nine months corrected gestational age. However, it increased the frequency of laser therapy, anesthesia with intubation, treatment-related systemic complications, and repeat treatments (Arch Ophthalmol. 2003; 121(12):1684-94).

OBJECTIVE: To determine the cost-effectiveness of ET compared to conventional management.

DESIGN/METHODS: We developed a stochastic decision analytic model based on ETROP to assess the incremental cost of ET per eye with severe visual impairment prevented. We used the third party payer perspective. Physician costs were derived from insurance reimbursement rates; hospital costs from converted charges using department-specific Medicare cost-to-charge ratios; and resource utilization and efficacy from ETROP published outcome data. Costs were expressed in 2005 US dollars. Time horizon was from birth through nine months corrected gestational age, corresponding to the ETROP data collection period. Parameter uncertainty was quantified using probabilistic sensitivity analysis to generate cost-effectiveness acceptability curves. We also performed deterministic sensitivity analyses to address uncertainty in key cost and resource assumptions.

RESULTS: In the base case analysis, ET had an incremental cost-effectiveness ratio (ICER) of $14,200 per eye with severe visual impairment prevented. There was a 90% chance that ET would be cost-effective at a willingness-to-pay threshold of $40,000, a 0.5% chance that ET would be dominant (cost-saving), and a 2.1% chance that ET would be dominated. The ICER was most sensitive to the cost of additional eye exams and to the cost of laser therapy. It was minimally sensitive to all other variables. In a best-case analysis, ET was cost-saving, while in a worst-case analysis the ICER was $50,500 per eye with severe visual impairment prevented. In a subgroup analysis, treatment of eyes with Type 1 ROP (as defined by ETROP Cooperative Group) had an ICER of $6,200 per eye with severe visual impairment prevented.

CONCLUSIONS: ET is not only efficacious, but has an ICER within the range of other commonly accepted interventions. Given the high lifetime costs of severe visual impairment, ET is expected to provide long-term cost savings.

181 10:15 AM Fellow in Training

Levels of (SpO_2) between 85% and 93% Are Associated with Normoxemia in Newborns (NB) Receiving Oxygen Therapy (FiO2>0.21) in the Neonatal Intensive Care Unit (NICU)

Armando R. Castillo, Hernando Baquero, Freddy Neira, Ramiro Alvis, Ann Critz, Richard Deulofeut, Augusto Sola. Neoanatal-Perinatal Medicine, Emory University, Atlanta, GA; Pediatric Department, Universidad del Norte, Barranquilla, Colombia; Pediatrix Medical Group, North Dallas Practice, Dallas, TX; Mid Atlantic Neonatology, Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: NB breathing room air (RA) have normal SpO_2 of 95-100% but keeping SpO_2 95-100% in NB breathing FiO2>0.21 can cause hyperoxia. In 2003 and 2006, we described that SpO_2 85-95% is associated with less morbidity. There is concern that these SpO_2 levels may cause persistent or intermittent hypoxemia.

OBJECTIVE: To evaluate PaO_2 at different SpO_2 levels in NB with arterial catheters.

DESIGN/METHODS: Prospective comparison of PaO_2 and SpO_2 in stable NB in 6 NICU's located at sea level in 2 countries. PaO_2 obtained for clinical indications; simultaneous SpO_2 was recorded at the time of the arterial gas. Comparisons were made only in stable NB if the SpO_2 changed <1% before, during and after the collection of the sample. Statistics: Chi square, Fishers, bivariate and multivariate analysis.

RESULTS: 976 paired SpO_2 values in 122 NB; 18% of the samples when NB in RA. GA and BW: 29.2±5.2w and 1338±871g. NB in RA: mean and median SpO_2 were 93.9%±4.3 and 95% (73-100%); with SpO_2 85-93%, mean PaO_2 was 58.3±14.2mmHg. When SpO_2>93%, mean PaO_2 was 68.8±15.9mmHg. NB breathing FiO_2>0.21: A) With SpO_2 85-93%, mean PaO_2 was 56.3±14.7mmHg, median 54mmHg (29-112); PaO_2 of 40-80mmHg in 86.8% of samples, and PaO_2<40mmHg in 8.6%. B) With SpO_2>93%, mean PaO_2 was 107.3±59mmHg, median 91mmHg (34-438) ($p \leq 0.001$vs infants with SpO_2 85-93%); 59.5% of the PaO_2 values were >80mmHg and 39.5% between 40-80 mmHg.

CONCLUSIONS: NB breathing FiO2>0.21: I) Normoxemia is much more frequent with SpO_2 85-93% than with SpO_2>93%; II) SpO_2 85-93% avoids abnormally high PaO_2 and is infrequently associated with low PaO_2; iii) SpO_2 >93% is associated with hyperoxia, which may be of risk in some NB receiving FiO2>0.21.

182 10:30 AM

Avoiding Hyperoxemia during Neonatal Resuscitation: Time to Response of Different SpO_2 Monitors

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BACKGROUND: It has become clear that O_2 is used excessively during newborn (NB) resuscitation and that NB given FiO_2>0.21 can be hyperoxic in many cases. Even though in these NB the optimal SpO_2 is not known, accurate knowledge of FiO_2 used and SpO_2 levels during resuscitation, with avoidance of SpO_2 >95%, can lead to less hyperoxemia and oxidant stress. It has been argued that it is impossible to measure SpO_2 in NB resuscitation or unstable conditions; however, time to stable SpO_2 reading under these conditions has not been studied in detail for different SpO_2 monitors.

OBJECTIVE: To assess, during NB resuscitation in unstable conditions, a) if SpO_2 can be measured reliably and b) if the time to stable reading is different between different SpO_2monitors.

DESIGN/METHODS: Prospective observational study of NB who received resuscitation in unstable conditions in the delivery room (DR) and NICU as routinely performed. In each individual NB, two sensors from two different SpO_2 monitors were applied simultaneously to each feet or to left palm and wrist. Time to reach a stable SpO_2 and HR reading was measured by an observer who started a digital stopwatch when the sensors were placed (Time "0") and stopped it when wave and readings were clear and stable (of value for clinical care). SpO_2 monitors used were: Ohmeda Biox 3700 monitor (Boulder CO, USA), Masimo Radical (Masimo Corporation, Irvine, Calif) (set to detect a signal with maximal sensitivity, averaged over 2 seconds with LNOP Hi-Fi sensor); and Nellcor N395 (Pleasanton, Ca). Statistics: SPSS (version 13.0) Chi^2, t student, $p<0.05$.

RESULTS: In 19 NB in the DR (Gest age 32±6 w, 5 min Apgar 5) and in 5 in NICU (35±3 w, very unstable, re-intubation) the mean±SD, median and extreme values time (in seconds) to stable reading were 21.7±7; 21 and 18-32 (Masimo); 67.3±13; 71 and 40-89 (Nellcor); 74.2±12;76 and 40-98 (Ohmeda) ($p < 0.01$).

CONCLUSIONS: Adequate and clinically useful reading of SpO_2 is possible during NB resuscitation. The time to stable and adequate reading is significantly different between SpO_2 monitors. The SpO_2 monitor with the fastest response time would allow for more rapid adjustments of FiO_2 during resuscitation and avoid unnecessary exposure to hyperoxia.

183 10:45 AM Fellow in Training

What Factors Influence Whether Neonatologists Attend Deliveries at the Limits of Viability (20-23 wks GA)?

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BACKGROUND: The birth of a preterm infant at the limits of viability is regarded as an emergency that requires the presence of experienced obstetricians (OB) and neonatologists. *New York State public health law 4146: Induced viable births* states that when an abortion is to be performed after the 20th week of pregnancy, a physician other than the physician performing the abortion shall be in attendance to provide medical care for *any live birth.* Little is know about application or consideration of this law in day-to-day practice.

OBJECTIVE: To determine: 1) the current practices of neonatologists when dealing with a fetus at the limits of viability (20-23 wks); and, 2) whether these practices are guided by predetermined hospital protocols, by interpretation of New York State law, or by other personal factors.

DESIGN/METHODS: A 15 question survey was designed and collected from 48 neonatologists working in New York State hospitals with level I, II, III and IV newborn services. Neonatologists were queried for their years of experience, their gender, and their religious and cultural beliefs. Questions included criteria for attendance of deliveries at less than 23 weeks gestational age (GA), hospital policies regarding attendance of these deliveries and designation of providers who make viability determinations in these circumstances.

RESULTS: Of the respondants, 64% were male, 60% were ≥ 40yrs of age, 41% had ≥ 10 yrs of practice. 15% of neonatologists responded that religion plays a part in their decision to attend deliveries at the limits of viability. 48% of neonatologists attend deliveries starting at ≥ 22 wks GA. Surprisingly, 12% of neonatologists attend deliveries at ≥20 wk GA. 42% of neonatologists attend deliveries for birth weights starting ≥ 400 grams. 56% responded that the primary OB decides the viability of a newborn. Strikingly, 39% of neonatologists were completely unaware of *New York State Health Law 4146* . Local practice is the dominant reason cited for delivery room attendance at the limits of viability (42%).

CONCLUSIONS: There is a lack of uniformity in handling deliveries of infants born at 20 to 23 wks of gestation. Enhanced prenatal care and emerging technology are expanding the limits of viability. New protocols need to be developed to accommodate this new era.

184 11:00 AM Fellow in Training

Challenges in Provision of a Directed Blood Donor Program in Infants ≤1250gms

Moi Louie, Shetal Shah, Karen Hendricks-Munoz, Pradeep Mally. Neonatology, New York University, New York, NY; Neonatology, Stonybrook University Hospital, Great Neck, NY.

BACKGROUND: Packed red blood cell (PRBC) transfusion (txn) is a therapeutic mainstay for infants ≤ 1250gms. Directed donor blood (DD) txn is thought to decrease donor exposure to transfusion.

OBJECTIVE: To evaluate donor exposures in infants receiving direct and random blood txns.

DESIGN/METHODS: 164 infants ≤ 1250gms were admitted to the Neonatal Intensive Care Unit from 1/01-4/06 and received a txn. Infants were analyzed and divided into 4 groups:

1) 100% Random donors (RD); 2) 100% DD; 3) Majority (>50%) RD and 4) Majority (≥50%) DD. Student T-test analysis was performed.

RESULTS: The majority (68%) of initial blood txns were administered within the first week of life. 11 infants received 100% DD blood leading to 1.5 donor exposures/patient. 105 infants received 100% random donor blood with 2.7 exposures/patient. The highest exposures/patient was in Groups 3 and 4 with the greatest in infants who received majority RD blood.

	Group 1 100% Random N=105	Group 2 100% Direct N=11	Group 3 Majority Random N=28	Group 4 Majority Direct N=20	P value
GA (wks)mean±std	28.6±2.7	29.3±1.8	27±1.4	27.7±1.4	0.28
BW (g) mean±std	971±182	1091±113	860±209	1006±183	0.31
Transfusions/patient	6.9	3.2	11.3	8.3	0.02
Exposures/patient	2.7	1.5	4.4	3.6	0.04

CONCLUSIONS: Exclusive DD txns are associated with the lowest donor exposure, this is a rare occurrence, due to the processing time of our blood bank (3-5 days). Providing the majority of txns from DD blood did not decrease the donor exposure, but was observed to have a higher donor exposures/patient compared to the 100% RD group. Infants who received 100% RD blood had the second lowest donor exposures/patient. DD programs must initiate participation as soon as feasible. If this is not possible, it may be preferable to provide 100% random blood.

185 11:15 AM Fellow in Training

A Practice Plan (PP) to Lower the Initiating FiO2 in the Delivery Room (DR) in Very Low Birth Weight (VLBW) Infants Requiring Respiratory Support (RS) Is Feasible

Anita Stola, Jeffrey Perlman. Dept of Pediatrics, NYPH Weill Cornell Medical College, NY, NY.

BACKGROUND: O2 exposure during DR resuscitation (RESUS) even when brief is potentially more toxic than previously believed. The PaO2 level as well as the optimal O2 saturation (SAT) necessary to avoid toxicity remains unclear; it has been suggested that the PaO2 be maintained < 80mmHg and NRP guidelines suggest a SAT range of 85% to 95% to achieve this goal. Prior DR management in our hospital was 100% O2. Retrospective review of 47 VLBW infants < 1500g born in 2004, requiring DR RESUS and RS i.e. CPAP or PPV showed that 26/47(55%) had initial PaO2 > 80 mmHg and for SATs > 95% the PaO2 = 117 ± 88. For SATs between 85% and 95% the PaO2 levels were ↓ 59± 17 (P<0. 05). Based on these data, a PP was introduced: starting FiO2 between 21% to 100%, management guided by postductal pulse oximetry to maintain SATs between 85% to 95% from birth through transport to NICU for VLBW infants ≤ 1500gm.

OBJECTIVE: The study objectives were to determine 1) whether the PP would result in PaO2 levels < 80 mmHg from an initial early ABG 2) whether infants with PaO2 < 80mm Hg would require darr O2 at 24 hours of life.

DESIGN/METHODS: 32 VLBW infants ≤ 1500gm born between June and October 06, requiring DR Resus and RS have been evaluated. Starting FiO2, ABG and SAT values upon NICU admission were recorded.

RESULTS: The initiating FiO2 was 0.41± 0.07 (range .21-0.50). All infants had a prompt ↑ in heart rate with CPAP (n=14) or BMV (n=18). 22 / 32 infants (69%) vs 21/47(44%)(2004)(P=0.04) had PaO2 < 80 .Ten (31%) had PaO2 >80 (mean = 131 ± 90) When compared to 2004 data the overall mean PaO2 was ↓ i.e. median 64 vs 86 (p=0.02), number of infants with PaO2 > 80 was less i.e. 10/32 (31%) vs 26/47(55%) (p=0.04) and median FiO2 at 24 hrs i.e. 23 vs 30(p=0.007). No differences in PCO2 i.e. 47 ±13 vs 47±10 or pH 7.26vs 7.27 were noted.

CONCLUSIONS: Implementation of DR and transport blenders, oximetry to maintain SATs 85-95, coupled with intense education has resulted in a ↓ in the starting FiO2 to ~ 40%, a significant ↓ in number of infants with PO2 < 80mmHg, without a concomitant change in pCO2 or pH. Moreover the FiO2 administered at 24 hours is lower. These preliminary provide objective data for initiating DR Resus at lower FiO2 and maybe even lower. The overall benefits or untoward consequences of this change await longer term evaluation.

186 11:30 AM Fellow in Training

Free Bilirubin Concentrations (UCBf) in the Newborn Infant

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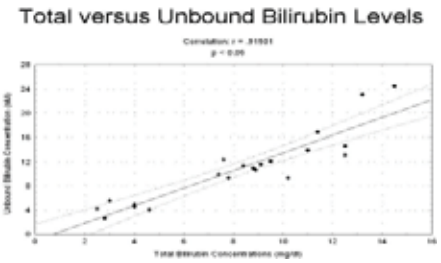
BACKGROUND: Elevated UCBf levels are suggested to be responsible for bilirubin neurotoxicity since total serum bilirubin concentration (TSB) is not a reliable predictor. The AAP guidelines for management of jaundice are based on TSB, but additional studies are recommended to better define the relationship between central nervous system damage and exposure to hyperbilirubinemia.

OBJECTIVE: We hypothesized that serum levels of UCBf, as measured by a novel method, correlate with TSB.

DESIGN/METHODS: Blood was obtained from a cohort of infants with hyperbilirubinemia to measure TSB and UCBf during the first week of life. TSB was analyzed by a standard method. Plasma was prepared, frozen and analyzed for UCBf by a newly developed fluorescent probe that is specific for UCBf which involves adding the UCBf probe to diluted plasma and measuring the resulting fluorescence intensity. The measured UCBf concentrations ranged from 4 to 25 nM.

RESULTS: Twenty five blood samples were obtained from 10 infants (BW 2752+/-820 g; GA 35.9+/-3.5 wks). The TSB was 8.3+/-3.6 mg/dl and the UCBf was 11.5+/-6.5 nM. The UCBf levels correlate significantly with the TSB levels (r= 0.91, p<0.05). Comparison of data from 5 term (BW 3.07+/-0.78 g, GA 38.0+/-1.2 wks) with 5 preterm (BW 2.41+/-0.73 g, GA 33.8+/-3.9 wks) showed significant differences in UCBf (6.1+/-3.3 nM vs. 12.4+/-5.6 nM) and in UCBf/TSB (1.1+/-0.2 nM/mg/dl vs. 1.4+/-0.2 nM/mg/dl).



CONCLUSIONS: The new method of UCBf measurement reveals that UCBf correlates with TSB and that term infants have lower total UCBf levels compared to preterm infants, confirming previous observations by other methods.

187 11:45 AM

Fellow in Training

Noise Level in Neonatal Intensive Care Unit before and after Interventions

Shruti Gupta, Donna Baranek, Carol Catania, Janet E. Larson. Department of Pediatrics, StonyBrook University Medical Center, StonyBrook, NY.

BACKGROUND: It is now known that safe sound levels are extremely important for healthy development of preterm infants. The American Academy of Pediatrics recommends a safe noise level for a premature infant to be 45 dB. An infant in a Neonatal Intensive Care Unit (NICU) is exposed to average ambient noise levels ranging from 50-88 dB with peaks over a 100dB at times. Loud sharp noises cause physiological changes including increase in heart rate, increased respiratory rate, apnea and decreases in oxygen saturations. Loud noises also change the sleep states of infants leading to unnecessary stress which can impact infant development. While some loud noise in the NICU is unavoidable, we have decided to implement changes in our busy level-3 NICU that can decrease the noise level and hence decrease the stress levels on our infant population.

OBJECTIVE: To undertake measures to reduce noise in a busy level-3 Neonatal Intensive Care Unit in a major teaching hospital.

DESIGN/METHODS: We took several measures in an effort to decrease noise in the NICU. We started with recording baseline decibel readings at different times of the day in all 5 rooms in our NICU in different positions (inside and outside the babies isolette) and near the nursing station. We also collected surveys from the staff to understand their perception of noise in the NICU. After we had baseline data available we made interventions one by one which included education, implementation of quiet time hours, placement of noise indicator lights, isolette covers, and door signs. We recorded decibel readings after interventions were made. Statistical analysis was performed using unpaired t-test.

RESULTS: Before interventions were made the average noise levels were as follows: the average high was 78.34 $\pm$ 8.19 dB and the average low was 49.60 $\pm$ 3.46 dB. After the intervention of education, quiet time and the noise indicator lights the average high was 62.95 $\pm$ 7.52 dB and the average low was 46.19 $\pm$ 3.84 dB. We were able to demonstrate a significant decrease in the average high dB readings by 15.39 dB with a p value of <0.001.The average low noise levels decreased by 3.41dB with a p value <0.001.

CONCLUSIONS: Simple interventions make a highly significant difference in noise levels in the Neonatal Intensive Care Unit. We are in the process of implementing further changes and examining their effects on an ongoing basis.

General Pediatrics III - Preventative Pediatrics Platform Session

Sunday, March 11, 2007 **9:45 AM-12:00 PM**

188 9:45 AM Fellow in Training

Intervention Services of Macropremies during the First Three Years — A Pilot Study

Nadeem A. Hashmi, Brenda Hussey-Gardner, Fernando Mena, Rose M. Viscardi. Pediatrics, U/Maryland, Baltimore, MD.

BACKGROUND: Macropremies, who comprise 6.5% of newborns, often receive less formal neurodevelopmental monitoring than infants <32 wks, who comprise only 1.1% of newborns. However, the rate of development delay in macropremies may be greater then currently perceived.

OBJECTIVE: To investigate the intervention services received by high risk macropremies during the first three years of life and explore potential relationships between receipt of these services and neonatal medical diagnoses.

DESIGN/METHODS: We reviewed the databases of the University of Maryland NICU Follow-Up Program (UMNFP) and the Baltimore City Infants and Toddlers Program (BITP for all Baltimore City residents born 32-36 wks GA from 1/1/1997 to 12/31/1999, who were referred to UMNFP. The program databases documented evaluation results, timing and type of intervention services received.

RESULTS: 205/863 (23.7%) patients referred to the UMNFP were macropremies of whom 113 (55%) were Baltimore City residents. 29 macropremies continued follow-up for until 3 years of age (Group A). Of the 84 infants with <3 years follow-up (Group B), 60 received some follow-up, 9 received BITP services, and 24 were lost to any follow-up. There were no statistically significant differences in GA, BW or discharge diagnosis between Groups A and B. 20 Group A infants (69%) qualified for intervention services from BITP: 48.3% PT, 31% OT, 31% special instruction (SI), and 41.1% speech. 15.8% of services were initiated birth to 1 year, 28.9% 1 to 2 years, and 55.2% 2 to 3 years. At 3 years, 16 (55.2%) qualified for special preschool services: 44.8% speech, 31% SI, 20.7% OT, 17.2% PT, 6.9% audiology, and 3.4% vision. Of all NICU diagnoses, hydrocephalus correlated with PT (p=.032) and vision (p=.004) services, and tonal abnormalities correlated with PT (p=.043) and OT (p=.043) services.

CONCLUSIONS: A significant number of high-risk macropremies qualified for early intervention and special preschool services, only a minority of those who received services qualified prior to one year of age. These data suggest close monitoring of high-risk macropremies over the first three years of life. Further studies are needed to better identify the subpopulations of macropremies who are at high-risk for developmental delay and warrant closer monitoring.

189 10:00 AM

A Comparison between the Rx Medibottle and Oral Syringe in Dosing Infants with a Bitter-Tasting Medication: A Randomized Controlled Clinical Trial

Jolly Radhakrishnan, Khudsia R. Irfan, Richard Neugebauer, Glickman Cynthia, Stefan Hagmann, Murli U. Purswani. Pediatrics, Bronx-Lebanon Hospital Center, Bronx, NY.

BACKGROUND: The caliberated oral syringe (Sy) is the standard liquid drug-delivery system for infants. While accurate, it can cause coughing, choking, and medication (Med) loss with spitting up, frequently leading to incomplete dosing. Infants often require restraint, and poor acceptance negatively influences adherence. The Rx Medibottle (Mb) is designed with an inner sleeve that accommodates a syringe, allowing Med to be introduced into the nipple while the infant sucks. Previous studies have shown it to be well accepted, but were limited to pleasant-tasting Med.

OBJECTIVE: To compare acceptance of Mb to Sy when used to administer a dose of liquid prednisolone (Pr), a bitter-tasting Med, to infants.

DESIGN/METHODS: A randomized controlled trial that enrolled infants (<2 yrs) admitted to hospital and prescribed a daily dose of 2 mg/kg of Pr (3 mg/ml) as treatment for a respiratory illness. Subjects were assigned to receive a dose of Pr using either Sy (control) or Mb (non-breastfed infants). Acceptance was assessed using a 5-item validated Medication Acceptance Scale (MAS), independently scored (each item 0-2 points, range 0-10) by the administering nurse (Nu) and child-life therapist (Th), who reviewed a videotape of Med administration. Administration time was measured in seconds (s). In intent to treat analyses, MAS means were compared using the student's t-test and median time (not normally distributed) using the Mann-Whitney U test.

RESULTS: 76 infants enrolled (59% male, 38 in each arm), with a mean age of 12 months (range 1-23). Distribution of infants in the two arms did not differ by age or gender. Infants lacking an outcome measure in the Mb (1) and Sy (4) arms were assigned the mean value in the Sy arm. The MAS mean was significantly higher in the Mb arm compared to the Sy, both for the Nu (7 vs 5, p<0.001) and the Th (6.5 vs 4.9, p<0.002) ratings. Nu and Th rated Mb infants more likely to receive the entire dose compared to Sy (68% vs 32% and 62% vs 38% respectively, p<0.002). Median administration time was 72s for Mb and 66s for Sy (p<0.35).

CONCLUSIONS: Infant acceptance of a single dose of a bitter-tasting Med using Mb was superior to Sy. More Mb infants received the entire dose compared to Sy, without significant difference in administration time.

190 10:15 AM

Does Television Viewing during Middle-School Lead to Poorer School Performance?

Iman Sharif, Thomas A. Wills, James D. Sargent. Pediatrics, Children's Hospital at Montefiore/AECOM, Bronx, NY; Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY; Pediatrics, Children's Hospital, Dartmouth Medical School, Lebanon, NH.

BACKGROUND: The relationship between television(TV) viewing and school performance has been a subject of much debate. We have recently published a cross-sectional study demonstrating a detrimental association between TV viewing (both time spent and R-rated content) and school performance in a community sample of students in northern New England. We now report on longitudinal data from a national representative sample of youth, initially 10-14 years of age.

OBJECTIVE: To determine whether TV viewing is associated with poorer school performance over time.

DESIGN/METHODS: Prospective cohort study. A random-digit dial procedure was used to select youth for a survey of media use. Subjects reported on their school performance, media use, personality characteristics, and demographics. Main media use variables included: # hrs weekday TV viewing; TV in bedroom, %movies seen(from a list of 50) that were PG-13 or R-rated. Subjects were re-surveyed after 24 months. The primary outcome variable was school performance ["What grades do you normally get?" (1) a mix of A's and B's; (2) mostly B's; (3) a mix of B's and C's; (4) mostly C's; (5) mostly D's and F's]. Multivariate ordinal logistic regression was used to model change in school performance over time.

RESULTS: Of 6,519 subjects enrolled, 4215 had complete data at 24 months. Mean age at follow-up was 13.5 years.Median household income was $30-50,000; median parental education level was "some college." Most watched <1 hr (25%) or 1-2 hrs (47%) TV on weekdays. 60% had a TV in their bedroom; median proportion of PG-13&R movies viewed was 64%. After adjusting for baseline school performance, adolescent personality characteristics, parenting style, and demographics, two variables were associated with poorer school performance: TV in bedroom [OR=1.15(CI 1.00,1.32), p<0.05], and higher % PG-13&R-movies[OR=1.04 (CI 1.01,1.08; p<0.01) for every 10% increase].

CONCLUSIONS: Confirming our cross-sectional findings, in this prospective study, having a TV in the bedroom and more frequent viewing of PG-13/R-rated movies predicted poorer school performance over time, after stringent control for confounders. Controlling access to certain types of media could lead to improvements in school function.

191 10:30 AM Fellow in Training

Recurrent Urinary Tract Infections: Risk Factors and Effectiveness of Prophylaxis in a Primary Care Cohort

Patrick H. Conway, Brandon Henry, Avital Cnaan, Theoklis Zaoutis, Robert Grundmeier, Ron Keren. Robert Wood Johnson Clinical Scholars, University of Pennsylvania, Philadelphia, PA; General Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA; Biostatistics, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: In a primary care cohort, no published studies have evaluated the risk factors for recurrent UTI and the risks and benefits of prophylactic antibiotics.

OBJECTIVE: 1. To identify factors associated with recurrent UTI. 2. To determine the effectiveness of prophylactic antibiotics for preventing recurrent UTI and their effect on the development of resistant infections.

DESIGN/METHODS: In a primary care network of 27 pediatric practices sharing a common electronic health record, we identified all children younger than 6 years who had an initial UTI between 7/1/2001 and 5/31/2006 and tracked them until they developed a recurrent UTI or their last clinic visit. We used survival analysis to identify risk factors for recurrent UTI, including age at first UTI, gender, race, presence of vesicoureteral reflux (VUR), and prophylactic antibiotic exposure (defined as a time varying covariate). In a nested case-control study, we utilized logistic regression to determine risk factors for resistant vs. pan-sensitive bacteria as the cause of recurrent UTI.

RESULTS: During the study period, 81,997 children had a clinic visit within network, 612 children had a first UTI, and 82 children had a recurrent UTI. Mean observation time was 408 days. The incidence rate for recurrent UTI was 0.12/person-year. In multivariate survival analysis, only white race (HR 2.0, 95% CI 1.2-3.3) and age over 2 years (HR 2.0, 1.2-3.3) were associated with increased risk of recurrent UTI. Prophylactic antibiotics, VUR, and gender were not significantly associated with risk of recurrent UTI. Among recurrent UTIs, antibiotic resistance was associated with prophylactic antibiotic exposure (OR 7.1, 1.5-33.3), non-white race (OR 4.6, 1.5-13.9), and age less than 2 years (OR 3.9, 1.3-11.8).

CONCLUSIONS: The rate of recurrent UTIs from this primary care population was significantly lower than reported in previous studies that were typically small clinical trials or from referral populations (12% per year vs. 21-69% recurrence within 6-12 months). Prophylactic antibiotics did not protect against recurrent UTI and were associated with increased risk of resistant infections.

192 10:45 AM House Officer

Introduction of a Modified Neonatal Resuscitation Course to Lay Midwives in the Dominican Republic

Robert W. Comer, Barbara Graves, Jane Cross. Department of Medicine/Pediatrics, Baystate Medical Center, Springfield, MA.

BACKGROUND: It is estimated that 40% of the under five mortality worldwide occurs during the neonatal period, with a significant proportion from birth asphyxia. In the Dominican Republic, greater than 90% of births occur in a hospital setting with an infant mortality rate estimated to be 24/1000 live births. This necessitates training of hospital personnel in neonatal resuscitation at the point of delivery (POD).

OBJECTIVE: Lay midwives, who attend the majority of term and near term deliveries (≥ 33 weeks gestation) in a regional referral hospital in the Dominican Republic, were trained in a modified neonatal resuscitation program designed to give them the ability and confidence to perform resuscitation at the POD. Previously, resuscitation was carried out in a separate unit, delaying resuscitation by several minutes or more.

DESIGN/METHODS: A modification of an evidence-based neonatal resuscitation program was implemented using adult learner theories. Fifty-four participants were evaluated for their knowledge base prior to the course using a pre test and immediately following the course with a post test. Twenty-six and 29 of the original participants were reevaluated with a post test at 3 and 9 month intervals, respectively. The overall course was then evaluated by 24 participants in focus groups at 12 months. Outcome was measured by birth asphyxia events requiring admission to the neonatology unit one year prior to the intervention compared to one year post intervention.

RESULTS: Using Students T test, there was a highly significant change in post test knowledge immediately after ($p < 0.01$), at 3 month ($p < 0.01$) and at 9 month ($p < 0.01$) intervals and participants were more confident with their resuscitation abilities at 12 months. There were 15 birth asphyxia events in a total of 2689 deliveries that required admission to the neonatology unit one year prior to the intervention compared with 22 events of 2885 deliveries one year post intervention. Differences were not significant.

CONCLUSIONS: Implementation of a modified neonatal resuscitation course was effective in training lay midwives neonatal resuscitation for term and near term infants and had a lasting effect on their knowledge base and ability to perform resuscitation. Outcome studies are needed to determine if neonatal resuscitation is feasible in resource poor settings.

193 11:00 AM Fellow in Training

Does the Perceived Intrusiveness of Child Sexual Abuse Affect Caregiver's Willingness To Act?

Ingrid Walker-Descartes, Mary Rojas, Yvette Sealy, Satya Laren, Danielle Laraque. Pediatrics-General Pediatrics, Mount Sinai School of Medicine, New York, NY; Pediatrics-Adolescent Medicine, Mount Sinai School of Medicine, New York, NY; Department of Community and Preventative Medicine, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: The mechanics of child sexual abuse (CSA) involve a spectrum of behaviors towards children ranging from exhibitionism to intercourse, with a predictable progression from less intrusive to more intrusive acts. Recognition of these patterns and timely intervention by a caregiver may interrupt that progression and minimize the negative impact of abuse.

OBJECTIVE: Hypothetical disclosure scenarios of CSA were used to determine the probable actions of caregivers.

DESIGN/METHODS: A convenience sample of caregivers was recruited from a practice in East Harlem, NY. In anonymous interviews, caregivers were asked about their probable actions following hypothetical disclosures authored by investigators. These included:1) exposure to porn/masturbation; 2) fondling; and 3) penetration (vaginal and anal). Potential actions included: "Take things into own hands (fight the accused)," "Involve the authorities (ED, ACS, and Police)," and "Schedule a visit with one's pediatrician (PMD)." The responses were rated from 1=strongly disagree to 5=strongly agree. No caregiver responded that they would "Do nothing." Mean scores and SD were calculated.

RESULTS: A total of 92 caregivers completed the interview of which 23% noted their own history of CSA, while 8% and 12% respectively noted a past negative experience with ACS and Police. Overall, caregivers agreed that something should be done upon disclosure of CSA(mean 4.0, SD 0.5). Most agreed that they would involve authorities regardless of the act: porn/masturbation (mean 4.3, SD 0.7), fondling (mean 4.5, SD 0.6) and penetration (mean 4.6, SD 0.6). The mean score across all scenarios for making an appointment with the PMD was 4.5, SD 0.8. The mean score taking matters into their own hands across all scenarios was 2.5, SD1.1.

CONCLUSIONS: Our findings show that caregivers feel that any level of CSA merits medical attention and suggest that caregivers are more likely to say that they would involve authorities than take matters into their own hands. PMDs can serve as allies and a valued resource to guide caregivers through a complex process that will not further traumatize their child.

194 11:15 AM

Smoking Cessation in Caregivers of Pediatric Emergency Department Patients

Sabina B. Singh, Donald Marks, Brigitte M. Baumann, Edwin J. Boudreaux. Pediatric Emergency Medicine, St Christopher's Hospital for Children, Philadelphia, PA; Emergency Medicine, UMDNJ-RWJMS at Camden, Camden, NJ.

BACKGROUND: Caregivers of children diagnosed with a smoking related illness are often counseled about improvement in their child's health if they quit smoking. There is paucity of data identifying predictors of smoking cessation or stage of change (SOC).

OBJECTIVE: To examine smoking stage of change and its predictors among caregivers of Pediatric Emergency Department (PED) patients.

DESIGN/METHODS: This was a prospective, cross-sectional study undertaken at an urban, tertiary PED. A structured interview completed by caregivers assessed demographics, child and caregiver health problems, smoking/quit history, SOC, and perceived health benefits of quitting. Chi-2, t-tests, or ANOVA, were conducted to examine predictors of SOC. Variables at $p<0.10$ were entered into a multiple regression analysis predicting SOC.

RESULTS: Of 269 caregivers, 115 (39%) reported the child lives with someone who smokes, and 89 (30%) reported that they themselves had smoked within the past 30 days. Past-year incidence of child health problems (asthma, colds, otitis media) was higher among children with a caregiver who smoked ($p<0.05$). Although only 6 (7%) of smoking caregivers attributed their child's present illness to second-hand smoke, 45 (51%) believed their child's health would improve if they quit smoking. Of the 75 caregiver smokers indicating SOC, (59%) were in Precontemplation (no intention to quit), 22 (29%) in Contemplation (intention to quit within 6 months), and 9 (12%) in Preparation (intention to quit within 1 month and previous quit attempt in past 12 months). Regression analysis revealed two independent predictors of SOC ($p<0.05$): length of previous quit attempt and perceived personal health benefits of quitting.

CONCLUSIONS: Second-hand smoke appeared to be related to greater child illnesses in the past year, and most caregivers recognized that their child would experience improved health if s/he quit smoking. Concern over their child's health risk, however, did not appear to be a strong motivator. Caregivers most prepared to quit are those who have longer previous quit attempts and those who believe smoking cessation will reduce their own health risks. Counseling caregivers about their own health risks as compared to the child's health risks of smoking might have a greater impact.

Emergency Medicine Platform Session

Sunday, March 11, 2007 9:45 AM-12:00 PM

195 9:45 AM House Officer

Low Risk Criteria for Pelvic Radiography in Pediatric Blunt Trauma Patients

Andrew T. Wong, KeriAnne B. Brady, David H. Rubin, David A. Listman. Dept of Emergency Med, St Barnabas Hospital, Bronx, NY; Dept of Pediatrics, St Barnabas Hospital, Bronx, NY; Dept of Pediatrics, Weill Cornell School of Medicine, New York, NY.

BACKGROUND: The American College of Surgeons recommends any patient with blunt trauma undergo radiographic evaluation including a pelvis x-ray (PXR). Studies have questioned the utility of routine PXR in pediatric blunt trauma victims. To date there are no accepted criteria to determine which patients do not require PXR. Selective elimination of PXR would save time, money and unshielded radiation exposure to the gonads.

OBJECTIVE: To determine which patients do not warrant a PXR based on mechanism of injury and physical exam.

DESIGN/METHODS: Medical records of blunt trauma patients birth-25 years from 1/1/2002 to 6/30/06 from an urban level 1 trauma center with PXRs were examined. Variables included sex, mechanism of injury (MOI), GCS, Pediatric Trauma Score, fall height, lower extremity injury, blood on rectal exam, blood at meatus and clinical need for CT. Outcomes were abnormal PXR, CT result and need for surgery.

RESULTS: 579 patients underwent 580 trauma evaluations (76% male). 22 (4 %) patients had a fracture identified on PXR. The age was 18±5.7 yrs (mean±SD). Mechanisms of injury included fall (12.1%), MVC occupant (27.4%), MVC pedestrian (35.7%), assault (21%) and other (3.8%). Mean GCS was 14.4; with 4% of patients range 3-8, 4.3% range 9-13 and 91.7% range 14-15. There was no significant association between age, MOI, GCS, blood on rectal exam and presence of a pelvic fracture. There was a strong association between pelvic fracture and clinical lower extremity injury ($p=.007$), abnormal pelvis exam ($p<.001$) and clinical need for CT scan of abdomen and pelvis ($p<.001$). Patients requiring surgery for pelvis fracture had similarly significant associations. The negative predictive value for pelvis fracture was 98% for lower extremity injury, 99% for abnormal exam of pelvis, and >99% for clinical need for CT scan.

CONCLUSIONS: Clinical findings in pediatric blunt trauma patients have strong predictive value for pelvis fractures. The combination of lack of lower extremity injury, normal exam of pelvis and lack of clinical need for abdomino-pelvic CT scan reliably rule out the presence of pelvic fracture and the need for PXR. Retrospectively applying these criteria to our cohort would have eliminated the need for PXR in 263 (45%) patients.

196 10:00 AM

A Decade of Change in Pediatric Emergency Department Utilization

Melissa S. Stockwell, Sally E. Findley, Matilde Irigoyen. Dept of General Pediatrics; Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND: Frequent use of pediatric emergency departments (PED) for primary care is common in many inner city communities. Promotion of state child health insurance (SCHIP) over the past few years has been expected to reduce PED use for non-emergent reasons.

OBJECTIVE: To understand how insurance and other factors have affected pediatric emergency department utilization for non-emergent reasons over a ten year period, 1997-2006.

DESIGN/METHODS: Bilingual cross-sectional surveys were conducted in 1997 (n=131), 2001 (n=50), 2006 (n= 127) of families of children <19 years old seen in a pediatric emergency department in a low-income community in New York City for non-emergent reasons during traditional primary care office hours. Chi-square analyses were used to compare differences in factors affecting PED use, including presence of a usual source of health care, insurance, and reasons for using PED rather than usual source of care including access, cost and trust, when available.

RESULTS: While there were no significant changes in the percent of Latinos and African Americans in the community, there was a decrease in African American families seen at the PED from 1997 to 2006 (17.8 vs. 7.4%, $p < .05$). There was no significant change in the number of Latino families (78% to 84%). Neither Medicaid/SCHIP rates (69.1% in 1997, 74.8% in 2006) nor the number of uninsured children (11.8% in 1997, 9.7% in 2006) changed significantly. The majority of children had a usual source of care (95.3% in 1997, 2006), however, in 2006, children were 2.7 times as likely as to use a community health center or hospital clinic for their regular pediatric care than they were in 1997 (OR 2.7, 95% CI: 1.58-4.60). During the same period, families were significantly more likely to visit the PED because of limited access to their usual source of care (19.4% in 1997 vs. 35.2% in 2006, $p <.05$). The percent of families visiting the PED because of dissatisfaction with their usual source of care or greater trust in the PED rose from 4.5% in 1997 to 24.5% in 2001 and 18.8% in 2006, ($p <.01$).

CONCLUSIONS: In this population, promotion of SCHIP has not impacted insurance rates of children visiting the PED. Despite presence of a usual source of health care, limited access to that care and greater trust in the PED still remain major factors in why families visit the emergency department for non-emergent care.

197 10:15 AM House Officer

Utility of Procalcitonin To Identify Young Febrile Infants at Low Risk of Serious Bacterial Infections

Scott Weiss, Andrew Dauber, Vincenzo Maniaci, Eric Nylen, Richard Bachur. Medicine, Children's Hospital, Boston, MA; Endocrine, VAMC, Washington, DC.

BACKGROUND: Differentiating young febrile infants with serious bacterial infection (SBI) from those with viral infections is difficult without laboratory investigation. There has been little advancement in the diagnostic evaluation and treatment of these infants during the last decade. Procalcitonin (PCT) may be a novel biomarker for SBI.

OBJECTIVE: (1) study the test performance of PCT in young febrile infants; (2) determine an optimal cut-off value of PCT to identify infants at low risk for SBI.

DESIGN/METHODS: A prospective cohort study at a large pediatric ED. Infants ≤90 days with fever ≥38C and no bacterial infection by exam were enrolled. Subjects received routine care. Patients were excluded for antibiotic use, immunizations <48 hrs, or underlying conditions. *Definite* SBIs were defined as a pathogen from blood or CSF, ≥ 50,000 cfu/ml pathogen from urine, or 10-50,000 cfu/ml pathogen from urine with a positive urinalysis (UA). *Possible* SBIs were defined as 10-50,000 cfu/ml from urine with negative UA or focal opacity on chest x-ray. PCT was measured using a quantitative immunometric assay. The diagnostic performance of PCT was determined through ROC analysis; a cut-point was chosen to optimize identification of low-risk patients.

RESULTS: PCT was measured in 136 infants.18 patients (13%) had definite SBIs (13 UTI; 1 UTI w/ bacteremia; 4 bacteremia) and 6 (4%) had possible SBIs. Median ages of all patients and subgroup of SBI patients were 52 days(IQR 31-75) and 43 days(IQR 20-70). Mean PCT (SD) for definite SBI vs non-SBI were 1.79 (2.21) ng/mL vs 0.34 (0.93) [mean diff 1.45, 95%CI 0.85,2.04]. Mean PCT (SD) for *combined* definite and possible SBI vs non-SBI were 2.75 (4.58) ng/mL vs 0.34 (0.93) [mean diff 2.4, 95%CI 1.48,3.33]. Mean PCT for bacteremic patients was 2.90 ng/mL(range 0.25-7.30). Area under ROC curve for definite SBI and *combined* definite + possible SBI was 0.80 and 0.81.The optimal cut-point for determining low risk was 0.12 ng/mL yielding sensitivity 96%, specificity 30%, PPV 23%, NPV 97%, and positive and negative likelihood ratios (95%CI) of 1.38 (1.19,1.60) and 0.14 (0.02,0.95).

CONCLUSIONS: Procalcitonin can identify febrile infants at low risk of SBI. Using PCT, 30% of infants can be classified as low risk and might benefit from a more limited evaluation and observation without empiric antibiotics.

198 10:30 AM Fellow in Training

End-Tidal Carbon Dioxide: The Wave of the Future

Melissa L. Langhan, Lei Chen. Department of Pediatrics, Section of Emergency Medicine, Yale University School of Medicine, New Haven, CT.

BACKGROUND: End-tidal carbon dioxide ($ETCO_2$) monitoring is an objective marker of ventilatory status. Traditionally it has been used to confirm endotracheal intubation (ETI) and monitor ventilatory status. Newer nasal-oral cannulas can provide monitoring of nonintubated patients undergoing moderate sedation or with metabolic disturbances including diabetic ketoacidosis and gastroenteritis.

OBJECTIVE: To determine the current availability and utilization of continuous $ETCO_2$ monitoring in Pediatric Emergency Departments (PED).

DESIGN/METHODS: Between June and July 2006 a web-based survey was distributed to the fellowship directors of all accredited pediatric emergency medicine (PEM) programs in the United States and Canada. This survey addressed availability and current utilization of continuous $ETCO_2$ monitoring in the PED, as well as its perceived strengths and weaknesses.

RESULTS: Forty-one out of 58 (71%) PEM fellowship directors completed this survey. Thirty six respondents (88%) have access to continuous $ETCO_2$ monitoring for intubated patients and 22 respondents (54%) for nonintubated patients. $ETCO_2$ monitoring is used always or often by 71% of respondents for ETI confirmation. $ETCO_2$ monitoring for nonintubated patients is always or often used by 20% of respondents for moderate sedation, by 14% of respondents for trauma, by 4% of respondents for metabolic disturbances. Of the institutions that utilize continuous $ETCO_2$ monitoring, 100% feel it is easy to use, 97% feel the results are accurate, and 91%feel the results are easy to interpret. However, 28% of respondents do not feel knowledgable regarding current literature and 43% of respondents feel that the equipment is expensive. Reasons for not using continuous $ETCO_2$ monitoring in the PED are lack of availability (65%), lack of familiarity (29%), lack of perceived need (24%), and perception of poor evidence in the medical literature for use(18%).

CONCLUSIONS: Continuous $ETCO_2$ monitoring is available in the majority of PEDs for both intubated and nonintubated patients. However this technology is currently underutilized in children who are spontaneously breathing. The application of this noninvasive monitoring device should be further explored by PEM physicians.

199 10:45 AM

Impact of Sexual Assault Nurse Examiners on the Evaluation of Sexual Assault in a Pediatric Emergency Department

Kirsten Bechtel, Deborah Gallagher, Elizabeth Ryan. Pediatrics, Yale University School of Medicine, New Haven, CT; Nursing, Yale-New Haven Hospital, New Haven, CT.

BACKGROUND: Nearly 44% of sexual assault victims in the US are younger than 18 years of age. These victims often present to Emergency Departments for care after the assault. The purpose of this study was to evaluate the effect of Pediatric Sexual Assault Nurse Examiners (SANEs) on the evaluation and management of pediatric and adolescent sexual assault victims in a Pediatric Emergency Department (PED).

OBJECTIVE: To evaluate whether the use of SANEs in a PED improves the medical care of pediatric and adolescent sexual assault victims.

DESIGN/METHODS: Medical records of patients who presented to an urban PED after sexual assault from December 2004-April 2006 were reviewed in a retrospective, blinded fashion for the following documentation: 1) the genitourinary (GU) examination; 2) evaluation for sexually transmitted infections (STI) (N. gonorrhea and C. trachomatis), and serology for Hepatitis B and C, HIV and VDRL; 3) prescription of chemoprophylaxis for STI, HIV, and pregnancy. Medical records were grouped as to whether or not a SANE had been involved in the patients care. Chi-square analysis or Fishers exact test were used to examine differences between the two groups.

RESULTS: Of the 91 patients whose medical records were reviewed, 37 had been evaluated by a SANE and 54 patients had not. 98% of patients were female adolescents. There were no differences between the two patient groups with respect to age or race. Patients evaluated by a SANE were more likely to have the GU examination documented (71% vs. 41% p=. 01). Eligible patients were more likely to have STI testing (100% vs. 72% p=. 0002), and serology for Hepatitis B and C (100% vs. 71% p=. 0002), HIV (97% vs. 72% p=. 003), and VDRL (97% vs. 72% p=. 003) when a SANE had been involved in their care. There were no significant differences between groups with respect to prescription of chemoprophylaxis for STI, HIV or pregnancy.

CONCLUSIONS: Use of SANEs in a PED leads to improvements in the medical care of sexual assault patients. Ongoing quality assurance in programs that use SANEs is needed to insure optimal medical care of children and adolescents who have been sexually assaulted.

200 11:00 AM

Using Spectroscopy To Assess the Ages of Bruises

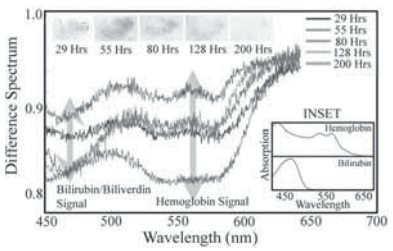
Susan J. Duffy, John W. McMurdy, Gregory D. Jay, Gregory P. Crawford. Dept of Emergency Medicine, Brown Medical School, Providence, RI; Dept of Engineering, Brown University, Providence, RI.

BACKGROUND: Skin bruises may indicate trauma or abuse.Clinicians' usually assess bruises based on appearance without objective criteria.Only histopathological determinations of the time dependent enzymatic degradation products (DP) of hemoglobin (Hgb) have been validated. Recent investigations have reported on the promise of using visible color spectroscopy of Hgb DP to date bruises.

OBJECTIVE: To determine how the diffuse reflection spectra (DRS) of human bruises progress over time and the extent to which this represents a well-defined and consistent pattern correlating with the DRS of Hgb DP.

DESIGN/METHODS: The DRS of bruises of known ages in a sample of volunteers were measured using a non-invasive spectrometer with a fiber optic reflectance probe placed on the surface of bruises. Daily measurements were taken at multiple points on and off the bruises for their duration. Spectral data were collected and the ratio of bruised and unbruised spectra were analyzed with MATLAB.

RESULTS: We analyzed the DRS from 13 bruises in adults.As shown in Fig.1, the bruises all revealed a specific pattern in the temporal progression of the DRS paralleling the known spectrum of Hgb (Inset) with an initial increased absorption, highlighted by double peaks at ~550 nm, followed by a decline. The maximum absorption difference between normal/unbruised skin occurred at an average bruise age of 97 hours. Concurrent with the decreasing absorption trend, a peak was then observed in the vicinity of the known bilirubin spectrum at ~460 nm (Inset).



CONCLUSIONS: In traumatic bruises, we found a consistent spatial variation in DRS over time that correlated with the DRS of known Hgb DP.In the future, correlating specific Hgb degradation peaks with specific ages of bruises may lead to an objective and clinically useful way to date bruises.

201 11:15 AM

Relationship of Serum S100B and Intracranial Injury in Children with Accidental Closed Head Trauma

Kirsten Bechtel, Sarah Frasure, James Dziura, Christine Simpson. Yale University School of Medicine, New Haven, CT.

BACKGROUND: Symptomatic children with closed head trauma (CHT) often undergo computed tomography (CT) to exclude intracranial injury (ICI). S100B, a time-dependent protein made by CNS glial cells and chondrocytes, has been shown to be elevated in the serum of patients with brain injury and in patients with fractures.

OBJECTIVE: To determine if serum S100B levels are higher in children with ICI and can determine which children will have ICI after CHT; and the effect of fractures and time of venipuncture after injury on S100B levels.

DESIGN/METHODS: Children < 18 years old who initially presented to an urban Pediatric Emergency Department, or were transferred from a referral hospital, within 6 hours after accidental CHT and had cranial CT, were prospectively enrolled. After informed consent, samples were obtained by venipuncture and analyzed for a quantitative serum level of S100B. The primary outcome, mean serum level of S100B between children with ICI and without ICI, and the secondary outcomes, fractures and the time of venipuncture, on the level of S100B, were analyzed by analysis of covariance. Discriminatory value of S100B to detect ICI was evaluated by the area under the ROC curve (AUC).

RESULTS: 152 children were prospectively enrolled-24 with ICI and 128 children without ICI. There were no significant differences between the 2 groups with respect to age, gender or ethnicity. Injury mechanisms were predominantly falls (42%), pedestrian struck by a vehicle (23%), motor vehicle crashes (13%), and sports collisions (9%). 25 children had fractures. Time of venipuncture after injury was significantly later in children with ICI (p=.03). Mean S100B levels were significantly greater in those children with ICI (212.9 ng/L vs. 84.4 ng/L p= .0001), in children with fractures (p=.0008) and in children who were non-white. (p=.03). After controlling for time of venipuncture, fractures and race, mean S100B levels were still greater in children with ICI (409 ng/L vs. 118 ng/L p= .0001). Discriminatory value of S100B to detect ICI (AUC) was .67.

CONCLUSIONS: After controlling for time of venipuncture, fractures and race, S100B levels were still higher in children with ICI than those without. However, discriminatory value of S100B to detect ICI was only .67. Further study of S100B is needed to determine if it is a helpful adjunct to evaluate children for ICI after CHT.

202 11:30 AM House Officer

Does Parental Perception of the Quality of Their Primary Care Matter in the Decision Whether To Use the Pediatric Emergency Department for Episodic Illness?

Kimberly A. Bleier, Andrew D. Racine, Jeffrey R. Avner, Elizabeth M. Alderman. Pediatrics, Children's Hospital at Montefiore, Bronx, NY.

BACKGROUND: Close to 29 million pediatric emergency department (PED) visits are recorded annually in the U.S. The independent effect of parental perception of the quality of their child's primary care on the decision to use the PED for episodic illness, however, is not well understood.

OBJECTIVE: To use hypothetical scenarios to estimate the independent association of parental perception of primary care quality on the decision whether to seek care in the primary care office or the PED for a child's episodic illness.

DESIGN/METHODS: We surveyed a convenience sample of 154 patients/patients' parents (age 0-21 years) who visited a busy urban PED. Questions related to patient demographics, simulated medical scenarios, and a measure of parental perception of primary care (Seid's P3C). For 10 hypothetical conditions ranging from low acuity (fever, sore throat, ear pain, rash) to medium acuity (abdominal pain, headache and vomiting, diarrhea for 3 days) to high acuity (broken bone, bleeding cut, difficulty breathing) occurring either during or after office hours, respondents were asked whether they would visit the primary care practice or go to the PED. Perceived high quality primary care (HQPC) was defined as P3C score in the top 15% ile. Bivariate Student t tests and multivariate OLS regressions were estimated for each scenario.

RESULTS: In unadjusted bivariate comparisons for low acuity conditions, parents who identified HQPC chose to go to the PED 25% of the time compared to 46% of time for those who did not identify HQPC (p=0.02). In multivariate OLS regressions after controlling for insurance type, race/ethnicity, child's age, and education level of the parent, HQPC ratings were associated with choosing to go to the PED for low acuity conditions 24% less often (p<0.01). For medium or high acuity conditions and for care after office hours, no statistically significant associations were found between how often care was sought in the PED and patient demographics or HQPC ratings.

CONCLUSIONS: Independent of demographic characteristics, parents who view their child's primary care to be of high quality are less likely to seek care in the PED during office hours for low acuity medical problems. Improvements in the quality of primary care as perceived by parents may decrease use of PED for non-urgent care.

203 11:45 AM

Adolescent Use of Emergency Department: Does Source of Primary Care Make a Difference?

Elizabeth M. Alderman, Jeffrey R. Avner, Andrew D. Racine. Division of Adolescent Medicine, Dept. of Pediatrics, Albert Einstein College of Medicine/Children's Hospital at Montefiore, Bronx, NY; Division of Pediatric Emergency Medicine; Division of General Pediatrics.

BACKGROUND: Many of the 18 million ED visits by adolescents are for non-urgent problems which would be more appropriate for treatment by the primary care provider. Adolescents receive primary care in various settings.

OBJECTIVE: To determine if adolescents identifying an adolescent medicine service (AMS) as primary care source compared to adolescents receiving primary care elsewhere in an integrated urban medical system (non-AMS) were more likely to revisit the pediatric emergency department (PED), return to primary care provider (PC) or be hospitalized post-index PED visit.

DESIGN/METHODS: As part of a larger randomized controlled intervention,adolescents ages 13-21 y registering in PED in an urban PED were tracked over the subsequent 10 months to record all visits to primary care (AMS or non-AMS), PED, or inpatient service (H). Mean numbers and odds ratios of each type of visit were compared between AMS and non-AMS subjects using multivariate logistic and OLS regressions to control for covariates.

RESULTS: Compared to 1573 (93%) non-AMS subjects, 119 AMS (7%) subjects were more likely on public insurance (52% vs 40%, p=.009), female (75% vs 54% p=.001), and non-minority (7.6% vs 4% p=.01). In unadjusted comparisons, AMS and non-AMS subjects did not differ in the probability of PED visit or in the mean number of PED visits but AMS subjects were more likely to have H (14.3% vs 7.4%, p=.008) or primary care visits (77.1% vs.62.9%, p=.001) after index PED visit. Multivariate analyses controlling for gender, ethnicity, insurance status, proximity to PED and hospitalizations showed no difference in adjusted mean number of PED between AMS and non-AMS subjects. This analysis did demonstrate lower adjusted odds of return PED visit for AMS subjects vs. non-AMS subjects (OR 0.68, p=.059) and higher adjusted odds of return primary care visit (OR 2.39, p<0.001).

CONCLUSIONS: This study demonstrates attending an adolescent medicine specialty practice for primary care increased the probability of follow-up primary care visits after index ED visit and decreased the likelihood of repeat ED visits over a year. Elements of adolescent specialty care producing such outcomes are worthy of further study.

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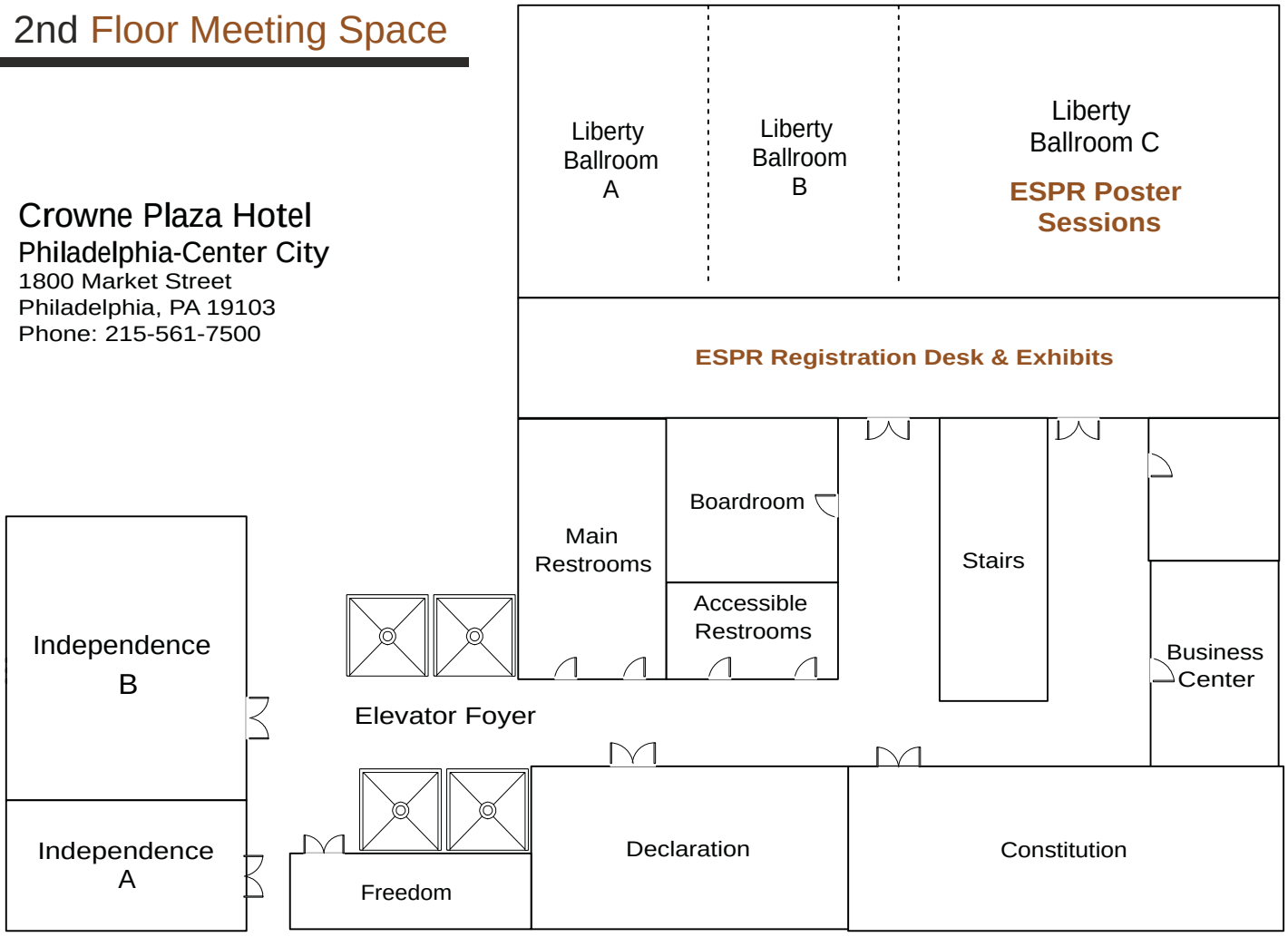

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