Program Guide

March 26-28, 2010 • Doubletree Hotel • Philadelphia, PA

22nd Annual Meeting

Jointly Sponsored By:
The Center for Continuing Education,
Tulane University Health Sciences Center
Eastern SPR
Officers & Council

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Joseph Bliss, MD, PhD
Sharon Smith, MD

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1993–1996 Alan R. Fleischman, MD
1991–1993 Marc Yudkoff, MD
1989–1991 Joseph B. Warshaw, MD
1988–1989 Laurence Finberg, MD

Contents

Sponsorship Honor Roll 3
Recognition of New Members 4
Faculty 5
Meeting Services & CME Accreditation 5
Schedule-at-a-Glance 6
Friday Programming 7–8
Saturday Programming 8–13
Sunday Programming 13–15
Abstracts 16–78
Author Index 79
Note Pages 80
Dear Colleagues,

Welcome to the 22nd Annual Meeting of the Eastern Society for Pediatric Research (ESPR) and to our host city of Philadelphia, the Cradle of Liberty!

The Eastern Society for Pediatric Research Council and Planning Committee are confident that you will enjoy our exciting program. Highlights include State-of-the-Art Plenary Talks and the highly popular Lunch with the Professor educational program for trainees, which has been expanded to cover two pertinent topics. High-quality original research is presented in subspecialty platform sessions with leading clinical and scientific authorities moderating the presentations and in two poster sessions.

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

The continued success 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 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, Jesse Osman and Lisa Thompson. 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 2010 sponsor for the CME program. In addition, we thank various members of the regional pediatric community for reviewing the submitted abstracts and for moderating our platform sessions. 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 and experience in the pursuit of excellence. We hope that you enjoy and profit from the meeting, and look forward to your continued participation in future meetings!

Lawrence Nogee, MD
President

Edmund F. La Gamma, MD, FAAP
Secretary

George Porter, Jr. MD, PhD
Chair, Planning Committee

Sponsorship Honor Roll

The ESPR would like to express appreciation to the following companies for their support:

Corporate Sponsors
Abbott Nutrition
Ikaria
Mead Johnson Nutritionals

Display Tables
Abbott Nutrition
Abbott Nutrition Health Institute
CAS Medical Systems, Inc.
Ikaria
Pediatrix Medical Group
Cornerstone Therapeutics, Inc.

Help Support our exhibitors by visiting their booths during these hours:
Friday 6:00 pm - 7:30 pm
Saturday 7:30 am - 8:30 am
10:30 am - 10:45 am
4:00 pm - 4:15 pm
6:00 pm - 7:30 pm
Sunday 7:45 am - 8:45 am
9:30 am - 9:45 am

Academic Sponsors
Paul H. Dworkin, MD
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Chairman, Department of Pediatrics
Stony Brook University School of Medicine
Stony Brook, NY

Philip O. Ozuah, MD, PhD
Albert Einstein College of Medicine, The Children’s Hospital at Montefiore
Bronx, NY

Nina F. Schor, MD, PhD
Golisano Children’s Hospital of URMC
University of Rochester Medical Center
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Lawrence Nogee, MD
President

Edmund F. La Gamma, MD, FAAP
Secretary

George Porter, Jr. MD, PhD
Chair, Planning Committee

Philadelphia, PA • March 26-28
RECOGNITION OF NEW MEMBERS

The Council of the Eastern Society for Pediatric Research would like to recognize the following new members who have joined the society within the last year.

Membership in the Society reflects not only peer recognition of research achievements in pediatrics, but continuing commitment to pediatric research and fostering the career development the next generation of pediatric researchers. The Council and Society members welcome active participation in the organization. Like our parent organization, the Eastern SPR seeks to promote the generation of new knowledge, the professional growth of the current and next generation of academic pediatricians, and the translation of research discoveries into treatments that will benefit children worldwide. We believe that membership and active participation in the Eastern Society for Pediatric Research can meaningfully contribute to professional success as an academic pediatrician.

To celebrate this achievement, new members will be recognized at the Opening Reception on Friday, March 26, 2010. Once again, congratulations and welcome to the Eastern Society for Pediatric Research.

Peter Belamarich, MD, Children’s Hospital at Montefiore Albert Einstein College of Medicine
Mario Cruz, MD, St. Christopher’s Hospital for Children
Robert Green, MD, Mount Sinai School of Medicine
Lilly Immergluck, MD, Morehouse School of Medicine
Laura Koenigs, MD, Baystate Children’s Hospital
Qing Lin, PhD, The Children’s Hospital of Philadelphia
Ogechukwu Menkiti, MBBS, The Children’s Hospital of Philadelphia
Ricardo Mora, MD, New York University Langone Medical Center
Elijah Paintsil, MD, Yale University School of Medicine
Warren Rosenfeld, MD, Children’s Medical Center at Winthrop-University Hospital
Subhasri Sangam, MD, St. Christopher’s Hospital for Children
Robert Shaddy, MD, The Children’s Hospital of Philadelphia
Anna Vetrano, PhD, UMDNJ-Robert Wood Johnson Medical School
Registration and CME Desk Hours
Registration will be held on the 3rd floor. Registration hours are as follows:

- Friday, March 26: 4:00pm – 7:00pm
- Saturday, March 27: 7:30am – 7:30pm
- Sunday, March 28: 7:30am – 1:00pm

Abstract Publication
All abstracts being presented at the 2010 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. Presenters should have submitted their presentations in advance, are still required to check in at Speaker Ready.

Speaker Ready (Chamber Board Room-4th 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 Doubletree Philadelphia is located on the 3rd floor.

Statement of Need
There are few programs entirely dedicated to presentation of medical research by junior physician scientists across a broad array of medical disciplines. In keeping with the purpose stated by the society in its bylaws, missions and goals, the Eastern Society for Pediatric Research Annual Meeting is organized to foster teaching and investigation, to encourage young investigators and provide a platform for the presentation of original research.

Learner Objectives: At the conclusion of this educational activity, the participant should be better able to:
- Critically evaluate the emerging translational and clinical research.
- Discuss new developments in pathophysiology of human disease with colleagues.
- Identify new areas of investigation which will inform research and improve patient care.
- Develop optimal strategies for clinical investigation and transmission of clinical research results.
- Develop relationships with mentors and peers to address the barriers which interfere with research development.

Target Audience
Multi-specialty clinical & basic researchers; Ph.D. basic/clinical scientists; Medical students who have performed a research project

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 11.75 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.

How To Obtain Your AMA PRA Category 1 Credits™
Tulane and the Eastern Society for Pediatric Research are now using a secure electronic format for evaluation and credit verification. The evaluation remains anonymous but the link does allow you to give us your contact information which will be incorporated into the Certificate of Credit.

At the conclusion of the conference on Sunday, you will be sent a link to an electronic evaluation and credit verification form. If you do not receive this in your inbox on Sunday afternoon, check your spam/junk mailbox. You can contact cme@tulane.edu if you did not receive it and Tulane will send you another link for claiming your credits.

You will receive your certificate of credit by Wednesday, April 21, 2010. If you do not receive it by then, please notify Tulane University at cme@tulane.edu.

Faculty
Vineet Bhandari
Yale University School of Medicine
New Haven, CT

Mitchell S. Cairo
Columbia University
New York, NY

Joseph D. DeCristofaro
SUNY Stony Brook, Stony Brook, NY

Jon Epstein
University of Pennsylvania
Philadelphia, PA

Susan Furth
Children’s Hospital of Philadelphia
Philadelphia, PA

Matthew J. Gillespie
Children’s Hospital of Philadelphia
Philadelphia, PA

Mary Harris
Children’s Hospital of Philadelphia
Philadelphia, PA

Rusly Hamono
Flushing Hospital Medical Center
Flushing, NY

Margaret K. Hostetter
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New Haven, CT

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Philadelphia, PA

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Albert Einstein Medical Center
Philadelphia, PA

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Buffalo, NY

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Philadelphia, PA

Heber Nielsen
Tufts Medical Center
Boston, MA

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Khodayar Rais-Bahrami
Children’s National Medical Center
Washington, DC

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Buffalo, NY

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Stony Brook, NY

Iman Sharif
Nemours/A.I duPont Hospital for Children
Wilmington, DE

Sharon R. Smith
Connecticut Children’s Medical Center
Hartford, CT

Bonnie E. Stephens
Brown University
Providence, RI

Melissa Stockwell
Columbia University
New York, NY
**Eastern SPR Schedule-at-a Glance**

Doubletree Philadelphia  
March 26-28, 2010

<table>
<thead>
<tr>
<th><strong>Friday, March 26</strong></th>
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<tbody>
<tr>
<td>6:00pm–7:30pm</td>
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<tr>
<td><strong>Poster Session I &amp; Reception</strong>&lt;br&gt;— Symphony Ballroom - 3rd Floor —</td>
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<tr>
<th><strong>Saturday, March 27</strong></th>
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<tbody>
<tr>
<td>7:30am–8:30am</td>
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<tr>
<td><strong>Continental Breakfast</strong>&lt;br&gt;— Symphony Ballroom - 3rd Floor —</td>
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<tr>
<td>8:15am–10:30am</td>
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<tr>
<td><strong>Neonatology - Pulmonology</strong>&lt;br&gt;— Overture - 3rd Floor —</td>
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<tr>
<td><strong>Pulmonary Development</strong>&lt;br&gt;— Concerto - 3rd Floor —</td>
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<tr>
<td><strong>General Pediatrics I</strong>&lt;br&gt;— Aria A - 3rd Floor —</td>
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<tr>
<td><strong>Neurobiology I</strong>&lt;br&gt;— Maestro B - 4th Floor —</td>
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<tr>
<td><strong>Infectious Diseases</strong>&lt;br&gt;— Minuet - 4th Floor —</td>
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<tr>
<td><strong>Endocrinology/Obesity</strong>&lt;br&gt;— Maestro A - 4th Floor —</td>
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<tr>
<td>10:45am–11:45am</td>
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<tr>
<td><strong>Plenary Session I</strong>&lt;br&gt;PLENARY LECTURE&lt;br&gt;Susan L. Furth, MD, PhD&lt;br&gt;Update on the Chronic Kidney Disease in Children Study&lt;br&gt;— Overture - 3rd Floor —</td>
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<tr>
<td><strong>Meet the Professor Lunch</strong>&lt;br&gt;Heber Nielsen, MD&lt;br&gt;Demystifying the NIH&lt;br&gt;— Aria A - 3rd Floor —</td>
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<tr>
<td>Rita Ryan, MD&lt;br&gt;Top Ten Biostatistical Errors&lt;br&gt;— Concerto - 3rd Floor —</td>
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<tr>
<td>12:00pm–1:00pm</td>
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<tr>
<td><strong>Eastern SPR Business Meeting</strong>&lt;br&gt;— Rhapsody - 4th Floor —</td>
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<td>1:10pm–4:00pm</td>
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<tr>
<td><strong>Plenary Session II</strong>&lt;br&gt;MENTOR OF THE YEAR&lt;br&gt;Margaret Hostetter, MD&lt;br&gt;Heparin and Candida albicans&lt;br&gt;— Overture - 3rd Floor —</td>
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**YOUNG INVESTIGATOR PRESENTATIONS: (2:00pm–4:00pm)**

| **4:00pm–4:15pm** |  |
| **Coffee Break**<br>— Symphony Ballroom - 3rd Floor — |  |
| 4:15pm–5:45pm     |  |
| **Neonatology - Epidemiology and Follow Up**<br>— Concerto - 3rd Floor — |  |
| **Neonatology - Clinical Studies I**<br>— Overture - 3rd Floor — |  |
| **Neurobiology II**<br>— Maestro B - 4th Floor — |  |
| **Immunizations**<br>— Aria A - 3rd Floor — |  |
| **Cardiovascular**<br>— Minuet - 4th Floor — |  |
| **General Pediatrics II - Vulnerabilities**<br>— Maestro A - 4thFloor — |  |
| 6:00pm–7:30pm     |  |
| **Poster Session II & Reception**<br>— Symphony Ballroom - 3rd Floor — |  |

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<thead>
<tr>
<th><strong>Sunday, March 28</strong></th>
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<td>7:45am–8:45am</td>
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<tr>
<td><strong>Continental Breakfast</strong>&lt;br&gt;— Symphony Ballroom - 3rd Floor —</td>
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<tr>
<td>8:30am–9:30am</td>
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<tr>
<td><strong>Plenary Session III</strong>&lt;br&gt;PRESENTATION OF THE YOUNG INVESTIGATOR AWARDS&lt;br&gt;PLENARY LECTURE&lt;br&gt;Jon Epstein, MD&lt;br&gt;Developmental Mechanisms of Cardiovascular Disease&lt;br&gt;— Overture - 3rd Floor —</td>
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<tr>
<td><strong>Coffee Break</strong>&lt;br&gt;— Symphony Ballroom - 3rd Floor —</td>
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<tr>
<td>9:45am–12:00pm</td>
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<tr>
<td><strong>Neonatology - Clinical Studies II</strong>&lt;br&gt;— Concerto - 3rd Floor —</td>
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<tr>
<td><strong>Neonatology - Pulmonary Injury</strong>&lt;br&gt;— Overture - 3rd Floor —</td>
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<tr>
<td><strong>Pulmonary and Asthma</strong>&lt;br&gt;— Aria A - 3rd Floor —</td>
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<tr>
<td><strong>General Pediatrics III - Medical Education</strong>&lt;br&gt;— Maestro B - 4th Floor —</td>
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<tr>
<td><strong>Emergency Medicine</strong>&lt;br&gt;— Maestro A - 4th Floor —</td>
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<tr>
<td><strong>GI/Nutrition/Hematology - Oncology</strong>&lt;br&gt;— Minuet - 4th Floor —</td>
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</tbody>
</table>
46 Provider Acceptance of Universal Depression Screening
John Rausch, William Rausch, Karen Soren. – Abstract 46

47 Urogenital Symptoms in Pre-Menarchal Girls: Prevalence and Associations
Cynthia W. DeLago, Carmen V. Vasquez, Claudia Clarke. – Abstract 47

48 Urogenital Symptom-Reporting: Sexual Abuse vs. Exposure to Genital Irritants in Pre-Menarchal Girls
Cynthia W. DeLago, Claudia Clarke, Martin Finkel. – Abstract 48

Saturday, March 27, 2010
Neonatology - Pulmonology Platform Session

8:15 AM-10:30 AM Overture

Moderator: Shetal Shah, MD

8:15 AM Pulmonary Hemodynamics in Asphyxiated Lambs Resuscitated with 21% and 100% Oxygen
Fabio J. Savorgnan, Daniel D. Swartz, Bobby Mathew, Karen A. Wynn, Rita M. Ryan, Satyan Lakshminrusimha. – Abstract 49

8:30 AM Transit In Utero Knockout (TIUKO) of the Cystic Fibrosis Conductance Regulator (ASCFTR) Alters the Cytokine Response to Birth Hypoxia in the Lungs of Sprague-Dawley Rat Pups
Rachael Grodick, J. Craig Cohen, Shetal Shah. – Abstract 50

8:45 AM Does Epigenetics Play a Role in Bronchopulmonary Dysplasia?
Jayanth Kocherlakota, Kristen Aland, Johanna Calo, Vanessa Mercado, Lance A. Parton. – Abstract 51

9:00 AM Structural and Functional Changes in Neonatal Sprague Dawley Rats Lungs Exposed to Antenatal Magnesium Sulfate
Swati Aleti-Jacob, Erin Kileen, Janet Larson, J. Craig Cohen, Shanthi Sridhar. – Abstract 52

9:15 AM Mitochondrial Superoxide Dismutase Polymorphism and the Susceptibility for Bronchopulmonary Dysplasia
Edward Hurley, Kristen Aland, Johanna Calo, Lance A. Parton. – Abstract 53

9:30 AM Single Nucleotide Polymorphisms of Extracellular Superoxide Dismutase (EC-SOD) in the Pathogenesis of Bronchopulmonary Dysplasia
Johanna M. Calo, Hima Maramreddy, Joie Fisher, Divya Chhabra, Kiran Dwarkanath, Sonya Strassberg, Mitsashi Singh, Kristen Aland, Lance A. Parton. – Abstract 54

9:45 AM Incidence of and Risk Factors for Bronchopulmonary Dysplasia in Non-Ventilated Preterm Infants
Renee M. Behme, Sharon Kirkby, Wendy Turenne, Linda Genen, Jay Greenspan, Kevin Dysart. – Abstract 55

10:00 AM Do Plasminogen Activator Inhibitor-1 Single Nucleotide Polymorphisms Increase the Susceptibility of ELBW Infants to Bronchopulmonary Dysplasia?
Divya Chhabra, Johanna Calo, Kristen Aland, Kiran Dwarkanath, Amanda Walsh, Lance A. Parton. – Abstract 56


Pulmonary Development Platform Session

8:15 AM-10:30 AM Concerto

Moderator: Heber Nielsen, MD

8:15 AM IUGR Inhibits Pulmonary VEGF Expression in Rat Pups
Omotola O. Uwaifo, Norma B. Ojeda, Barbara T. Alexander. – Abstract 58

8:30 AM Hormonal Maintenance of Surfactant Production in Cultured Type II Cells of Adult Human Lung
Philip L. Ballard, Jae W. Lee, Xiaohue Fang, Cheryl C. Chapin, Linda W. Gonzalez, Venkatadri Kolla, Michael A. Matthay. – Abstract 59
Saturday, March 27 continued

**Neurobiology I**

**Platform Session**

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>8:45 AM</td>
<td>SS-31, a Mitochondria-Targeted Cytoprotective Peptide, Is Neuroprotective in Male but Not Female Neonatal Rats Following Cerebral Hypoxia-Ishemia</td>
<td>Marie T. Berg, Hazel S. Szeto, Ouenie B. Brown, Jeffrey M. Perlman, Susan J. Vannucci.</td>
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</table>

**General Pediatrics I**

**Platform Session**

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

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>8:15 AM</td>
<td>Wishful Thinking: Safe Transportation of Newborns at Hospital Discharge</td>
<td>S.C. Rogers, K. Gallo, H. Saleheen, G. Lapidas.</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Storing Medical History on USB Drives: The CHAM DRIVE Project</td>
<td>Sara M. Marnell, Katherine Freeman, Catherine C. Skae.</td>
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<tr>
<td>8:45 AM</td>
<td>Internet Use by Parents for Health Information in an Urban Community</td>
<td>Lorena Muniz, Wipanee Phupakdi, David H. Rubin.</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Use of a Patient Portal in Pediatrics</td>
<td>Iman Sharif, David West.</td>
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<tr>
<td>9:15 AM</td>
<td>Addressing Children’s Hospital Crowding by Smoothing Occupancy</td>
<td>Evan Fieldston, Matthew Hall, Samir Shah, Marion Sills, Anthony Slonim, Angela Myers, Courtney Cannon, Susmita Pati.</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Relationship between Housing Characteristics and Environmental Exposures in Urban Minority Children</td>
<td>Marissa Hauptman, Mary S. Wolff, Maida P. Galvez, Barbara Brenner, Susan Teitelbaum.</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>Using Patient Satisfaction Scores To Identify Disparities in Care</td>
<td>Maria Petruni, Mariane Stefano, Alex Kosier, Jobayer Hossain, Magdy Attia, Jay Greenspan, Iman Sharif.</td>
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**Infectious Diseases**

**Platform Session**

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>8:15 AM</td>
<td>Cerebrospinal Fluid (CSF) Cytokines Are Predictors of Bacterial Meningitis in Infants</td>
<td>Lakshmi Srinivasan, Laurie Kilpatrick, Samir S. Shah, Sonya Abbas, Shelley Rankin, Michael A. Padula, Karin L. McGowan, Kaitilin Mahoney, Mary C. Harris.</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Effect of Comprehensive Infection Control Measures on the Rate of Late Onset Infection in Very Low Birth Weight Infants</td>
<td>Linda Wicker, Judy G. Saslow, Sahil Shah, Vishwanath Bhat, Sulaiman Samoth, Nicole Kemble, Emma Brandon, Kee H. Pyon, Gary E. Stahl, Zubair H. Aghai.</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>How Quickly Are Blood Cultures Positive in Infants? A Prospective Study</td>
<td>Michael A. Padula, Maya L. Dewan, Samir S. Shah, Karin L. McGowan, Kaitilin R. Mahoney, Mary C. Harris.</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Cost Effective and Safe Management of Early Onset, Asymptomatic Presumed Neonatal Sepsis with Intramuscular Antibiotics</td>
<td>Binta Lambert, Kyrus Woodroff, Deborah E. Campbell, Suhas M. Nafday.</td>
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Eastern Society for Pediatric Research 2010 Annual Meeting
Neonatology - Epidemiology & Followup
Platform Session

Moderator: Bonnie Stephens, MD

4:15 PM The Impact of Treatment Hospitals on the Disparity in Preterm Birth Experienced by African American Women
Erika F. Dennis, Corinne Fager, Scott A. Lorch. – Abstract 110

Suhb S. Hwang, Vincent C. Smith, Marie C. McCormick, Wanda D. Barfield. – Abstract 111

4:45 PM Assessment of Language Development and Related Risk Factors in Preterm Infants
Roshanak Mossabez, William Francis, Kathleen Finnegan, Soraya Abbasi. – Abstract 112

5:00 PM The Incidence of Morbidities and NICU Admissions among Early Term (37-38 6/7 Weeks) and Late Term (39-41 Weeks) Neonates at Women and Children’s Hospital of Buffalo (WCHOB)
Sharon Sengupta, Alyssa Herrmann, Vivien Carrion, Rita Ryan, James Shelton, Satyan Lakshminrusimha. – Abstract 113

5:15 PM Outcome of Preterm and Late Preterm Multiple Gestations Conceived by Assisted Reproduction
Ime Essien-Lewis, Preston Hoffman-Williamson, Toni Mancini, Emidio Sivieri, Soraya Abbasi. – Abstract 114

5:30 PM Predictors of Mortality, Length of Stay and Co-Morbid Hypothermia in Hospitalized Neonates with Pneumonia in Eritrea, Africa
Shehat I. Shah, O. Zemichael, Hong Dao Meng. – Abstract 115

Neonatology - Clinical Studies I
Platform Session

Moderator: Khodayar Rais-Bahrami, MD

4:15 PM Validation of Visible Light Tissue Oximetry in Newborn Infants
Nahid Rostami, Martin Keszer. – Abstract 116

4:30 PM Comparison of Simultaneous Cerebral Oximeter and Pulse Oximeter Data in Preterm Infants with RDS
Nickie Niforatos, Mariam Said, Khodayar Rais-Bahrami. – Abstract 117

4:45 PM Cardio Respiratory Monitoring in the NICU: Evaluation of a Wireless Monitor
N. Asu-Amankwa, K. Rais-Bahrami. – Abstract 118

5:00 PM Is Screening for Retinopathy of Prematurity Necessary in Growth Restricted Neonates Born after 30 Weeks Gestation?
Leslie Pierce, Annemarie Stroustrup, Ian R. Holzman, Edward Raab. – Abstract 119

5:15 PM Quality Improvement (QI) Project To Improve Admission Temperatures in Very Low Birth Weight Infants
Sahua M. Nafday, Binta Lambert, Deborah E. Campbell. – Abstract 120

5:30 PM Short Term Effects of the Use of Incubator Covers on Preterm Infants with Birthweight Less Than 1500 grams
Swati Aleti-Jacobs, Donna Baranek, Carol Catania, Kathy Greke, Shanthy Srithar. – Abstract 121

Neurobiology II
Platform Session

Moderator: Robert Kalb, MD

4:15 PM Mechanism of Activation of cAMP Response Element Binding (CREB) Protein during Hyperoxia in Neuronal Nuclei of Newborn Piglets
Erica Mandell, Shilpa Dass, Qazi M. Ashraf, Om P. Mishra, Maria Delivoria-Papadopoulos. – Abstract 122

4:30 PM Insulin Growth Factor (IGF) Signaling Pathway Is an Important Defense Against Hypoxic Neuronal Injury
Saima Aftab, Robert Kalb. – Abstract 123

Immunizations
Platform Session

Moderator: Barbara Kelly, MD

4:15 PM Three-Year Experience with Administration of Trivalent Inactivated Influenza (TIV) Vaccine to Parents of High-Risk Infants in the Neonatal Intensive Care Unit (NICU) Demonstrates Sustainability
Angelene Seach, Shetal Shah. – Abstract 128

4:30 PM Effect of Rotavirus Vaccination on Hospitalization and Seasonality of Disease from Rotavirus Infection in Pediatric Patients
Haytham Hamwi, Babu Bangaru, Susana Rapaport, Louis Primavera, David Di John. – Abstract 130

4:45 PM Effect of Rotavirus Vaccination on Hospitalization and Seasonality of Disease from Rotavirus Infection in Pediatric Patients
Haytham Hamwi, Babu Bangaru, Susana Rapaport, Louis Primavera, David Di John. – Abstract 130

5:00 PM Getting the RSV Season Onset and Offset Right To Optimize Immune Prophylaxis
Jennifer Vodzak, Yolanda M. Inumerable, Alan T. Evangelista, Sarah S. Long. – Abstract 131

5:15 PM Extent and Timeliness of Seasonal Influenza Vaccine Coverage in Children from an Underserved Community, 2004-2008
Annika M.O. Hofstetter, Kathrik Natarajan, Raquel Andres Martinez, Melissa S. Stockwell. – Abstract 132

5:30 PM Parental Knowledge and Attitudes towards Human Papillomavirus Vaccine and Willingness To Vaccinate Urban Adolescents
Alina Stanica, Patricia Burrus-Warmoth, Louis Primavera, Fernanda Kupferman-Meik. – Abstract 133

Cardiovascular
Platform Session

Moderator: Matt Gillespie, MD

4:15 PM Interleukin-6 (IL-6) Reduces Tight Junction Protein Expression in Cerebral Cortical Microvessel Endothelial Cells from Young and Adult Sheep
Susan S. Cohen, Erin E. Cummings, Graevyna B. Sadowska, Steven W. Threlkeld, Surendra Sharma, Barbara S. Stonestreet. – Abstract 124

4:30 PM Nitric Oxide Counters the Hyperoxia-Induced Pro-Inflammatory Phenotype in Astrocytes
Christie Bruno, Todd Greco, Harry Ischiropoulos. – Abstract 125

4:45 PM Mechanism of Caspase-3 Activation during Hyperoxia in the Cerebral Cortex of Newborn Piglets
Lynn Fuchs, Heidi Taylor, Qazi Ashraf, Om P. Mishra, Maria Delivoria- Papadopoulous. – Abstract 126

5:00 PM Nitric Oxide Counters the Hyperoxia-Induced Pro-Inflammatory Phenotype in Astrocytes
Christie Bruno, Todd Greco, Harry Ischiropoulos. – Abstract 125

5:15 PM Mechanism of Caspase-3 Activation during Hyperoxia in the Cerebral Cortex of Newborn Piglets
Lynn Fuchs, Heidi Taylor, Qazi Ashraf, Om P. Mishra, Maria Delivoria- Papadopoulous. – Abstract 126

5:30 PM Age Dependent Inter-Alpha Inhibitor Protein (IAIP) Expression in Ovine Cerebral Cortex (CC)
Marta Spasova, Steven Threlkeld, Graevyna Sadowska, Yow-Pin Lim, Barbara S. Stonestreet. – Abstract 127

Saturday, March 27 continued

Immunizations
Platform Session

4:15 PM-5:45 PM

Cardiovascular
Platform Session

4:15 PM Donor Troponin I Levels and Graft Survival in Pediatric Heart Transplantation

4:30 PM Transient In Utero Knockout (TIUKO) of the CFTR Gene Results in Increased Levels of Myocardial Inflammatory Markers in Adult Sprague-Dawley Rat Pups
Rachael Grodick, Angelene Seach, J. Craig Cohen, Shetal Shah. – Abstract 135

4:45 PM Intrathecal Growth Restriction Alters Norepinephrine Response in Rat Aortas in a Developmental and Gender Specific Manner
Catalina Bazacielu, Melissa Carmen, Bobby Mathew, Rita M. Ryan, Satyan Lakshminrusimha, Daniel D. Swartz. – Abstract 136

Philadelphia, PA • March 26-28

11
Saturday, March 27 continued

5:00 PM Comparison of Mesenteric Tissue Oxygenation during Indomethacin and Ibuprofen Therapy for Patent Ductus Arteriosus in Preterm Infants
Mayoor Bhatt, Anna Petrowa, Rajeev Mehta. – Abstract 137

5:15 PM Mitochondria Structure and Function Matures during Mammalian Cardiac Development
Jennifer Hom, Rodrigo Quintanilla, Shey-Shing Sheu, George A. Porter. – Abstract 138

5:30 PM Modified Response to Calcium by PAK Phosphorylation of Cardiac Troponin I
Jonathan J. Edwards, John C. Robinson, Genaro Ramirez-Correa, Anne M. Murphy. – Abstract 139

General Pediatrics II - Vulnerabilities

Platform Session

4:15 PM-5:45 PM Maestro A
Moderator: Melissa Stockwell, MD, MPH

4:15 PM Endocrine Disruptors and Childhood Social Impairment
Amir Miodovnik, Mary S. Wolff, Chenbo Zhu, Antonia M. Calafat, Minor J. Silva, Stephanie M. Engel. – Abstract 140

4:30 PM Additional Forms of Victimization in Children Exposed to Violence
Ruth Rubio, Paola Carugno, Rosemarie DiDonato, David H. Rubin. – Abstract 141

4:45 PM Is Neurocognitive Function Associated with Youth Gambling Trajectories?
Caitlin A. Brown, Hallam Hurt, Nancy L. Brodsky, Laura M. Betancourt, Kathleen A. McKenna, Joan M. Giannetta, Daniel Romer. – Abstract 142

5:00 PM On-Line Survey of Feeding and Gastrointestinal Problems in Children with High Functioning Autism: Comparison with Their Normally Developing Siblings
Vahe Badalyan, Richard H. Schwartz. – Abstract 143

5:15 PM Accuracy of Pediatricians' Identification of Developmental and Behavioral Problems
Sheila Merchant, R. Christopher Sheldrick, Ellen C. Perrin. – Abstract 144

5:30 PM A Needs Assessment of Health Care Professionals for a Violence Prevention Program at St. Christopher's Hospital for Children
Mario Cruz, Daniel Taylor, Aakanksha Mehta, Stephen Sandlich. – Abstract 145

Poster Session II

6:00 PM-7:30 PM Symphony Ballroom

1 Window Fall Trauma in Children
Alison B. McCrone, Kathleen A. Lillis, Ali Ebrahimi, William Grant. – Abstract 146

2 Cervical Spine Injuries in Children: A 7-Year Review at St. Barnabas Hospital, Level 1 Trauma Center, Bronx, NY
Sheryl Grace R. Kho, Wipancee Phupakdi. – Abstract 147

3 The Tipping Point: Hidden Dangers of the Transition to Digital Television
Katherine E. Nicholson, Lei Chen. – Abstract 148

4 Interrater Reliability of the Clinical Examination in Pediatric Soft Tissue Infections
Jennifer R. Marin, Warren B. Bilker, Ebbing Lautenbach, Elizabeth R. Alpern. – Abstract 149

5 Capnography Improves Recognition of Endotracheal Tube Dislodgement by Prehospital Providers
Melissa L. Langhan, Kevin Ching, Payal Kadia, Michelle Alletag, Lei Chen. – Abstract 150

6 Pediatric Residents' Competencies in the Care of Surgical Patients: A Needs Assessment
Anna M. Carr, Matilde Irigoyen. – Abstract 151

7 Pediatric Resident Experiences Coping with Stress during Residency Training
Paula Mas-Wright, DavidHarness, Alison J. Falck. – Abstract 152

8 The Perception of Pediatric House Staff and Attendings on the Necessity of Specific Resuscitation Skills
Alison Gurttman, Daniel Fein, Sadia Edmonds-Myles, Kathryn Scharbach, Jacqueline Weingarten-Arams. – Abstract 153

9 High Fidelity Simulation Improves Neonatal Procedural Skills and Team Behaviors
Jesse Bender, Robin Shields, Karen Kennally. – Abstract 154

10 Mycoplasma Pneumonia Increases Symptom Severity in Children with Status Asthmaticus
Mimily Harsono, Won Baik-Han, Partha Chatterjee, Susana Rapaport, Rusly Harsono. – Abstract 155

11 The Association between Disease Beliefs and Indoor Environmental Control Practices among Children with Asthma
Aneka Roy, Lauren Steele, Juan Wisnivesky. – Abstract 156

12 Demonstration of Metered-Dose Inhaler and Spacer with Mouthpiece Administration Technique by Pediatric Asthma Patients
Patricia Viishal Edmondson, Rusly Harsono. – Abstract 157

13 Novel Mutation in the SKT10 Gene Causing a Clinical Syndrome Associated with Juvenile Polyposis and Tubular Adenoma
Patricia Calvin-Parton, Lowenheim Mark, Weiss Jody. – Abstract 158

14 An Association of Vitamin D Deficiency and Anemia in the Pediatric Population
Anna Waraich, Ashok Valluri, Dominic Sabatino, Stephen P. Katz. – Abstract 159

15 Quantity or Quality: What Controls the Decision To Pause/Stop a NICU Bottle Feeding?
M. Kathleen Philbin, Barbara Medoff-Cooper, Teesha Thomas, Soraya Abbasi. – Abstract 160

16 Superior Mesenteric Artery Blood Flow Velocity: Relationship to Increasing Gestational and Post-Natal Age
Alecia M. Thompson, Cicero T. Silva, A. Semih Gork, Richard A. Ehrenkranz. – Abstract 161

17 Meconium Interferes with NIRS Measurements of the GI Tract in Premature Neonates
Alecia M. Thompson, Richard A. Ehrenkranz, Paul Benni. – Abstract 162

18 Lack of Correlation of Nutritional Outcomes at 1 Year of Age with Bronchopulmonary Dysplasia (BPD) Severity in Premature Infants
Nathan Demurs, Amanda McGreavey, Jaclyn Davis, Vincent Smith, Lawrence Rhein. – Abstract 163

19 Non-Invasive Arm Anthropometry Accurately Estimates Body Composition in Low Birth Weight Infants ( Birth Weight <2500g, LBW)
Rita P. Verma, Penny London. – Abstract 164

20 Neonatal Nursing Perceptions of Breastfeeding Support in the NICU
Vera J. Burton, Allison Falck. – Abstract 165

21 Treatment of Asymptomatic Full Term Newborns for Presumptive Early Sepsis
Tatyana Gabinsky, Anecia Bidiwala, Simona Protesa, Melvin Gertner. – Abstract 166

22 Birth Hyperoxia Alters Lung Levels of T-Lymphocytes in Gram-Negative-Infected Sprague-Dawley Rat Pups
Angelina Seah, J. Craig Cohen, Shetel Shah. – Abstract 167

23 Duration of Maternal Human Papillomavirus Infection and Risk of Spontaneous Preterm Birth
Komal S. Soin, Neil S. Seligman, Aisha Nnoli, Jason K. Baxter, Kevin Abbasi. – Abstract 168

24 Can the Ribosomal RNA (rRNA) Gene PCR Improve the Diagnosis of Bacterial Meningitis in Children? A Systematic Review
Lakshmi Srinivasan, Jared Pisapia, Samir S. Shah, Casey Halpern, Mary C. Harris. – Abstract 169

25 Differentiating between Methicillin Resistant (MRSA) and Methicillin Sensitive (MSSA) Staphylococcus Aureus Wound Infections in Children Based on Initial Presentation
Almas Patanker, Ashok Valluri, Jacob J. Rosenberg, Stephen P. Katz. – Abstract 170
10:30 AM Heme Oxygenase-1 Is Important in Lung Recovery after Neonatal Mice Exposed to Hyperoxia
Guang Yang, Tianzhe Zhuang, Phyllis A. Denney, Qing Lin. – Abstract 206

10:45 AM Biphasic Pattern of Inflammatory Response in Neonatal Mice Exposed to Inhaled LPS
Ooechikwu R. Menkiti, Huayan Zhang, Honghong Sun, Junjie Mei, Yuhong Liu, George S. Worthen. – Abstract 207

11:00 AM Duration of Birth Hyperoxia Alters Levels of T-Lymphocytes in the Lungs of Month-Old Sprague-Dawley Rats
Angeline Seah, J. Craig Cohen, Shetal Shah. – Abstract 208

11:15 AM CXCL5 Regulate Chemokine Scavenging and Pulmonary Host Defense to Bacterial Infection
Junjie Mei, Yuhong Liu, Michael Favara, Ning Dai, Samithamby Jevaselvan, Janet S. Lee, G. Scott Worthen. – Abstract 209

11:30 AM The Effects of Hyperoxia and Lipo-Poly Saccaride (LPS) on Inflammatory Mediators in the Lungs of Sprague-Dawley Rat Pups
Elizabeth Buescher, J. Craig Cohen, Shetal Shah. – Abstract 210

11:45 AM Alveolarization and Cytokine Responses Are Altered in Adult Mice Exposed to Neonatal Hyperoxia
Serquei V. Kishkurno, Rita M. Ryan, Lori Nielsen, Huanmei Wang, Vasant H. Kumar. – Abstract 211

Pulmonary & Asthma Platform Session

9:45 AM-12:00 PM Overture
Moderator: Vasanth Kumar, MD
9:45 AM Hyperoxia Induced NF-κB Activation Alters the Expression of Rev-ERBα and Differentiation of Mouse Lung Fibroblasts
Maurice D. Hinson, Guang Yang, Ping La, Clyde A. Wright, Phyllis A. Denney. – Abstract 205

10:00 AM Nitric Oxide Inhibits NF-κB Regulated Adhesion Molecule Expression in Human Neoplastic Pulmonary Endothelial Cells Exposed to Hyperoxia
Fadeki Agboke, Amal P. Fernando, Ping La, Guang Yang, Phyllis A. Denney, Clyde J. Wright. – Abstract 204

10:15 AM Neonatal Hyperoxia Increases Leukotriene B₄ (LTB₄) Production in Room Air Recovered Adult Mice
Vasant H. Kumar, Serquei V. Kishkurno, Lori Nielsen, Huanmei Wang, Rita M. Ryan. – Abstract 205

10:30 AM Heme Oxygenase-1 Is Important in Lung Recovery after Neonatal Mice Exposed to Hyperoxia
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Serquei V. Kishkurno, Rita M. Ryan, Lori Nielsen, Huanmei Wang, Vasant H. Kumar. – Abstract 211

10:45 AM Racemic Albuterol or Levalbuterol, Continuous or Very-Frequent-Intermittent Nebulizations: A Prospective, Randomized Controlled Study in Children with Status Asthmaticus
Mimily Harsono, Partha Chatterjee, Won Baik-Han, Susana Rapaport, Rusly Harsono. – Abstract 216

11:00 AM Macrolide Treatment in Children with Status Asthmaticus: Antimicrobial or Anti-Inflammatory?
Mimily Harsono, Partha Chatterjee, Won Baik-Han, Susana Rapaport, Rusly Harsono. – Abstract 217

11:15 AM Breathing Easy: The Economic Implications of Outdoor Air Pollution and Pediatric Asthma Hospitalizations
Angkana Roy, Perry Sheffield, Kendrew Wong, Leonardo Trasande. – Abstract 218

11:30 AM The Association between Asthma Education and Use of Environmental Control Practices
Angkana Roy, Lauren Steele, Emily Blanchard, Atray Dixit, Juan Wisnivesky. – Abstract 219

11:45 AM Psychosocial Stress and Asthma: The Role of Neighborhood Safety
Nita Vangeepuram, Maida Galvez, Barbara Brenner, John Doucette, Mary S. Wolff. – Abstract 220

General Pediatrics III - Medical Education Platform Session

9:45 AM-12:00 PM Maestro B
Moderator: David Rappaport, MD
9:45 AM Could Physician Education and Application of Pharmacokinetic Principles Improve Serum Gentamicin Levels in Neonates?
Fadel Balge, Katherine Han, Gladys El-Chaar, Susana Castro-Alcaraz. – Abstract 221

10:00 AM Post-Simulation Debriefing Is Crucial to Residents’ Disaster Triage Performance and Patient Outcomes
Mark X. Cicer, Jason Zigmont, Marc Auerbach, Kevin Ching, Carl R. Baum. – Abstract 222

10:15 AM Impact of Implementing Family Centered Rounds (FCR) in a Neonatal Intensive Care Unit
Kristin C. Voos, Anne-Lise Yohay, Gail Ross, Mary J. Ward, S. Neta Oserio, Jeffrey M. Perlman. – Abstract 223

10:30 AM Satisfaction with Family-Centered Rounds: Perspectives of Families, Nurses, Trainees, and Attending Physicians
David I. Rapaport, Tara A. Ketterer, Vahideh Nilforoshan, Iman Sharif. – Abstract 224

10:45 AM Impact of an Evidence-Based Medicine Curriculum on Residents’ Medical Literature Use
Kathryn Scharbach, Philip O. Ozuah. – Abstract 225

11:00 AM A Novel Approach to Residents’ Scholarly Activities (RRC Requirement IV B)
Fernanda E. Kupferman, Rusly Harsono, David DiJohn, Lily Lew, Louis Primavera, Susana Rapaport. – Abstract 226

11:15 AM Pediatric Resident Knowledge of Sport-Related Concussion
Katherine E. Nicholson, Lei Chen. – Abstract 227

11:30 AM New Interns Have Little Training or Confidence in Their Pediatric IV Skills
Pavl Kadia, David Kessler, Eric Weinberg, Chris Strother, Julie Lindower, Joshua Rocker, Laura Haubner, Matei Petrescu, Lindsey Tilt, Gunjan Kamdar, Grace Arteaga, Marc Auerbach. – Abstract 228

11:45 AM A Multi-Center Study of Infant Lumbar Puncture during Medical School
David Kessler, Eric Weinberg, Chris Strother, Julie Lindower, Joshua Rocker, Laura Haubner, Grace Arteaga, Matei Petrescu, Lindsey Tilt, Gunjan Kamdar, Michael Miller, Jessica Foltin, Marc Auerbach. – Abstract 229
Sunday, March 28 continued

9:45 AM-12:00 PM Maestro A
Moderator: Sharon Smith, MD

9:45 AM Ultrasound Evaluation of Skull Fractures in Children
Antonio Riera, Lei Chen. – Abstract 230

10:00 AM To CT or Not CT: Neurologic Complaints in Young Children Presenting to the Emergency Department
Rebecca S. Kriss, Karen R. Carpenter, Karin B. Nelson, Tarannum M. Lateef. – Abstract 231

10:15 AM The Association of Weight Percentile and Motor Vehicle Crash Injury among 3 to 8 Year Old Children
Mark R. Zonfrillo, Kyle A. Nelson, Michael J. Kullan, Dennis R. Durbin. – Abstract 232

10:30 AM Impact of the CARES Psychiatric Assessment Unit on Patient Management in the Emergency Department
Lauren C. Griffin, Peter D. Masso, Lynn Mangini, Michael Stevens, Sharon R. Smith. – Abstract 233

10:45 AM 2009 Swine Flu Epidemic and Pediatric Emergency Services; What Have We Learned?
David Listman, Jeffrey Chen, Rosemary Didonato, Elliot Schottland, David Perlstein, David H. Rubin. – Abstract 234

11:00 AM Patient Satisfaction in a Pediatric Emergency Department (ED): What Really Matters?
Anita Roy, Jobayer Hossain, Alex Koster, Mariane Stefano, Kay Holbrook, Magdy Attia, Jay Greenspan. – Abstract 235

11:15 AM Detection of Hypoventilation by Capnography and Its Association with Hypoxia in Children Undergoing Sedation with Ketamine
Melissa L. Langhan, Lei Chen, Clement Marshall, Karen A. Santucci. – Abstract 236

11:30 AM Impact of an Economic Disaster on Access to Child Healthcare and Utilization of the Pediatric Emergency Department
Mark X. Cicero, Veronika Northrup, Fangyong Li, Karen Santucci. – Abstract 237

11:45 AM Decreasing Unplanned Return Visits in Children with Fever in the Emergency Department
Amy L. Dunn, Josh Palmbech, Sharon R. Smith. – Abstract 238

GI / Nutrition / Hematology - Oncology Platform Session
9:45 AM-12:00 PM Minuet
Moderator: Mitchell Cairo, MD

9:45 AM Detection of Pepsin in Mouth Swab, a Noninvasive Method of Detecting Gastroesophageal Reflux in Preterm Infants
Sabeena Farhath, Judy G. Saslow, Sam Sounder, Zhoping He, Barbara Amendolia, Sulaiman Samooh, Vishwanath Bhat, Kee H. Pyon, Gary E. Stahl, Dev Mehta, Zubair H. Aghai. – Abstract 239

10:00 AM Using Near Infrared Spectroscopy (NIRS) To Measure Bowel Motility in Preterm Infants
Mariam Said, Nickie Niforatos, Khodayar Rais-Bahrami. – Abstract 240

10:15 AM Effect of Antenatal Erythromycin in Establishing Feeding in Preterm Neonates
Venkata S. Majiiga, James Smith, Boriana Parvez. – Abstract 241

10:30 AM Percentage of Endothelial Progenitor Cells (EPC) in Human Umbilical Cord Blood of Preterm and Term Newborns
Ranjan Monga, Nitin Chouthai, Steven Buck, Priyankar Sharma, Saiprasad Gopal. – Abstract 242

10:45 AM Role of Apoptosis in the Progression of Hematopoietic Abnormalities in Noonan Syndrome
Kimihiko Oishi, Andres Hidalgo, In-Kyong Kim, Paul S. Frenette, Bruce D. Gelb. – Abstract 243

11:00 AM Inflammatory Responses to Long-Chain Polynsaturated Fatty Acids (PUFA) in Neonatal Neutrophils
A.M. Vetrano, F.E. Archer, D.L. Laskin, B. Weinberger. – Abstract 244
1 The Disparity in Preterm Birth for African American Mothers in the Context of Maternal Morbidities
Erika F. Dennis, Corrine Fager, Scott A. Lorch.
Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA.
BACKGROUND: The disparity in birth outcomes for African American women is well documented. Many studies have controlled for maternal disease in the attempt to explain disparities in birth outcomes. The degree to which this disparity persists within disease specific populations is not well researched.
OBJECTIVE: To compare disparities in preterm birth (<37 weeks gestation) between all women and women with one of six pregnancy complications.
DESIGN/METHODS: Using linked birth certificate data and infant and maternal discharge summaries from all women delivering in Missouri, California, and Pennsylvania between 2001-2003 (N=1,812,938), we constructed separate logistic regression models among all women and among women with hypertensive disorders, diabetes, infectious diseases, oligohydramnios, premature rupture of membranes (PROM), and placental abnormalities. In the models we controlled for race, age, initiation of prenatal care, year, insurance, parity, maternal and paternal education, treatment hospital, and medical problems.
RESULTS: African American mothers were more likely to have at least one medical problem (41.6%) compared to other races (32.1%) and more likely to have more than one medical problem (10.7%) relative to other races (6.2%). In our population wide regression model we obtained an adjusted OR for preterm birth in African American mothers of 1.26 [1.23-1.29] relative to Whites. In our disease specific models there was no statistically significant difference in the odds of preterm birth for African American mothers with hypertensive disorders (OR 1.06, 95% CI 0.98-1.13) and oligohydramnios (OR 1.08, 95% CI 0.93-1.22). African American mothers with diabetes (OR 1.25, 95% CI 1.13-1.36), PROM (OR 1.22, 95% CI 1.11-1.32) and infections (OR 23.95, CI 1.16-1.30) had similar rates to our baseline analysis. Mothers with placental abnormalities (OR 1.17, 95% CI 1.02-1.33) showed a modest decrease in the likelihood of preterm birth relative to the general population.
CONCLUSIONS: African American women are more likely to suffer from multiple medical complications during pregnancy. The cumulative impact of multiple medical conditions in addition to sociodemographic and environmental factors may be a major contributor to the well described disparity in preterm birth. In women with hypertensive disorders and oligohydramnios, the disparate rates of preterm birth can be completely explained by sociodemographic, treatment hospital, and other comorbidities.

2 Predictors of Low Weight (Less Than 10%) at 12 Months Corrected Age in NICU Graduates
Jordan S. Kase.
Division of Newborn Medicine, Maria Fareri Children’s Hospital, Valhalla, NY.
BACKGROUND: Some infants are born preterm or require NICU admission due to in utero weight <10% for gestational age(GA). Many NICU patients grow poorly due to high metabolic demands of a sick infant. However, catch-up growth often occurs after NICU discharge.
OBJECTIVE: To identify factors associated with and potential predictors of poor catch-up growth in former NICU patients at 12 months(m) corrected age(CA).
DESIGN/METHODS: Subjects are former NICU patients evaluated at a NICU follow-up(Fu) program at 12m CA±2m. Associations were established for antenatal factors with small for gestational age(SGA) infants, and antenatal or neonatal factors with weight <10% at 12m(Lt12) for both SGA and normal birthweight(NbWt) infants. χ2 analysis compared categorical variables and t-test compared continuous variables presented as mean±SEM. P<0.05 is statistically significant.
RESULTS: 693 patients were evaluated at 12 months CA. 8.9% were SGA. By the 1st Fu exam, 13% had weight <10%(Lt13). 22.8% were Lt12. Significant antenatal/ fetal correlations with SGA were: medically indicated delivery (MI) v spontaneous birth (SB) 15% v 25%; preeclampsia 21% v 7%; meconium noted at delivery 26% v 9%; congenital heart disease (CHD) 19% v 9%; urgenital (GU) anomalies 21% v 9%; birth length (BL) <10% <10% 45% v 55% birth head circumference (BHC) <10% v 45% 3%, GA 53.6±6.0 v 52.4±6.2 weeks. 52% of SGA patients were Lt12. They were significantly more likely to be: born due to a MI cause than SB 9.3 v 0.6%; be Lt1 24% v 2%; have: a low BL

3 Fellow in Training
3.1 Differences in Hospital Outcomes of Grade 3 and 4 IVH in ELBW Neonates When Withdrawal of Care Is an Option?
Sabrina Malik, Edmund LaGamma, Boriana Parvey.
Pediatrics, Division of Newborn Medicine, Maria Fareri Childrens Hospital-NYMC, Valhalla, NY.
BACKGROUND: The severity of intraventricular hemorrhage (IVH) ranges from mild to severe, but no effective preventative strategies exist and long term neurodevelopmental disabilities may be devastating. Extremely Low Birth Weight neonates (ELBW) are particularly vulnerable to developing IVH, but only a small number will have a severe bleed (Grade 3/4). The morbidities and mortality of Grade 3 & 4 are usually not reported separately. As the mechanisms may differ, we hypothesize that Grade 3 & 4 IVH in ELBW will differ in terms of incidence, risk factors and short term outcomes.
OBJECTIVE: To review the separate, incidence, risk factors and short term outcomes of Grade 3 & 4 IVH in ELBW.
DESIGN/METHODS: Retrospective chart extraction of all ELBW with a HUS documented Grade 3 or 4 IVH admitted to our Regional NICU from March 2004 to February 2009.
RESULTS: Among all admissions (3084) the incidence of Grade 3 & 4 IVH was 1% and 1.5% respectively. 474 neonates were ELBW, with a survival of 72%. The incidence of Grade 3 & 4 IVH in this group was 5.3% and 7% respectively. The gestational age and birth weight between ELBW with Grade 3 & 4 IVH were similar: 25.4±2.2w (23-32) and 718±148 g (695; 530-960) vs.720±141 (716; 530-960) respectively.[mean ± SD; median, range]. Mortality between the 2 IVH groups did not differ (40% vs 58%) but was higher than in all other ELBW (28%). The mortality in the Grade 4 was secondary to active withdrawal of life support as opposed to the Grade 3 where it was related to complications of prematurity. There was a trend of higher maternal (chorioamnionitis, PPROM, preeclampsia) and neonatal (sepsis, NEC, Aggar scores) risk factors in the group with Grade 3 IVH. The VP shunt rates were similar between both groups (4% vs 6%). Further, the incidence of Grade 3 and 4 IVH at our institution was lower than reported by NICHD (1997-2002) and VON (2005) in ELBW: for grade 3: 11% and 8% and for Grade IVH: 10% respectively.
CONCLUSIONS: Severe IVH is associated with a high mortality, however we differ in our approach to Grade IVH by offering withdrawal of life support. We did not identify differences in the incidence, risk factors and short term outcomes between the ELBW with Grade 3 & 4 IVH. Long term follow up of all survivors with severe IVH is being conducted to determine if there are any differences in the neurodevelopmental outcomes.

4 Fellow in Training
4.1 Prognostic Factors for Mortality in Late-Onset Sepsis in VLWB Infants
Orly L. Levit, Veronika Northrup, Vineet Bhandari, Patrick G. Gallagher, Matthew J. Bizzarro.
Pediatrics, Yale University School of Medicine, New Haven, CT; Biostatistics Support Unit, Yale Center for Clinical Investigation, New Haven, CT.
BACKGROUND: Late-onset sepsis (> 3 days of life) in VLBW infants is associated with increased risk of morbidity and mortality. The risk of late-onset sepsis is inversely related to BW and gestational age (GA), but other factors also influence sepsis-related outcomes. The objectives of this study were to determine risk factors which predict death in VLBW with late-onset sepsis.
DESIGN/METHODS: Data were collected from all VLWB infants admitted to the Yale Newborn Special Care Unit from 1/1989 to 12/2007 with at least one episode of blood culture-proven late-onset sepsis. Episodes of sepsis were categorized as Gram-positive, Gram-negative, and fungal. Data collection included demographics, clinical features, laboratory information and outcome. Multivariable logistic regression analysis was employed to compare and contrast different types of infection to determine differences in death and long-term outcome. 
RESULTS: There were 299 (60.8%) children with Gram-positive, 139 (29.1%) with Gram-negative, and 48 (10.1%) with fungal infections. Mean GA and BW was significantly lower among children with fungal infection (25.4 weeks, 763.5 g) vs Gram-positive (26.6 weeks, 854.9 g) vs Gram-negative (26.8 weeks, 927.6 g) infections (p=0.017). There was a greater proportion of death due to sepsis among children with Gram-negative infection (13%, p=0.009) compared with Gram-positive infections (4.1%). The difference between Gram-negative and fungal infections was not significant (p=0.5). Having either Gram-negative or fungal infection was a significant independent predictor of elevated risk of death due to sepsis, even after adjusting for other risk factors. Other important predictors for death due to sepsis were BW (p=0.05), endotracheal intubation (p=0.009), days with a central line (p=0.0001), concurrent necrotizing enterocolitis (p=0.04) and length of stay (p=0.0001). Hypoglycemia (p=0.04), neutropenia (p=0.04) and thrombocytopenia (p=0.01) were significant presenting signs in neonates with sepsis-related death.
CONCLUSIONS: Late-onset Gram-negative and fungal infections in VLWB infants carries a high risk of death. We speculate that identification and modification of these risk factors may improve the prognosis in this devastating condition.
Gender-Specific Effects of Gestational Substance Exposure on Deep Gray Matter and Memory in Young Adults
BACKGROUND: Animal and human studies suggest gender-specific neural effects of gestational substance exposure (GSE). Our prior work on GSE revealed volume differences in caudate that persist over time. Non-control members of this cohort were prenatally exposed to cigarettes, alcohol, marijuana and/or cocaine.
OBJECTIVE: We perform voxel-wise image analyses within the deep gray matter to determine whether GSE leads to gender-specific alterations in young adult brain development.
For each gender, we relate the imaging measurements to memory composite scores assessed by neuropsychometric testing.
DESIGN/METHODS: We use T1 3.0T MRI and publicly available, open-source-template-based brain mapping (i.e., ANTs [Frees et al.)] to investigate voxel-wise volumes of caudate nucleus, thalamus, putamen and hippocampus in socioeconomically matched young adults with and without GSE. All measures are taken relative to brain size in 83 subjects (49 female, 34 male) from the Hurt et al. cohort (average age: 17.4±1). We use voxel-wise ancova to isolate the effects of GSE, early home environment and age at time of scan.
RESULTS: Male thalamus, hippocampus and caudate nucleus volumes are significantly affected by GSE, with a non-overlapping sub-region of the striatum showing effects related to home environment at age 4. Volumes of GSE-related structures are significant predictors of memory composite scores in males, when early home environment and age are used as covariates. No significant results are found in females. Figure 1 panels (a) through (c) show the group-specific template where red areas are significantly affected by GSE in males and blue shows a significant early home environment effect. Both color bars show FDR-corrected p-values < 0.05.[figure1]
CONCLUSIONS: This study suggests: 1) greater sensitivity of male deep gray matter to GSE and early home environment than females; and 2) GSE is also related to reduced memory task scores in males, more than females.

6
Fellow in Training
Neonatal Hypoxic Ischemic Encephalopathy: Metabolic Predictors of Survival
Judy E. Zisk, Kevin Dwan, Janet Larson, Susan Adenivi-Jones.
Neonatology, Thomas Jefferson University, Philadelphia, PA.
BACKGROUND: Hypoxic ischemic encephalopathy (HIE) occurs in 4 per 1000 live births with a mortality rate of up to 75%. Long term morbidity is improved with hypothermia treatment. In untreated HIE patients, predictors of outcome include perinatal factors, abnormal laboratory values, EEG and brain MRI. At TIUH all infants referred for hypothermia treatment are screened to exclude metabolic disease. In this population transient abnormalities are common. Few studies identify whether these metabolic parameters are associated with death in HIE infants.
OBJECTIVE: To determine whether metabolic parameters predict survival (mortality) in hypothermia treated HIE infants.
DESIGN/METHODS: A retrospective cohort of 155 infants with asphyxia who met the criteria.
RESULTS: Male thalamus, hippocampus and caudate nucleus volumes are significantly affected by GSE, with a non-overlapping sub-region of the striatum showing effects related to home environment at age 4. Volumes of GSE-related structures are significant predictors of memory composite scores in males, when early home environment and age are used as covariates. No significant results are found in females. Figure 1 panels (a) through (c) show the group-specific template where red areas are significantly affected by GSE in males and blue shows a significant early home environment effect. Both color bars show FDR-corrected p-values < 0.05.[figure1]
CONCLUSIONS: This study suggests: 1) greater sensitivity of male deep gray matter to GSE and early home environment than females; and 2) GSE is also related to reduced memory task scores in males, more than females.

Fellow in Training
Neural Monitoring of Cerebral Hemodynamics in Postoperative Cardiac Patients during Blood Transfusions
BACKGROUND: DCS is a novel optical modality, validated in neonatal and adult populations by various techniques, which allows bedside measurement of relative cerebral blood flow (rCBF). Combined with near infrared spectroscopy (NIRS), DCS can assess both rCBF and oxygenation changes during routine postoperative cardiac care. Cerebral hemoglobin difference (ΔHbD) and total hemoglobin concentration (ΔTHC) as measured by NIRS have been shown to correlate with measures of rCBF. These indirect estimations of rCBF may fail during certain postoperative interventions such as blood transfusions.
OBJECTIVE: To describe a novel bedside optical technique for continuously monitoring CBF and oxygenation in postoperative cardiac patients focusing on the effects of blood transfusion on ΔHbD and ΔTHC.
DESIGN/METHODS: This prospective observational study of continuous DCS/NIRS monitoring occurred in the cardiac intensive care unit (CICU) for 12 hours after neonatal heart surgery. Vital signs were continuously captured and time-locked with optical data. Blood transfusions were described by volume, infusion rate and time after surgery. Data were summarized with median (range) or mean ± SD with paired t-tests used to compare pre-post data where appropriate. Pearson correlation coefficients were calculated with significance set at p<0.05.
RESULTS: Five neonates received 7 blood transfusions during the postoperative monitoring period. Median transfusion volume was 25 ml (15-60) given over 30 min (10-120min) at a median time of 51 min after surgery (5.8-571min). On transfusion completion, a significant increase was seen in mean arterial pressure (9.7mmHg +/- 9.4, p=0.005). NIRS measures of oxy- and deoxy-hemoglobin increased by a median of 4.4μM (0.9-7.1μM) and 0.31μM (6.6-18.7μM) respectively. Correlations between ΔTHC and rCBF as well as ΔHbD and rCBF did not achieve statistical significance (r=-0.61, p=0.19; r = -0.49, p=0.44, respectively).
CONCLUSIONS: Postoperative cerebral hemodynamic monitoring is enhanced by DCS measurements which are insensitive to conditions that may alter the rCBF estimation based on hemoglobin concentrations measured by NIRS. Combining direct measurement of rCBF using DCS with NIRS will improve postoperative monitoring of cerebral physiology.

7
Fellow in Training
Mechanism of Pharmacophory of Bcl-2 during Hypoxia in the Cerebral Cortex of Newborn Piglets
Subhasri Sangam, Shilpa Dass, Nicholas Obiri, 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 up-regulation of anti-apoptotic protein Bax, without affecting the expression of anti-apoptotic protein Bcl-2 in the cerebral cortex of newborn piglets, thus increasing the ratio of pro-/anti-apoptotic proteins in newborn piglets. The ratio of pro-apoptotic to anti-apoptotic proteins determines the survival of newborn neurons. Tyrosine phosphorylation of anti-apoptotic protein Bcl-2, however, results in loss of anti-apoptotic potential of protein.
OBJECTIVE: To investigate the mechanism of phosphorylation of anti-apoptotic proteins Bcl-2 during hypoxia, we hypothesize that the hypoxia-induced increased tyrosine phosphorylation of Bcl-2 is a pro-apoptotic protein that is increased.
DESIGN/METHODS: Piglets were divided in normoxic (Nx, n=5), hypoxic (Hx, n=5) and hypoxic-pre-treated with N-Nitro L-Arginine (Hyx+NNLA, n=5). Hypoxic animals were exposed to FiO2 of 1.0 for 2 hr and PaO2 maintained above 400 mmHg while Nx group were kept at 80-100 mmHg. NNLA (40mg/kg, i.v.) was administered to piglets 30 min prior to hypoxia. ATP and phosphocreatinine (PCr) levels were determined. Neuronal nuclei were isolated and proteins separated by 12% SDS-PAGE and probed with tyrosine phosphorylated Bcl-2 antibody. The protein bands were visualized with enhanced chemiluminescence, analyzed by imaging densitometry and band density expressed as absorbance (OD x mm).
RESULTS: ATP (µmol/g brain) was 4.9±1.1 in the Nx, 5.1±0.5 in the Hx (p<0.05) and 4.6±0.9 in Hyx+NNLA (p<0.05). PCr (µmol/g brain) was 3.3±0.6 in Nx, 3.2±0.5 in Hyx group (p<0.05) and 3.3±0.5 in Hyx+NNLA (p<0.05). Density of Phosphorylated Bcl-2 was 82.37±3.72 in Nx, 70.56±1.78 in Hyx group (p<0.05) and 72.98±1.84 in Hyx+NNLA (p<0.05). The data show that administration of NNLA prior to hypoxia decreased the phosphorylation of Bcl-2 in the neuronal nuclei of the cerebral cortex of newborn piglets.
CONCLUSIONS: We conclude that post-translational modification of anti-apoptotic protein Bcl-2 during hypoxia is nitric oxide-mediated. We speculate that tyrosine phosphorylated Bcl-2 will facilitate apoptosis in the neuronal nuclei of the cerebral cortex of newborn piglets.

8
Fellow in Training
Diffuse Correlative Spectroscopy (DCS) Enhances
Fellow in Training

Mechanism of Caspase-3 Expression during Hyperoxia in the Cerebral Cortex of Newborn Piglets

Lynn Fuchs, Heidi Taylor, Qazi Ashraf, Om P. Mishra, Maria Delivoria-Padapadosou.

Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: We have shown that hyperoxia results in increased expression and activity of caspase-3 in the cerebral cortex of newborn piglets. Hyperoxia also results in increased nitration of neuronal proteins due to generation of nitric oxide (NO). NO may alter the expression of caspase-3 by preventing the hyperoxia-induced increase in nuclear Ca++ influx and subsequent calcium calmodulin-dependent kinase IV (CaMK IV) mediated pathway of transcription through cyclic AMP response element binding protein (CREB) phosphorylation.

OBJECTIVE: The present study tests the hypothesis that the hyperoxia-induced increased expression of caspase-3 in the cytosolic fraction of the cerebral cortex of newborn piglets is mediated by NO derived from neuronal nitric oxide synthase (nNOS).

DESIGN/METHODS: Piglets were divided into: normoxia (Nx, n=3), hyperoxic (Hyx, n=3) and hyperoxic-treated with a highly selective nNOS inhibitor 7-nitro-indazole-sodium (Hyx+NINA, 1 mg/kg, i.v., 60 min prior to hyperoxia, n=2) groups. Hyperoxia was induced by exposure to an FiO2 of 1 to maintain PaO2 at >400 mmHg for 120 min. ATP and phosphocreatine (PCr) were determined biochemically to document cerebral tissue energy status. Cytosol was isolated. Expression of caspase-3 was determined by Western blot using a caspase-3 antibody and bands were detected by enhanced chemiluminescence. Band density was determined and expressed as absorbance (OD x mm2).

RESULTS: Levels of ATP (mole/g brain) were 4.9±1.1 in Nx, 5.1±0.5 in Hyx, and 4.8±0.7 in Hyx+7-NINA (p<NS). PCr (mole/g brain) was 3.3±0.6 in Nx, 3.2±0.5 in Hyx, p=NS and 3.1±0.4 in Hyx+7-NINA (P<NS). Expression of caspase-3 was 54.52±3.87 in Nx, 112.70±9.11 in Hyx (p<0.05) and 63.82±8.49 in Hyx+7-NINA (p<0.05 vs Hyx). The data demonstrate that hyperoxia resulted in increased expression of caspase-3 in the cytosolic fraction of the cerebral cortex of newborn piglets and that the administration of a highly selective nNOS inhibitor prevented the hyperoxia-induced increased expression of caspase-3.

CONCLUSIONS: We conclude that the hyperoxia-induced increased expression of caspase-3 in the cerebral cortex of newborn piglets is mediated by NO derived from neuronal nitric oxide synthase (nNOS). We speculate that NO free radicals generated during hyperoxia result in increased expression of caspase-3 through activation of CREB protein, a transcription factor that triggers expression of apoptotic proteins.

(Submitted by NIH-HD 20337)

Fellow in Training

Effect of Continuous Glucose Monitoring (CGM) on Quality of Life, HbA1C, Fasting Blood Glucose and the Variability of Blood Glucose Reading in Children with Type 1 Diabetes Mellitus

Vista Shakiba, Sharazid A. Alageheband, Jean Corrigan, Siham Accach.

Pediatrics, Winthrop University Hospital, Mineola, NY; SUNY/ Stony Brook School of Medicine, Stony Brook, NY.

BACKGROUND: In youths with Type 1 diabetes strict diabetes control is difficult to achieve and can often result in greater risk of severe hypoglycemia. Continuous glucose monitoring is a part of routine work-up of patients with suspected growth hormone deficiency (GHD) & multiple pituitary hormone deficiencies (MPHD). The role of neuroimaging in diagnosis & management of idiopathic short stature (ISS) is still under debate.

OBJECTIVE: To study pituitary & brain findings on MRI (Magnetic Resonance Imaging) in patients with ISS & GHD.

11

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OBJECTIVE: To evaluate the extent of patient satisfaction in using CGM as an effective tool for maintaining tight glycemic control and improving the quality of life of children and adolescents with Type 1 Diabetes.

DESIGN/METHODS: In this retrospective study, a questionnaire concerning satisfaction of CGM use was sent to 75 patients 3-25 years of age who were using CGM. A total of 21 responded to the self-reported questionnaire.

RESULTS: Among the 21 respondents (age 4-24 years), 17 (81%) were satisfied with CGM, 15 (71%) believed that CGM changed their lifestyle, 10 (48%) reported decrease in HbA1C and 3 (14%) reported stable HbA1C. (Mean diabetes duration was 7.5 years). The main reasons for satisfaction included: fewer finger sticks, ability to see trends, ability to detect unexpected highs and lows, better blood glucose control, feeling safe, good night time safeguard, more independence with self-management and good control of HbA1C. The main reasons for dissatisfaction included: pain on insertion, wearing another device, difficulty setting up the device, minor scarring, and not always reliable or accurate. Being more confident, having less concern over lows, less frequent testing, easier diabetes management, having more sense of security and being able to sleep better were reported as lifestyle changes with the use of CGM.

CONCLUSIONS: The high level of patient satisfaction demonstrates that implementing CGM into the treatment plan of pediatric patients with Type 1 Diabetes may prove to be an effective and worthwhile decision to maintain and improve their lifestyle and glycemic control.

12

Fellow in Training

Short Term Treatment with Anastrozole Does Not Affect Bone Strength in Pubertal Boys with Short Stature

Sofia Shapiro, Julia Chen, Oksana Lekarev, Joseph Fusco, G. Felipe Duarte, Elizabeth Wallach, Karl J. Jensen, Robert Rapaport.

Pediatric Endocrinology, Mount Sinai School of Medicine, New York, NY; Orthopaedics, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Aromatase inhibitors (AI) have been used to delay bone maturation in boys to improve adult height. In growth hormone-treated adolescents, anastrozole (AN) treatment for 3 years did not adversely affect bone mineral density (BMD).

MATERIAL & METHODS: BMD is not an accurate indicator of bone strength during growth. A novel, non-invasive indicator of bone strength is bone robustness (BR), calculated using a multiple regression model measuring bone mass and width relative to growth in length of the 2nd metacarpal on hand x-rays. Normative growth patterns were derived from films of boys in the Bush study. A nonrandom collection of ~4000 x-rays of children and adults, the basis of the Greulich and Pyle atlas.

OBJECTIVE: To assess bone strength in pubertal boys with short stature treated with AN.

DESIGN/METHODS: Ten non-GHD pubertal boys, treated with AN 1 mg daily >6 months, and 16 untreated boys with short stature were evaluated. BR (total area/length), cortical area, mass of diaphyseal bone mass and Metacarpal Index (MCI, cortical thickness/outer diameter) of the 2nd left metacarpal were used to calculate residuals relative to Bush standards for each subject. Residuals were compared in boys on AN before and after treatment and to controls. Data are expressed as mean±SD.

RESULTS: Age, time of follow up and pubertal stage at baseline were not different between AN boys (age 13.3±1.1y, E 17±4.9, 2m, Tanner stage 2.3±1.2) and control groups (age 12.5±1.3y, E 15±1.8, 2m, Tanner 2.1±1.3). BR and CA in AN boys were not different before and after treatment (-0.06±0.09 vs -0.04±0.1, CA -3.52±2.25 vs -2.32±1.62) and not different from controls. MCI increased in AN boys after treatment (-0.002±0.07 vs 0.024±0.09, p=0.02) but not in controls (0.003±0.04 vs 0.017±0.06, p=0.22). Mean height SDS in AN group increased (-1.31±0.51 to -1.13±0.49).

CONCLUSIONS: Short-term AN treatment did not adversely affect bone strength in pubertal boys with short stature. The increase in MCI suggests that AN may have a positive effect on bone mass, as previously noted. These preliminary findings need to be confirmed in larger, prospective studies.

13

Fellow in Training

Neuroimaging Plays a Role in Evaluation of Pituitary Defects in Children with ISS

Oksana Lazareva, Priyanka Fernandez, Irene Mamkin, Amit Bhangoo, Svetlana Ten.

Pediatric Endocrinology, Infants and Childrens Hospital of Brooklyn at Maimonides Medical Center, Brooklyn, NY.

BACKGROUND: Neuroradiologic neuroimaging is a part of routine work-up of patients with suspected growth hormone deficiency (GHD) & multiple pituitary hormone deficiencies (MPHD). The role of neuroimaging in diagnosis & management of idiopathic short stature (ISS) is still under debate.

OBJECTIVE: To study pituitary & brain findings on MRI (Magnetic Resonance Imaging) in patients with ISS & GHD.

(Submitted by NIH-HD 20337)

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OBJECTIVE: To study pituitary & brain findings on MRI (Magnetic Resonance Imaging) in patients with ISS & GHD.

(Submitted by NIH-HD 20337)
RESULTS: Among ISS patients 25 were found to have normal structures of brain & pituitary (58.1%), 7 had pituitary microadenoma (16.2%), 6 had hypoplastic pituitary (13.9%) & 8 had isolated GHD, 2 of these had GHRI receptor mutations.

OBJECTIVE: To study the variations in management of DKA amongst subspecialists, general pediatricians and trainees, and their opinion of a need for written guidelines.

BACKGROUND: Despite consensus statements by the European Society of Pediatric Endocrinology / Lawson Wilkins Pediatric Endocrine Society (2004) and the International Society for Pediatric and Adolescent Diabetes (2009) recommending guidelines for management of diabetic ketoacidosis (DKA), there is no standardized protocol for DKA management in United States.

RESULTS: Out of 1918 electronic invites, 694 participated. We included 577 (83%) pediatricians in our analysis, of whom 44% were SP (20% PICU, 29% Endo, 21% Hosp, 20% ER), 31% GP, 25% and 25% PL respectively and subspecialists, especially for larger fluid bolus and bicarbonate usage. The majority of responses were analyzed using percentages for descriptive analyses and chi-square tests for comparisons between categorical variables.

CONCLUSIONS: Among 346 visitors to the site, 203 responded, yielding 150 completed surveys. Of the completed surveys, 94 (51%) were PED, of whom 48 were in training, and 56 (53.3%) were FP, of whom 31 were in training. Based on correct answer KScores, L1, L2 and L3 were reached by 96%, 84% and 7% of physicians, respectively, with a breakdown into five groups of: L1(0%), L2 (96.3%), L3 (7.4%) and FP (2.8%). Pscores were higher among PED (p<0.002).

Further long term, prospective studies in children using these cut off limits will further clarify the need for written guidelines.

16 Knowledge and Practices about Vitamin D Supplementation among Pediatricians and Family Practitioners

Pratibha Rana, Fernanda Kupferman, Susana Rapaport, Lily Lew.

Vitamin D deficiency (VIDD) is known to cause rickets. Trends toward exclusive breast feeding and avoidance of direct sunlight have increased the risk for VIDD. Since screening for VIDD is not routine, the American Academy of Pediatrics (AAP) recently recommended increasing the daily intake of Vitamin D (VID) to 400 IU in all infants and adolescents.

OBJECTIVE: To assess the primary physicians’ awareness of new guidelines on daily VD requirements, and to compare knowledge and practices about supplementation between pediatricians (PED) and family practitioners (FP).

DESIGN/METHODS: This was a descriptive, observational, cross-sectional study using a 37-question survey to assess primary physicians’ knowledge and practices about VD. The questionnaire was sent electronically to over 2000 PED and FP via Zoomerang. Based on the number of correct answers for knowledge (KScores) and practices (PScores), the survey was scored (S) as L1 (≥80%), L2 (60-79%) and L3 (<60%). Physicians not practicing primary care were excluded. Data was analyzed using percentages for descriptive analyses and chi-square tests for comparisons between categorical variables.

CONCLUSIONS: Among 346 visitors to the site, 203 responded, yielding 150 completed surveys. Of the completed surveys, 94 (51%) were PED, of whom 48 were in training, and 56 (53.3%) were FP, of whom 31 were in training. Based on correct answer KScores, L1, L2 and L3 were reached by 96%, 84% and 7% of physicians, respectively, with a breakdown into five groups of: L1(0%), L2 (96.3%), L3 (7.4%) and FP (2.8%). Pscores were higher among PED (p<0.002).

CONCLUSIONS: There was inadequate knowledge and incomplete implementation of AAP guidelines with respect to VD among both PED and FP. Most practitioners acknowledged the need for more training. Practices regarding VD supplementation were suboptimal, especially by FP; and duration of practice had little impact on knowledge about VD by physicians.

17 Fellow in Training

Sex Related Analysis of ALT and Its Association with Metabolic Profile in Obese Children

Rishi Gupta, Vinip Lohiya, Irene Mamkin, Sonal Bhandari, Svetlana B. Ten.

Pediatric Endocrinology, Maimonides Medical Center, Brooklyn, NY.

BACKGROUND: Alanine aminotransferase (ALT) elevations are considered a surrogate marker of nonalcoholic fatty liver disease.

OBJECTIVE: In the present study we evaluated the prevalence of elevated ALT levels in obese children using recently proposed sex related cut off values (ALT >30 IU/L for males and ≥30 IU/L for females) and analyzed the association between ALT levels and metabolic profile in both the sexes.

DESIGN/METHODS: In a retrospective analysis, charts of 155 obese children (BMI z-score ≥ 2 for age and sex) who attended pediatric endocrinology clinic at our center (age range 5-20 yrs) with negative markers for viral hepatitis were analyzed.

RESULTS: 5.46:2.63% (47%) boys and 44% (52%) girls had elevated ALT levels. Overall boys had higher TG and lower HDL values than girls. TG values were significantly increased and HDL decreased in children with elevated ALT levels irrespective of sex. There was no difference in BMI, and blood pressure values between children with and without elevated ALT. Homeostasis model assessment of insulin resistance(HOMA-IR) showed a tendency to be higher in girls with elevated ALT levels (p=0.06). ALT levels correlated significantly with TG (r= 0.34), HDL (r= -0.26), TG/HDL (r= -0.37), fasting glucose (r= 0.45).

Table 1: Metabolic profile of subjects(n=155)

<table>
<thead>
<tr>
<th>Metabolic parameter</th>
<th>Normal Boys</th>
<th>Normal Girls</th>
<th>Obese Boys</th>
<th>Obese Girls</th>
</tr>
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<tbody>
<tr>
<td>BMI</td>
<td>53.6±6</td>
<td>48.5±10</td>
<td>55.2±7</td>
<td>51.1±9</td>
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<tr>
<td>ALT</td>
<td>≤30 IU/L</td>
<td>≤30 IU/L</td>
<td>&gt;30 IU/L</td>
<td>&gt;30 IU/L</td>
</tr>
<tr>
<td>HDL</td>
<td>≥55 mg/dl</td>
<td>≥55 mg/dl</td>
<td>≤55 mg/dl</td>
<td>≤55 mg/dl</td>
</tr>
<tr>
<td>TG</td>
<td>≤190 mg/dl</td>
<td>≤190 mg/dl</td>
<td>&gt;190 mg/dl</td>
<td>&gt;190 mg/dl</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>1.4±0.5</td>
<td>1.1±0.3</td>
<td>3.3±1.9</td>
<td>2.6±1.1</td>
</tr>
</tbody>
</table>

CONCLUSIONS: There is a large prevalence of elevated ALT levels in obese children associated with adverse metabolic profile by using updated age and sex related cut off values for ALT. This is much higher, specially in girls, than reported in most pediatric studies using ALT cut off at 40IU/L.

Further long term, prospective studies in children using these cut off limits will further clarify the value of this observation.
Assessing travel patterns and resource utilization can inform community level interventions and public health policies that promote healthy behaviors and communities.

## 20 Fellow in Training

### Waist Circumference z-Scores Are Better Correlates of Multiple Adiposity-Related Co-Morbidity Risk Factors Than BMI z-Scores in Early Adolescence


Reduce Obesity and Diabetes (ROAD) Project, AMDeC, NY, NY.

BACKGROUND: Body Mass Index (BMI) is commonly used as an index of body fatness. Waist Circumference (WC) is an easily obtainable anthropometric measure to identify children with increased central adiposity.

OBJECTIVE: To examine whether BMI or WC is a better correlate of risk factors for adiposity-related co-morbidities.

METHODS: We analyzed anthropometric (BMI and WC), clinical (systolic and diastolic BP’s) and biochemical (lipids, and inflammatory cytokines (ie: IL-6) from 162 school children 11-15 yrs of age as a part of ROAD consortium. Insulin secretory capacity was measured as AIR (mean rise in insulin 3 and 5 minutes after 25 gm of i.v. dextrose) and GDI [log (AIR x [fasting glucose]/[fasting insulin])] HOMA and QUICKI indices were calculated. WC and BMI z-scores were regressed against clinical and biochemical variables using a multiple stepwise linear regression analysis such that the effects of each z-score are “corrected” for the fractional variance attributable to the other. Analyses were performed in all subjects and in a subgroup who were overweight (BMI >85%ile for age and sex).

RESULTS: Significant correlations of waist circumference, but not BMI z-scores were found with indices of insulin sensitivity and HOMA. Significant correlations of BMI, but not waist circumference z-scores were found with IL-6. Similar findings were obtained in the entire subject population and only those subjects with BMI >85%ile (see Table 1).

<table>
<thead>
<tr>
<th>Table 1. Correlates of WC and BMI z-scores with co-morbidity risk factors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC z-score (beta)</td>
</tr>
<tr>
<td>Diastolic BP</td>
</tr>
<tr>
<td>HOMA</td>
</tr>
<tr>
<td>QUICKI</td>
</tr>
<tr>
<td>AIR</td>
</tr>
<tr>
<td>p-value = 0.05</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Waist circumference z-scores are, by and large, better correlates of risk factors for multiple adiposity-related co-morbidities than BMI z-scores. These data suggest that measurement of waist circumference may be a better index of metabolic and cardiovascular risk than BMI.

## 21 Fellow in Training

### Waist Circumference Is A Better Marker Than BMI in Predicting Body Fat and Insulin Sensitivity in Middle School Children


Reduce Obesity and Diabetes (ROAD) Project, AMDeC, NY, NY.

BACKGROUND: Waist circumference (WC) is closely related to development of insulin resistance and metabolic syndrome. WC is also a better measure of the visceral/central adiposity as compared to BMI yet it is rarely used by the primary care physician.

OBJECTIVE: To compare WC and BMI z-score as a predictor for development of insulin resistance.

METHODS: 162 children (aged 11-15) were studied as a part of the ROAD (Reduce Obesity and Diabetes) study. Measurements of height, weight, WC, and body fat %, systolic & diastolic blood pressures were obtained. Fasting glucose, Insulin and a 5 min IVGTT was performed. BMI z-score, WC z-score, HOMA, QUICKI, Acute Insulin Response (AIR), Glucose Disposition Index (GDI) indices were calculated. The data was divided into 2 subgroups based on the WC Group 1 with WC <90% & Group 2 WC >90%. The same group was divided based on BMI into 3 groups based on the standard definition of healthy, overweight and obesity. The data was analyzed using unpaired t-test and regression analysis. Correlation analysis was performed between BMI z-score and WC z-score against metabolic parameters.

RESULTS: WC z-score correlated much better with body fat % as compared to BMI z-score. The HOMA index correlated better with WC z-score than with BMI z-score. WC z-score and BMI z-score also correlated strongly with Wi SDS, Ht SDS, BP%, fasting insulin, DBP and negatively with QUICKI (Table 1). The metabolic parameters were also significant different in subjects with WC >90% as compared with a t test with WC <90% (Table 2).

### Correlation of WC & BMI for various components:

<table>
<thead>
<tr>
<th>Body Fat %</th>
<th>Insulin 0 min</th>
<th>HOMA</th>
<th>QUICKI</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC</td>
<td>0.68*</td>
<td>0.25*</td>
<td>0.25*</td>
</tr>
<tr>
<td>BMI</td>
<td>0.58*</td>
<td>0.25*</td>
<td>0.25*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistical Differences noted in groups based on WC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist Circumference</td>
</tr>
<tr>
<td>Body Fat %</td>
</tr>
<tr>
<td>Insulin 0 min</td>
</tr>
<tr>
<td>HOMA</td>
</tr>
<tr>
<td>QUICKI</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Our data shows that WC z-score correlates better than BMI z-score with measures of insulin resistance. WC z-score is also a better marker for body fat % which is a precursor to insulin resistance and metabolic syndrome.
The Use of Body Image Silhouettes in a Latino Community
dCarvn Kerman, Tinni Chu, John Rausch, Mary McCord
Department of Pediatrics, Columbia University, New York, NY.
BACKGROUND: Latino children are at a disproportionately high risk for becoming overweight. Both image silhouettes have been used to study an individual’s ability to correctly assess his or her weight, but few have involved Latinos. It is important to understand the ability of this population to correctly identify their weight category in order to develop strategies to combat the obesity epidemic.

OBJECTIVE: To assess the ability of Latino parents to correctly pick their BMI from a set of body image silhouettes and to determine which factors are responsible for the discordance between real and perceived BMI.

DESIGN/METHODS: Data was collected at an inner city pediatric practice in Northern Manhattan. 231 parents were shown Stunkard’s 9 body image silhouettes and asked to choose the one most resembling their figure. They also completed a 21-question survey, including demographics, self-reported height and weight, and whether they viewed themselves as underweight, normal weight, or overweight. Correlation coefficients were determined for calculated BMI and self-reported BMI category as well as calculated BMI and chosen silhouette BMI. Using multiple logistic regression a model was developed to predict factors significantly affecting parents’ ability to correctly select the silhouette that represented their BMI.

RESULTS: Participants were mostly Latino (93%) from the Dominican Republic (52%). 59.7% primarily spoke Spanish. Based on reported height and weight, 1.5% of respondents were underweight, 41.9% were normal weight, 33.2% were overweight, and 23.2% were obese. The correlation coefficient between calculated BMI and self-reported BMI category was 0.52; the correlation coefficient between calculated BMI and chosen silhouette BMI was 0.53. Controlling for potential confounders, age and obesity were found to significantly affect choice of the correct silhouette. Obese individuals had 92% lower odds of picking the correct silhouette (95% CI 0.03-0.2). Also, the older an individual, the more likely he or she was to pick the correct silhouette. Height, duration of residence in the US, race, insurance and education level, were not significant.

CONCLUSIONS: Body image silhouettes, which were created for and have primarily been studied in Caucasians, must be used with caution in young Latino adults, particularly those who are obese. Further studies are needed using pictorial figures devoid of ethnic-specific facial and body shapes for quality assessment of body image in Latino individuals.

23 Fellow in Training
A Novel Approach To Combat Pediatric Obesity Modeled after a Successful Program for Adults
Asda A. Willis, Laura A. Wedemeyer, Michelle G. Dresser, Cathy Nonas, Lynn D. Silver
Pediatric Gastroenterology and General Academic Pediatrics, The Mount Sinai Medical Center, New York, NY; Health Promotion and Disease Prevention - Bur. of Chronic Disease, New York City Department of Health and Mental Hygiene, New York, NY.

BACKGROUND: Half of adults and 41% of New York City elementary school children are overweight or obese. The NYC Department of Health & Mental Hygiene seeks to combat chronic illnesses such as obesity through the Public Health Detailing Program, a primary care provider outreach initiative modeled on pharmaceutical detailing. Success of an Adult Obesity Action Kit led to development of an Obesity in Children Action Kit, both containing clinical tools, patient education materials and provider resources. The 3 key recommendations for both campaigns encouraged providers to: (1) assess all patients for overweight and obesity using BMI (2) educate patients about healthful eating and physical activity and (3) help patients set realistic goals for healthy eating and exercise.

OBJECTIVE: To introduce an adult and pediatric obesity campaign and action kit to medical providers and staff, and to assess the self-reported uptake of key recommendations and kit materials.

DESIGN/METHODS: Health care sites in previously identified high-need areas in Brooklyn, the Bronx and Harlem were chosen for both campaigns. The Adult Obesity campaign was conducted from March-July 2008; the Pediatrics campaign began in July 2009. Interactions with providers and office staff included unscheduled visits and scheduled group presentations by PHDP representatives. At the initial visit, reps administer an assessment survey, reinforce key recommendations, and introduce the kit. At a follow up visit the assessment questions are re-administered.

RESULTS: The Adult Obesity Campaign reached a total 199 sites with 455 visits and 2,433 contacts. Of 178 providers who completed initial and follow up surveys, the percentage who reported using clinical tools and/or key recommendations increased from 27% at initial visit to 95% at follow up. At follow up 47% of providers reported assessing BMI and weight, vs 25.2% initially (p<.05), and 95.8% vs. 77.2% (p<.05) did goal setting with patients. Similar tools were developed and incorporated into the Obesity in Children Action Kit. The pediatric campaign targets of 167 Pediatrics and Family Practice sites. Data collection is ongoing.

CONCLUSIONS: Materials from an obesity campaign targeting adults in NYC were well received and widely implemented by providers. The most successful tools were used to develop a kit to combat pediatric obesity, targeting providers in the same neighborhoods, hopefully leading to similar outcomes.

24 Is Decreasing Visual Acuity Associated with Higher BMI in Children?
Ali F. Alhadi, Paola Carugno.
Pediatrics, St Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Childhood overweight and obesity has escalated during the past 30 years with certain groups at more risk. The prevalence of visual impairment among US children and adolescent is 6.8/10,000, with varying levels of visual acuity. Decreased visual acuity may increase the risk of being overweight or obese in this population. No data is available to support a link between decreasing visual acuity and an increased risk of overweight or obesity.

OBJECTIVE: To examine the relationship and prevalence of overweight and obesity among children with visual impairment.

DESIGN/METHODS: This is a cross-sectional study of ambulatory children enrolled in a specialized school for the visually impaired in Bronx, NY. Demographic and physical exam data was collected for each child. Children were divided into 4 groups based on the degree of visual acuity in the best eye, in accordance with the competitive sports classification of International Blind Sports Federation (see table). Statistical analysis focused on the relationship between each group of visual impairment and the body mass index (BMI) and the incidence of overweight and obesity (chi-square and ANOVA).

RESULTS: 98 subjects were enrolled in the study. The mean age (±SD) was 13.3±4.0, range 5 to 21 years. 31% of the students resided at the school during the weekdays and 56% were female. Hispanic and African American students were the majority (43% and 36% respectively), followed by Caucasians (12%). BMI ranged from 14 to 42 with a mean of 22±5.9. The study group had an average overweight (BMI ≥ 85%) rate of 13.3% and an obesity (BMI ≥ 95%) rate of 32.7%. These were slightly higher than the average for NY State (12% and 24% respectively). There was no significant difference among the 4 subgroups of visual acuity (ranging from visual acuity of 20/60 to no light perception) both for the rates of overweight (p=0.58) and obesity (p=0.45).

Visual acuity (BVA classification) and obesity rates*:

<table>
<thead>
<tr>
<th>Definition</th>
<th>N</th>
<th>Obesity %</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 20/200</td>
<td>95</td>
<td>24</td>
</tr>
<tr>
<td>20/200 - 20/70</td>
<td>90</td>
<td>20</td>
</tr>
<tr>
<td>20/70 - 20/50</td>
<td>80</td>
<td>25</td>
</tr>
<tr>
<td>≥ 20/50</td>
<td>10</td>
<td>40</td>
</tr>
</tbody>
</table>

*NS, by ANOVA

CONCLUSIONS: These data suggest that although children and adolescents with visual impairment tend to have a higher BMI than the general population, decreasing visual acuity alone was not associated with increased rates of overweight or obesity.

25 Fellow in Training
Short and Long Term Neurodevelopmental Outcomes after Treatment of Patent Ductus Arteriosus with Ibuprofen Versus Indomethacin
Alla Kushner, Joaquin M.B. Pinheiro.
Neonatology, Albany Medical Center, Albany, NY.

BACKGROUND: Ibuprofen treatment of patent ductus arteriosus (PDA) has been shown to be as effective as indomethacin. Indomethacin, unlike ibuprofen, is thought to reduce cerebral blood flow velocity and cerebral oxygenation, which could lead to cerebral ischemia and/or periventricular leukomalacia (PVL). This could significantly influence neurodevelopmental outcomes of babies treated for PDA.

OBJECTIVE: Ibuprofen and indomethacin treatment of PDA have comparable effects on the frequency of severe IVH or PVL, and long term neurodevelopmental function.

DESIGN/METHODS: At the end of 2006, our institution switched from routinely using indomethacin to ibuprofen. An IRB-approved, retrospective chart review (2005-2008) was performed. Neurodevelopmental follow up data were collected at corrected age of 4-6 months, 8-13 months, and last available developmental follow up visit. The same developmental pediatrician evaluated all patients using Gesell Developmental Screen for the presence and severity of developmental disabilities (absent, mild, moderate or severe) and for cerebral palsy (CP). Incidence and grade of IVH and PVL were also recorded. Chi-square and logistic regression modeling were used for data analysis.

RESULTS: There were no significant differences between treatment groups in short or long term neuromotorbehaviors.

<table>
<thead>
<tr>
<th>Study Outcomes</th>
<th>N</th>
<th>Severe IVH or PVL (%)</th>
<th>Death (%)</th>
<th>Death of patients (%)</th>
<th>Developmental disabilities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indomethacin</td>
<td>165</td>
<td>9.1%</td>
<td>7.3%</td>
<td>76%</td>
<td>76%</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>186</td>
<td>9.2%</td>
<td>9.7%</td>
<td>76%</td>
<td>76%</td>
</tr>
</tbody>
</table>

There were also no differences in disabilities or CP, in the absence of severe IVH or PVL, using univariate or multivariate analyses. On multivariate analyses, the odds (OR [95%CI]) of disabilities were significantly decreased by older gestational age (0.6 [0.4-0.9]; p< 0.02) and female gender (0.4 [0.3-0.7]; p< 0.002), increased by severe IVH or PVL (OR 3.4 [1.5 - 7.8]; p< 0.004), and unchanged with treatment.

CONCLUSIONS: There were no differences in the rates of IVH or PVL at follow up in infancy after use of either indomethacin or ibuprofen for treatment of PDA. There were also no differences in the rates of CP or developmental disabilities between groups. These data, rates on a substantial number of patients, suggest that ibuprofen and indomethacin have similar safety profiles with respect to neurodevelopmental outcomes, an important consideration when choosing medications for PDA treatment.

26 Fellow in Training
Comparison of Renal Effects of Ibuprofen Versus Indomethacin during Treatment of Patent Ductus Arteriosus
Alla Kushner, Joaquin M.B. Pinheiro.
Neonatology, Albany Medical Center, Albany, NY.

BACKGROUND: Ibuprofen treatment of PDA has been shown to be as effective as indomethacin in small randomized controlled trials, with possibly fewer adverse effects. However, adverse renal effects of ibuprofen have been noted in some trials and suspected in our practice.

OBJECTIVE: To examine whether ibuprofen and indomethacin treatment of PDA have comparable effects on renal function as evidenced by serum creatinine and urine output.

DESIGN/METHODS: At the end of 2006, our institution switched from using indomethacin to ibuprofen. IRB-approved, retrospective chart review of 351 patients (2005-2008). Serum creatinine and urine output were recorded prior to start of treatment, during each course and after the last course. Pre-treatment creatinine and urine output means were compared to treatment and post treatment values using paired t-test. Serum creatinine and urine output means were compared to normal reference values using one-sample t-test.
treatment means using 2-factor repeated measures ANOVA using Minitab and SPSS. Dunnnett’s post-hoc test was used to compare changes from baseline to each treatment course.

RESULTS: 186 patients received ibuprofen (2007-2008) and 165 indomethacin (2005-2006). There was no difference between drug treatment groups in gestational age, birth weight, gender, or birth weight in the early neonatal period. The number of courses needed (p=0.008) inversely correlated with both birth weight and gestational age. During the first course (all patients) there was a significant change in renal function with both drugs, greater with indomethacin. In the 218 patients who received only one course, there was a significant increase in creatinine by (0.1mg/dL, p=0.001) after indomethacin. The 125 neonates who received 2 or more courses, decrease in urine output and increase in creatinine was not significantly different between drugs. Interaction between course number and drug type was seen, with greater decreases in urine output from baseline in the second (by 0.9 ml/kg/hr, p≤0.002) and third (by 0.9 ml/kg/hr, p≤0.05) courses of ibuprofen. Renal effects post-treatment returned to baseline, regardless of the number of courses.

CONCLUSIONS: Both drugs have a similar detrimental effect on renal function, which is more evident with urine output. Indomethacin had more prominent initial renal effects. Ibuprofen decreased renal function in the 2nd and 3rd courses, similarly to indomethacin. Clinical management during PDA treatment should anticipate changes in renal function, even with multiple courses.

27 Fellow in Training

Is There a Genetic Basis for Responsiveness of PDA to Ibuprofen in Premature Neonates?

Kiran Dwarkanath, Bridget Oliveri, Kristen Aland, Divya Chhabra, Mitsugi Singh, Johanna Calo, Lance A. Parton.
Division of Newborn Medicine, Maria Fareri Children’s Hospital and NYMC, Valhalla, NY.

BACKGROUND: The successful medical closure of PDA in ELBW infants may be influenced by a number of factors, including the balance between the expression of prostaglandins and their inhibitors, NSAIDs. The role of genetic polymorphism in the metabolism of ibuprofen is important in determining adequate plasma concentrations required for effective prostaglandin inhibition. The polymorphism in the genes encoding the enzymes that mediate ibuprofen metabolism, CYP2C8 and CYP2C9, may influence the effect of ibuprofen on ductal closure.

OBJECTIVE: We hypothesize that there is a genetic basis for responsiveness to ibuprofen treatment of PDA in ELBW neonates.

DESIGN/METHODS: ELBW infants are routinely screened for PDA by echocardiography on day 2. Those with moderate to severe PDA with left-to-right flow are medically treated with 3 doses of ibuprofen. This study assessed the relationship between the SNP distribution of NSAID-metabolizing enzymes and ductal closure. DNA was isolated from buccal swabs. A total of 16 patients were recruited from the NICU. 12 closed their PDA with medical treatment and 4 required surgical ligation. The SNP distribution of NSAID-metabolizing enzymes was determined using Taqman probes.

RESULTS: More boys needed ibuprofen (3:1) while girls responded better to ibuprofen (m:1:3.5). There was no difference in racial distribution. SNP analyses revealed a CYP2C8 SNP with different genotype distributions between those who closed their PDA with medical treatment compared to those who failed to medical treatment and required surgical intervention (p=0.08).

CONCLUSIONS: A SNP for CYP2C8, involved in the metabolism of ibuprofen, was close to significance when ELBW infants who closed their PDA medically were compared to those requiring surgical ligation. Other SNPs of COX1, COX2, and CYP2C9 were not associated with medical closure of the PDA in ELBW infants.

28 Fellow in Training

Patent Ductus Arteriosus in Extremely Preterm Infants: How Many Courses of Indomethacin Are Appropriate before Surgical Ligation?

Lynda Adrouche-Amrani, Karen M. Gluck, Jing Lin, Robert S. Green, Ian R. Holzman.
Pediatrics, The Mount Sinai Medical Center, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Patent ductus arteriosus (PDA) is very common in extremely low birth weight infants and is responsible for increased mortality and morbidity. PDA is usually treated with cyclooxygenase inhibitors (COI). Failure of ductal closure after the first course of COI is reported in infants and is responsible for increased mortality and morbidity. PDA is usually treated with ibuprofen (total=3) may be given, prior to the need for surgical ligation. DNA isolated from buccal swabs is purified, and subjected to real-time PCR utilizing specific Taqman probes for allele discrimination. ANOVA and chi-square analyses were performed, with statistical significance at p<0.05.

RESULTS: This is an prospective ongoing study, which has analyzed 16 patients to date-12 closed their PDA after 1-3 courses of ibuprofen (total=3) may be given, prior to the need for surgical ligation.

CONCLUSIONS: A SNP for CYP2C8, involved in the metabolism of ibuprofen, was close to significance at p<0.05. Other SNPs of COX1, COX2, and CYP2C9 were not associated with successful medical closure of PDA in ELBW infants.

29 Car Seat Tests – Are They Worth It?

Pediatrics, Albert Einstein Medical Center, Philadelphia, PA; Respiratory Therapy, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: The AAP has recommended all infants <37 weeks gestation spend a period of observation in a car seat prior to hospital discharge to assess for apnea, bradycardia or oxygen desaturation. The most recent Cochrane review found no randomized trials fulfilling appropriate criteria to assess this issue, and suggested further studies to determine if the car seat challenge accurately predicts the risk of clinically adverse events.

OBJECTIVE: We reviewed our recent experience with car seat tests to determine if it accurately predicts the risk of clinically adverse events over a time period of up to 6 months.

DESIGN/METHODS: Retrospective chart review of all infants in both the term nursery and the NICU who had a car seat test performed between 1/05 and 12/08. Car seat studies are performed within 24 hours of hospital discharge on infants <37 weeks gestation or GSA. Infants failing the test are retested with adjustment of position. Infants failing 3 times are discharged in a car bed. Per hospital protocol, infants <35 weeks gestation at birth also have a 24 hour pneumogram performed within 48 hours of discharge.

RESULTS: 785 infants had car seat tests and only 43 (5.5%) failed their initial test. There were no significant differences in gestational age at birth (34.2±3.3 v. 33.5±3.3 weeks; p=0.2) or birth weight (2.24±0.6 v. 2.11±0.7 kg; p=0.18) between all infants studied and those who failed their initial car seat test. 313 infants had a pneumogram in addition to the car seat test. 178 of them (56.8%) had an abnormal pneumogram, even though the vast majority, 158 (88.6%), passed their car seat test. Infants whose pneumograms were normal were significantly older at birth (GA=33.1±2.2 v. 31.2±3.5 wk; p=0) and of greater birth weight (1.87±0.4 v. 1.67±0.6 kg; p<0.0005) than those with abnormal pneumograms. Compared to the pneumogram, the sensitivity of the car seat test for determining clinically significant events was 0.1; the specificity was 0.94, the positive predictive value 0.69 and the negative predictive value 0.45.

CONCLUSIONS: The car seat test is not effective at identifying those infants at risk for a significant clinical event such as apnea, bradycardia or oxygen desaturation when compared to pneumogram evaluation. Consideration should be given to performing a pneumogram on those infants who fail a car seat test to better delineate their cardiorespiratory abnormalities.

30 House Officer

Car Safety Seat Testing in Level I Nurseries: Are We There Yet?

Priya Bhaskar, Sharon Pao, Marsha Waggoner, Karen R. Carpenter.
Department of Pediatrics, Inova Fairfax Hospital for Children, Falls Church, VA; Virginia Commonwealth University School of Medicine, Inova Campus, Falls Church, VA.

OBJECTIVE: We reviewed our recent experience with car seat tests to determine if it accurately predicts the risk of clinically adverse events over a time period of up to 6 months.

DESIGN/METHODS: Data were collected via survey. Hospitals with free standing Level I nurseries completed an online survey. Survey questions were chosen to assess compliance with the 2009 AAP policy.

RESULTS: There were 65 surveys returned: 16 complete surveys were from free standing Level I nurseries. 84% of nurseries completed an email survey. Hospitals with Level I within II/III nurseries were recruited from a NICU listserve and completed an online survey. Survey questions were chosen to assess compliance with the 2009 AAP policy.

CONCLUSIONS: A SNP for CYP2C8, involved in the metabolism of ibuprofen, was close to significance when ELBW infants who closed their PDA medically were compared to those requiring surgical ligation. Other SNPs of COX1, COX2, and CYP2C9 were not associated with medical closure of the PDA in ELBW infants.

Demographics

<table>
<thead>
<tr>
<th>Medical Treatment</th>
<th>Surgical ligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>256/1.8</td>
</tr>
</tbody>
</table>

CYP2C8 genotype and PDA response to Ibuprofen

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Medical treatment</th>
<th>Surgical treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>GG</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

CONCLUSIONS: A SNP for CYP2C8, involved in the metabolism of ibuprofen, was close to significance when ELBW infants who closed their PDA medically were compared to those requiring surgical ligation. Other SNPs of COX1, COX2, and CYP2C9 were not associated with medical closure of the PDA in ELBW infants.
Adaptive Control of Inspired \(O_2\) To Maintain Oxygenation Stability in Preterm Infants

Ke He, Pyon, Zubair Aghai, Gary E. Stahl, Vishwanath Bhat, Sulaiman Sannoh, Judy G. Saslow.

Pediatrics/Neonatology, Cooper University Hospital-UMDNJ/Robert Wood Johnson Medical School, Camden, NJ.

BACKGROUND: Premature infants are at increased risk of developing complications related to oxygen use. A closed-loop adaptive oxygen control device that automatically adjusts the inspired \(O_2\) (FiO\(_2\)) to maintain pulse oximetry within a set range would be an ideal strategy to manage the infant’s exposure to oxygen.

OBJECTIVE: To evaluate a closed-loop adaptive device and compare the automated regulation of FiO\(_2\) in maintaining a target oxygenation range to manual FiO\(_2\) regulation based on routine standard care on preterm neonates treated with high flow nasal cannula (HFNC) or nas cannula (NC).

DESIGN/METHODS: Each infant was studied for 4 hours on 2 modes of \(O_2\) control: automatic computerized adjustment of FiO\(_2\) (adaptive control) and the manually adjusted FiO\(_2\). The percentage of time each infant spent in the target range of \(\geq 90\%\) of the desired oxygenation (Sp\(_O_2\)) was calculated and compared for both modes.

RESULTS: Premature infants who required supplemental oxygen by HFNC or NC were studied (N=15; [mean±SD] birth wt 935 ± 299 grams, gestational age 27 ± 2.1 weeks; at time of study, weight 1865 ± 547 g, age 51 ± 23.4 days, FiO\(_2\) 0.31 ± 0.08). The changing trends in the Sp\(_O_2\) and FiO\(_2\) values during both modes for one subject are shown in Figure 1.

![Figure 1](image1)

This typical case shows how the Sp\(_O_2\) was maintained in the target range as the FiO\(_2\) automatically adjusted in the computerized mode. For the 15 infants studied, the percent time in the target Sp\(_O_2\) range was maintained at 79.4±12.7% for the computerized mode and at 58.5±18.8% for the manual mode (P<0.001, Student’s T-test).

33 Timing the Peak Occurrence of NEC in Premature Infants ≤ 34 Weeks Gestation

Naveed Hussain, Aniruddha S. Vidwans.

PEDIATRICS, University of Connecticut Health Center, Farmington, CT.

BACKGROUND: Infants of ≤34 wk gestational age (GA) at birth are at increased risk of necrotizing enterocolitis (NEC). Factors leading to NEC in premature infants are yet to be fully elucidated. Timing the peak occurrence of the NEC may yield important clues to its pathophysiology.

OBJECTIVE: To describe the timing of onset of NEC in premature infants ≤34 wk GA.

DESIGN/METHODS: A prospective study was done with ≤34 wk GA infants admitted to the Univ. of CT Health Center NICU from Jan 1990 to Jun 2009. During this time-period a uniform feeding protocol was used. Infants with NEC (Bell’s stages 2 or 3) based on clinico-radiographic findings were studied. Spontaneous intestinal perforations without NEC were excluded. Incidence of NEC was calculated for each GA group and postnatal timing of NEC was calculated for the post-menstrual age (PMA) and the day of life (DOL) at onset.

RESULTS: Of the 9,426 infants ≤34 GA wk, NEC was confirmed in 142 (1.5%) infants. A high rate (13%) was noted for the 23 wk GA group; and for other groups the incidence ranged from 7.3 - 0.7% with poor correlation with GA at birth (Fig 1). The mean PMA of onset of NEC was 31.3 wk (median 31.5); and the peak occurrence of this condition was between 30-34 wk PMA. NEC onset (DOL) of onset was 27.9 days. Peak timing (DOL) of NEC was inversely correlated with GA at birth with mean onset at 28 days for the most immature infants and 7 days for the most mature (Fig 2).

Timing of initiation of postnatal medications such as steroids, indomethacin, and diuretics (furosemide, chlorothiazide and spironolactone) was not independently correlated with the onset of NEC.

CONCLUSIONS: NEC was more strongly correlated with postnatal age (DOL or PMA) than with GA at birth. NEC was most likely at PMA of 31-34 wk irrespective of GA at birth. The more immature infants were likely to develop NEC at later days of life. Speculation: Maturational issues relating to the gut or other immunological changes may play a role in the pathogenesis of NEC.

34 Prospective Randomized Control Trial of Restrictive Fluid Management in Transient Tachypnea of the Newborn

Annemarie Stroustrup, Ian R. Holzman.

Division of Newborn Medicine, Kravis Children’s Hospital, Mount Sinai Medical Center, New York, NY; Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Transient tachypnea of the newborn (TTN) is a self-limited respiratory distress syndrome of neonates. Otherwise healthy newborns with TTN require management in an intensive care setting, thus increasing length and cost of hospitalization and decreasing parent-child bonding in the first (and median) days of life. Although TTN accounts for a large percentage of late preterm and term neonatal intensive care unit admissions, little data underlie current management of TTN. This prospective randomized controlled trial compares fluid management strategies for neonates with TTN.

OBJECTIVE: To determine whether fluid restriction speeds resolution of respiratory distress in neonates with TTN.

DESIGN/METHODS: Late preterm and term neonates with TTN were randomized to either standard fluid management or restricted fluid management. Term infants received standard 60 mL/kg/day of intravenous (IV) fluids or restricted 40 mL/kg/day on day of life 1. Preterm infants received standard 80 mL/kg/day of IV fluids or restricted 40 mL/kg/day. Intravenous fluids

CONCLUSIONS: There was a 36% increase in the percentage of time spent in the target Sp\(_O_2\) range during the computerized mode of the closed-loop adaptive \(O_2\) control device when compared to the manual mode. Further studies are necessary to determine long term outcomes of this device used in preterm infants or to expand its application. Acknowledgement: We thank Columbia Life Systems, Inc. for the use of their device in this study.

35 Fellow in Training

Tidal Volume in Infants with Congenital Diaphragmatic Hernia

Saumya Sharma, Kabir M. Abubakar, Martin Keszler.

Department of Pediatrics, Division of Neonatology, Georgetown University Hospital, Washington, DC.

BACKGROUND: Optimal ventilatory strategies that minimize lung injury in infants with Congenital Diaphragmatic Hernia (CDH) are not well studied. Volume guarantee (VG) ventilation may reduce lung injury, because volume, not pressure is the key determinant of lung damage. VG is the primary mode of support in our institution, targeting PaCO\(_2\), of 40-55 mmHg. High-frequency jet ventilation is used only as rescue when high pressure is needed. Appropriate tidal volume (VT) in patients with CDH and pulmonary hypoplasia might be expected to be lower than in other infants of similar weight. However, there are no published data to guide selection of VT in these unique patients.

OBJECTIVE: To provide normative data for VT required to achieve adequate PaCO\(_2\) in neonates with CDH.

DESIGN/METHODS: We reviewed medical records of all infants admitted to Georgetown University Hospital with CDH from 1997 to 2009 managed with conventional ventilation during at least a portion of their acute illness. Patient demographics, mode of ventilation, ventilator settings, observed VT, respiratory rate (RR) and corresponding blood gas values pre and post-surgery were recorded. Minute ventilation (MV) was calculated as RR x VT. Only VT values with corresponding PaCO\(_2\), in an acceptable range of 35 to 60 mmHg were included. Mean VT and MV/kg were calculated for each patient and these mean values were then subjected to descriptive statistical analysis.

RESULTS: Eighteen patients were managed on conventional ventilation during this period. Mean gestational age and birth weight were 38.4 ±2.6wks and 3340±1475g. Four patients were on conventional ventilation only after surgery and 1 was extubated without surgery. Four patients required ECMO in the pre-op period for severe persistent pulmonary hypertension. Mean VT was 4.61 ± 0.80 ml/kg (3.82-6.58) before surgery and 4.52 ± 0.82 ml/kg (3.13 -6.39) after surgery (p=NS). Mean respiratory rate was 58.4 ± 6.0 pre and 56.6 ± 4.6 post surgery. Mean MV was 272.2 ± 44.0 ml/min/kg (197.9-330.3) before surgery and 249.2± 47.2 ml/min/kg (155.2-325.4) after surgery (p=NS).

CONCLUSIONS: Despite their pulmonary hypoplasia, the VT associated with acceptable PaCO\(_2\) values in infants with CDH is comparable to VS infants of similar age and weight. This should not be surprising, because their \(CO_2\) production is not different and thus they need similar MV.

These are the first normative data to guide selection of VT in VS infants with CDH.
were increased by 20 mL/kg/day daily for all patients. The primary outcome was duration of respiratory distress, a composite outcome encompassing duration of tachypnea, hypoxia, and need for respiratory support. Secondary outcomes were length of time to first oral feed and time to discharge from the NICU.

RESULTS: Data from the 38 patients enrolled in the trial to date were included in this interim analysis. Twenty-four were preterm and 14 were term neonates. No adverse events due to fluid restriction occurred. No significant difference was seen between the two groups in duration of respiratory distress as measured by need for respiratory support. Babies who received fluid restriction in the first 72 hours of life had significantly shorter duration of admission in the NICU (p<0.001), however.

CONCLUSIONS: This interim analysis was not powered for statistical significance. However, duration of admission in the NICU was significantly decreased in fluid-restricted patients compared to patients receiving standard fluid management. This was a surprising finding, as there was no statistical difference in duration of respiratory support between the two groups. Inclusion of data from all patients enrolled in time of presentation will permit more complete evaluation of the benefits of fluid restriction in this patient cohort. This interim analysis demonstrates that fluid restriction benefits neonates with TTN.

35 Retrospective Study of Epinephrine Use in the Delivery Room Resuscitation of Infants Born ≤25 Weeks
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BACKGROUND: Practice varies widely with the use of epinephrine (epi) in the delivery room (DR) resuscitation of infants of borderline viability. There is very little evidence supporting the usefulness of or the futility of using epinephrine in infants ≤25 weeks.

OBJECTIVE: To study the outcomes to discharge of infants ≤25 weeks gestation who received epi in the DR.

DESIGN/METHODS: Eligible patients were identified from the electronic database of the Women & Children’s hospital of Buffalo between January 2000 to Dec 2008 using the search terms epinephrine or cardiopulmonary resuscitation. Fourteen patients were matched to 28 controls for gestational age ≥1 week, birth weight ≥1000 g, race and closest birth date. The outcome variables studied included incidence of hypoglycemia, bronchopulmonary dysplasia, total number of days of mechanical ventilation, intraventricular hemorrhage, periventricular leukomalacia (PVL), necrotizing enterocolitis, number of days to full oral feeds and length of stay in the NICU. Chi square, Mann Whitney and ANOVA tests were used for statistical analysis. Power and sample size calculations were performed.

RESULTS: There were no statistically significant differences in the mortality, or any of the short-term morbidities studied.

<table>
<thead>
<tr>
<th>Baseline Characteristics &amp; Results</th>
<th>Epi</th>
<th>Control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age (weeks)</td>
<td>27 4/7 (±4)</td>
<td>28 1/7 (±4)</td>
<td>NS</td>
</tr>
<tr>
<td>Birth Weight</td>
<td>1070 (±20)</td>
<td>1093 (±69)</td>
<td>NS</td>
</tr>
<tr>
<td>Antenatal Steroids (%)</td>
<td>46.5</td>
<td>47</td>
<td>NS</td>
</tr>
<tr>
<td>Apgar 1 &amp; 5 minutes (median)</td>
<td>7.3 (±0.2)</td>
<td>7.3 (±1.3)</td>
<td>0.036</td>
</tr>
<tr>
<td>Cord pH</td>
<td>7.23</td>
<td>7.33</td>
<td>NS</td>
</tr>
<tr>
<td>Need for Supplemental Oxygen (%)</td>
<td>&lt;0.001</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>IVH Grade 3 or 4 (%)</td>
<td>11</td>
<td>14</td>
<td>NS</td>
</tr>
<tr>
<td>PVL (%)</td>
<td>8.5</td>
<td>12</td>
<td>NS</td>
</tr>
<tr>
<td>Ventilator Days</td>
<td>80</td>
<td>65</td>
<td>NS</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>127</td>
<td>134</td>
<td>NS</td>
</tr>
<tr>
<td>Survived to Discharge (%)</td>
<td>89</td>
<td>88</td>
<td>NS</td>
</tr>
</tbody>
</table>

More babies had PVL in the epi treated group but this did not reach statistical significance.

CONCLUSIONS: The use of epi in the delivery room resuscitation of infants at the threshold of viability appears safe for all of the short-term outcomes studied in this small sample. Studies with more infants would be helpful to examine the incidence of PVL and long term neuro developmental outcomes of infants ≤25 weeks treated with epi during neonatal resuscitation.

36 Fellow in Training How Often Are Very-Low-Birth-Weight (VLBW) Infants Normocarbic, Normothermic and Normoglycemic after Birth?
Necu Singh, Gautham Suresh.
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BACKGROUND: Optimal respiratory management, thermoregulation, and maintenance of euglycemia in the period immediately after birth and resuscitation of VLBW infants is crucial, and directly related to their morbidity and mortality.

OBJECTIVE: (1) Determine how often the first measured partial pressure of blood carbon dioxide (PCO2), temperature, and blood glucose were in the optimal range in inborn VLBW infants (2) Identify factors associated with out-of-range values.

DESIGN/METHODS: We retrospectively reviewed charts of all consecutive inborn VLBW infants born between 1/1/2007 and 12/31/2008 for maternal and infant characteristics, perinatal management and infant physiologic measures. We defined optimal ranges as 35-65 mm Hg for PCO2, 36.5-37.5 degrees Celsius for temperature, and 40-150 mg/dl for blood glucose. We analyzed data using Stata 11.

RESULTS: The 110 VLBW infants born in the study period had a mean (SD) gestation of 28.7 (2.8) weeks and a mean (SD) birth weight of 1045 (300) grams. Of these infants, 46% were male, 73% were born by Cesarean section, 67% received a complete antenatal steroid course, and 69% received surfactant. The median (interquartile range, IQR) of the Apgar scores were 6 (3-8) and 8 (7-9) at 1 and 5 minutes respectively. In the first few hours of life 84% of infants had a blood gas sample, 95% a temperature measurement, and all a blood glucose measurement. At the time of the first blood gas, 90% were on mechanical ventilation or on continuous positive airway pressure. The first blood gas was obtained at a median (IQR) of 63 (48-95) minutes, and the first blood glucose at a median (IQR) of 48 (30-60) minutes after birth. The first documented value was in the optimal range for 73% of PCO2 values, 48% of temperature values, and 82% of blood glucose values. Hypercapnia was noted in 14% of infants, hypercarbia in 13%, and hyperthermia in 4%. There were no statistically significant differences (p>0.05) in birth weight, gestation, antenatal steroids, delivery mode, and Apgar scores between infants with PCO2, temperature or glucose values within and outside the optimal range.

CONCLUSIONS: There was wide variation in the time of obtaining the first blood gas and blood glucose samples in inborn VLBW infants. Approximately a quarter of these babies had PCO2 levels outside the optimal range, half were hypothermic, and nearly one-fifth were hypoglycemic. There is a need for standardization and consistent early assessment and management of such infants.

37 Reference Values for Nocturnal Oxygen Saturation in Healthy Preterm Infants
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BACKGROUND: When weaning formerly premature infants from supplemental oxygen in the outpatient setting, most providers utilize nocturnal oximetry studies. However, reference values for nocturnal oxygenation in the appropriate comparison group, formerly premature infants who do not require supplemental oxygen at time of Neonatal Intensive Care Unit (NICU) discharge, have not yet been defined.

OBJECTIVE: The purpose of this study is to determine reference values for nocturnal oxygenation in preterm infants who do not require supplemental oxygen at time of NICU discharge in comparison with full-term healthy infants.

DESIGN/METHODS: Overnight recordings of oxygen saturation were obtained using a Masimo Rad 7 oximeter from convenience samples of healthy full-term infants and formerly preterm infants. The preterm infants met the following inclusion criteria: (1) Corrected gestational age 35-36 weeks, with gestational age at birth ≤32 weeks, a NICU stay of at least 7 days, without need for supplemental oxygen within the last 48 hours and without future anticipated need for supplemental oxygen. Data was analyzed using ProFox software. A minimum of 7 hours of valid recording time was required for analysis. Percentage of time spent less than specific target saturation levels and number of desaturation episodes were determined.

RESULTS: This data represents 80% of the anticipated cohorts. We obtained data from 79 full-term infants and 49 preterm infants. Baseline SpO2 values for full term and former preterm infants were similar, but former preterm infants had significantly more intermittent brief desaturations (Figure 1, p<0.0001).

CONCLUSIONS: When weaning preterm infants from supplemental oxygen, the total percentage of time above the saturation levels utilized in our study can be used as a guideline for reference standards. The clinical relevance of the increased desaturation episodes seen in the preterm infants compared to full-term infants requires further study.

24 Eastern Society for Pediatric Research 2010 Annual Meeting
Analyses using the child’s report as the dependent variable and both parent reports as independent variables.

RESULTS: Adolescents’ responses were more strongly correlated with parents’ projected proxy. A 2-tailed Pearson’s correlation was performed comparing the parent’s standard proxy and parent-proxy report of QoL.

Parents were asked to complete the measure twice, first as a standard proxy and second as a projected proxy. As part of a larger study that demonstrated the validity of the measures, parents were asked to predict how their child would respond. As part of this larger study, the compliance of screening for ASD was examined.

OBJECTIVE: To examine the barriers that influence caregivers from initiating contact with a mental health professional for their child.

CONCLUSIONS: There is a higher degree of concordance between adolescents’ self-reports of QoL and parents’ evaluations when parents answer as they predict that their child would answer, than when asked to report their own opinions. These findings suggest that future parental evaluations of adolescents’ QoL, at least in this population, may more accurately portray adolescent’s opinions if framed as a projected proxy.

House Officer

39 Compliance of Pediatricians at an Urban Community Hospital with American Academy of Pediatrics Guidelines for Screening of Autism Spectrum Disorders before and after Educational Intervention

Mahesh Chikkamnath, Monideep Dutt, Fernanda Kapferman, Jose Serruya, Louis Primavera, Susana Ramanp, Kanchalak Roychoudhury.

Pediatrics, Floating Hospital Medical Center, Flushing, NY; Department of Psychology, Touro College, New York, NY.

BACKGROUND: The American Academy of Pediatrics (AAP) recommends that all children be screened for ASD at 18-month (m) and 24-m well-child visits (WCV) with a standardized screening tool like Modified Checklist for Autism in Toddlers (M-CHAT). There are limited data on which active interventions would increase the compliance of screening for ASD.

OBJECTIVE: To evaluate the screening for ASD by the pediatricians (P) at a community hospital before and after publication of AAP guidelines and then after educational intervention (EI) with grand rounds by a developmental pediatrician (DP) at the hospital.

DESIGN/METHODS: This was a retrospective, observational study by chart review of the WCV of children at 18 m and 24 m. Patients were divided into 3 groups: Group 1 (G1- May 07 to Oct 07), prior to AAP guidelines; Group 2 (G2- Nov 07 to April 08), after Nov 07 AAP guidelines; and Group3 (G3- May 08 to Sept 09), after educational intervention in May 08 by DP.

RESULTS: Of the total 199 subjects, having educational intervention increased the number of M-CHATs done at 18 m from 0% in G1 (N=47) and G2 (N=53) to 14 (15%) in G3 (N=89), which was statistically significant (p<0.001). Having EI increased the number of M-CHATs done at 24 m from 0% in G1 (N=47) and G2 (N=53) to 14 (15%) in G3 (N=89), which was statistically significant (p<0.001). At 24 m, if the pediatrician had developmental concerns about the child, the number of M-CHATs done was increased (p=0.027), but no difference was noted at 18 m. At 24m, positive M-CHAT screens increased referral to a DP/Neurologist (p=0.026). In children who had M-CHATs done, there were no significant differences whether they were seen by the attending alone or with a trainee.

CONCLUSIONS: Publication of AAP guidelines had impact on screening of ASD after educational intervention. Other strategies are needed to further increase the compliance.

40 Parental Assessments of Quality of Life of Adolescents with Autism Spectrum Disorders

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Pediatrics, Floating Hospital, Tufts Medical Center, Boston, MA.

BACKGROUND: When completing Quality of Life (QoL) questionnaires as proxies for their children, parents often ask whether they should answer questions based on their own judgment or as they believe their child would respond. As part of a larger study that demonstrated the validity of self-reported QoL among adolescents with autism spectrum disorders (ASDs), we compared parents’ ratings of their child’s QoL, first as a standard proxy, in which they responded to the questions based on their own evaluation of the adolescent’s well-being, and then as a “projected proxy,” imagining how their child would answer the same questions. Previous research using standard parent-proxy has shown only moderate concordance, at best, between adolescent self-report and parent-proxy report of QoL.

DESIGN/METHODS: Data were collected from 39 adolescents (ages 13-18) with ASDs, and one of each adolescent’s parents. Adolescents were asked to complete the PedsQL generic form, and parents were asked to complete the measure twice, first as a standard proxy and second as a projected proxy. A 2-tailed Pearson’s correlation was performed comparing the parent’s standard and projected QoL evaluations with those of their child.

RESULTS: Adolescents’ responses were more strongly correlated with parents’ projected proxy reports than with standard proxy reports for all QoL subscales [see Figure]. Additional regression analyses using the child’s report as the dependent variable and both parent reports as independent variables, showed the parent’s standard report to be non-significant in every case.

CONCLUSIONS: There is a higher degree of concordance between adolescents’ self-reports of QoL and parents’ evaluations when parents answer as they predict that their child would answer, than when asked to report their own opinions. These findings suggest that future parental evaluations of adolescents’ QoL, at least in this population, may more accurately portray adolescent’s opinions if framed as a projected proxy.

41 Resident in Training

41 Exposure of Child and Adolescent Psychiatry Fellows to Autism Spectrum Disorder

Sandy H. Rhee, Basant Pradhan, Wendy Ross.


BACKGROUND: In the last decade, there has been an increase in Autism Spectrum Disorder (ASD) cases throughout the nation. With increased concern from parents about their children having autism, they will turn to health professionals such as child and adolescent psychiatrists, pediatricians and neurologists more often for ASD evaluation and treatment. However, standards have not been developed for training child psychiatry fellows in the care of children with ASD.

OBJECTIVE: To survey child and adolescent psychiatry fellows across the nation about their level of confidence, education and clinical experience about ASD.

DESIGN/METHODS: We conducted a cross-sectional survey of all child and adolescent psychiatry fellows training in the United States. Program directors asked fellows to participate in an online anonymous questionnaire about their formal training, clinical experience, and level of confidence in identifying, treating and accessing services for children with ASD.

RESULTS: Overall 101/781 fellows (12.9%) responded: 51 were 1st year, 50 2nd year. Faculty training the fellows in ASD included a child psychiatrist 95%, plus a developmental pediatrician 35%, a child neurologist 28% or a child psychologist 47%. Exposure to ASD patients was provided at an autism clinic in 50%, a child psychiatry clinic in 36% and other settings in 11%. Regarding their clinical exposure to children with ASD in a 6-month period, 36% of fellows treated 1-5 ASD patients, 23% treated 6-10, and 37% treated >10 patients. The results also show heterogeneous responses of the amount of ASD patients they are assessing during fellowship. 13.9% reported seeing over 21 ASD patients and yet a significant percentage (35.6%) reported seeing only 1-5 ASD patients over a 6-month period. Nearly half of fellows had 4 lectures on ASD, and 1.5/ 11 lectures. The survey revealed the majority of fellows felt confident in diagnosing (82%), treating (68%) and providing services (58%) for ASD patients. Fellows that reported the highest confidence level in treating ASD also reported minimal clinical exposure to ASD patients, 31.7% of these fellows evaluated only 1-5 patients over a 6-month period.

CONCLUSIONS: Currently, formal training and clinical exposure to children with ASD in child psychiatry fellowships is highly variable. The results seem to suggest high confidence levels even with limited clinical exposure. Development of standards and practices in educating psychiatric fellows about ASD should be considered.

42 Factors Affecting Parental Mental Health Treatment Initiation in Children and Adolescents

Elliott V. Levin, Joy P. Brock, Jane B. Henderson.

Children’s Hospital of The King’s Daughters, Norfolk, VA.

BACKGROUND: Many parents and guardians fail to follow up on mental health referrals for their children resulting in a crisis or emergency when the child’s problems escalate. Most literature has focused on the mental health treatment process and outcomes without examining barriers preventing caregivers from making the initial contact with a mental health care provider.

OBJECTIVE: To examine barriers that influence caregivers from initiating contact with a mental health referral following a primary care visit with a pediatrician or clinical social worker.

DESIGN/METHODS: Caregivers of children 2-18 years of age, who were initially seen by their primary care physician and then referred for mental health services, were contacted by phone 3 weeks after their initial pediatric appointment and were asked to participate in a single phone survey session. Data were collected over a one year period using a modified version of Kassir’s Barriers to Treatment Participation Scale-Parent, which examines the caregiver’s perceptions of the barriers to initiating contact with a referral.
RESULTS: Reasons for mental health referrals are listed in Table 1.

<table>
<thead>
<tr>
<th>Mental Health Referrals</th>
<th>Total Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>24</td>
</tr>
<tr>
<td>Attention</td>
<td>25</td>
</tr>
<tr>
<td>Depression</td>
<td>17</td>
</tr>
<tr>
<td>Anxiety</td>
<td>11</td>
</tr>
<tr>
<td>Anger</td>
<td>28</td>
</tr>
<tr>
<td>Sleep</td>
<td>55</td>
</tr>
<tr>
<td>Item</td>
<td>6</td>
</tr>
</tbody>
</table>

*Numbers are greater due to multiple reasons for referral.

Of 190 eligible subjects, 134 could not be reached for follow-up because of disconnected phones, invalid numbers or unreturned phone calls. A principal components analysis (with Varimax rotation) was conducted to examine the overall structure of barriers, revealing three factors related to structure, resource and need issues. A logistic regression comparing contact with a referral to the three factors indicated that for each standard unit increase in caregivers’ perceptions of the need for mental health services, participants were 2.53 times more likely to initiate contact with a referral.

Table 2

<table>
<thead>
<tr>
<th>Logistic Regression</th>
<th>R</th>
<th>Wald</th>
<th>Odds Ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>2.2</td>
<td>6.7</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Resource</td>
<td>2.9</td>
<td>6.7</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>9.3</td>
<td>6.7</td>
<td>2.53</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*NS = non-significant

CONCLUSIONS: The first step to seeking out mental health services is initiating contact with a mental health provider. External barriers appear less important to caregivers than the internal barrier of perceived need for mental health services. Future research could examine caregivers’ perceptions of the need for or benefits of seeking mental health services.

43 The Role of a Community Hospital in Implementing a School-Based Seasonal Influenza Vaccination Project in the South Central Bronx

Lauren C. Brown, Murli Purswani, Tess K. Wiskel, David D. Blomquist, Sarah E. Sullivan, Julie A. Comley, Anne Burrowes, Diane G. Stronc.

Bronx-Lebanon Hospital Center, Bronx, NY; Community Health Education Center, Bronx-Lebanon Hospital Center, Bronx, NY.

BACKGROUND: Influenza (flu) vaccination rates reveal that only 8.9% of children between the ages of 2-17 without a high-risk condition receive their annual flu vaccine. Several studies have shown that conducting school-based flu clinics may represent an alternate strategy to increase vaccination rates and provide herd immunity.

OBJECTIVE: 1) To design and implement a school-based flu vaccination program through a community hospital in 8 South Central Bronx primary and middle schools. 2) To immunize 20% of students in these 8 schools.

DESIGN/METHODS: The Department of Education assisted in identification of 8 primary and middle schools in close proximity to Bronx-Lebanon Hospital. Once schools were identified and partnerships established, consent forms (English, Spanish and French) were distributed at back-to-school nights and given to schools to send home with students. Vaccine history of each consented child was verified in the New York Citywide Immunization Registry (CIR). School flu clinics occurred between 10/9/09-11/6/09. Intranasal and killed vaccines were administered as indicated by a small team of practitioners while 3-5 staff/volunteers from the hospital’s Community Health Education Center provided administrative support. After each flu clinic, all vaccine doses were entered into the CIR. The Department of Health and Mental Hygiene, Bureau of Immunization, NYS provided medical supplies, vaccine, and program development support.

RESULTS: Of 5,186 students enrolled in all 8 schools, 1,340 (26%) returned consent forms and 854 (16.5%) were vaccinated. An additional 163 doses were administered to teaching staff, yielding a total of 1,017 flu doses given over a 28-day period. Consent form return rates ranged from 10%-59%, while vaccination rates ranged from 7%-38% in each school student population. The disparity between consent form return rates and vaccination rates is due to students who had already received the vaccine (31%), parents who refused the vaccine (23%), incomplete forms (15%), forms turned in late (14.4%), absenteeism (10%), and others (6.6%).

CONCLUSIONS: Using a local hospital as an intermediary when implementing a school-based flu vaccination program may be an effective strategy in a diverse, low-income community. Support from and partnership with the Departments of Health and Education helped ensure an optimal outcome.

44 Fellow in Training

Estimating Validity and Accuracy of Vaccine Recall

Sachin N. Desai, Daina Esposito, Marietta Vazquez.

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BACKGROUND: Vaccines are often given during a limited period and the chance of receipt during pregnancy is substantial. Reliability of report of influenza vaccine was measured at 83.6%, Se of 88.6%, Sp of 81.3%, PPV of 68.4%, NPV of 94%, and a k of 0.647. Agreement between sources was greatest for subjects with a shorter RT. Reliability of parent recall for varicella vaccination (N=2967) was higher (C 97.1%, Se 97.8%, Sp 95.1%, PPV 98.8%, NPV 98.7%, and a k of 0.806). Reliability of neonatal report of rotavirus vaccine was substantially lower (C 80.1%, Se 94.3%, Sp 77.8%, PPV 40.7%, NPV 98.8%, and a k of 0.465).

CONCLUSIONS: While parental and self vaccine recall was reasonable, there were differences in validity and accuracy by vaccine type.

45 Effect of Massage on Methadone Exposed Infants, RCT

Yun J. Lee, Barry M. Lester, Mary M. Roberts, Pauline Wright, Joseph M. McNamara.

Pediatrics, Women and Infants Hospital of R.I, Brown University, Providence, RI.

BACKGROUND: There has been a study on the effect of massage for infants from Methadone exposure although it improved weight gain and behavior for preterm infants.

OBJECTIVE: To see the utility of massage for neonates withdrawing from Methadone exposure.

DESIGN/METHODS: Infants are enrolled as preterm (PT=35-6 weeks) or full term (FT=37-42 Weeks) at 2 sites. Infants requiring Morphine to capture dose are given Phenobarbital loading of 10 mg/kg twice followed by maintenance at 2.5 mg/kg q12h. Infants are randomized after the loading either to massage=SCM or standard care(SC) alone once a day 5 times a week till weaning of morphine. Data are analyzed on LOS, NAS scores, the rate of decrease on morphine dose and NICU Network Neurobehavioral Scale (NNNS) summary scores. Statistical methods are general linear modeling, survival analysis and hierarchical linear modeling.

RESULTS: N=73 at the completion of the study. Demographics: two groups are comparable in numbers of male, GA, BW, HC, Apgars, 2 NAS scores before morphine, maternal Methadone dose, age, parity, education level, smoking and other drug use except cocaine. 1. Overall LOS was shorter for M group (P=0.04) due to PT with covariates of maternal Methadone dose, use of benzodiazepine and smoking. 2. The rate of decrease on Morphine was faster for PT group (P=0.004). 3. There was no difference on peak daily NAS scores for M and SC groups. 4. There was no difference between M and SC groups among FT on NNNS summary scores with covariates on sites. 5. Phenobarbital and Morphine improved quality of movements, hypertension and excitability in FTP (P=0.05). 6. They improved regulation in all groups but not stress/abstinence.

CONCLUSIONS: M improved attention in PT only after 5 days of massage. FL in PT was comparable and SC was not related to maternal Methadone dose. The rate of decrease on Morphine was more rapid for PT massage group than for SC. The rate of decrease was not significant among M and SC in FT. There was no difference on NNNS summary scores among M and SC in FT. Morphine and Phenobarbital affected PT and FT differently on NNNS summary scores. Massage improved attention in PT only.

46 Provider Acceptance of Universal Depression Screening

William Rausch, Karen Swartz.

Division of General Pediatrics, Columbia University, New York, NY.

BACKGROUND: Adolescent depression is common with serious outcomes. The U.S. Preventive Services Task Force recently recommended annual depression screening by primary care providers for all 12-18 year olds. Despite these recommendations, it is unclear how receptive providers will be to implementing screening due to time pressures and a lack of mental health providers.

OBJECTIVE: To identify the provider acceptability of universal screening for adolescent depression in pediatric primary care practices at an academic medical center.

DESIGN/METHODS: Over a 6 month period (July-December 2008) 598 patients aged 13 to 20 presenting to 3 pediatric primary care practices in an academic medical center were screened for depressive symptoms using the bilingual Columbia Depression Scale (CDS) at well and acute visits. A provider pre-survey (n=34) was conducted using 15 close and open ended questions to assess providers’ attitudes toward mental health screening and their beliefs on barriers to such screening and treatment. A post survey (n=30) was completed 4 months after the screening concluded and included the original questions plus 10 additional questions on CDS usage. Percentages were calculated and Fischer’s Exact Tests were utilized to determine changes in providers’ attitudes. A provider pre-survey (n=34) was conducted using 15 close and open ended questions to assess providers’ attitudes toward universal screening and their beliefs on barriers to such screening and treatment.

RESULTS: Forty-three providers utilized the CDS to screen patients and the same number filled out at least one survey with 21 filling out both a pre and post survey (60% residents). Prior to implementation of CDS screening, all providers felt it was their duty to identify mental health problems, but 35% were uncomfortable or uncertain about their comfort addressing adolescent depression. After the screening study, only 23% felt uncomfortable or uncertain about their comfort addressing adolescent depression. A provider pre-survey (n=34) was conducted using 15 close and open ended questions to assess providers’ attitudes toward mental health screening and their beliefs on barriers to such screening and treatment.

CONCLUSIONS: Primary care providers seemed to be receptive to depression screening during well adolescent visits, and implementation of screening appears to increase provider comfort addressing adolescent depression and had a positive impact on the patient-provider relationship. More work is required to make screening more efficient and sustainable.
Urogenital Symptoms in Pre-Menarchal Girls: Prevalence and Associations

Cynthia W. DeLago, Carmen V. Vásquez, Claudia Clarke.

Pregnancy, Albert Einstein Medical Center, Philadelphia, PA; Pediatrics, University of Medicine and Dentistry of New Jersey, Stratford, NJ.

BACKGROUND: Pre-menarchal girls with dysuria, genital soreness, pruritus, bleeding or vaginal discharge are diagnosed with vulvovaginitis when no other cause is found. A wide variety of chemical and mechanical irritants have been attributed to it, but no published studies describe prevalence, relationship to irritants/medical conditions.

OBJECTIVE: Describe prevalence and associated factors of urogenital symptoms in pre-menarchal girls.

DESIGN/METHODS: We surveyed 5-12 yr-old girls and their parents arriving for well-child visits at an urban, hospital-based pediatric office. Girls and their parents were questioned separately about past urogenital symptoms and perceived causes. Girls’ history of eczema, other medical conditions and medications, and exposure to genital irritants over the past year (tight-fitting underwear/pants/bathing suits, nylon underwear, bike or horseback riding, bubble baths, soap, shampoo, genital hygiene, and genital trauma) were obtained from the parent. We explored associations between genital irritants, medical conditions and urogenital symptoms.

RESULTS: One hundred thirty-seven 5-12 yr-old girls arrived consecutively for well-child visits July-August, 2009. 106 were pre-menarchal and consented. Parents of 24 girls reported their daughters ever had urogenital symptoms not attributed to medical conditions or trauma (prevalence: 23%); however, 48 girls reported ever having urogenital symptoms (prevalence: 45%). Most parents (30%) and girls (44%) could not identify a cause for the symptoms; of those that could, symptoms were attributed to poor hygiene (27% parents, 30% girls) and soap on the genitalia (21% parents, 12% girls). Genital irritant exposures most associated with parents’ reports of girls’ genital pruritus were: wearing tight underwear/pants/bathing suits; genital exposure to soap; and poor genital hygiene (all p<0.01, Fisher’s Exact test). Genital irritant exposures most associated with girls’ reports of genital soreness were soap and poor genital hygiene (all p<0.01, Fisher’s Exact test). No association between parents’ or girls’ symptom reporting and eczema was found.

CONCLUSIONS: Urogenital symptoms are common in pre-menarchal girls and are associated with wearing tight underwear/pants/bathing suits, soap exposure and poor genital hygiene. Eczema was not associated with symptom reporting. Understanding factors associated with urogenital symptoms can help health care providers prevent and treat this problem.

Urogenital Symptom-Reporting: Sexual Abuse vs. Exposure to Genital Irritants in Pre-Menarchal Girls

Cynthia W. DeLago, Martin Finkel.

Pediatric, Albert Einstein Medical Center, Philadelphia, PA; Pediatrics, University of Medicine and Dentistry of New Jersey-School of Osteopathic Medicine, Stratford, NJ.

BACKGROUND: Diagnosis of sexual abuse is often based on girls’ histories describing idiosyncratic details, such as symptoms related to abuse (dysuria, genital soreness, pruritus, vaginal discharge or bleeding). These symptoms also occur after exposure to genital irritants.

OBJECTIVE: Explore frequency/type of urogenital symptoms reported by pre-menarchal girls after inappropriate genital contact vs. genital irritant exposure.

DESIGN/METHODS: We surveyed 5-12 y/o girls arriving for sexual abuse exams (abuse group) at a regional abuse referral center and girls arriving for well-child exams at an urban pediatric office (control group). Girls disclosing inappropriate genital contact before menarche (abuse group) and pre-menarchal girls having recent exposure to a genital irritant (control group) were included. Parents were separately asked about their child’s overall and most recent genital irritant exposure and history of urogenital symptoms. Girls were asked scripted, open-ended questions to elicit symptoms temporally related to abuse or genital irritant exposure.

RESULTS: 24 /104 (abuse group) and 107/153 (control group) girls met inclusion criteria. Both groups had similar mean ages (8.5 yrs, SD 2.3, range 5.3-12.6 yrs), and prevalence of eczema, 21% vs. 26%. Genital exposures for both groups were similar in both groups, but more girls in the abuse group had exposure to tight underwear/pants/bathing suits, 67% vs. 27%, shampoo, 25% vs. 4%, and bikes, 92% vs. 74%. When asked how her genitalia felt after inappropriate contact or genital irritant exposure, 79% of abuse girls vs. 35% of controls stated it felt bad, hurt, burned, stung, or itched. When asked if it bothered her body, feelings or both, 8% of abuse girls said it bothered her body only and 54% said it bothered both; 33% of controls said it bothered her body and 1% said it bothered both. When asked if it hurt to do anything after, 29% of abuse girls said it hurt to urinate vs. 14% of controls.

CONCLUSIONS: When girls are asked specific open-ended questions about genital symptoms temporarily related to inappropriate genital contact vs. genital irritant exposure, sexually abused girls describe more symptoms than girls exposed to genital irritants, further supporting the value of taking a medical history when examining girls for possible sexual abuse.

Pulmonary Hemodynamics in Asphyxiated Lambs Resuscitated with 21% and 100% Oxygen

Fabio J. Savorgnan, Daniel D. Swartz, Bobby Mathew, Karen A. Wynn, Rita M. Ryan, Satyan Lakshminrusimha.

Pediatrics, University at Buffalo, Buffalo, NY.

BACKGROUND: The optimal oxygen concentration during resuscitation post-asphyxia is unknown. Oxygen is a potent and specific pulmonary vasodilator. Previous studies evaluating pulmonary hemodynamics with 21% and 100% oxygen in asphyxiated animals were conducted in 1-3 day old piglets in which the pulmonary vascular resistance (PVR) has already decreased postnatally. The effect of 21% oxygen resuscitation at birth in asphyxiated hyperanimalic animals with high PVR is not known.

OBJECTIVE: To evaluate changes in pulmonary hemodynamics following acute asphyxia by unblinded cord occlusion and resuscitation with 21% and 100% oxygen at birth.

DESIGN/METHODS: Term fetal lambs (141d) are partly exteriorized and instrumented to measure systemic blood pressure (SBP) and PVR. The umbilical cord is occluded and blood gases, PVR, SBP, heart rate, and arterial saturation are monitored every 1-2 min for 30 min or until heart rate decreases below 60 beats/min, whichever is earliest. The lamb is then mechanically ventilated for 30 min with either 21% or 100% oxygen and blood gases, SBP, PVR are monitored.

RESULTS: Nine lambs were instrumented and underwent asphyxiation by cord occlusion; 2 lambs died. Cord occlusion for 10 min results in hypercarbia and acidosis (pH 6.9±0.07, pCO2 101±14mmHg) with increased PVR. Resuscitation resulted in rapid decrease in PVR. Resuscitation with 21% or 100% oxygen ventilation resulted in marked differences in PaO2 but the decrease in PVR was similar in both groups.

Arterial Blood Gases

<table>
<thead>
<tr>
<th></th>
<th>pH</th>
<th>pCO2</th>
<th>pO2</th>
<th>pH</th>
<th>pCO2</th>
<th>pO2</th>
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<tbody>
<tr>
<td>Fetal</td>
<td>7.31±0.07</td>
<td>99.6±7</td>
<td>214±4</td>
<td>7.32±0.07</td>
<td>50.6±5</td>
<td>201±11</td>
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<tr>
<td>After cord occlusion</td>
<td>7.02±1</td>
<td>97.1±14</td>
<td>5.5±5</td>
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<td>109.3±31</td>
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<td>5min resuscitation</td>
<td>7.51±0.02</td>
<td>39.5±5</td>
<td>89.1±10</td>
<td>7.14±1.1</td>
<td>54.1±18</td>
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<td>30min resuscitation</td>
<td>7.24±1.2</td>
<td>36.2±5</td>
<td>52.1±13</td>
<td>7.26±0.4</td>
<td>42±2</td>
<td>459.6±2</td>
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CONCLUSIONS: In asphyxiated lambs with hypercarbia and pulmonary hypertension, 21% oxygen resuscitation at birth results in similar fall in PaO2 as 100% oxygen.

Objective: To determine the effect of birth hyperoxia on the levels of tumor necrosis factor alpha (TNF-alpha), Interleukins 1 Beta (IL-1B), 2 (IL-2), 4 (IL-4), 6 (IL-6) and 8 (IL-8) in the lungs of Sprague-Dawley rats.

Design/Methods: Four groups of time-pregnant Sprague-Dawley rat pups underwent transient uterine knockout of CFTR by anti-sense CFTR (ASCFTR) using a replication-deficient, adenovectored virus vector at 16 days gestation or Expressed Green Fluorescence Protein (EGFP) control. Dames delivered naturally & litters were placed in either room air or 100% hyperoxia for 24 hours after birth & recovered in room air. Lungs were harvested immediately after hyperoxia and on day of life 28. Immuno-histochemistry was performed on frozen sections to assay for levels of TNF-alpha, IL-1B, IL-2, IL-4, IL-6 and IL-8. Pixel count was used via quantitative confocal microscopy from 20 microscopic images per antibody. ANOVA testing with Bonferroni Correction was used to determine significance.

Results: Lung TNF-alpha levels were elevated after hyperoxia in the EGFP group on day 1 (p<0.003) but not the ASCFTR group. By DOL 28, both hyperoxia groups were below control (p<0.0001). IL-1B levels were increased after hyperoxia on DOL 1 both in the ASCFTR and EGFP groups (p<0.0001 for both), but remained elevated in the ASCFTR group by DOL 28 (p<0.0017). IL-4 levels were increased in response to hyperoxia on DOL 1 but decreased in the ASCFTR group (p=0.001, both). The ASCFTR group exhibited higher lung IL-4 than EGFP (p<0.001). By DOL 28, this difference normalized. Lung IL-6 was undetectable in the EGFP group on DOL 16 (p=0.0008). Lung IL-2 levels were increased in response to hyperoxia in the EGFP group on DOL 1. IL-8 levels in the ASCFTR animals were increased on DOL 1 after hyperoxia compared to control but decreased by DOL 28 (p=0.001 for both).

Conclusions: DISRUPTED lung organogenesis caused by TIUKO of the CFTR gene results in an abnormal inflammatory response to hyperoxia in the lung of Sprague-Dawley rats. This altered response only partially normalizes with time.


Objective: Antenatal magnesium administration improves lung function in postnatal period and induces structural and functional changes in the developing lung.

Design/Methods: Timed-pregnant Sprague Dawley rat dams were administered two (0.04 mg and 0.4mg) different doses of magnesium into amniotic sac at gestational age e16. Respiratory function testing was performed on day 9,10 and 11 at 3 different levels of positive end expiratory pressures (PEEP) of 0.3, 0.6 and 6 cm H2O. Unpaired T test was used to compare the PEEP and magnesium was performed on rat lungs, gestational age e16 that were exposed to antenatal magnesium at two (0.04mg and 0.004mg) different doses. Slide Book software was used for deconvolution and quantitation.

Results: Administration of 0.04mg of magnesium resulted in survival of pups. Administration of 0.4mg of magnesium was uniformly fatal in the fetal period. The respiratory function showed increased in airway resistance and tissue damping. There was no statistically significant difference in static compliance or hysteresis. The increase in airway resistance was noted in all levels of PEEP(0.3, and 6) with a P value 0.001. Elastance increased at a PEEP0.3 with a P0.001 and P0.05 of 6. Tissue damping increased in all level of PEEP (0.3 and 6) P0.01 of PEEP 0.3 correlates with decrease in compliance. The immunohistochemistry studies showed decrease uptake of the phosphorylated myosin light chain (MLC) with increasing levels of magnesium.

Conclusions: We conclude that rat pups exposed to antenatal magnesium at a dose of 0.04mg show more mature lung state compared to the controls. Based on magnesium and calcium homeostasis and the principles of stretch induced lung disease, we theorize the inhibition of calcium by magnesium, leads to decreased activation in the developing airway. The decreased uptake of phosphorylated MLC demonstrates the antagonizing effects of magnesium on calcium.


Objective: To determine the effect of birth hyperoxia on the levels of tumor necrosis factor alpha (TNF-alpha), Interleukins 1 Beta (IL-1B), 2 (IL-2), 4 (IL-4), 6 (IL-6) and 8 (IL-8) in the lungs of Sprague-Dawley rats.

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changes in expression of PAI-1. However the role of PAI-1 SNPs in BPD is unstudied.
OBJECTIVE: We hypothesize that PAI-1 SNPs which alter expression of PAI-1 are associated with ELBW infants who progress to BPD.

DESIGN/METHODS: This is an ongoing cohort study of infants weighing <1 kg at birth, without congenital or chromosomal anomalies. BPD was defined as oxygen dependence at 36 weeks post-menstrual age. DNA was isolated from buccal mucosal swabs followed by allelic discrimination utilizing specific probes for PAI-1-rs2227631 and rs2227672 by Real-time PCR. Chi square analyses and ANOVA were performed, with P<0.05 denoting statistical significance.

RESULTS: Patient demographic data revealed significant differences in birth weight and gestational age for those with BPD, as expected.

There were no statistically significant associations between either of these two SNP genotypes and BPD. It was however noticed that 4 out of 5 babies with the AG, GT (rs2227631, rs2227672; respectively) haplotypes did not develop BPD.

CONCLUSIONS: In the early phase of this investigation into potential genetic foundations of BPD contributed by the fibrinolytic pathway, we did not detect an association between either of the 2 PAI-1 SNPs tested and BPD.

57

Medical Student

10:15 AM
Vascular Endothelial Growth Factor Gene Polymorphism Is Associated with Susceptibility to Bronchopulmonary Dysplasia in ELBW Infants
New York Medical College, Valhalla, NY; Division of Newborn Medicine, Maria Fareri Children’s Hospital, Valhalla, NY.

BACKGROUND: The VEGF pathway has been associated with proliferation, differentiation and apoptosis of many cell types including lung epithelial cells. VEGF is a known growth factor involved in pulmonary vascular morphogenesis and alveologenesis. Variation in VEGF levels have been associated with several pulmonary diseases such as respiratory distress syndrome and bronchopulmonary dysplasia, BPD. Specifically, the 936 C/T SNP, located in the 3’ untranslated region, has been associated with variable plasma levels, with the minor allele causing increased VEGF expression.

OBJECTIVE: We tested the hypothesis that SNPs of VEGF contribute to the susceptibility to BPD in ELBW infants.

DESIGN/METHODS: This is an ongoing cohort study from 2002 to present, for infants weighing <1 kg at birth, without congenital or chromosomal anomalies. BPD is defined as the need for oxygen at 36 weeks postmenstrual age (PMA). DNA was isolated from buccal mucosal swabs via DNA adsorption to a silica gel based membrane. Allelic discrimination was then performed using specific probes for VEGF-410, -936, -1154 with Real-time PCR. Chi square analyses and ANOVA were performed with \( P<0.05 \) denoting statistical significance.

RESULTS: Lower gestational age and birthweight were associated with BPD severity, as expected. No differences in racial distribution were seen between the BPD and Non-BPD groups. VEGF SNP 936 approached significance \((P=0.07)\) when this genotype was compared between infants with BPD and those without BPD.

CONCLUSIONS: VEGF 936 polymorphism is associated with BPD severity. We speculate that this SNP, located in the 3’UTR may increase expression of VEGF, and contribute to the vascular remodeling associated with BPD.

2010 ESPR Abstracts

Philadelphia, PA • March 26-28

29
58
8:15 AM
IUGR Inhibits Pulmonary VEGF Expression in Rat Pups
Omotola O. Uwaifo, Norma B. Odeja, Barbara T. Alexander,
Division of Newborn Medicine, University of Mississippi, Jackson, MS; Department of Physiology, University of Mississippi, Jackson, MS.
BACKGROUND: An insult to a fetus at a critical period of development may result in permanent adaptive changes which lead to long term changes in organ structure and function (Barker 1994). Studies suggest that intrauterine growth restriction (IUGR), a crude marker for poor fetal development, can lead to impaired pulmonary development and function, yet the mechanism(s) has not been fully elucidated. Utilizing a rodent model of reduced uterine perfusion pressure (RUPP) that leads to IUGR by a reduction of nutrient and oxygen supply in utero, we are investigating mechanisms by which angiogenic factors may negatively affect pulmonary vascular development and consequently pulmonary structure and function.
OBJECTIVE: The objective was to investigate the role of IUGR on pulmonary VEGF expression.
METHODS: IUGR was induced at E14 in timed pregnant Sprague Dawley rats via the RUPP procedure. Briefly, silver clips was placed around the abdominal aorta above the iliac bifurcation and on both the right and the left ovarian arteries. Pups were spontaneously delivered and were kept with dams for the duration of the experiment. Pups were weighed daily and sacrificed on days P5, P14 and P28. Lungs were harvested, weighed and flash frozen in liquid nitrogen. Lung homogenates were prepared and VEGF protein was measured using the mouse VEGF (Quantikine assay (R&D Systems).
RESULTS: a) While there were significant differences in lung weight and body weight, there were no significant differences in the lung/body weight ratio between Control and IUGR pups, at each time period. b) There was a significant reduction in the VEGF protein expression in IUGR pups at days P14 and P28, but not at day P5. While VEGF expression increased with age in Control pups, this increase was blunted in IUGR pups.
CONCLUSIONS: This data suggests that IUGR induced by RUPP inhibits the expression of VEGF in the lung. This inhibition may negatively affect pulmonary vascular development and contribute to alterations in pulmonary development and function in IUGR offspring.

60
8:45 AM
CC10 mRNA Expression during Early Development: Impact of Surfactant and rhCC10 Treatments
BACKGROUND: CC10 is a pleiotropic anti-inflammatory protein secreted by airway clara cells and is deficient in the immature lung. Acute and iatrogenic inflammation has been hypothesized to precipitate progression to bronchopulmonary dysplasia from respiratory distress syndrome (RDS).
RESULTS: We have previously shown that surfactant treatment (SFT), followed by recombinant human clara cell secretory protein 10 (rhCC10) administration, reduces inflammation (J Appl Physiol 2005;99:2204-11) and increases surfactant and VEGF expression (Am J Physiol Lung Cell Mol Physiol 2005;289:L57-65) compared to SFT alone. The effect of SFT and/or rhCC10 on endogenous CC10 expression (CC10exp) in early development is unknown.
OBJECTIVE: To evaluate the effect of SFT and/or rhCC10 on CC10exp in the preterm lamb with RDS.
METHODS: No Treatment SFT Alone SFT + rhCC10
CC10exp (x 10-3) 6.62 ± 1.34 5.64 ± 3.04 0.60 ± 0.25
IL – 6 (ng/gm tissue) 134.6 ± 39 132.7 ± 30 16.6 ± 1.90*

CONCLUSIONS: These data demonstrate that rhCC10, and not SFT, alters CC10exp and IL-6 in the ventilated lung during early development. Given this SFT independent effect, we speculate that rhCC10 causes negative feedback by reducing inflammation. Further study is needed to quantify the action of other animal derived and synthetic SFT, corresponding inflammatory profiles, and rhCC10 dosing strategies on CC10exp as a protective strategy against inflammatory-induced lung disease. Support: NIH ST32HL091804, P20RR020173; Clarasse, Inc. (Clargen, Inc.); Ross Labs.

61
9:00 AM
Ph.D. Student
MicroRNA miR-205 Is Downregulated during Type II Alveolar Epithelial Cell Differentiation
Ruth B. Seabrook, Haiyan Xiaio, Linda W. Gonzales, Qing S. Lin.
Division of Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA; University of Pennsylvania School of Medicine, Philadelphia, PA.
BACKGROUND: Arrested lung development with incomplete pulmonary cell differentiation contributes significantly to the development of Bronchopulmonary Dysplasia (BPD). Therefore, understanding the molecular mechanisms of alveolar type II cell differentiation will provide insights into the mechanism of BPD pathogenesis and potentially identify novel therapeutic strategies. MicroRNAs (miRNAs) are a class of small, non-coding RNAs that are thought to play a crucial role in development and human disease. Previous studies using miRNA micro-arrays demonstrated that miR-205 undergoes a 10-fold decrease in expression following type II cell differentiation.
OBJECTIVE: To characterize the expression of miR-205 both in vitro and in vivo during alveolar epithelial differentiation, and to identify potential mechanisms of action of miR-205 in regulating differentiation.
METHODS: No Treatment SFT Alone SFT + rhCC10
Relative CC10exp (x 10-3) 8.62 ± 1.34 8.64 ± 3.04 0.60 ± 0.25
IL – 6 (ng/gm tissue) 154 ± 3.39 156.7 ± 3.30 16.6 ± 1.90*

CONCLUSIONS: These studies demonstrate that rhCC10, and not SFT, alters CC10exp and IL-6 in the ventilated lung during early development. Given this SFT independent effect, we speculate that rhCC10 causes negative feedback by reducing inflammation. Further study is needed to quantify the action of other animal derived and synthetic SFT, corresponding inflammatory profiles, and rhCC10 dosing strategies on CC10exp as a protective strategy against inflammatory-induced lung disease. Support: NIH ST32HL091804, P20RR020173; Clarasse, Inc. (Clargen, Inc.); Ross Labs.
CONCLUSIONS: MiR-205 is significantly downregulated during lung alveolar epithelial development, particularly type II cell development. Failure of downregulation may be associated with the development of BPD. Experiments are ongoing to determine potential regulatory targets of miR-205.

62 9:15 AM
Knock-Down of Presenilin-1 (PSEN-1) Blocks ErbB4-Regulated Surfactant Synthesis in MLE-12 Cells
Anika Ritzkat, Ekaterina Pringe, Melissa Dere, Cristina Seagin, Oya Guenegozu, MaryAnn Y. Volpe, Christopher D. Mann, Heber C. Nielsen, Tufts Medical Center, Boston, MA; Hanover Medical School, Hanover, Niedersachsen, Germany; Tufts School of Medicine, Boston, MA.
BACKGROUND: ErbB4 receptor signaling is critical for type II cell maturation and surfactant synthesis. We reported that ErbB4 knock down inhibits surfactant protein production. The specific signaling pathway through which this is mediated is not known. A novel ErbB4 signaling mechanism we have identified is presenilin-1 (PSEN-1), a membrane cleavage of ErbB4 by the γ-secretase enzyme complex, followed by nuclear transport of the intracellular cleavage product. We have also shown that expression of PSEN-1, the active enzyme component of the γ-secretase complex, is strongly increased in late gestational age fetal mouse alveolar type II cells.
OBJECTIVE: We hypothesized that ErbB4 control of surfactant synthesis requires the activity of PSEN-1.
DESIGN/METHODS: We used pre-designed siRNAs (Applied Biosystems) targeting three separate regions of the PSEN-1 mRNA to knock down PSEN-1. We studied the effect of knock down on SP-B and SP-C mRNA levels using MLE-12 cells. First, to optimize conditions, cells were transfected with cocktails containing different levels of equimolar amounts of the three PSEN-1 siRNA sequences using Dharmafect 2 (Dharmacon) as the transfection reagent. Then RT-PCR was used to measure SP-B and SP-C mRNA with beta-actin as an internal standard. Results were expressed as the % change after PSEN-1 knockdown of siRNA-treated controls. RESULTS: Optimum knock down (80% after 48 hrs) was achieved by a cocktail containing 3 nM of each sequence. Data for surfactant protein mRNA are the averages of two experiments, each done in triplicate. PSEN-1 knock down reduced mRNA for both SP-B (67% of scrambled control) and SP-C (61% of scrambled control). Treatment with scrambled siRNA or Dharmafect alone did not significantly affect SP-B or SP-C mRNA compared to untreated controls.
CONCLUSIONS: These data support the hypothesis that PSEN-1 activity is a crucial component of ErbB4 signaling regulation of SP-B and SP-C gene expression in MLE-12 type II cells. Interpretation in the context of our previous studies, these data support a model of ErbB4 signal transduction involving nuclear localization of the intracellular ErbB4 fragment for regulation of surfactant protein synthesis.Funding: NIH HL085648, HL07390, Gerber Foundation, Peabody Foundation, Tufts Institutional Grant

63 9:30 AM
MiR-221 and miR-130 in Developing Lung: Role in Hox Gene Regulation
Cell, Molecular and Developmental Biology, Tufts University, Boston, MA; Newborn Medicine, Floating Hospital at Tufts Medical Center, Boston, MA.
BACKGROUND: MicroRNAs regulate expression of Hox transcription factors including ones necessary for lung development. Hoxa5 and Hoxb5 have distinct functions in lung alveolar and airway formation. Hoxa5 is regulated by miR-130a and Hoxb5 by miR-221 in other cell types. Specific regulation of Hoxa5 and Hoxb5 in developing lung by these miRNAs is unknown.
OBJECTIVE: We hypothesize that miR-130a and miR-221 help control lung development through regulation of Hoxa5 and Hoxb5.
DESIGN/METHODS: Expression of miR-130a and miR-221 was determined in E15-18 fetal mouse lungs by qRT-PCR (normalized to E15). In situ hybridization was used in E16-E18 fetal mouse lung tissue sections to identify cell-specific miR-130a and miR-221 expression. To study effects of miR-130a and miR-221 down-regulation or up-regulation on lung development, E14 whole fetal mouse lungs were cultured ex vivo (48hr) with control (scrambled) or anti-miR or mimics to miR-130a and 130b, respectively. MiR-130a- and miR-221-mediated changes in Hoxa5 and Hoxb5 expression were determined at E14 and E21. RESULTS: miR-130a- and miR-221 RNA levels remained unchanged from E15-E17. At E18, miR-130a decreased slightly but miR-221 increased significantly (~20-fold). Spatial and cellular localization differentially changed with advancing gestation. MiR-130a expression was more intense in epithelium than mesenchyme at E16. Mesenchymal expression increased at E17 but epithelial expression decreased in distal airways. By E18, miR-130a was restricted to mesenchyme and columnar epithelium of more central airways. Conversely, at E16, miR-221 was strongly expressed in both bronchial epithelium and mesenchyme. At E17, epithelial expression decreased whereas mesenchymal expression remained strong around central airways. At E18, mesenchymal expression became even more intense and epithelial expression remained minimal. Cells with miR-130a treatment led to smaller lungs with reduced airway branching whereas mimics 130a treatment led to much larger lungs, with numerous finely arborized branches that extended into central lung regions. Conversely, anti-miR-221 treated lungs had more distal branch generations whereas mimics 221 treated lungs had less airway branching and more dilated airways. CONCLUSIONS: MiR-130a and miR-221 temporal, spatial and cell-specific expression as well as induced alterations in lung branching caused by these miRNAs parallel our published work on Hoxa5 and Hoxb5 in developing lung and support lung-specific regulation of Hoxa5 and Hoxb5 by expression of miR-130a and miR-221, respectively. Support: HL37930, HD044784, TMC Grant, Peabody Foundation.

64 9:45 AM
MUC1 in the Developing Lung: Response to Inflammation
BACKGROUND: Mucins are a family of high-molecular-weight glycoproteins present in mucus. MUC1/MUC1 (MUC in human; Muc in nonhuman) is a membrane-tethered mucin expressed on the surface of mucosal epithelial cells. Recent studies demonstrate that airway MUC1/MUC1 has an anti-inflammatory effect and is likely important to the pro- and anti-inflammatory balance that determines lung protection. During early development, the lung is deficient in anti-inflammatory defenses such as surfactant proteins and CC10, a Clara cell-secreted pleiotropic protein. It is unknown if lung MUC1 is 1) developmentally regulated or 2) responsive to exogenous surfactant therapy (ST) and/or rhCC10 anti-inflammatory therapy.
OBJECTIVE: To assess: 1) age-related differences in lung Muc1 protein; 2) lung Muc1 protein responses to ST and/or rhCC10 intervention in the preterm lamb with respiratory distress syndrome.
DESIGN/METHODS: Preterm lambs (n = 18; 126 ± 3 SE days) were instrumented, delivered, paralyzed, and ventilated. Following baseline measurements, the lambs were randomized to group (n=6/group): untreated, ST (Survanta®; 100mg/kg), or ST followed by intratracheal rhCC10 (1.5 mg/kg). After 4 hrs, the lambs were anesthetized, dissected, and lung tissue was snap frozen. Ewe (n=6) were anesthetized, dissected, and lung tissue was snap frozen. All lung tissue was prepared for analyses of Muc1 protein by ELISA with CT3 antibody to recognize the cytoplasmic tail needed for IL-8 protein in the lamb using ovine-specific sandwich ELISA.
RESULTS: Lung Muc1 was lower (p < 0.0001) in the lambs as compared to adult sheep (ewe). Lung Muc1 and IL-8 were lower (p < 0.05) in lambs treated with ST followed by rhCC10 compared to those receiving no treatment or ST alone. There was no significant difference in lung IL-8 or Muc1 between lambs receiving no treatment compared to ST alone.
CONCLUSIONS: These data demonstrate that lung Muc1 protein is developmentally regulated, increasing with age. In addition, while relatively low in the preterm, Lung Muc1 is responsive to the pre-existing inflammatory background and can be modulated by specific interventional therapies that reduce inflammation. As such, further study is warranted to investigate lung MUC1 regulation in early development, it’s use as a novel biomarker of lung injury, and/or as a lung protective therapeutic approach. Supp.: NIH 5T32HL091804; P20RR018073; RO1 HL-47152/Clearassure, Inc. (Claragen, Inc.); Ross Labs.

65 10:00 AM
Pulmonary Vascular Resistance (PVR) Response to Oxygen Is Altered by Inhaled Nitric Oxide (iNO) in Lambs with PPHN
Satyan Lakshminrusimha, Bobby Mathew, James A. Russell, Karen A. Wynn, Rita M. Ryan, Javasree Nair, Daniel D. Szwartz, Pediatrics, University at Buffalo, Buffalo, NY.
BACKGROUND: Ventilation with high concentrations of oxygen is the mainstay of therapy in persistent pulmonary hypertension of the newborn (PPHN). Some infants with PPHN are managed with suprasphyiophospholipidate PαO2 levels to prevent episodes of hypoxic pulmonary vasoconstruction. The optimal FiO2, during management of PPHN is not clear. We reported that in lambs with PPHN, increasing FiO2 above 0.5 does not result in additional decrease in PVR. However, decreasing FiO2 to 0.21 or 0.1 results in marked elevation in PVR (Pediatr Res.2009Nov;65(5):94-4). The effect of iNO on the relationship between PFIO2 and PFI0, in the newborn is not known.
OBJECTIVE: To study the relationship between PFI0 and PFI0 in control and PPHN lambs receiving iNO.
DESIGN/METHODS: PPHN was induced by antenatal ligature of the ductus arteriosus in fetal sheep 8d prior to delivery. Lambs were delivered by C-section and instrumented to measure pulmonary arterial (AP) and left atrial pressures and pulmonary blood flow. At 2h of age, 5 PPHN lambs and 3 controls were randomly and sequentially ventilated with varying concentrations of oxygen (FiO2 0.1, 0.21, 0.5 and 1.0) for 10-20 min each while receiving 20 ppm iNO. Blood gases were analyzed from aorta and PA at each FiO2 level.
RESULTS: There was no significant increase in PVR in PPHN and control lambs on iNO despite hypoxic ventilation with 10%O2. While receiving iNO, PVR did not change during ventilation with different oxygen levels despite significant changes in PO2 levels in the aorta and PA.
Conclusions: In aortic and pulmonary arterial Po2 and PVR in newborn control and PPHN lambs receiving inhaled NO
RESULTS: 101 mothers were enrolled with mean age 29.4 years (15-45 years); 51% white, 18% black, 27% Hispanic; 50% college degree or higher; 52% privately insured. CSS information: 18%

CSS Misuses Identified (n=101)
- INFANT PLACEMENT IN CSS (122 misuses)
  - Incorrect harness placement
  - Incorrect seat belt position
  - Incorrect retainer clip position
  - Loose harness straps
  - Loose car seat belt
  - Incorrectized CSS parts

CSS PLACEMENT IN VEHICLE (122 misuses)
- Not 45 degree angle
- Not attached to vehicle
- Loosely attached
- Tilted to side

CONCLUSIONS: Despite national, state, and hospital policies that require newborns to be transported in a CSS, we found a significant amount of concerning CSS misuse in our study population.

68
8:30 AM
Storing Medical History on USB Drives: The CHAM DRIVE Project
Sara M. Marnell, Katherine Freeman, Catherine C. Skae.

Pediatrics, Children’s Hospital at Montefiore/Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Past medical history is vital to any patient encounter. Lack of an accurate past medical history can lead to medical error. Providers spend substantial time obtaining this information. While recent focus has been on EMR, a system created for patient possession has not been well-studied.

OBJECTIVE: To evaluate the impact of providing patients discharged from Children’s Hospital at Montefiore with a password-protected USB drive containing their past medical history and discharge summary.

DESIGN/METHODS: Setting: Inner-city children’s hospital. Descriptive study using questionnaire. Inclusion criteria: hospitalization >7 days, NICU/PCCU admission, chronic medical condition, or enrollment in program serving children with complex needs. A password-protected USB drive (CHAM DRIVE) containing patient medical history and discharge summary was provided on discharge. Subjects were contacted by phone >6 weeks after discharge to complete a questionnaire. Demographics and data regarding device satisfaction and usage were recorded and analyzed.

RESULTS: 125 subjects were enrolled. 77 questionnaires (62%) completed to date. Mean age=7.8 years, 94% minority, 56% English primary language, 73% Medicaid, 85% own computers. At >6 weeks post-discharge, 97% of enrollees still had the CHAM DRIVE (1=stolen, 1=lost). Satisfaction: 100% liked having their own copy of medical information and would recommend the CHAM DRIVE to others. 99% felt it was safe. 89% were more interested in keeping track of medical information since receiving it. Usage: 87% reported carrying it to hospital and clinic visits, 83% of subjects had a clinic visit, 59% of subjects had been to our ED; 43% had been admitted to our hospital; 4% had been to outside ED; 1% had been admitted to outside institution. 44% of subjects reported CHAM DRIVE use during the clinic visit; 41% reported use in our ED, 56% reported use in our hospital, 100% reported use in outside ED; 100% reported use in outside hospital. The difference in usage rates between clinic (44%) vs. ED (45%) vs. hospitalization (58%) did not reach statistical significance (p=.39).

CONCLUSIONS: These findings provide evidence regarding the impact of a medical record system created for patient possession. Patients/families value having their own copy of medical information and are more interested in keeping track of this after receiving a CHAM DRIVE. They found the system to be safe and would recommend it to others. More investigation is warranted regarding usage practices.
RESULTS: 291 questionnaires were completed; the respondents age ranged from 17-59 years with a mean±SD age of 30.7±8 years. 76% had an education level of high school or less than high school, 81% were Hispanic, 48% reported being more comfortable reading Spanish. Computer related data showed: 64% had a computer at home, 58% had internet access at home, 55% used email, and 65% used the internet to look up health information for their children routinely if they had a computer at home (52% had used it at least once in the past). The most popular web sites for health information were WebMD (38%) and Uninvision (21%). 58% expressed a desire to communicate with their physician by email. Significant predictors of internet health information behavior were level of education (adjusted OR 9.1, 95%CI 3.1), computer at home (adjusted OR 3.3, 95%CI 1.1,7.6,3) and prior access to the internet (adjusted OR 22.5, 95%CI 5, 10). No other OR data suggest that there is a significant relationship between variables.

CONCLUSIONS: These results are consistent with the findings of other studies. A greater proportion of Black children were living in public housing (54%) is significantly greater than the proportion of Hispanic children living in public housing (46%), p<0.001. A greater proportion of Black children were living in prewar (53%) housing compared to Hispanic children (47%), p<0.001. Age or gender did not differ by housing characteristics. After adjusting for covariates, children living in public housing had statistically significantly higher cotinine levels than children in privately owned housing (p<0.005). None of the other biomarkers were significantly associated with ownership or housing age.

OBJECTIVE: To assess SHS and ED exposure levels in urban minority children based on housing characteristics.

DESIGN/METHODS: In a cohort study of Hispanic and Black, New York City (NYC) children ages 6-8 years, parents/guardians were interviewed in-person. Analyses include 242 girls and 98 boys. Using ArcGIS, geocoded home addresses were matched to housing data in the NYC Dept of City Planning Primary Land Use Tax Lot Output database. Housing characteristics were assessed: neighborhood factors including housing characteristics.

OBJECTIVE: To assess SHS and ED exposure levels in urban minority children based on housing characteristics.

RESULTS: The proportion of Black children living in public housing (54%) is significantly greater than the proportion of Hispanic children living in public housing (46%), p<0.001. A greater proportion of Black children were living in prewar (53%) housing compared to Hispanic children (47%), p<0.001. Age or gender did not differ by housing characteristics. After adjusting for covariates, children living in public housing had statistically significantly higher cotinine levels than children in privately owned housing (p<0.005). None of the other biomarkers were significantly associated with ownership or housing age.
CONCLUSIONS: The significant difference in cotinine, in children living in public versus private housing suggests that housing characteristics are one aspect related to SHS exposure that needs to be explored further. As childhood asthma remains the leading cause of hospitalizations in the US, further public health efforts targeting healthy homes and more specifically, public housing, may be warranted.

73
Fellow in Training
9:45 AM
Bed Usage in the Pediatric Intensive Care Unit
Evan Fieldston, Christian Terwiesch, Joshua Metlay. CHOP PICU Research Group, Univ of PA, Philadelphia, PA; Children’s Hospital of Philadelphia, Philadelphia, PA.
BACKGROUND: Patient flow refers to movement of patients through health care organizations or parts of it. For quality, value, and access reasons, significant attention is focused on optimizing patient flow. Pediatric Intensive Care Units (PICU), with limited number of beds and resource-intensive services, are a key component of flow and an important place for optimization. PICUs are crossroads for many patients and delays in moving them in or out can negatively impact clinical status and may decrease overall efficiency. Delays in moving patients out of the PICU, when no longer in need of critical care services, may mean that value-added services are being denied to other patients—a form of waste.

OBJECTIVE: Use real-time observation to describe utilization, flow through, and bottlenecks of PICU beds at a large, urban, academic children’s hospital.

DESIGN/METHODS: A recording tool was developed through clinical and operational expert input and through iterative pilot use. It was then used to collect >20,000 bed-hours of real-time observation of patient flow in the pediatric intensive care unit (PICU) over 5 non-consecutive weeks.

RESULTS: 82% of bed-hours were used for critical-care value-added services, 8% on logistics, 9% on non-value-added uses, and 1% unclear. 95% of all bed-hours were consumed on 14 activities (see table).

Table: PICU bed usage

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilated patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unventilated patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PICU staff courtesy</td>
<td></td>
<td></td>
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<tr>
<td>Critical care NOS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiology staff courtesy</td>
<td></td>
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</tr>
<tr>
<td>Environmental services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-ventilation (&lt;12 hours)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental services</td>
<td></td>
<td></td>
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<tr>
<td>Arterial line</td>
<td></td>
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<tr>
<td>High-flow nasal cannula</td>
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<tr>
<td>Environmental services</td>
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<tr>
<td>Post-ventilation (&lt;12 hours)</td>
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<tr>
<td>Environmental services</td>
<td></td>
<td></td>
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<tr>
<td>Unclear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure underway</td>
<td></td>
<td></td>
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<tr>
<td>Other activities (&gt;99 hours each)</td>
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</table>

There were wide variations in timing on certain logistical and non-value-added services, suggesting that bottlenecks can be identified and improved to maximize functional capacity.

CONCLUSIONS: Much time in the PICU was spent caring for patients at high levels of intensity. Identifiable periods of logistical and non-value-added occupancy were identifiable, as well as bottlenecks. Process improvement work can be directed at areas of delay uncovered by this systematic frontline analysis, to maximize functional capacity, which may improve quality (safety, efficiency, effectiveness, timeliness, patient-centeredness, equity), access, staff satisfaction, education, and value.

74
10:00 AM
Using Patient Satisfaction Scores To Identify Disparities in Care
Maria Petri, Mariane Stefano, Alex Koster, Jobver Hasson, Magdy Afia, Jay Greenspan, Iman Sharif
General Pediatrics, Nemours/A.I. duPont Hospital for Children, Wilmington, DE.

BACKGROUND: Non-white race, lower literacy, and limited English proficiency predict lower patient satisfaction scores among adults. Identifying disparities in satisfaction in pediatrics can help lay the groundwork for designing interventions to improve health care delivery to underserved children.

OBJECTIVE: To compare emergency department (ED) satisfaction scores by race and preferred language.

DESIGN/METHODS: We analyzed ED Press Ganey (PG) patient satisfaction surveys at a children’s hospital between 2006-2009. Surveys were sent by PG to random samples of patients within 1 week of their visit (42 questions, Likert scale 1-5, 5=“Top Box”). Surveys were sent in English unless the hospital database recorded Spanish as the family’s preferred language. Using the hospital’s database, survey responses were linked to patient demographics and ED visit variables. We used chi-square to compare satisfaction for each PG question by race and preferred language. Ordinal logistic regression was used to adjust for variables known to affect satisfaction: length of stay, acuity/emergent vs non-emergent, time before seeing first doctor, fast-track vs core ED, Medicaid vs other insurance.

RESULTS: 2601 PG surveys were returned; 21% (538) by non-white patients. Preferred languages in the hospital database were English(10%) and Spanish (2%); no data was recorded for the remaining 88%. Spanish surveys were returned for 39(2%) patients. Top-Box scores were less likely for non-white patients: “nurse courtesy” (60% vs. 69%, p<0.0001); “trainee courtesy” (56% vs. 66%, p<0.0001); “nurse attentive to needs” (60% vs. 69%, p=0.009); “nurse listened” (62% vs. 69%, p<0.0001); “nurse helpful” (64% vs. 69%, p<0.0001); “nurse friendly” (62% vs. 69%, p<0.0001); “doctor treated me with respect” (62% vs. 69%, p<0.0001). We also found that non-white patients were significantly less likely than white patients to recommend (adjusted B=-0.40, p<0.0001). Spanish vs. English surveys trended similarly:

- “nurse courtesy” (59% vs. 69%, p<0.0001); “trainee courtesy” (55% vs. 66%, p<0.0001); “nurse attentive to needs” (60% vs. 69%, p=0.009); “nurse listened” (61% vs. 69%, p<0.0001); “doctor treated me with respect” (54% vs. 69%, p<0.0001); “the doctor showed concern for my well-being” were answered on a 5-point Likert scale (1=strongly disagree, 5=strongly agree). We piloted the APSC and revised the wording for clarity. We recruited a convenience sample of 320 adolescents from six urban primary care subjects. Subjects completed the APSC and demographic questions immediately after their physician visit. Median age was 16 yrs (12-21); 66% female; 37% black; 59% Hispanic. Reliability was tested with Cronbach’s alpha. Factor analysis was conducted using principal components analysis with Varimax rotation.

RESULTS: Of the 320 APSCs administered, 293 were valid for analysis. Mean Likert scale score on each of the 15 items ranged from 3.67±1.30 to 4.57±0.82 (3 items reverse-coded). The APSC demonstrated strong internal reliability with alpha of 0.887. Item total correlations were small for 2 items, both reverse-coded; removal of the 2 items slightly increased the alpha for the scale. The factor analytic solution for APSC reduced the scale with 12 items loading on the initial factor and explaining 47.5% of the variance. The 3 reverse-coded items loaded on the second factor explaining 9.6% of the variance. We named this the “distrust factor” as items include “doctor not interested in me,” “doctor did not listen to me,” and “I worry that doctor may not keep information private.”

CONCLUSIONS: The APSC has strong reliability and measures a nearly unidimensional construct. The second factor may measure a different construct or it may be that reverse phrasing confuses adolescent respondents. Future analysis will examine how the 3 items perform when not reverse-phrased.

Neurobiology I
Platform Session

Saturday, March 27, 2010
8:15 AM-10:30 AM
76
8:15 AM
Development of a Semiquantitative Fetal Brain Maturation Score on MRI
Daniel J. Licht, Catherine Limperopoulos, Adre J. du Plessis, James C. Gee, Jue Wu, Grady Hedstrom, Suvej P. Awate, Arastoo Vossough
Neurology, The Children’s Hospital of Philadelphia, Philadelphia, PA; School of Physical and Occupational Therapy, McGill University, Montreal, PA; Neurology, The Children’s Hospital of Boston, Boston, MA; Radiology, Pennsylvania University, Philadelphia, PA.

BACKGROUND: Fetal diagnostic centers are increasingly relying on magnetic resonance imaging (MRI) of the fetus for surgical planning and prognosis counseling. Evaluation of central nervous system structures for lesions or malformations is standard practice. Assessment of fetal brain maturation is currently not available but may provide important prognostic data and facilitate the future study of human brain development in high-risk fetuses.

OBJECTIVE: To develop a valid, yet simple to use semiquantitative scale of fetal brain maturation that can be used in routine clinical fetal MRI.

DESIGN/METHODS: A semiquantitative scale and scoring system for assessing brain maturation was developed by major modifications to a previously validated ex-utero brain maturational score. Six visual indices, including myelination, presence and locations of the germinal matrix, frontal/occipital cortical folding, insular cortical folding, and sulcal depth of each of the superior and inferior temporal sulci were used. Thirty-one normal fetal brains were assessed via fetal MRI by Grady Hedstrom, Suyash P. Awate, Arastoo Vossough.

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The Children’s Hospital of Boston, Boston, MA; Radiology, Pennsylvania University, Philadelphia, PA.

RESULTS: The two independent raters had a correlation of r=0.951 (p<0.001) for the maturational score assessment. The correlation of the score with gestational age and R²=0.89 for brain volume.

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**MRI and Neurosensory Impairment (NSI) in Infants with Hypoxic Ischemic Encephalopathy (HIE) Treated with Head Cooling (HC)**

Raquel Gomez, Shobhna Desai, Marcy Gringlas, Susan Adeniyi-Jones.

**OBJECTIVE:** 1. To evaluate NSI and neurologic sequelae in a cohort of HIE infants treated with HC. 2. To determine if MRI may help identify neonates at risk for NSI.

**DESIGN/METHODS:** A retrospective analysis of surviving infants with HIE treated with HC between 1/2005 and 9/2008, who had an MRI prior to discharge and were assessed by either a developmental neonatologist or a pediatric neurologist at 12-36 months, were included. MRIs were performed at mean age of 24 days (range 0-80). All infants had normal head ultrasound at diagnosis and no significant intracranial abnormality. The precooling pattern was classified as GM, WM, or GM+WM. MRI groups were compared using unpaired t-test for continuous variables and Fisher’s exact test for categorical variables.

**RESULTS:** Of the 131 infants treated with HC, 112 (85%) survived to discharge; of these 63 (56%) were followed to at least 1 year of age. Of the 63 infants, 38% had a CP, 27% had Sx, 21% had CVI, 19% had SNHL, 17% had MC, and 33% had feeding disorder. The incidence of NSI by MRI category is shown in table.

**CONCLUSIONS:** Infants with GM+WM MRI abnormalities had multiple NSI. 10% of infants with no MRI had some NSI and are at risk for altered quality of life. These infants need close follow-up with early intervention.

**Fellow in Training**

8:30 AM

**Maturational Arrest of Oligodendrocyte Lineage in Intraventricular Hemorrhage**

Krishna Dummula, Govindaiah Vinukonda, Furong Hu, Muhammad T. Zia, Doreen Badhka, Praveen Balakotaiah

**OBJECTIVE:** To evaluate apoptosis, proliferation and maturation of oligodendroglial cells in premature rabbit pups with IVH compared to pairs without IVH (Non-IVH). SS31 treatment was associated with reduced infarct size among male pups (infarct = 23% of controls). SS31 may underlie the differences reported here.

**CONCLUSIONS:** SS31 treatment was associated with reduced infarct size among male pups (infarct = 23% of controls). SS31 may underlie the differences reported here.

**Fellow in Training**

8:45 AM

**SS-31, a Mitochondria-Targeted Cytotrophic Peptide, Is Neuroprotective in Male But Not Female Neonatal Rats Following Cerebral Hypoxia-Ishchemia**

Marie T. Berg, Hazel S. Szeto, Queenie B. Brown, Jeffrey M. Perlman, Susan J. Vannucci.

**OBJECTIVE:** The purpose of this study was to determine whether SS-31 is neuroprotective in neonatal HI. SS-31 treatment was associated with reduced infarct size among male pups (infarct = 23% of controls). SS31 may underlie the differences reported here.

**CONCLUSIONS:** SS31 treatment was associated with reduced infarct size among male pups (infarct = 23% of controls). SS31 may underlie the differences reported here.
Results of the longitudinal study on the effects of GCE on brain structure and function. The effects of GCE on brain structure are persistent into young adulthood, while the effects on resting CBF are temporary. Further studies are needed to understand the long-term effects of GCE on brain function.
Cerebrospinal Fluid (CSF) Cytokines Are Predictors of Bacterial Meningitis in Infants

Lakshmi Srinivasan, Laurie Kilpatrick, Samir S. Shah, Soraya Abbasi, Shelley Rankin, Michael A. Padula, Karin L. McGowan, Katieiln Mahoney, Mary C. Harris.

Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA; Physiology, Temple University School of Medicine, Philadelphia, PA; Pediatrics, University of Pennsylvania, Philadelphia, PA; Microbiology, University of Pennsylvania School of Veterinary Medicine, Philadelphia, PA.

BACKGROUND: Bacterial meningitis causes significant morbidity and mortality. Lumbar puncture (LP) is often deferred in critically ill infants, and antibiotics administered presumptively, thereby reducing the yield of cultures. The accuracy of pro- and anti-inflammatory cytokines in predicting bacterial meningitis is unclear.

OBJECTIVE: To examine the predictive ability of CSF cytokines in the diagnosis of bacterial meningitis in infants.

DESIGN/METHODS: This prospective, multi-center study included infants <6 mos undergoing LPs. Pro- and anti-inflammatory cytokines were measured using a cytometric bead array. Bacterial meningitis was defined in two ways: 1) Positive CSF culture and 2) Positive Gram stain, or CSF pleocytosis with either CSF protein >120 mg/dL or CSF glucose <20 mg/dL (consensus definition).

RESULTS: 261 subjects had a median GA of 35 wks [interquartile range (IQR): 28-39] and a median PNA of 6d [IQR: 2-30]. While IL-10 most accurately predicted bacterial meningitis (LR of 47.2), other cytokines also showed promise, including IL-12 (LR of 22.2), IL-6 (LR of 19.5), TNFα (LR of 14.1), IL-1β (LR of 13.8), and C-reactive protein (LR of 13.1).

CONCLUSIONS: Chronic intermittent hypoxia may be responsible for increases in the myogenic tone in rat medium cerebral arteries. Further experiments are being conducted to determine the role of reactive oxygen species and endothelium mediated dilation.

Infectious Diseases Platform Session

Saturday, March 27, 2010
8:15 AM-10:30 AM

85

Fellow in Training

8:15 AM
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Lakshmi Srinivasan, Laurie Kilpatrick, Samir S. Shah, Soraya Abbasi, Shelley Rankin, Michael A. Padula, Karin L. McGowan, Katieiln Mahoney, Mary C. Harris.

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CONCLUSIONS: Chronic intermittent hypoxia may be responsible for increases in the myogenic tone in rat medium cerebral arteries. Further experiments are being conducted to determine the role of reactive oxygen species and endothelium mediated dilation.

86

8:30 AM
Effect of Comprehensive Infection Control Measures on the Rate of Late Onset Infection in Very Low Birth Weight Infants


Pediatrics/Neonatology, Cooper University Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ.

BACKGROUND: Late onset infection is a significant problem in very low birth weight (VLBW) infants (birth weight ≤1500 grams) and can lead to increased mortality and morbidity. The incidence of late onset infection in VLBW infants in our Neonatal Intensive Care Unit (NICU) was >35% before 2004, much higher than 20% reported in other studies. A comprehensive infection control measure was introduced in 2004 to decrease the late onset infection rate in the NICU. The infection control measures incorporated education guidelines for NICU staff and environmental improvements to the NICU.

OBJECTIVE: To study the effects of comprehensive infection control measures on the rate of late onset infection in VLBW infants.

DESIGN/METHODS: VLBW infants who were born between January 2001 and December 2004 (pre-intervention group) were compared with infants who were born between January 2005 and December 2008 (intervention group). Late onset infection was defined as a positive blood and/or CSF culture after 3 days of life. Demographic and clinical data were collected from infants’ medical records. The two groups were compared for baseline demographics, risk factors for infection and the rate of late onset infection.

RESULTS: 350 VLBW infants were admitted to NICU during pre-intervention period and 315 during intervention period. There was no significant difference in baseline demographics and risk factors for late-onset infection (birth weight, gestational age, sex, race, prenatal steroids, prenatal antibiotics, prolonged rupture of membranes, Apgar scores, duration of central lines, duration of total parenteral nutrition (TPN), postnatal steroids and mechanical ventilation) between the two groups. The incidence of late-onset infection was significantly reduced from 36% before intervention to 22% with intervention (p<0.001).

CONCLUSIONS: Comprehensive infection control measures significantly reduced the rate of late onset infection in VLBW infants.
RESULTS: Blood cultures were positive in 201 (16.7%) of 1203 samples from 107 (21.4%) of 500 infants. The overall median TtP was 18.3 h (interquartile range [IQR] = 12.7 – 27.7 h) among infants with a median age 42 d and GA >28 wks. Gram-positive (GP) organisms, n = 144 (71.6%) were predominant with coagulase-negative Staphylococcus (CONS), n = 109, representing 52.4% of all cultures followed by S. aureus (n=20) and Enterococcus (n=13). Among Gram-negative (GN) bacteria, n=50 (24.9 %), E.coli (n=13), Klebsiella (n=12) and Enterobacter (n=11) were most common. Polymicrobial isolates, n = 3 (1.5%), and Candida sp., n = 4 (2.0%), were rare. TtP for CONS differed vs. non-CONS GP (p = 0.001) and GN (p = 0.001) subgroups. At 48 hours, 90.8% of CONS isolates were detected, compared with 94.3% detection of all other bacteria. Central line cultures, n=77, had a significantly shorter TtP, 15.2 h (10.3 – 22.2 h) (median [IQR]), compared with peripheral sites, n=114, 19.8 h (14.7 – 31.6 h), (p = 0.005), although culture volume did not differ significantly.

CONCLUSION: Time to detection of positive blood cultures varied significantly by organism type and site of culture. Bloodstream infections with Gram-negative organisms were detected most quickly. CONS, the most commonly detected organism, had the longest TtP among all bacteria, and fungal cultures had the longest TtP of all organisms. Isolates from central lines were detected sooner than those drawn peripherally.

88
Fellow in Training
9:00 AM
Cost Effective and Safe Management of Early Onset, Asymptomatic Presumed Neonatal Sepsis with Intramuscular Antibiotics
Binta Lambert, Koryse Woodrooffe, Deborah E. Campbell, Suhas M. Nadfay
Pediatrics - Neonatology, Children’s Hospital at Montefiore - Weiler, Bronx, NY; Pediatrics-Neonatology, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Presumed neonatal sepsis in the term infant remains the most common admission in the Neonatal Intensive Care Unit (NICU). Despite broad agreement for management of symptomatic neonates, the management issues related to asymptomatic, early onset presumed neonatal sepsis remains controversial.

OBJECTIVE: To evaluate the outcomes, utility, safety, and cost benefit of intramuscular antibiotics (IM) administered in the regular newborn nursery (NBN) for the treatment of presumed neonatal sepsis in asymptomatic term neonates.

METHODS/RESULTS: Our protocol for treatment of presumed sepsis in asymptomatic full term neonates ≥2000 grams at birth includes intramuscular ampicillin and gentamicin, until cultures of blood and/or CSF are negative for 48-72 hours with close monitoring in the NBN. Retrospective review of this cohort was undertaken from July 2001 to July 2008. Failure of IM antibiotic treatment was considered, if the neonate became symptomatic, had positive blood or CSF cultures or was readmitted for sepsis within two weeks of nursery discharge. Data were analyzed for the relationship between key predictors to the presence of neonatal bacterial infection and a failure of IM antibiotic treatment. Cost savings were based on the current NICU and NBN admission reimbursement rates from Medicaid for institutional as well as for physician billing.

RESULTS: Total Admissions in NBN=29, 698 total admissions (2137 IM injections). CONS (GN) bacteria, n=50 (24.9%), S. aureus (n=13), K. pneumoniae (n=12), K. oxytoca (n=11), Enterobacter (n=11), Enterococcus (n=12). Polymicrobial isolates, n = 3 (1.5%), and Candida sp., n = 4 (2.0%), were rare. TtP for CONS differed vs. non-CONS GP (p = 0.001) and GN (p = 0.001) subgroups. At 48 hours, 90.8% of CONS isolates were detected, compared with 94.3% detection of all other bacteria. Central line cultures, n=77, had a significantly shorter TtP, 15.2 h (10.3 – 22.2 h) (median [IQR]), compared with peripheral sites, n=114, 19.8 h (14.7 – 31.6 h), (p = 0.005), although culture volume did not differ significantly.

CONCLUSION: Time to detection of positive blood cultures varied significantly by organism type and site of culture. Bloodstream infections with Gram-negative organisms were detected most quickly. CONS, the most commonly detected organism, had the longest TtP among all bacteria, and fungal cultures had the longest TtP of all organisms. Isolates from central lines were detected sooner than those drawn peripherally.

89
Fellow in Training
9:15 AM
Matthew P. Kronman, Rui Feng, Yuan-Shung Huang, Grace E. Lee, Samir S. Shah
Division of Infectious Diseases, Children’s Hospital of Philadelphia, Philadelphia, PA; Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania, Philadelphia, PA; Department of Pediatrics, Health Analytics Unit, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: National rates of outpatient pediatric CAP are unknown. No pediatric centers have systematically measured antibiotic use for CAP.

OBJECTIVE: To determine rates of CAP by age group and trends in antibiotic use for CAP from 1994 to 2007.

METHODS: We combined data from the CDC’s 1994-2007 National Ambulatory and National Hospital Ambulatory Medical Care Surveys (NAMCS, NHAMCS). We included children 1-8 years of age with outpatient pneumonia and excluded children admitted at initial visit and those with chronic medical conditions (except asthma). We determined CAP rates over two-year intervals to ensure robust national estimates. Prescribed antibiotics were categorized as penicillins (penicillin or amoxicillin), macrolides, cephalosporins, or other. Poisson regression was used to determine changes in rates of pneumonia and antibiotic prescribing.

RESULTS: Annual rates of CAP were highest in 1-5 year-olds at 33.8-50.5/1000, and lowest in 11-18 year-olds at 2.4-10.3/1000. We identified no significant changes in CAP rates in any age group over the 14 year study period (p = 0.87, 0.30, and 0.22 for ages 1-5, 6-10, and 11-18 respectively). Macrolides were prescribed in 31.4-46.9% of cases, cephalosporins in 13.5-35.8%, penicillins in 5.6-31.3%, and other antibiotics (aminopenicillin/clavulanate, sulfonamides, or tetracyclines) in 22.1-41.8%. Poisson regression demonstrated increasing macrolide use (p = 0.001) and decreasing penicillin use (p = 0.002) among children 11-18 years but no trends in antibiotic use in the younger age groups.

CONCLUSIONS: We present national estimates of pediatric CAP incidence by age group. Despite the introduction of a successful pneumococcal vaccine (targeting the most common bacterial cause of CAP) in 2000, pneumonia diagnoses have not decreased nationally since 1994. Macrolide use for CAP increased over the study period, although there are reports of increasing pneumococcal resistance to macrolides and there is no evidence that macrolides improve CAP outcomes.
in chronic lung disease and cerebral white matter injury. We hypothesized that EPA and DHA modulate cytokine response to lipopolysaccharide (LPS) in monocytes in vitro and cord blood ex vivo as a model of neonatal inflammation.

OBJECTIVE: To determine whether pretreatment with EPA and DHA reduces pro-inflammatory cytokine responses.

DESIGN/METHODS: Monocytes derived from human leukemic cell line THP-1 were used to develop a model system. After differentiation in vitro, cells were cultured with/without EPA or DHA at 25 or 100 μM for 48h, then stimulated with LPS for 24h. Culture supernatants were collected and analyzed for cytokines TNF-α, IL-6, IL-10, and IL-12 using validated ELISAs. Neonatal cord blood samples were freshly obtained, incubated with/without EPA or DHA for 24h, then stimulated with LPS. Supernatants were collected and tested.

RESULTS: Treatment of THP-1 monocytes with DHA or EPA significantly inhibited IL-6, IL-10, and IL-12 responses to LPS in a dose dependent manner (Tab.1). Significant inhibition of TNF-α levels was seen after pre-culture with DHA but not EPA. Preliminary data in 4 neonatal cord blood samples show similar reduction in IL-12 response by p<0.005. Studies of other cytokine responses are still pending.

CONCLUSIONS: Treatment with the n-3 fatty acids EPA and DHA inhibits pro-inflammatory cytokine response to LPS in vitro and ex vivo. The inhibitory effect on IL-10 and IL-12 are novel. While still in progress, preliminary experiments with neonatal cord blood show analogous effects. These findings suggest a potential role for DHA and EPA as nutritional modifiers of neonatal inflammation.

92 Medical Student

10:00 AM

Prevalence and Pattern of Disclosure of HIV Status in HIV-Infected Children in Ghana

Stacey Kallem, Lorna Renner, Musie Ghebremichael, Elijah Paintsil.

Yale University School of Medicine, New Haven, CT; University of Ghana Medical School, Accra, Ghana; Harvard University, Cambridge, MA.

BACKGROUND: With the advent of highly active antiretroviral therapy (HAART), HIV-infected children are surviving into adulthood. There is evolving evidence that the disclosure of the HIV status to HIV-infected children has psychological benefits and positive effects on the clinical course of the disease. When and how to disclose the diagnosis of HIV to children remains a clinical dilemma. There is paucity of data from resource limited settings on disclosure.

OBJECTIVE: To investigate the prevalence, pattern, and determinants of HIV disclosure in HIV-infected children in Ghana.

DESIGN/METHODS: A cross-sectional study from the Pediatric HIV Clinic at Korle-Bu Teaching Hospital (Accra, Ghana) was conducted. The children and their caregivers were interviewed separately and their medical records were reviewed. HIV disclosure status was based on the concordance between report by the caregiver and the child. Fisher’s exact tests were used to compare categorical variables between children who knew their HIV status and those who did not know. Wilcoxon rank sum tests were used for continuous variables. Multivariate analyses using logistic regression models were employed to examine the predictors of HIV disclosure.

RESULTS: Seventy one caregiver-child dyads were enrolled. The children were aged from 8 to 14 years. The prevalence of disclosure was 21%. The mean age at disclosure was 11.72 years. The demographic characteristics associated with disclosure were age of the child (p=0.01), the level of education of child (p=0.01), deceased biologic father (p=0.02), administration of own HIV medications (p=0.02), and longer duration on HIV medication (p=0.02). Socio-economic status of caregiver, WHO clinical staging, and CD4 T lymphocyte count at the time of interview were not associated with disclosure. Age, level of education of the child, deceased biologic father, administration of own HIV medication remained the main predictors of HIV disclosure status, after logistic regression.

CONCLUSIONS: We found a lower rate of HIV disclosure than reported for most resource rich countries. However, the main predictors of disclosure, age and the level of education, were consistent with findings from resource rich countries. Our findings underscore the need for a systematic and a staged approach of pediatric HIV disclosure in resource limited countries in providing support and a skill set for caregivers to use.

93 Resident

10:15 AM

Use of the Rapid HIV Test in the Newborn and Cord Blood

Laura Malaga, Prabha Rajbandari, Juhri Purwanshi, Stefan Hagmann, James Dunne, Murli Purwanshi.

Brons-Lebanon Hospital Center, Bronx, NY; Irvington High School, Irvington, NY.

BACKGROUND: The rapid HIV test (R-HIV) has replaced the standard HIV ELISA that used to be performed as part of the two-test algorithm for diagnosing HIV infection. They are classified as point-of-care tests, yielding a result in less than 30 minutes, with sensitivities and specificities similar to the ELISA. The OraQuick® Advance Rapid HIV-1/2 Antibody Test (OraQuick®) manufactured by OraSure Technologies, Inc, PA, is FDA-approved for use in individuals ≥12y.o. The accuracy of OraQuick® has not been established in children <12y.o.

OBJECTIVE: To determine sensitivity and specificity of the OraQuick® R-HIV compared to the gold standard HIV ELISA when used to test for HIV in blood obtained from newborns and in umbilical cord plasma.

DESIGN/METHODS: Cord plasma and blood from babies born to HIV-infected and uninfected women in a community hospital served as the source of antibody positive (HIV+) and negative (HIV-) samples. Between 5-10 extra drops of blood were collected from the newborn heelstick performed at the time of the newborn metabolic screen. Unused stored cord blood was retrieved, and plasma obtained after centrifugation. Each newborn blood sample and corresponding cord plasma were assigned a unique study number after all patient identifiers were removed, and were tested using both the HIV ELISA (Siemens, NY) and the OraQuick®. The study was approved by the hospital’s Institutional Review Board.

RESULTS: From 6/2009 to date, a total of 45 (8 HIV+ and 37 HIV-) samples have been collected from babies between 36-42 weeks gestational age. Newborn blood samples showed complete correlation between the two testing methods, 8/8 HIV+ and 32/32 HIV- [table 1]. For 5 HIV- samples, no infant blood was infused blood available for HIV ELISA testing. Cord plasma also showed complete correlation, 6/6 HIV+ and 31/31 HIV- [table 2]. For 2 HIV+ and 6 HIV- samples, cord blood could not be retrieved.

Table 1. Newborn Blood

<table>
<thead>
<tr>
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<th>HIV ELISA (Standard)</th>
<th>OraQuick®</th>
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<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>HIV-</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>HIV+</td>
<td>31</td>
<td>0</td>
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</table>

Table 2. Cord Plasma

<table>
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<tr>
<th></th>
<th>HIV ELISA (Standard)</th>
<th>OraQuick®</th>
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</thead>
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<tr>
<td></td>
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</tr>
<tr>
<td>HIV-</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>HIV+</td>
<td>31</td>
<td>0</td>
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</tbody>
</table>

CONCLUSIONS: These results reveal that when testing for HIV in newborn blood and cord plasma, the OraQuick® is 100% sensitive and specific, and is comparable to the HIV ELISA. The number of HIV+ women in our study was small. However, the study is ongoing in order to increase the sample size and determine if the sensitivity and specificity obtained are preserved.

Endocrinology / Obesity Platform Session

Saturday, March 27, 2010 8:15 AM-10:30 AM

94 Fellow in Training

8:15 AM

Familial Short Stature Due to a Novel Splice Site Mutation in the SHOX Gene

Jennifer Danzig, Michael A. Levine.

Division of Endocrinology, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Haploinsufficiency of the pseudautosomal homeobox gene SHOX causes short stature and skeletal defects in patients with Leri-Weill and Turner syndromes. Homozygous SHOX mutations cause Langer Mesomelic Dysplasia with marked shortening and underdevelopment of long bones. In contrast, SHOX polyposis is associated with tall stature. The variable skeletal phenotypes in these syndromes suggest a quantitative relationship of functional protein to bone development and growth.

OBJECTIVE: Molecular characterization of familial short stature in a unique kindred.

DESIGN/METHODS: We studied non-consanguineous parents and their three children (two males, one female), each of whom had postnatal growth failure with height Z scores ranging from -2.4 to -1.7. Skeletal development was otherwise normal. Genomic DNA was extracted from peripheral blood cells and the exons and flanking intronic sequences of the SHOX gene were amplified by PCR and analyzed by DHPLC and direct DNA sequencing.

RESULTS: Each child was heterozygous for a novel splice acceptor site mutation in intron-1 of the SHOX gene (c.18+1G>A). The mother (155 cm) had mild SHOX alleles, but the father was homozygous for the c.1435C>A mutation. He was short (152.4 cm) but physical examination and skeletal survey were normal; his father (160 cm) and mother (155 cm) had both been moderately short. Haplotype analysis of the father’s DNA using SNPs linked to SHOX was consistent with a previous pseudautosomal crossover of the mutation from an X to Y chromosome during male meiosis; presumed consanguinity likely led to homozygosity of c.1435C>A. Review of a database of >6100 patients with short stature revealed this substitution in only one additional unrelated patient and no subject with normal stature. In silico analyses (SplicePort) indicated a moderately reduced score value (1.09 v 2.47, threshold 0) for the for the mutant allele.

CONCLUSIONS: We report a novel SHOX gene splice site mutation in a family with idiopathic short stature. The variable heights in affected members of this family and absence of specific skeletal dysplasia in the homozygous father are consistent with a splice site alteration within the mutant SHOX allele that allows some functional SHOX protein to be produced through normal splicing of the defective transcript. Finally, this family illustrates a rare recombination event within the PAR1 region that explains homozygosity of a SHOX mutation with male transmission of mutant alleles to sons and a daughter.

95 8:30 AM

Associations between Obesity, Asthma and Inflammation in Inner-City Adolescents

Unab I. Khan, Carmen R. Issasi, Susan M. Couphey, Deepa Rastogi, Christopher Andrade.

Department of Pediatrics, Albert Einstein College of Medicine, Bronx, NY; Department of Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY.
BACKGROUND: Both obesity and asthma are highly prevalent in inner-city African American (AA) and Hispanic (H) adolescents. Obesity is a known independent risk factor for cardiovascular disease (CVD), and is associated with elevated C reactive protein (CRP), a marker of systemic inflammation. CRP is a strong risk factor for CVD. Due to underlying inflammation, asthma has also been proposed as a potential risk factor for CVD. Studies in adults report higher CRP levels in asthmatics, but fail to account for co-morbid obesity. The association of obesity, asthma and CRP is not known in adolescents.

OBJECTIVE: To examine the independent and synergistic effects of obesity and asthma on CRP in inner-city AA and H adolescents.

DESIGN/METHODS: 129 adolescents were recruited in four categories: 1) Normal weight non-asthmatics (NWNA); 2) Normal weight asthmatics (NWA); 3) Obese non-asthmatics (ONA); 4) Obese asthmatics (OA). Those with acute or chronic inflammatory illnesses or using systemic steroids in three months prior to recruitment were excluded. CRP was measured using an immunonephelometric assay. Groups were compared using ANOVA and Chi square test.

RESULTS: Although CRP levels were different between the four groups, within-group differences were significant only by obesity, not by asthma status.

Comparison of Variables between groups

<table>
<thead>
<tr>
<th></th>
<th>NWNA (n=31)</th>
<th>NWA (n=19)</th>
<th>ONA (n=43)</th>
<th>OA (n=36)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean yrs. ± sd)</td>
<td>16±1.2</td>
<td>16±1.4</td>
<td>16±1.3</td>
<td>16±1.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Sex (girls/boys)</td>
<td>3/28</td>
<td>7/12</td>
<td>25/18</td>
<td>23/13</td>
<td>0.09</td>
</tr>
<tr>
<td>BMI (mean ± sd)</td>
<td>23.9±3</td>
<td>21.9±3</td>
<td>31.8±5</td>
<td>37.5±5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CRP (geometric mean ± sd)</td>
<td>0.59±0.37</td>
<td>0.87±0.30</td>
<td>2.3±0.30</td>
<td>2.8±0.28</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

In multivariate analyses adjusted for age, sex and race, obesity was associated with CRP in both asthmatics (β: 1.45, p <0.001) and non-asthmatics (β: 1.28, p<0.001), while asthma was not associated with CRP in either obese (β: 0.506, p=0.18) or normal weight groups (β: 0.138, p=0.77). Effect modification was not observed (p-interaction=0.683).

CONCLUSIONS: In inner-city AA and H adolescents, obesity but not asthma, is associated with elevated CRP levels. Unlike adult studies, our data shows no independent or synergistic association between obesity, asthma and CRP suggesting that CVD risk reduction efforts in high-risk adolescents should continue to focus on obesity.

96
House Officer

8:45 AM
Parental Perceptions and Attitudes toward Obesity in a Latino Community
Caryn Kerman, Timi Chu, John Rausch, Mary McCord.
Department of Pediatrics, Columbia University, New York, NY.

BACKGROUND: Latino children comprise a group that is at high risk for becoming overweight. Few studies have looked at the attitude of Latinos, particularly Dominicans, to use pictorial images as a tool to examine their views on health in relation to weight. It is important to understand the factors that affect these views in order to develop effective strategies to combat the obesity epidemic.

OBJECTIVE: To examine the beliefs of Latino parents about the ideal for healthy body sizes for both themselves and their children and the factors that affect these ideals.

DESIGN/METHODS: 231 parents at an urban community health center associated with an academic medical center were shown Stunkard’s 9 body image silhouettes of adults and Millard’s 7 gender-specific body image silhouettes of children and asked to select the image that was the most healthy in all cases. Demographic information and self-reported height and weight were also collected. Multiple logistic regression models were created to determine factors significantly associated with parents’ choice of the healthiest silhouette for themselves as well as their children.

RESULTS: Participants were mostly Latino (93%) from the Dominican Republic (52.8%) and primarily Spanish speakers (59.7%). Based on reported height and weight, 1.5% were underweight, 41.9% were normal weight, 23.3% were overweight, and 23.2% were obese. For each year parents spent in the US, they had an 8% increased odds of choosing an overweight silhouette as most healthy for themselves (95% CI 1.01-1.15). Parents who perceived themselves as normal weight or overweight were 12.8 times more likely to choose an overweight silhouette as healthy (95% CI 1.5-108.3). Divorced individuals were more likely to select a normal weight silhouette as the most healthy in all cases. Demographic information and self-reported height and weight were also collected. Multiple logistic regression models were created to determine factors significantly associated with parents’ choice of the healthiest silhouette for themselves as well as their children.

CONCLUSIONS: The recall of birthweights for inner city, minority children in Growing Up Healthy is highly accurate and suggests suitability of birthweight recall data in epidemiological studies. However, there is evidence that birthweight has predictive value for BMI percentile at the early time period (r-squared=0.97, p=0.002) as well as at the later time period (r-squared=0.77, p=0.07).

Mean BMI Percentile at the Early Time Period (age 2-5) by Birthweight

CONCLUSIONS: Recall of birthweights for inner city, minority children in Growing Up Healthy is highly accurate and suggests suitability of birthweight recall data in epidemiological studies. However, there is evidence that birthweight has predictive value for BMI percentile at the early time period (r-squared=0.97, p=0.002) as well as at the later time period (r-squared=0.77, p=0.07).

97
9:00 AM
The Relationship between Physical Activity and Depression among US Adolescents in a National Sample
John Rausch.
Division of General Pediatrics, Columbia University, New York, NY.

BACKGROUND: Depression is a significant problem in adolescence. There is growing evidence in adults that increased physical activity leads to improved mental health. Obesity is also increasingly recognized for its association with lowered self esteem and a variety of psychiatric disorders. The relationship between activity level, obesity and depression needs to be more fully investigated in diverse groups of adolescents.

OBJECTIVE: To investigate the relationship between self reported physical activity levels in US adolescents and subsequent levels of depressive symptoms in adolescence and young adulthood and to examine whether this effect is independent of BMI category.

DESIGN/METHODS: This is a secondary data analysis of the public access data set of Add Health, a longitudinal study of a nationally representative sample of US adolescents aged 11-21 (n=6,504 cases). The association between self reported physical activity and depression was investigated using regression models. After univariate analyses were completed, BMI categories were added to the model. Finally, multivariate regression models were constructed to account for the important potential effect modifier of gender on both activity level and BMI categories as well as the important confounders age, race, household income, grade in school, rural vs. urban setting, and health status.

RESULTS: Self-reported activity levels were inversely associated with depressive symptoms in univariate analysis in both adolescence and young adulthood (p <.0001). BMI and gender had no significant effect on self reported activity levels. In multivariate analyses adjusted for confounders, activity levels were no longer significantly associated with depressive symptoms after controlling for important confounders. Alcohol use also existed between obesity and depression (p=.006) and gender was an effect modifier of this association (p=.006). The association between obesity and depressive symptoms was positive in females as opposed to males where there was an inverse relationship. Other factors that remained significant in our final model for depressive symptoms in young adulthood were age, race, sex, grade in school, and general health (p < .001).

CONCLUSIONS: Activity levels were not significantly associated with depression symptoms in this study after controlling for confounders. Obesity was independently associated with depressive symptoms and modified by gender. Future studies need to clarify these associations and should use more objective measures of activity level.

98
Medical Student
9:15 AM
Accuracy of Parental Recall of Birthweight and Associations between Birthweight and Subsequent Body Mass Index in Minority, Inner City Children
Carolyn H. Marcus, Maida P. Galvez, Susan L. Teitelbaum, Mary S. Wolff.
Mount Sinai School of Medicine, New York, NY; Preventive Medicine, Mount Sinai School of Medicine, New York, NY; Pediatrics, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Parental recall of birthweight is often used in epidemiological studies. However, the association between birthweight and subsequent body mass index (BMI) in children varies among studies. Yet, little is known about (1) accuracy of parental recall of birthweight and (2) associations between birthweight and BMI in minority, inner city children.

OBJECTIVE: This study investigated accuracy of parental recall of birthweight in “Growing Up Healthy,” a longitudinal cohort of NYC boys and girls 6 to 8 years. Associations between birthweight and subsequent BMI percentile at two periods in childhood were also assessed.

DESIGN/METHODS: Recalled birthweights from the Growing Up Healthy Study baseline questionnaires were compared to Labor and Delivery records (n=70). Additional birthweight, gestational age, height and weight data were collected by chart review. For each individual with birthweight data available, two age and gender-specific BMI percentiles were calculated: an early period, between the ages of 2 and 5 (n=103), and a later period, between the ages of 0.5 and 9.5 (n=168). BMI percentiles were calculated using CDC national data.

RESULTS: There was a high degree of agreement between recalled birthweights and chart birthweights (mean difference = 0.11 kg, r-squared = 0.92). There was a strong positive association between birthweight and BMI percentile at the early time period (r-squared=0.97, p<0.002) as well as at the later time period (r-squared=0.77, p=0.07).

99
Fellow in Training
9:30 AM
The Effect of School Physical Activity on Students’ Leisure Physical Activity in a Predominantly Urban Latino Community
Dana Sirota, Evelyn Jenkins-Bergey, Raquel Andres Martinez.
Division of General Pediatrics, Columbia University, New York, NY.

BACKGROUND: Over the last thirty years, the percentage of children who are considered overweight or obese has doubled from 15% to 30%. Latino youth are particularly affected. School-based programs can reach large populations of at-risk children however, their effectiveness is mixed. Healthy Schools Healthy Families (HSHF) is a physical activity and nutrition program for elementary school students in a predominantly minority community in Northern Manhattan. The physical activity component includes Transition Exercises (TE), short 15-20 second teacher led classroom-based exercises, and General Physical Activities (GPA), which consist of recess and gym
time. Interventions similar to TE have been shown to significantly increase the amount of student physical activity by addressing barriers such as lack of time and physical space. Nonetheless, few TE interventions have shown an effect on physical activity performed outside of school (leisure activity), which may be a useful indicator for the sustainability of healthy lifestyles in children.

OBJECTIVE: To assess the effect of TE or GPA on leisure activity for students in the HSFP program.

DESIGN/METHODS: Fourth graders (N= 316) participating in HSFP were surveyed about their leisure activity at the start and end of the 2008 school year. The total number of TE and GPA minutes performed at school was separately recorded throughout the year. A McNemar test determined changes in leisure activity and paired t-tests assessed the effect of the amount of TE or GPA on leisure activity at the end of the year. Multivariable analysis assessed school effects.

RESULTS: Students were predominantly Latino (62%). Half were male and the mean age was 9.0 (±0.56 SD) years. Students reported an increase in leisure activity from the start to the end of the school year (35.8% vs. 41.1%; p<0.05). Additionally, students who spent more time doing TE (>20 min/week) showed a significant improvement in their reported leisure activity (r=1.199; p<0.005). There was no significant change for the group with less TE time (<20 min/week).

significant association existed between GPA and leisure activity. On multivariable analysis, a school effect was noted.

CONCLUSIONS: For students participating in HSFP, TE, but not GPA was significantly associated with an increase in leisure time activity; however, this may have been influenced by school assignment. Further studies should explore the effect of TE on leisure activity.

101
9:45 AM
House Officer

Baseline Readiness of Morbidly Obese Inner-City Adolescents To Change Diet and Activity Behaviors

Eleanor Bathory, Jessica Rieder, Arthur E. Blank.
Department of Family & Social Medicine, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, NY; Department of Pediatrics, Division of Adolescent Medicine, Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Attendance at a weight loss program predicts weight loss in adults and children. However, retention of morbidly obese adolescents long enough to achieve and sustain meaningful weight loss remains elusive. Understanding baseline readiness to change lifestyle behaviors may help improve design of teen weight loss programs to promote long-term success.

OBJECTIVE: To study readiness to change diet and activity behaviors in morbidly obese, inner-city adolescents presenting to a weight loss program.

DESIGN/METHODS: We recruited obese (BMI >95th % for age and sex) adolescents (aged 12-21 years) at their initial visit to an inner-city children’s hospital weight loss clinic. Subjects were offered an individual session with a social worker to assess readiness to change diet and activity behaviors. Subjects were recorded and assigned a stage of change using the Transtheoretical Model. Stages of change were defined as 1) Precontemplation-no interest in change or no awareness that being obese was a health risk; 2) Contemplation-ambivalent about change but able to assess barriers and benefits; 3) Preparation-preparing for specific sustained changes; or 4) Action-sustained changes in diet and activity >1 week. Of 49 subjects enrolled 53% were Hispanic, 33% black, and 65% girls. Mean age was 14.8 ±1.9 yrs (12-18 yrs), baseline mean BMI 41.8 ±8.5.

RESULTS: Of the 37 subjects who attended the individual session 35% were in precontemplation, 49% in contemplation, 5% in preparation, and 11% in action. Comparing subjects in contemplation vs. precontemplation, a significantly higher proportion of older adolescents (15-18 yrs) were in contemplation compared to younger adolescents (12-14 yrs) (75% vs. 19% and 29% vs. 48%, respectively, p<0.02). There were no significant sex differences in readiness to change.

CONCLUSIONS: Although these morbidly obese, inner-city youth joined a weight loss program, the majority (64%) entered with either no awareness that being obese was a health risk, or ambivalent behaviors or no interest in changing their diet and activity behavior. Older adolescents were significantly more likely to be contemplating change than younger adolescents. Sex did not influence readiness to change. These findings suggest that weight loss programs for morbidly obese adolescents should be age-appropriate: facilitating movement from precontemplation to contemplation for younger adolescents and contemplation to preparation for older adolescents.

102
10:15 AM
Fasting Serum IGFBP-1 with Fasting Serum Insulin Is a More Sensitive Marker of Insulin Resistance and Hypertriglyceridemia in Children


BACKGROUND: Insulin-like growth factor binding protein-1 (IGFBP-1) may be an early marker of diabetes risk.

OBJECTIVE: We hypothesized that an index defined as QUICKI x log_{10}[IGFBP-1] (QUICKI = 1/(log_{10}[fasting glucose] x [fasting insulin]) would be a better correlate of adiposity-related morbidity risk factors than either IGFBP-1 or QUICKI alone. This index was defined as QUICKI = log_{10}[IGFBP-1].

DESIGN/METHODS: We analyzed anthropometric (BMI, % fat, and waist circumference) and biochemical (lipids, inflammatory cytokines [TNF-α, IL-6, CRP], glucose, and adiponectin) from 36 school children 11-13 yrs of age as a part of ROAD consortium. Insulin secretory capacity was measured as acute insulin response (AIR, mean rise in insulin 3 and 5 minutes after 25 g of i.v. dextrose) and glucose disposal index [GDI, log_{10}[AIR x [fasting glucose]]/[fasting insulin]]

RESULTS: The IGFBP1 index was better correlated with multiple clinical (BMI, % fat, waist circumference and biochemical (fasting insulin, triglycerides, and adiponectin) indices of adiposity-related morbidity risk than either the QUICKI or IGFBP-1 (Table 1).

CONCLUSIONS: An IGFBP-1 index is better correlated with multiple adiposity-related morbidity risk factors than QUICKI or IGFBP-1 alone. This is particularly true for phenotypes associated with the metabolic syndrome (waist circumference triglycerides and HDL cholesterol).

Table 1

<table>
<thead>
<tr>
<th>Index</th>
<th>BMI</th>
<th>Fat %</th>
<th>QUICKI</th>
<th>IGFBP1</th>
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<tbody>
<tr>
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<tr>
<td>IGFBP-1</td>
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</tbody>
</table>

*Biochemical parameters associated with the metabolic syndrome*
Saturday, March 27, 2010
1:10 PM-4:00 PM

103

2:00 PM
Clinical Prediction Modeling To Stratify ROP Risk Using Postnatal Weight Gain

Ophthalmology, Children’s Hospital of Philadelphia, Philadelphia, PA; Ophthalmology, Scheie Eye Institute, University of Pennsylvania, Philadelphia, PA; Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada; Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Current ROP screening criteria in the US, UK, and Canada have poor specificity, with <10% of the infants identified for eye exams requiring treatment. Both low birth weight IGFl levels and slow postnatal growth (as a surrogate for IGFl) are associated with subsequent ROP.

OBJECTIVE: Develop and assess a clinical prediction model that uses postnatal weight gain to identify infants at risk of developing severe ROP.

DESIGN/METHODS: Secondary analysis of prospective data from the Premature Infants in Need of Transfusion (PINT) Study, which enrolled 451 infants weighing <1000 gm at birth. After excluding deaths prior to assessed ROP status, 369 infants were analyzed. Multivariate logistic regression was used to predict development of severe ROP (stage 3 or laser surgery), by using gestational age (GA), birth weight (BW) and weight gain rate (WGR) per day calculated from weekly weights.

RESULTS: 67 (18.2%) infants had severe ROP. Median GA was 26 wks (range 22-34); median BW was 800 gm (range 445-995). The relative risk of severe ROP for every 10 gm decrease in WGR was 1.15 (95% CI 1.06-1.24). A multivariate logistic model was run on a weekly basis, to detect an alarm indicating a need for eye exams. An alarm was triggered when the predicted probability of severe ROP was >0.085. This model identified 66 of 71 infants with severe ROP, with a sensitivity of 99% (95% CI 94%-100%), specificity 36% (32%-41%), positive predictive value 26% (22%-30%), and negative predictive value 99% (96%-100%). The median time between alarm and severe ROP diagnosis was 10.8 wks (range 1.9-17.6). All 33 lased infants were correctly identified.

CONCLUSIONS: A predictive model using BW, GA, and WGR reduced the number of infants with BW <1000 gm who require eye exams by 50%, missed 1 infant with severe ROP, and identified all infants with laser surgery in a high-risk cohort. Fitting the model to a broader sample that is representative of current screening guidelines and inclusive of larger BW, lower-risk infants is expected to further reduce exams and improve prediction.

104

2:15 PM
Determinants of the Interpersonal Variation in Treatment Response to Anti-HIV Nucleoside Analogues
Elijah Paintsil, Ginger Dutschman, Rong Hu, Yung-Chi Cheng.

Pediatrics, Yale University, New Haven, CT; Pharmacology, Yale University, New Haven, CT.

BACKGROUND: The response to highly active antiretroviral therapy (HAART) varies among patients; HIV-infected children are disproportionately affected by the untoward effects of HAART. Nucleoside analog reverse transcriptase inhibitors (NRTIs) are the backbone of HAART. NRTIs are phosphorylated in a step-wise fashion to their active metabolites (triphosphates) by cellular kinases. We hypothesized that the individual differences in treatment response may be due to the differences in intracellular accumulation of NRTI-triphosphates.

OBJECTIVE: To investigate individual differences and determinants of intracellular accumulation of NRTI metabolites.

DESIGN/METHODS: Peripheral blood mononuclear cells (PBMCs) from 40 (20 females and 20 males, 16 years and above) healthy HIV-seronegative volunteers were incubated with radiolabelled analogues (4’-Ed4T, AZT, or 3TC) for 24 hours. HPLC was used to analyze the intracellular metabolites. Standard enzyme assays and Western blotting assays were used for evaluation of enzyme activities (e.g., thymidine kinase [TK]-1, and deoxyctydine kinase [dCK]) and protein expression levels (e.g., TK-1, dCK, thymidylate kinase [TMPK], and cytidine monophosphate kinase [CMPK]). The TK-1 and dCK genes of selected individuals were sequenced to determine expression levels (e.g., TK-1, dCK, thymidylate kinase [TMPK], and cytidine monophosphate kinase [CMPK]).

RESULTS: A total of 32 infants were recorded at both 32w and 36w post-menstrual age. Both adult word counts per hour (16.1 ± 5.1 vs 10.5 ± 3.0) and infant vocalizations/hr (6 ± 11 vs 10 ± 15) significantly between 32 and 36 weeks (p<0.001). Infant exposure to adult language as % of total time significantly from 32w (2.1%) to 36w (5.1%). Monitor noise from 26.6% to 37.8%, silence from 36% to 27.5%, and other noise from 35.4% to 29.6% from 32w to 36w. For every 10% increase in words infants were exposed to they their total vocalizations by 6% (p<0.0001). When a parent was present infants vocalized significantly more than when a parent was not present (13.3 vs 7.7 vocalizations per hour, p<0.0003), and had significantly more conversational turns per hour (6.1 vs 1.5, p<0.0001).

CONCLUSIONS: PT infants begin to make vocalizations prior to their projected due date and are exposed to more adult language, monitor noise, other noise and silence; (b) to test the hypothesis that infants who are exposed to more adult language will have more vocalizations. DESIGN/METHODS: Prospective cohort study. Infants ≤2500 gms b.wt., who were medically stable and not intubated were enrolled. Mean Bwt was 920g ± 201 and gestation was 27 wks. 16 infants who are exposed to more adult language will have more vocalizations.

105

2:30 PM
NJ Seeds Hospital Day: Impact of a Hospital-Based Program on Student Career Choice
Scott Vergano, Ben H. Lee.

General Pediatrics, Goryeb Children’s Hospital at Atlantic Health, Morristown, NJ; Neonatology, Atlantic Health, Atlantic Neonatal Research Institute, Morristown Memorial Hospital, Morristown, NJ.

BACKGROUND: Minority groups are underrepresented among physicians in the United States. Professionals who stimulate interest in careers in medicine among underrepresented students have typically been expensive, difficult to implement, and poorly evaluated by controlled studies.

OBJECTIVE: To evaluate the association of a one-day hospital-based enrichment program with stated plans for a medical career among academically motivated eighth-grade students from economically disadvantaged backgrounds.

DESIGN/METHODS: This retrospective cohort study involved students identified by New Jersey Scholars, Educators, Excellence, Dedication, Success (NJ SEEDS), a community-based organization that recruits students from economically disadvantaged backgrounds to study in an academic enrichment program at four sites throughout the state during their eighth-grade year. Currently, all students are offered the opportunity to participate in NJ SEEDS Hospital Day, an interactive, experiential one-day hospital visit involving shadowing physicians and discussions on career pathways in medicine. During the implementation phase, from 2001-2008, some sites participated in a Hospital Day program while other sites did not. In fall 2008, alumni of all NJ SEEDS sites were surveyed regarding their educational and career plans. Data were collected anonymously and summarized as appropriate. Multiple logistic regression was used to identify student characteristics associated with a stated career goal in medicine.

RESULTS: Thirty-nine of 169 students (23%) at sites that participated in Hospital Day stated that they plan to pursue a medical degree, compared with 42 of 279 students (15%) who were not exposed to a Hospital Day experience (p=0.03). Adjusting for gender, race, cohort, type of high school, and tutoring by a Hospital Day physician, factors that significantly increased the likelihood of pursuing a medical career were Hospital Day participation (OR 2.0, 1.2-3.4) and Asian ethnicity (OR 2.2, 1.1-4.2).

CONCLUSIONS: An experiential, hospital-based one-day program had significant effects in changing career plans among economically disadvantaged, academically motivated eighth-grade students, even when surveyed up to eight years after participation.

106

3:00 PM
Impact of Language Exposure in the NICU on the Development of Vocalizations in Preterm Infants
Melinda Caskey, Betty Vohr, Bonnie Stephens, Richard Tucker.

Department of Pediatrics, Women & Infants’ Hospital, Providence, RI.

BACKGROUND: Human fetuses have the ability to hear as early as 23 weeks gestation and in utero are exposed to their mother’s voice as the most consistent and prominent sensory input. PT infants are at ↑ risk of speech and language delay, and yet little is known about the impact of early language exposure in preterm infants on the development of early vocalizations.

OBJECTIVE: To describe the sound environment of PT infants included in the NICU, including adult hourly word counts, infant vocalizations and conversational turns, percentage of time infants are exposed to language, monitor noise, other noise and silence; (b) to test the hypothesis that infants who are exposed to more adult language will have more vocalizations.

RESULTS: A total of 32 infants were recorded at both 32w (±2) and 36w (±2). Both adult word counts per hour (16.1 ± 5.1 vs 10.5 ± 3.0) and infant vocalizations/hr (6 ± 11 vs 10 ± 15) significantly between 32 and 36 weeks (p<0.001). Infant exposure to adult language as % of total time significantly from 32w (2.1%) to 36w (5.1%). Monitor noise from 26.6% to 37.8%, silence from 36% to 27.5%, and other noise from 35.4% to 29.6% from 32w to 36w. For every ↑ 10% increase in words infants were exposed to they ↑ their total vocalizations by 6% (p<0.0001). When a parent was present infants vocalized significantly more than when a parent was not present (13.3 vs 7.7 vocalizations per hour, p<0.0003), and had significantly more conversational turns per hour (6.1 vs 1.5, p<0.0001).

CONCLUSIONS: PT infants begin to make vocalizations prior to their projected due date and are exposed to more adult language, monitor noise, other noise and silence; (b) to test the hypothesis that infants who are exposed to more adult language will have more vocalizations.
Sinus Node Dysfunction in Long QT Syndrome: Involvement of HCN Pacemaker Current

Pooja D. Kulkarni, Yelena Kryukova, Richard B. Robinson.
Pediatrics, New York Presbyterian Hospital/Columbia University, New York, NY; Pharmacology, Columbia University, New York, NY.

BACKGROUND: Sinus node dysfunction is observed in Long QT syndrome. MinK-related peptide 1 (MRP1) mutations are associated with long QT syndrome (LQT6). MRP1 interacts with the hyperpolarization-activated, cyclic nucleotide gated (HCN) family (molecular correlate of pacemaker channel), serving as a β subunit that can alter channel amplitude and kinetics but not voltage dependence, although the effect may vary with HCN isoform and species. High levels of MRP1 and HCN subunits are expressed in the cardiac sinoatrial node, where the pacemaker channel contributes to impulse initiation. Human MRP1 (hMRP1) mutants associated with LQT6 may differ from wild-type hMRP1 (WTMRP1) in terms of interaction with or functional impact on human HCN (hHCN) subunits. This difference could provide a physiological basis for sinus node dysfunction in LQT6.

OBJECTIVE: We hypothesized that mutant hMRP1s affect function (kinetics, voltage and/or amplitude) of hHCN2 differentially than that of WTMRP1. We used site-directed mutagenesis to create 2 specific LQT6 mutations: T8 and M54T.

DESIGN/METHODS: Transient transfection of neonatal rat myocyte cultures was done using shuttle vectors PDC51SHC2 alone or in combination with either PcNeoWTMRP1, PcNeoT8AhMRP1 or PcNeoM54ThMRP1. Expressed HCN2 current was recorded using a patch electrode in whole cell mode on myocytes. An Axopatch-200B amplifier and pClamp9 software (Axon Instruments) were used for acquisition and analysis of kinetics, amplitude and voltage dependence.

RESULTS: Co-expression of T8AhMRP1, but not M54ThMRP1, with hHCN2 decreased amplitude (pA) of hHCN2 current compared with other conditions: (Mean±SEM) 1851±357, 2086±194, 1768±256, 617.5±85 for hHCN2 alone, with WTHMRP1, with M54ThMRP1 and with T8AhMRP1 respectively (n=6-9, p<0.05 for T8AhMRP1 by ANOVA). Kinetics of HCN2 activation was defined by fitting the fast component of the trace with a single exponential fit. Both T8AhMRP1 and M54ThMRP1 had slower activation kinetics than hHCN2 alone or with WTHMRP1, as ANOVA; p<0.001. No effect on voltage dependence was demonstrated as previously reported.

CONCLUSIONS: The combination of a decrease in current amplitude and slower activation kinetics of hHCN2 co-expressed with mutant T8AhMRP1 would be expected to result in less depolarizing current early in cardiac diastole. This may provide a physiological explanation for sinus node dysfunction in long QT syndrome 6 and a basis for further pharmacologic interventions.

Impact of Delivery Room (DR) Resuscitation on Outcomes of Very Low Birth Weight (VLBW) Infants: Results from the Caffeine for Apnea of Prematurity (CAP) Trial

Children’s Hospital of Philadelphia and University of Pennsylvania, Philadelphia, PA; McMaster University, Hamilton, Canada; University of Melbourne, Melbourne, Australia; University of Manitoba, Winnipeg, Canada; Université Laval, Québec, Canada.

BACKGROUND: The impact of different levels of DR resuscitation on clinically important short and long-term outcomes of VLBW infants is uncertain.

OBJECTIVE: We used data from the international CAP trial to examine the relationships between different levels of DR resuscitation and outcomes up to 18 months.

RESULTS: VLBW infants who received delivery room CPR and survived to a corrected age of 18 months did not have an increased risk of disability.

CONCLUSIONS: VLBW infants who received delivery room CPR and survived to a corrected age of 18 months did not have an increased risk of disability.
CONCLUSIONS: The decreased constriction to NE and enhanced relaxation to SNAP seen postnatally may be indicative of mesenteric vasodilation in response to enteral feeding. In the late preterm lamb, peak constrictor response correlates with the gestational period of peak incidence of clinical NEC. These results may have implications in the pathogenesis of NEC.

Neonatology - Epidemiology & Followup Platform Session

Saturday, March 27, 2010
4:15 PM-5:45 PM

110
4:15 PM
The Impact of Treatment Hospitals on the Disparity in Preterm Birth Experienced by African American Women
Erika F. Dennis, Corinne Fager, Scott A. Lorch.
Neonatology Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA.
BACKGROUND: Attempts to fully account for the disparity in preterm birth for African American women have been ineffective. The explanatory role of treatment hospitals and maternal complications have not been well studied.
OBJECTIVE: To quantify the cumulative impact of sociodemographic factors, medical complications, and hospital level effects on the disparity in preterm birth rates experienced by African American women.
DESIGN/METHODS: Using linked birth certificate data and infant and maternal discharge summaries from all women delivering in Missouri, California, and Pennsylvania between 2001-2003 (N=1,812,938), we constructed logistic regression models to assess the degree to which sociodemographic factors, medical complications, and hospital level effects account for disparities in rates of preterm birth (<37 gestation weeks). Medical complications included hypertensive disorders, diabetes, infectious diseases, placental abnormalities, premature rupture of membranes, oligohydramnios, anemia, thyroid disorders, lupus, and kidney disease.
RESULTS: In the base model controlling for state, year, and race alone, we found that African American women had the highest rates of preterm birth compared to Whites (OR 1.77, 95% CI 1.74-1.80). In a subsequent model accounting for state, year, race, age, month prenatally cared began, insurance, parity, maternal and paternal education, we found a decreased OR of 1.56 (95% CI 1.53-1.59) accounting for a 27% reduction in odds of preterm delivery. Adding major medical problems to this model reduced the odds ratio for preterm birth among African Americans by a total of 44% (OR 1.43, 95% CI 1.40-1.46). When we created a model including treatment hospital, race, and year the odds ratio declined by 40% (OR 1.46, 95% CI 1.44-1.49). In our final model controlling for all demographic parameters, medical conditions, and treatment hospital, we found the largest reduction of 66% in the odds ratio for preterm delivery among African American women (OR 1.26, 95% CI 1.21-1.31).
CONCLUSIONS: Maternal complications and treatment hospital together account for approximately 53% of the disparity in preterm birth experienced by African American women. Reducing rates of pregnancy complications and understanding the underlying reasons for hospital variation in outcomes offer potential methods to reduce this disparity.

111
4:30 PM
Division of Newborn Medicine, Children’s Hospital Boston, Boston, MA; Department of Neonatology, Beth Israel Deaconess Medical Center, Boston, MA; Department of Pediatrics, Harvard Medical School, Boston, MA; Harvard School of Public Health, Boston, MA; Division of Reproductive Health, Centers for Disease Control and Prevention, Atlanta, GA.
BACKGROUND: Maternal periodontal disease has been implicated as a possible risk factor for preterm birth. Among both children and adults, there are significant disparities in oral health status by race and ethnicity. Population-based studies assessing the oral health experiences of women in the peripartum period are lacking.
OBJECTIVE: The aim of this study is to describe the oral health experiences of mothers during their most recent pregnancy and to assess racial and ethnic disparities in maternal oral health experiences.
DESIGN/METHODS: We analyzed 2004-06 data from the CDC Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based surveillance system that collects data on pregnancy and postpartum experiences of mothers who have recently delivered a live infant. Ten states included in the analysis had a ≥70% weighted response rate and three standard questions pertaining to oral health. White non-Hispanic (WNH), Black non-Hispanic (BNH), and Hispanic women were selected for analysis. We used weighted percentages/standard errors and multivariate logistic regression, controlling for selected descriptive characteristics.
RESULTS: Among the 35,267 women studied, only 41% of all women received oral health counseling during pregnancy. In the adjusted multivariate analyses, BNH women were more likely to have a dental problem compared to WNH women (OR 1.19, CI 1.05-1.35) while there was no difference between Hispanic and WNH women (OR 0.87, CI 0.72-1.04). BNH and Hispanic women were less likely to obtain dental care compared to pregnant women to WNH (OR 0.87, CI 0.77-0.98; OR 0.77, CI 0.64-0.91 respectively) and were also less likely to ever have had teeth cleaning (OR 0.64, CI 0.52-0.78; OR 0.36, CI 0.29-0.46 respectively). Compared to WNH women, BNH and Hispanic women were less likely to have a teeth cleaning before pregnancy (OR 0.82, CI 0.72-0.94; OR 0.60, CI 0.50-0.72 respectively) as well as during pregnancy (OR 0.68, CI 0.59-0.76; OR 0.74, CI 0.61-0.90 respectively).
CONCLUSIONS: Significant racial/ethnic disparities in maternal oral health experiences exist. Most women are not offered dental counseling during pregnancy. Given the association between poor oral health and overall health, especially in increasing the risk for cardiovascular events and possibly preterm birth, ensuring the oral health of all pregnant women should be an essential component of prenatal care.

112
4:45 PM
Assessment of Language Development and Related Risk Factors in Preterm Infants
Roschchan Moseabed, William Francis, Kathleen Finnegan, Soraya Abbasi.
University of Pennsylvania/CHOP/Pennsylvania Hospital, Philadelphia, PA.
BACKGROUND: Developmental language disorder is reported in 5-10 percent of children born at term gestation. Many congenital and acquired conditions such as degenerative neurolologic disorders, infection and hemorrhagic or ischemic brain injury can be associated with language delay. Preterm infants are at greater risk of these insults resulting in motor, sensory and cognitive impairment, which in isolation or combination, can contribute to poor language development. There is limited data available on speech and language development in preterm infants.
OBJECTIVE: Evaluate language development of preterm infants using the validated Language Development Survey and Bayley III at 18-24 months corrected age and associated risk factors.
DESIGN/METHODS: 267 preterm infants (BW 1428±549 SDgms, mean GA 29.8±2.9 SDwks, range 23-34wks) had neuro-developmental assessment (Bayley III) at 6, 9, 12, 18, and 24 months corrected age (CA). A Language Development Survey (LDS) was completed by parents between 18-24 months (22.5±3SD). Infants were divided into 3 groups. Group 1 (significantly declined; <30 words), group 2 (moderately delayed; 30-50 words), and group 3 (normal; >50 words with words or language). Comparisons were made by using ANOVA and logistic regression.
RESULTS: At 18-24 months CA, 33.3% of infants had abnormal results on LDS (22.7% in group 1, 10.6% in group 2). 36.2% of group 1 were born before 28 weeks GA as compared to 20.3% of group 3 (p<0.002). There was a significant correlation between LDS and Bayley III language (104±13 SD, p<0.001) and motor (106±12SD, p<0.003) composite scores. There was a trend between LDS and Bayley III cognitive composite score (108±14SD, p=0.06). The majority (96%) of infants were primarily English speaking. No significant association was identified between gender, race, frequency of otitis media, maternal age, maternal education level, socioeconomic background and language development. Lower GA and BW had a negative effect on language development (p<0.029 and p<0.011). Sepsis and BPD were associated with poor language development (p=0.042 and p=0.008) after controlling for GA and BW.
CONCLUSIONS: In our study population, one third of preterm infants had abnormal language scores at 2 years of age. Sepsis, BPD, lower GA and BW were associated with poor language development. LDS results were comparable to Bayley III speech assessment. LDS appears to be a suitable screening tool for language delay in former preterm infants.

113
5:00 PM
The Incidence of Morbidities and NICU Admissions among Early Term (37-38 6/7 Weeks) and Late Term (39-41 Weeks) Neonates at Women and Children’s Hospital of Buffalo (WCHOB)
Shannon Sengupta, Alyssa Herrmann, Vivien Carrion, Rita Ryan, James Shelton, Satyan Lakshminrusimha.
Pediatrics, University at Buffalo, Buffalo, NY.
BACKGROUND: The past decade has witnessed a heightened awareness about increased risk of respiratory morbidities, feeding intolerance, and increased NICU admission among late-preterm infants born between 34 to 36 6/7 weeks gestation. We propose that, based on similar mechanisms, the early-term (gestational age 37 0/7 – 38 6/7 weeks) babies have worse outcomes than those born at gestational age 39 0/7-41 6/7 weeks.
OBJECTIVE: We hypothesize that amongst all full term babies born at WCHOB between January 2006 to December 2008, neonates born between 37-38 6/7 weeks have significantly increased morbidities and NICU admissions (respiratory, feeding issues, infections) as compared to neonates born at 39 0/7-41 6/7 weeks. The primary outcome was the need for NICU admission.
DESIGN/METHODS: This study is a retrospective chart review of all NICU admissions at ≥37 weeks gestation from 1/06/12-7/31/08. These were divided into early-term (37-38 6/7 weeks) and late-term (39-41 weeks) newborns. Exclusion criteria was major congenital malformations.
RESULTS: There were 7626 term live births during the study duration; 28% of these births were between 37-38 6/7 wks of gestation. The proportion of NICU admission, the need for respiratory support, rates of suspected sepsis and hypoglycemia were significantly higher in the early-term neonates as compared to the late-term neonates.

<table>
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<th>Table 1: Early Term 37-38 6/7 wks vs Late Term 39-41 wks (N=2148)</th>
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<tr>
<td>Respiratory Support</td>
<td>62(4.9)</td>
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<tr>
<td>Hypoglycemia</td>
<td>99(6.7)</td>
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<td>Antibiotic therapy</td>
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| Data shown as number (%)

Eastern Society for Pediatric Research 2010 Annual Meeting
predictors of mortality and length of stay. Bivariate analysis was used to determine the impact of admission hypothermia (temperature <35.0°C) on outcomes. Chi-square and Fisher’s Exact Test were used.

RESULTS: 1503 infants were admitted to the NICU during the study period. 306 were diagnosed with pneumonia, with an overall mortality of 13.7%. In multivariate analysis, gestational age, birthweight less than 2kg, (p= 0.04 95%, Confidence Interval 1.0 to 16.7) and Apgar score at one minute (p= 0.01 95%, Confidence Interval 0.12 to 0.58) were predictive of mortality. Birthweight less than 2kg was the only variable associated with increased length of stay (p=0.001 95% Confidence interval 0.48-0.98) Hypothermia was a comorbid condition in 25.8% of cases with pneumonia. There was no statistical difference in mortality rate based on presence of hypothermia (p=0.14 Chi-Square). When stratified by birthweight, the incidence of hypothermia decreased with increased birthweight. Hypothermia was seen in 50% of patients less than 2kg. No statistical difference in mortality was seen in hypothermic patients when stratified by birthweight.

CONCLUSIONS: Gestational age, birthweight and low initial Apgar score are predictors of mortality in Eritrean neonates with pneumonia presenting to a tertiary care center. Birthweight is also associated with increased length of stay. A high incidence of co-morbid hypothermia exists in this population, particularly in infants less than 2 kg. We speculate attention to inexpensive interventions such as kangaroo care may decrease the incidence of hypothermia, which although did not affect length of stay or mortality, is well known to increase other NICU co-morbidities.

**Neonatology - Clinical Studies I**

**Saturday, March 27, 2010**

**5:15 PM**

**Outcome of Preterm and Late Preterm Multiple Gestations Conceived by Assisted Reproduction**

**Ine Essien-Lewis, Preston Hoffman-Williamson, Toni Mancini, Emidio Sivieri, Soraya Abbasi.**

Pediatriads, U of P/CHOP/Pennsylvania Hospital, Philadelphia, PA; OB/GYN, U of P/Pennsylvania Hospital, Philadelphia, PA.

BACKGROUND: Singleton pregnancies resulting from assisted reproduction technology (ART) are reported to be at greater risk for complications as compared to those spontaneously conceived (SPONT). However, ART is associated with an increased number of multiple gestations pregnancies and data regarding the outcomes of multiple gestations from ART compared to SPONT is limited and has yielded conflicting results.

OBJECTIVE: To compare the outcome of multiple gestation pregnancies conceived through assisted reproduction technology to spontaneous conception.

DESIGN/METHODS: A retrospective analysis of multiple gestations in an inborn tertiary care center from 1998 to 2008. Maternal demographics, method of conception, antepartum, delivery complications and neonatal outcomes for pregnancies conceived through ART (N=299), intratertiary insemination (IUI, N=39), ovulation induction (OVI, N=79), or SPONT (N = 902) were compared using chi-square, analysis of variance, and logistic regression tests.

RESULTS: ART mothers were significantly older (34.0 ±5.0y vs 29.1 ±6.0y, P=0.01). ART, IUI, and OVI mothers were more likely to be Caucasian (87%, 90%, and 80% vs 44%, P<0.001). The rate of C-Section delivery was significantly higher in the ART group (73% vs 57%, P<0.001). The incidence of PPROM, clinical chorioamnionitis, chronic hypertension, preeclampsia, antenatal steroids and alcohol and tobacco use were similar. ART group had significantly lower GA and had similar BW as compared to SPONT. ART infants had significantly more RDS (p=0.002) as compared to SPONT. BPD was significant higher in the OVI group (p= 0.027) as compared to SPONT. All other neonatal outcomes, including mortality, PDA, IVH, NEC, sepsis, duration of ventilation, and length of stay, were similar. More infants were born at term GA in SPONT than ART (12.4% vs 6.7%). The two groups had similar rate of late preterm gestation (51.5% vs 51%). Late preterm ART infants had longer duration of oxygen than SPONT (3.2±1.2d vs 2.3± 1.9d). All other outcomes were similar.

CONCLUSIONS: More spontaneously conceived multiple gestations were born at term gestation. The ART group had similar growth to those conceived spontaneously when controlled for GA. ART infants had higher incidence of RDS. Late preterm ART infants had longer need for oxygen. Further investigation is needed to determine the possible predisposition of ART infants to certain complications of preterm birth.

**5:30 PM**

**Predictors of Mortality, Length of Stay and Co-Morbid Hypothermia in Hospitalized Neonates with Pneumonia in Eritrea, Africa**

**Shetali I. Shah, O. Zemichael, Hong Dao Meng.**

Neonatology/Pediatrics, Stony Brook University School of Medicine, Stony Brook, NY; Pediatrics, Orott School of Medicine, Asmara, Eritrea.

BACKGROUND: Millennium Development Goal No. 4 aims to reduce neonatal mortality by 2/3 by 2015. Sub-Saharan Africa has the highest rate, and in Eritrea rates have remained constant between 1995-2002. Pneumonia is the third leading cause of neonatal death in this region.

OBJECTIVE: To determine predictors of mortality in a hospitalized cohort of infants with pneumonia in Asmara, Eritrea.

DESIGN/METHODS: Retrospective review of all 2006 admissions to the Orott Pediatric Hospital Neonatal Intensive Care Unit, the only tertiary center in the country. Data on age, birth weight, gender, mode of delivery, Apgar score, maternal age, birth location, admission diagnosis, admission comorbidities and outcome was collected. Multivariate analysis was used to determine
RESULTS: Nine preterm neonates with gestational age of 29-32 weeks and weight 980-1650 g were monitored. All subjects had RDS but had no known brain issues. 4 of 9 subjects experienced bradycardia during the study. The figure contains an aggregate of SpO2, (mean and 1 SD) for each SpO2 value for all 9 subjects combined. 24.3 days of data were recorded where SpO2 was less than 80% for 1.1% of the total time.

CONCLUSIONS: The accepted clinical range in this population of SpO2 is 85-95%. Assuming a SpO2 range of 60-90%, some infant brains may tolerate a lower SpO2 due to the body’s compensatory mechanisms (assuming peripheral organs are not compromised). This is also supported by the SpO2-SctO2 difference, which decreases with SpO2. It is well known that pulse oximeter accuracy falls as SpO2 drops below 80% and worsens with vasovagal response. NIRS can provide reassurance of adequate brain oxygenation during transient SpO2 changes, even in the presence of severe hypotension since SpO2 pulsations are not required for NIRS measurements.

Fellow in Training
4:45 PM
Cardio Respiratory Monitoring in the NICU: Evaluation of a Wireless Monitor
Division of Neonatology, Children’s National Medical Center, Washington, DC.

DESIGN/METHODS: Studies of 31 premature infants showed the feasibility of acquiring heart rate data from the abdomen and back using the reflectance photoplethysmography (RPPG) method. Data collected from wireless monitor were compared to monitors using electrodes and wires.

RESULTS: Nine preterm neonates with gestational age of 29-32 weeks and weight 980-1650 g were monitored. All subjects had RDS but had no known brain issues. 4 of 9 subjects experienced bradycardia during the study. The figure contains an aggregate of SpO2, (mean and 1 SD) for each SpO2 value for all 9 subjects combined. 24.3 days of data were recorded where SpO2 was less than 80% for 1.1% of the total time.

CONCLUSIONS: The accepted clinical range in this population of SpO2 is 85-95%. Assuming a SpO2 range of 60-90%, some infant brains may tolerate a lower SpO2 due to the body’s compensatory mechanisms (assuming peripheral organs are not compromised). This is also supported by the SpO2-SctO2 difference, which decreases with SpO2. It is well known that pulse oximeter accuracy falls as SpO2 drops below 80% and worsens with vasovagal response. NIRS can provide reassurance of adequate brain oxygenation during transient SpO2 changes, even in the presence of severe hypotension since SpO2 pulsations are not required for NIRS measurements.

Fellow in Training
5:15 PM
Quality Improvement (QI) Project To Improve Admission Temperatures in Very Low Birth Weight Infants
Suhai M. Naiday, Binta Lambert, Deborah E. Campbell.
Pediatrics-Neonatology, Children’s Hospital at Montefiore-Weiler-AECOM, Bronx, NY.

BACKGROUND: Neonatal hypothermia, defined as temperature below 36 °C induces cold stress in ‘Very low-birth weight’ infants (VLBW < 1500 g), and can have serious consequences. Data from Vermont Oxford network (VON) revealed that the admission temperature rates < 36 °C of VLBW infants admitted to our ‘Neonatal intensive care unit’ (NICU) was 44.4 % compared to the network rates of 30.8%. OBJECTIVE: A QI project was designed to improve admission temperatures in VLBWI and to study whether admission temperature is independently associated with selected neonatal morbidities and in-hospital mortality.

DESIGN/METHODS: Multi-disciplinary team for prevention of Neonatal Hypothermia with the inclusion of neonatologists, nurses, social workers, and anesthesiologists was formed to identify and change the processes of care that contributed to the risk of hypothermia among VLBWI using PDSS (Plan-Do-Study-Act) methodology. Inborn VLBWI infants during two epochs: 12 months prior to the planning, education and implementation phase (January to December 2008) (n=116), and interim data (until October 2009) during the implementation period (April 2009 to March 2010) (n=56) were studied. Fisher’s Exact test was used to compare various characteristics. Subsequently, we will also perform multivariate logistic regression to risk-adjust between the two time periods for variables.

RESULTS: There was a marked improvement in the admission temperatures < 36 °C of VLBWI (44.4% vs. 30.8%, post and pre-QI measures respectively) despite increase in Cesarean section rates (74.1% vs. 62.1%). A decrease in mortality (7% vs.14.7%), death or morbidity (36.8% vs.48.3%), incidence of intraventricular hemorrhage ≥ Grade 3+ (5.8% vs. 12.6%), chronic lung disease (25.5% vs.30.1%), severe retinopathy of prematurity (4.7% vs.14.3%), median length of stay (58.0 d vs. 61 d) were seen after the QI measures were implemented. There was a trend toward improvement in the incidence of major morbidities.

CONCLUSIONS: After implementation of QI measures: 1. Interim data shows a significant improvement in admission temperature amongst VLBWI. 2. Reduction in mortality rates and the incidence of major morbidities has been demonstrated. However, we would need to account for confounders before attributing these changes to improved admission temperature alone. 3. No adverse outcomes have been observed so far. 4. Multi-disciplinary approach, employing defined strategies, global and targeted education and buy-in from stakeholders is recommended.

Fellow in Training
5:30 PM
Short Term Effects of the Use of Incubator Covers on Preterm Infants with Birthweight Less Than 1500 grams
Swati Aleti-Jacobs, Donna Baranek, Carol Catania, Kathy Gerke, Shanthi Sridhar.
Pediatrics, Stony Brook University Medical Center, Stony Brook, NY.

BACKGROUND: It is recommended by the Academy of Pediatrics that a safe noise level for a premature infant is 45 decibels (dB). The average ambient noise levels range from 50-88 dB with peaks over 100 dB at times in some NICU’s which can be hazardous to infant development. Additionally, continual light exposure may affect the sleep states of premature infants. Some basic and clinical research sources exist to support the use of incubator covers to minimize external sensory stimuli. Very little data is available on the effects of external stimuli on saturations and adverse outcomes. This study aims to quantify the benefits of incubator covers in premature infants. OBJECTIVE: To evaluate whether incubator covers have any short-term effects on breathing pattern and desaturation episodes in a stable preterm infant.

DESIGN/METHODS: A prospective study on stable infants born under 1500 grams birth weight. Intervention criteria: All infants under 1500 grams who are stable in a incubator. Exclusion criteria: Critical ill infants with PPHN will be excluded from the study. Infants’ pulse oxymeter trends and decibel meter were downloaded for a 24 hour period from patients in a covered incubator and were compared to trends from those infants in uncovered incubators. All data downloaded
Effects of these hypoxia resistance pathways on neuronal survival is unknown. Of particular interest, these pathways are known to provide organismal survival advantage in a hypoxic environment, enabling mechanistic investigation of the selective neuronal vulnerability phenomenon. Prior work has shown that hyperoxia in newborn piglets results in increased generation of oxygen free radicals and significant P values. There was no difference in heart rate variability.

**RESULTS:**

- There was no difference in heart rate variability.
- The soil nematode, *C. elegans*, are equally susceptible. The underlying mechanism of selective neuronal vulnerability is currently unknown. The degree of neuronal injury was graded from normal to severe injury.

**CONCLUSIONS:**

- The AF neurons of *C. elegans* are vulnerable to hypoxic insult and reduction in IGF receptor activity is protective against neuronal insult. This assay is a valuable tool in both identifying selective neuronal populations vulnerable to hypoxia and other hypoxic defense pathways.

**OBJECTIVE:**

To examine the effect of the pro-inflammatory cytokine IL-6 on tight junction protein expression using an in vitro model of the blood-brain barrier. We hypothesized that IL-6 down-regulates key protein constituents of the endothelial tight junctions.

**DESIGN/METHODS:**

Microvessels from young (n = 5) and adult (n = 3) ovine cerebral cortex were isolated after dissection, homogenization, and filtration. Microvessels were placed into culture, incubated with IL-6 at doses of 0 (control, phosphate buffered saline), 1 (low), 10 (middle) and 100 (high) ng/mL for 24 hours, harvested and preserved for protein analysis by Western protein expression using an

**RESULTS:**

- low dose (F = 1.6, P < 0.05 vs Nx), middle dose (F = 2.0, P < 0.01), and high dose (F = 3.4, P < 0.01 vs Nx). The dose-dependent IL-6 treatment reduced CL-5 expression in cerebral cortical microvessels from young (ANOVA, for IL-6 dose, F = 3.4, P < 0.05 vs Nx) and adult (F = 10.2, P < 0.01) sheep.

**Figure:** Open bars = young; closed bars = adult; * P < 0.05 vs. control value for same group.

**CONCLUSIONS:**

- We conclude that IL-6 down-regulates key protein constituents of the endothelial tight junctions.
- IL-6 treatment reduced CL-5 expression in cerebral cortical microvessels from young and adult sheep. We speculate that pro-inflammatory cytokines predispose to brain damage in part by down-regulating the tight junction proteins of the blood-brain barrier, thereby disrupting barrier integrity and potentially permitting entry of substances that could damage the brain.

**Fellow in Training**

**4:45 PM**

**Interleukin-6 (IL-6) Reduces Tight Junction Protein Expression in Cerebral Cortical Microvessel Endothelial Cells from Young and Adult Sheep**

Susan S. Cohen, Erin E. Cummings, Grazyna B. Sadowska, Steven W. Threlkeld, Surenandra Sharma, Barbara S. Stonestreet.

Department of Pediatrics, Women & Infants Hospital of Rhode Island, Providence, RI, Department of Neuroscience, Brown University, Providence, RI.

**BACKGROUND:**

The blood-brain barrier is a selective diffusion barrier that maintains central nervous system homeostasis. The blood-brain barrier is composed of endothelial cells connected by intercellular tight junctions that limit the entry of substances that could alter neuronal function. Pro-inflammatory cytokines have been implicated in the genesis of neonatal brain injury and may alter the protein constituents of tight junctions.

**OBJECTIVE:**

To examine the effect of the pro-inflammatory cytokine IL-6 on tight junction protein expression using an in vitro model of the blood-brain barrier. We hypothesized that IL-6 down-regulates key protein constituents of the endothelial tight junctions.

**DESIGN/METHODS:**

Microvessels from young (n = 5) and adult (n = 3) ovine cerebral cortex were isolated after dissection, homogenization, and filtration. Microvessels were placed into culture, incubated with IL-6 at doses of 0 (control, phosphate buffered saline), 1 (low), 10 (middle) and 100 (high) ng/mL for 24 hours, harvested and preserved for protein analysis by Western protein expression using an

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**Figure:** Open bars = young; closed bars = adult; * P < 0.05 vs. control value for same group.

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- IL-6 treatment reduced CL-5 expression in cerebral cortical microvessels from young and adult sheep. We speculate that pro-inflammatory cytokines predispose to brain damage in part by down-regulating the tight junction proteins of the blood-brain barrier, thereby disrupting barrier integrity and potentially permitting entry of substances that could damage the brain.

**Fellow in Training**

**Nitric Oxide Counters the Hyperoxia-Induced Pro-Inflammatory Phenotype in Astrocytes**

Christie Bruno, Todd Greco, Harry Ichispolous.

The Children’s Hospital of Philadelphia and the University of Pennsylvania, Philadelphia, PA.

**BACKGROUND:**

Studies have suggested that oxidative stress may injure the brain during neonatal exposure to hypoxia, while nitric oxide’s effect on the brain remains uncertain. Studies suggest that astrocytes may play a role in these processes as they participate in neurogenesis, neurotrophism, neurotransmitter consumption and release within the central nervous system (CNS). Exposure to various stimuli results in distinctive phenotypic changes referred to as astrogliosis. Astrogliosis is characterized by increased cell size, number and expression of glial fibrillary acidic protein (GFAP).
OBJECTIVE: Our objective is to determine if hyperoxia(O2) with or without nitric oxide(NO) induces astrogliaosis. We will expand the definition of astrogliaosis to include pathway-specific analysis of protein expression, secretion and elaboration of inflammatory mediators.

DESIGN/METHODS: Astrocytes were prepared from newborn mouse brain (P1) and grown in culture until confluency was achieved. Cells were then exposed to O2, NO, NO plus O2 or RA for 48 hours. Cells were harvested and analyzed for viability (n=3), morphology (n=3), protein expression and secretion (n=3) as well as cytokine secretion (n=3).

RESULTS: Astrocytes exposed to O2 exhibited decreased viability (p<0.01), while cells exposed to NO and NO plus O2 showed no difference in viability. Evaluation of the exposed cells revealed no significant morphologic differences, except for a decrease in process number with O2 plus NO exposure (p<0.05, vs Hyx). Cytoskeletal GFAP and Vimentin were not different amongst the exposure groups. Increased proliferating cell nuclear antigen (PCNA) was measured with O2 (p<0.05), and decreased with NO and NO plus O2 exposure (p<0.01). Cellular COX2 was increased with NO and with decreased NO exposure (p<0.05). Increased PGE2 was evident in the media of O2 exposed cells and decreased in NO exposure (p<0.01). Apo E in cell lysates and conditioned media decreased with NO and increased with NO exposure (p<0.001). Cell lysate clusterin increased with O2 and decreased with NO (p<0.01), with no difference in secretion.

CONCLUSIONS: Astrocytes exist respond to hyperoxic challenges with increased cellular proliferation, decreased expression of ApoE, increased expression of clusterin, and increased expression and secretion of inflammatory mediators, all of which may contribute to neonatal brain injury. These changes are countered by exposure to nitric oxide suggesting that NO exposure may confer beneficial effects in the brain.

126 Fellow in Training
5:15 PM
Mechanism of Caspase-3 Activation during Hyperoxia in the Cerebral Cortex of Newborn Piglets
Lynn Fuchs, Heidi Taylor, Qazi Ashraf, On P. Mishra, Maria Delivoria-Papadopoulos.
Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Phila, PA.

BACKGROUND: Previously we have shown that hyperoxia results in increased activation of caspase-3 in the cytosolic fraction of the cerebral cortex of newborn piglets. We have also shown that hyperoxia results in increased nitrilation of neuronal proteins indicating generation of nitric oxide (NO) free radicals in the cerebral cortical tissue. Nitric oxide generated during hyperoxia may alter the activity of caspase-3 by modulation of the sulfhydryl (-SH) group at the cysteine residue of caspase-3 enzyme.

OBJECTIVE: The present study tests the hypothesis that the hyperoxia-induced increased activation of caspase-3 in the cytosolic fraction of the cerebral cortex of newborn piglets is mediated by nitric oxide derived from neuronal nitric oxide synthase (nNOS).

DESIGN/METHODS: Piglets were divided into: normoxic (Nx), hypoxic (Hx, n=4) and hyperoxic-pretreated with a highly selective nNOS inhibitor 7-nitro-indazole sodium (Hyx-7-NINA, 1 mg/kg, i.v., 60 min prior to hyperoxia, n=5) groups. Hyperoxia was induced by exposure to an FiO2 of 1 to maintain PaO2 at >400 mmHg for 120 min. ATP and phosphocreatine (PCr) were determined biochemically to document cerebral energy status. Cystoskeletal fraction was isolated from the cerebral cortical tissue and caspase-3 activity was determined spectrophotometrically at 37°C for 60 sec using a specific fluorogenic synthetic peptide substrate for caspase-3.

RESULTS: ATP (μmoles/g brain) was 4.9±1.1 in the Nx group, 5.1±0.5 in the Hx group (p<NS), and 4.8±0.7 in the Hx+7-NINA group (p<NS). PCr (μmoles/g brain) was 3.3±0.6 in the Nx group, 3.2±0.5 in the Hx group (p<NS), and 3.1±0.4 in the Hx+7-NINA group (p<NS). Caspase-3 activity was 1.5±0.46 in Nx, 4.6±1.7±1.8 in Hx (p<0.05) and 1.72±0.60 in Hx+7-NINA (p<0.05 vs Hx). The data show that hyperoxia results in increased activity of caspase-3 in the cytosolic fraction of the cerebral cortex of newborn piglets and administration of a highly selective nNOS inhibitor prevented the hyperoxia-induced increased activity of caspase-3.

CONCLUSIONS: We conclude that the hyperoxia-induced increased activity of caspase-3 in the cerebral cortex of newborn piglets is mediated by nitric oxide derived from nNOS. We speculate that the increased activation of caspase-3 occurs through NO-modified mediation of sulfhydryl (-SH) group of cysteine residue in caspase-3 protein. (Funded by NIH-HD 20337)

127 Fellow in Training
5:30 PM
Age Dependent Inter-Alpha Inhibitor Protein (IAIP) Expression in Ovine Cerebral Cortex (CC)
Maria Spasova, Steven Threlkeld, Grazyna Sadowska, Yo-Win Lin, Barbara S. Stonestreet.
Pediatrics, Women and Infants Hospital, Providence, RI; Prothera Biologics, Providence, RI.

BACKGROUND: IAIPs are a family of proteins found in plasma in relatively high concentrations. IAIPs are closely related heavy chains (HC). IAIPs given intravenously reduce ischemic-reperfusion brain injury in adult rats. The HC also play a role in organization and maintenance of the extracellular matrix. Data is not available regarding IAIP expression in the brain of any species.

OBJECTIVE: To examine the effects of maturation on IAIP expression in the CC of fetuses at 70% and 90% gestation, and in newborn and adult sheep.

DESIGN/METHODS: CC samples were obtained from fetuses at 70% and 90% of gestation, newborn, and adult sheep and frozen. Protein expression was determined by Western immunoblot, densitometry performed and results expressed as a ratio to an internal control.

RESULTS: The IAIPs were detected in brain tissue as 250 kDa and 125 kDa protein bands by Western immunoblot with antibodies against IAIPs. The expression of the 250 kDa IAIP was higher in adult sheep than in the fetuses at 70% and 90% and in the newborn lambs (ANOVA, F = 6.1, P < 0.05). The 125kDa IAIP did not differ significantly among age groups (F = 1.33, P = 0.32). Figure: open bars = 125kDa IAIP; closed bars = 250 kDa IAIP; * P < 0.05 vs. adult values.

CONCLUSIONS: The presence of the IAIPs were detected for the first time in the brain from early in fetal and throughout ovine development as both 125 kDa and 250 kDa proteins. The expression of the 250 kDa proteins is higher in the adult than in the newborn and fetal cerebral cortices. Although the functions of IAIPs in the brain are not known, their presence in relatively high amounts raises the interesting possibility that they represent endogenous anti-inflammatory and neuroprotective molecules in the brain.

128 Medical Student
4:15 PM
Three-Year Experience with Administration of Trivalent Inactivated Influenza (TIV) Vaccine to Parents of High-Risk Infants in the Neonatal Intensive Care Unit (NICU) Demonstrates Sustainability
Alexis Sans, Sheryl Shih.
Pediatrics, Stony Brook University School of Medicine, Stony Brook, NY.

BACKGROUND: In 2007, 2 infants in Philadelphia died of pertussis contracted from their mothers. Influenza mortality in infants under 6 months of age with chronic respiratory disease is the highest of the pediatric age group. TIV vaccination is recommended for adults in contact with infants ≤ 6 months of age. Significant barriers to adult vaccination exist including cost, convenience, & access. NICU-based administration of TIV to parents of admitted infants has shown to increase immunization rates over one season, however issues regarding sustainable implementation of this program have been raised.

OBJECTIVE: To determine the feasibility of TIV administration to NICU parents over a three-year period and examine year-to-year differences in immunization rates.

DESIGN/METHODS: For a four-month period from November to March for the 2004-05, 2005-06, 2006-07 and 2008-09 flu seasons, all parents of admitted patients to our NICU were informed of the risks & benefits of TIV. All staff were educated about the dangers of influenza infection & instructed to reinforce the need to obtain vaccination. Parents were screened, medically consented, & immunized at their infant’s bedside. Immunization was available for 20 hrs per day at no cost. Data on TIV risk factors, immunization rates, and patient demographic factors was obtained.

RESULTS: Over the study period, 752 parents were screening for TIV administration. The rate of immunization screening remained fixed (78% to 81% per year). Immunization rate of parents did not vary significantly, (95% in 04-05, 92% in 06-06, and 91% in 08-09). The parent’s rates already received TIV for their infant’s NICU admission varied from 11.8% in 06-07 to 33% in 08-09. Rates of maternal immunization prior to NICU admission have risen steadily, from 18% in 04-05 to 23% in 06-07 to 46% in 08-09. Maternal immunization rates have varied from 1% to 19.8%. There was no significant difference in gestational age, length of stay, or time to immunization between the three years.

CONCLUSIONS: Administration of TIV in the NICU is a sustainable mechanism for effective immunization of parents. Immunization rates of pregnant mothers are rising compared to 5 years ago in our single center study. Maternal immunization rates, however, are significantly lower than maternal vaccination and should remain an area of focus for primary care providers, OB-GYNs, and pediatrics.

129 House Officer
4:30 PM
Impact of a Tdap Postpartum Intervention on Timeliness of Early Infant Immunization
Jasmin Kaur, Krissa George, Carolina Pena-Ricardo, Barbara Watison, Barbara Kelly.
Pediatric & Adolescent Medicine, Albert Einstein Medical Center, Philadelphia, PA; Division of Disease Control Immunization Program, Department of Health, Philadelphia, PA.

BACKGROUND: In 2007, 2 infants in Philadelphia died of pertussis contracted from their mothers. To decrease pertussis transmission, in 2008 the Philadelphia Department of Health launched a successful Tdap vaccination initiative for postpartum mothers at 3 regional hospitals. The effect of vaccination of postpartum mothers on subsequent infant vaccination is not well known.

OBJECTIVE: To examine the impact of a Tdap maternal postpartum intervention on subsequent

Immunizations Platform Session
Saturday, March 27, 2010
4:15 PM-5:45 PM
Offset of season was abrupt for all years, including 2009 (no wk with ≥2 RSV+ in spring after wk 15). Intersason hiatus of <2wk or no (0) RSV+ wk differed by years: hiatus only 15 and 10 weeks, resp, for ‘09 vs mean 24.2 and 18.5 weeks, resp, for ‘05-08. In 2009, there were 13 weeks without ≥2 RSV+ wk prior to meeting the CDC definition of season offset, which occurred in week 45. In weeks 39 through 44, 45% but <10% of tests were RSV+, although there was an average of 13.8 cases per week. If 2009 H1N1 positive tests are removed from total number of tests performed, case definition for RSV season would have been met in week 43.

CONCLUSIONS: The onset shoulder of the 2009 RSV season was unusually broad. Meeting the 10% threshold was confounded by concurrent 2009 H1N1. Better understanding of factors affecting RSV seasonality will permit optimal RSV prophylaxis.

5:30 PM
Parenteral Knowledge and Attitudes towards Human Papillomavirus Vaccine and Willingness To Vaccinate Urban Adolescents
Alina Stanica, Patricia Burris-Warmoth, Louis Primavera, Fernanda Kupfernagel-Meik
Pedicatrics, Flushing Hospital Medical Center, Flushing, NY; Psychology, Touro College, NY, NY.

BACKGROUND: Papillomavirus (HPV) vaccination is a significant source of morbidity and mortality in children. Full coverage rates remain low, particularly in those children under 9 years who require 2 vaccine doses to obtain optimal efficacy. Latino children appear to be at increased risk of influenza under-immunization, yet studies examining the extent and timeliness of coverage in this population are limited.

OBJECTIVE: To examine the extent and timeliness of influenza vaccine coverage in children from an underserved community in New York City during the 2004-5 through 2008-9 seasons.

DESIGN/METHODS: In this retrospective cohort study, influenza vaccination rates were evaluated in 23,745 children from a predominantly Latino underserved community using the New York Presbyterian-Institute for Research and Education Database.

RESULTS: Children were primarily Latino (60%) and had Medicaid (77%). Full coverage rates remained low, particularly in those children under 9 years who require 2 vaccine doses to obtain optimal efficacy. Latino children appear to be at increased risk of influenza under-immunization, yet studies examining the extent and timeliness of coverage in this population are limited.

CONCLUSIONS: The onset shoulder of the 2009 RSV season was unusually broad. Meeting the 10% threshold was confounded by concurrent 2009 H1N1. Better understanding of factors affecting RSV seasonality will permit optimal RSV prophylaxis.

5:15 PM
Extent and Timeliness of Seasonal Influenza Vaccine Coverage in Children from an Underserved Community, 2004-2008
Annika M.O. Hofstetter, Karthik Natarajan, Raquel Andres Martinez, Melissa S. Stockwell.
Department of Pediatrics, Columbia University, New York, NY; Department of Population and Family Health, Columbia University, New York, NY.

BACKGROUND: Papillomavirus (HPV) vaccination is a significant source of morbidity and mortality in children. Full coverage rates remain low, particularly in those children under 9 years who require 2 vaccine doses to obtain optimal efficacy. Latino children appear to be at increased risk of influenza under-immunization, yet studies examining the extent and timeliness of coverage in this population are limited.

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CONCLUSIONS: The onset shoulder of the 2009 RSV season was unusually broad. Meeting the 10% threshold was confounded by concurrent 2009 H1N1. Better understanding of factors affecting RSV seasonality will permit optimal RSV prophylaxis.
their daughter, without knowledge of the sealed responses. Acceptance or refusal was noted on the sealed envelope. Data were analyzed statistically with frequencies and Chi-Square test.

RESULTS: Forty subjects participated in the study. Most parents (87.5%) had a positive attitude towards vaccination in general and towards HPVV (85%). Older parents were statistically more likely to be consent for HPVV for their daughters and the rates of consent increased with the age of their daughters. Among the 35 parents who had knowledge of HPV, 71.4% were aware of the mode of transmission (p=0.002), and 68.6% knew it caused cervical cancer (p=0.003). Over half the parents who knew these facts received the information from health professionals rather than from media (p=0.041). Only 35% of parents believed that HPVV would not promote risky sexual behavior. Almost all patients (97.5%) were offered HPVV, and most of their parents consented (80%). Among parents who refused HPVV for their daughter, 87.5% received their information from media, while 12.5% of them received it from health professionals (p=0.009). Only 30% of parents believed their daughter’s risk of HPV infection.

CONCLUSIONS: Most parents had knowledge of HPV and were willing to vaccinate their daughters, but the information was not always accurate and complete. Parents seemed to have a false sense of security regarding their daughters’ exposure to HPV. Parents who were older received HPVV information from health professionals, and had older adolescent daughters were more likely to consent for HPVV.

Cardiovascular Platform Session

Saturday, March 27, 2010
4:15 PM-5:45 PM

134 Fellow in Training

4:15 PM

Donor Troponin I Levels and Graft Survival in Pediatric Heart Transplantation


BACKGROUND: Troponin I (TnI), a biomarker that reflects myocardial damage in patients with acute coronary syndromes, is often obtained during evaluation of a potential transplant donor heart. It is unclear whether any elevation in donor TnI levels can predict an adverse outcome and should thus preclude acceptance of a donor heart.

OBJECTIVE: The aim of this study was to examine whether TnI levels predict graft failure in pediatric heart transplantation.

DESIGN/METHODS: De-identified data on heart transplants performed in recipients ≥ 21 years old between 4/07-4/09 was provided by the Organ Procurement and Transplantation Network. Donor TnI level and recipient survival without retransplantation (graft survival) were examined for statistical correlation. Other donor and recipient variables were examined as possible predictors of graft failure.

RESULTS: Overall graft survival in the 846 heart transplants performed was 81.1% at 2 years. 662 donors had at least one TnI level recorded prior to transplant, with values ranging from 0.50 ng/ml (median 0.1). Using the last donor TnI level reported prior to graft harvest, there was no correlation between TnI level and graft failure (p=0.635). An ROC curve suggested no association between TnI and graft status (AUC=0.52; p=0.59), and there was no difference in graft survival (p=0.519) among quartiles of TnI (0.00-0.1, 0.1-0.35, 0.35-20.35 ng/ml). 72 transplanted donors had a TnI ≥1; graft survival was not associated with TnI (78% vs TnI≤82%) at 2 years (p=0.961). TnI values were also not associated with post-transplant hospital length of stay (r=−0.035; p=0.372).

CONCLUSIONS: In donor hearts accepted for pediatric heart transplantation, pre-harvest TnI elevations are not associated with increased graft failure. Further prospective studies are needed to help determine whether a threshold value for elevated troponin in heart transplantation exists. This work was supported in part by Health Resources and Services Administration contract 234-2005-370011C. The content is the responsibility of the authors alone and does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

135 Medical Student

4:30 PM

Transient In Utero Knockout (TIUKO) of the CFTR Gene Results in Increased Levels of Myocardial Inflammatory Markers in Adult Sprague-Dawley Rat Pups


Pediatrics, Stony Brook University School of Medicine, Stony Brook, NY.

BACKGROUND: Mechanosensory forces provide developmental stimuli in the embryologic development of the lungs, heart and intestine. In utero, these forces are mediated by the CFTR gene, which ultimately results in actin and myosin contraction generating the contractile force required in gestational development.TIUKO of the CFTR gene results in obesity, insulin resistance and the presence of visceral adiposity.Interleukin 1 beta (IL-1B), Interleukin 6 (IL-6), Matrix Metalloproteinases 10, 12 (MMP 10, 12), Nitric Oxide Synthase 2 (NOS-2) and Tumor Necrosis Factor Alpha (TNF-alpha) are well described, time-dependent, markers of myocyte inflammation.

OBJECTIVE: To determine the levels of these inflammatory markers in the myocytes of adult Sprague Dawley rats subjected to the TIUKO procedure.

DESIGN/METHODS: Two litters of time-pregnant Sprague-Dawley rat pups underwent transient in utero knockout of CFTR via surgical laparotomy with an intra-amniotic injection of anti-sense CFTR (ASCFTR) using a replication-deficient adenovirus vector at 17 days gestation or control with injection of EGF.Fetuses were harvested naturally and the rat pups were raised in unfiltered air. Hearts were harvested from 18-month old animals. Hematoxylin and Eosin (H&E) and interpreted by a blinded cardiac pathologist. Immuno-histochemistry was performed on frozen sections to assess for levels of IL-1B, TNF-alpha, MMP10, 12 and NOS-2. Pixel count was used for quantification and 20 microscopic images per antibody were obtained. Unpaired T-testing with Welch’s Correction using GraphPad software was used to determine significance.

RESULTS: IL-1 beta, IL-6, TNF-alpha, MMP 10, 12 and NOS-2 were increased compared to control. IL-1B and -2 levels were significantly elevated compared to control (p=0.003, for both). IL-6 levels were increased as well (p=0.009). NOS-2 levels were elevated in TIUKO animals (p=0.0001). MMP 10 and 12 were also elevated compared to control (p=0.0005 and p=0.0001, respectively).

CONCLUSIONS: ASCFTR animals exhibited increased levels of markers associated with myocardial stress without gross anatomic hypertrophic changes.Interference with mechanosensory processes during gestation results in elevated levels of protein associated with cardiac stress in adulthood.

136 Fellow in Training

4:45 PM

Intrauterine Growth Restriction Alters Norepinephrine Response in Rat Aortas in a Developmental and Gender Specific Manner

Catalina Bazach, Melissa Carmen, Bobby Mathew, Rita M. Ryan, Satyan Lakshminrusimha, Daniel D. Swartz.

Pediatrics, University at Buffalo, Buffalo, NY.

BACKGROUND: Intrauterine growth restriction (IUGR) affects 10% of all newborns. IUGR infants are found to be at increased risk of developing vascular / metabolic diseases (Barker, 1993; Woodall, 1996). In IUGR mice catch up growth normalized cardiovascular function in males but not females (Hermann, 2009).

OBJECTIVE: The objective was to evaluate the gender and developmental differences in constriction response to norepinephrine (NE) in thoracic aortic rings from IUGR and control rats. DESIGN/METHODS: Pregnant rats were fed a low protein diet (LPD) (8% protein) during pregnancy to induce IUGR; maternal LPD was continued until weaning at 3 wk, after which pups were placed on a high fat diet (32% fat) until 16 wk of age. Control rats were fed standard diet (19% protein) throughout the study. At 3 and 16wk, thoracic rings were removed and placed in an isolated tissue bath with Krebs Ringer solution bubbled with 5% CO2 and air. Constriction response to increasing concentrations of methacholine (10-8 to 10-4M) was recorded.

RESULTS: Eighteen IUGR rats and 14 controls were evaluated for aortic reactivity. At 3 wk of age, body weights of IUGR rats were significantly lower than controls (22.8±4 g vs 48±6 g) with no significant gender differences. At 16 wks, IUGR rats weighed similar to control rats. However, male rats weighted significantly more than females (427±23 g vs 276±14 g). Contractile response to NE was significantly higher in female control rats compared to IUGR females. In sharp contrast, no significant differences were noted between control and IUGR male rats at 3 and 16 weeks.

Rat Aorta Constriction to [10-6M NE]

CONCLUSIONS: Maternal LPD resulted in IUGR at birth; high fat diet provided after weaning resulted in catch up growth by 16 wks. Maternal protein restriction did not affect NE-induced contractility in male rats but significantly impaired contractility in female IUGR rats at 3 and 16 weeks of age. This result indicates that maternal protein restriction may induce long term alteration of vascular reactivity in female offspring.

137 Fellow in Training

5:00 PM

Comparison of Mesenteric Tissue Oxygenation during Indomethacin and Ibuprofen Therapy for Patent Ductus Arteriosus in Preterm Infants

Mayoor Bhatt, Anna Petrova, Rajeev Mehta.

Pediatrics, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ.

BACKGROUND: Both ibuprofen (IBU) and indomethacin (INDO) are non-selective cyclo- oxygenase inhibitors that are effective for the medical closure of patent ductus arteriosus (PDA), a highly prevalent and potentially life-threatening condition in very preterm born infants. Concern remains regarding the impact of IBU or INDO therapy on the regional tissue oxygenation. No study has compared the effect on mesenteric perfusion.

OBJECTIVE: We hypothesized that INDO as compared with IBU, affects mesenteric tissue oxygenation. To test this hypothesis, we compared the effect of IBU and INDO therapy on the mesenteric tissue oxygenation in preterm infants.

Eastern Society for Pediatric Research 2010 Annual Meeting
that the cTnI PAK-P mice demonstrated increased calcium sensitivity. Further studies will determine whether this increased calcium sensitivity results in diastolic dysfunction in vivo.

General Pediatrics II - Vulnerabilities

Saturday, March 27, 2010
4:15 PM-5:45 PM

Fellow in Training
4:15 PM

Endocrine Disruptors and Childhood Social Impairment
Amir Moosavik, Mary S. Wolff, Chenbo Zhu, Antonia M. Calafat, Minori J. Silva, Stephanie M. Eugals
Department of Preventive Medicine, Mount Sinai School of Medicine, New York, NY; National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA.

BACKGROUND: Endocrine disruptors (EDs) are hormonally active compounds that represent a broad class of molecules such as organochlorine pesticides, PCBs, phenolic compounds and phthalate esters; they are ubiquitous in the environment and have been linked to reproductive toxicity and neurodevelopmental effects in animals and humans. The prenatal period may be uniquely susceptible to the effects of EDs given the important role of both maternal and fetal thyroid and sex steroid hormones in brain development.

OBJECTIVE: To explore synthetic compounds that may affect brain development and behavior can be reduced and potentially prevent.

METHODS: A study was conducted to investigate the impact of two categories of endocrine disruptors, phthalate esters and phenolic compounds, on milder forms of autistic social impairment in an inner-city cohort of children.

RESULTS: Using adjusted general linear models, increased low molecular weight phthalate metabolite concentrations were associated with poorer SRS scores (B = 1.53, 95% CI 0.26-2.80, p-value: 0.02). SRS treatment subscale scores were also significantly poorer for Cognition (B = 1.43, p = 0.03); Communication (B = 1.80, p = 0.01); and Awareness (B = 1.29, p = 0.03), but not for Maniers or Motivation. There were no significant associations for high molecular weight phthalates or phenols, which have lower exposure levels.

CONCLUSIONS: Prenatal phthalate exposure was associated with social impairment in a healthy, urban population. Our findings are not limited to autistic spectrum disorders but may encompass multiple, overlapping developmental disorders in which social impairment is a salient feature. These results extend our previous finding of abnormalities in neonatal behavior and later childhood behaviors in relation to prenatal phthalate exposure.

141

House Officer
4:30 PM

Additional Forms of Victimization in Children Exposed to Violence
Ruby Ruoho, Paola Carugno, Rosemarie DiDonato, David H. Rubin
Pediatrics, St. Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Recent studies have documented increasing rates of direct & indirect victimization of children nationwide. The Child Advocacy Center of St. Barnabas Hospital is implementing the Safe Start Initiative Program designed to promote the development & application of evidence-based practices for children exposed to violence. The Program serves children aged 0-7 years exposed to domestic violence (DV) or community violence (CV). The purpose of this study was to investigate the impact of two categories of endocrine disruptors, phthalate esters and phenolic compounds, on milder forms of autistic social impairment in an inner-city cohort of children.

OBJECTIVE: To identify characteristics & exposure to other forms of victimization in children with known exposures to domestic or community violence.

METHODS: Baseline data from the Juvenile Victimization Questionnaire-Caregiver version (JVQ-B) were gathered from families as they enrolled in the Safe Start Program. Information included demographic data & the results of the JVQ-B which measures childhood victimization in 5 domains: conventional crime, child maltreatment, peer/sibling victimization, sexual victimization & witnessing violence/indirect victimization.

RESULTS: 135 patients enrolled in the Program (89 males (69%), 113 Hispanics (84%); 28 (21%) were < 2 yrs of age, 58 (44%) were 2-3 yrs of age, and 47(33%) were 5 to 7 years old. At the time of initial exposure to violence, 92 (70.2%) of the children were < 2 yrs of age, and at the time of enrollment in the project, 107 (79%) were > 2 yrs of age. By age 5, 80% were already exposed to multiple forms of victimization. Boys (70%) were more likely to witness DV than girls and were also more frequently physically abused than girls. Most girls who were sexually abused were abused by a known perpetrator. Children who witness DV were more likely to witness CV without a weapon. Increased frequency of exposure to DV was significantly associated with other forms of victimization: witnessing violence against a sibling, frequency of exposure to CV with and without a weapon, custody fights and hearing gun shots/bombs/witnessing street riots.

Frequency of exposure to DV was not associated with murder of somebody close to the child, neglect and sexual/verbal abuse.

Saturday, March 27, 2010
4:15 PM-5:45 PM

140
CONCLUSIONS: In children exposed to violence, initial exposure to DV and CV occurs early in life. These children are not identified until they are much older and have been exposed to other forms of victimization. More boys witness violence at home and suffer from physical abuse while older girls are victims of sexual abuse. Many of these children may be born into homes where DV and CV are already present or begin shortly after birth.

142 4:45 PM
Is Neurocognitive Function Associated with Youth Gambling Trajectories?
Caitlin A. Brown, Hallam Hurt, Nancy L. Brodsky, Laura M. Betancourt, Kathleen A. McKenna, Joan M. Giannetta, Daniel Romer.
BACKGROUND: Studies have examined the relations among patterns of youth gambling, impulsivity, sensation seeking, family demographics, and comorbid problems. Few youth gambling studies have assessed neurocognitive function (NCF).
OBJECTIVE: To identify trajectories of youth gambling; evaluate risk factors for youth gambling, in particular NCF; and identify comorbid problems.
DESIGN/METHODS: Youth aged 10-12 years of mixed SES (n=387) were enrolled from Philadelphia schools. Three annual evaluations included: 1) self-reported risk behaviors; 2) NCF (8 tasks assessing 3 systems: Working Memory, Cognitive Control, and Reward Processing); 3) Impulsivity (Eyseenk J, Junior Impulsivity Subscale); 4) Sensation Seeking (Reduced Brief Sensation Seeking Scale); 5) problem behaviors (ASEBA-YSR); and 6) family demographics. Our primary outcome was self-report of gambling for money. Trajectory group membership for gambling was derived using methods developed by Nagin et al. Risk factors were evaluated using backward multivariable logistic regression including relevant covariates with p<0.10 in preliminary bivariate analyses. Comorbid problems were identified by Chi-square analysis.
RESULTS: Two Gambling trajectory groups were identified: EarlyGamblers (EG) (n=111) who initiated at ages 10-12 and continued in later assessments, and LaterGamblers (LG) (n=276) who initiated at a later age and gambled less. Betting money on cards and sports were the most frequently reported gambling behaviors. Using Gambling group (LG) as the outcome, the final regression model for risk factors showed that EG are more likely male (p=0.001), report more active coping strategies (p=0.051), engage in Sensation Seeking (p=0.013) and Impulsive (p=0.014) behaviors, and have friends who gamble (p=0.001). NCF, however, did not differ between EG and LG. Additional factors not related to outcome were: parental monitoring and marital status, SES, race. In regard to comorbid problems, EG were more likely in the Borderline or Clinical range for YSR Externalizing and/or Internalizing and to engage in early drug use (all p<0.01).
CONCLUSIONS: In this cohort we identified two gambling trajectory groups. While EG were more likely to engage in Sensation Seeking and Impulsive behaviors, and exhibit more comorbid problems, EG did not differ from LG in NCF. We speculate that NCF may emerge as a relevant factor in problem gambling at later ages.

143 5:00 PM
On-Line Survey of Feeding and Gastrointestinal Problems in Children with High Functioning Autism: Comparison with Their Normally Developing Siblings
Pediatrics, Inova Fairfax Hospital for Children, Falls Church, VA.
BACKGROUND: Children with autism have a high prevalence of feeding and gastrointestinal autisms. Few studies have been done to identify the extent of these problems in high-functioning autistic children.
OBJECTIVE: To compare the prevalence of feeding difficulties and gastrointestinal disorders in children with autism and their normally developing siblings.
DESIGN/METHODS: A 41-item anonymous structured survey on development, attainment of milestones, feeding behavior, meal preferences, and gastrointestinal problems in both the child with autism and his/her sibling was posted as a secure online questionnaire at www.formsite.com (Vroman Systems, Inc., Chicago, IL). The link to the survey was sent to autism support groups in Northern America. Respondents were mainly from United States (77%) and Canada (17%). We received a total of 228 questionnaires containing information on 156 children with Asperger syndrome and 70 children with PDD. Mean age was 12, 7.6, and 10.8 years for Asperger, PDD, and control groups, respectively. 84% of autistic children and 51% of the control group were males.
RESULTS: Compared to their controls, children with Asperger and PDD had higher prevalence of maladaptive behavior problems at school (26% and 34% vs. 2% of controls), fear/dislike of new food (54% and 63% vs. 11% of controls), preference for specific food colors, shapes, textures (55% and 63% vs. 5% of controls), and pica (25% and 33% vs. 2% of controls), all statistically significant (Chi square p values <0.001). Children with Asperger and PDD had higher prevalence of gastrointestinal problems: vomiting (8% and 4% vs. 2% of controls), constipation (32% and 30% vs. 4%), soiling (19% and 26% vs. 2%), reflux (10% and 13% vs. 4%), abdominal pain (6% and 4% vs. 2%), and inadequate weight gain (23% and 27% vs. 7%), all statistically significant (Chi square p values <0.05). 20% of Asperger group and 28% of PDD group were on at least one restrictive diet compared to 8% of the controls. Prevalences of eosinophilic esophagitis, celiac disease and other intestinal diseases were similar across three groups. Prevalences of frequent feeding and GI problems were similar in Asperger and PDD groups, except unusual food preferences and dislike of new foods.
CONCLUSIONS: Children with Asperger syndrome or PDD have significantly higher rates of abnormal feeding behaviors and GI problems compared to their normally developing siblings.

144 5:15 PM
Accuracy of Pediatricians’ Identification of Developmental and Behavioral Problems
Sheila Merchant, R. Christopher Sheldrick, Ellen C. Perrin.
Pediatrics, Floating Hospital, Tufts Medical Center, Boston, MA.
BACKGROUND: Pediatricians are important gatekeepers to mental health services. Many investigators claim that unless they use validated screening instruments, pediatricians are not adequately identifying developmental or behavioral problems. However, the data to support this claim have not been systematically reviewed.
OBJECTIVE: To determine the accuracy of pediatricians’ clinical identification of behavioral and developmental problems in young children, we conducted a systematic literature review based on searches of Medline and bibliographies of relevant articles.
DESIGN/METHODS: We identified 11 studies that included: 1) an assessment of pediatric identification; 2) an independent criterion assessment (e.g., diagnostic interview, validated screening instrument, or qualification for services); and 3) follow-up of a sufficient number of cases to determine sensitivity and specificity. For each study, we calculated relevant statistics and evaluated quality using QUADAS criteria, a standard way to assess study methodology in systematic reviews of diagnostic accuracy.
RESULTS: We compared individual studies to AAP guidelines for screening instruments, which state that sensitivity and specificity should be above 0.70. Two studies were excluded because they focused on single disorders (sleep problems, language delay), and two additional studies were excluded because data were based solely on parent report of discussions with pediatricians. In each of the remaining 7 studies, sensitivity fell below the AAP threshold and specificity fell below the AAP threshold. Given the high variability in study quality, meta-analytic summary variables could not be calculated.

145 5:30 PM
A Needs Assessment of Health Care Professionals for a Violence Prevention Program at St. Christophers Hospital for Children
Mario Cruz, Daniel Taylor, Aakanksha Mehta, Stephen Sandlich.
Department of General Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA; Drexel University College of Medicine, Philadelphia, PA.
BACKGROUND: The profound effects of Community Violence (CV) on children and adolescents is well known. The American Academy of Pediatrics recommends screening and intervention for CV by pediatricians; unfortunately few routinely do so. Major barriers include lack of time, training, and perceived futility.
OBJECTIVE: To identify the attitudes and practices of CV screening in pediatric health care professionals at St. Christophers Hospital for Children (SCH).
DESIGN/METHODS: A survey about CV knowledge, attitudes and practices was administered to pediatric interns, residents, attending physicians, fellows, nurses, and social workers at SCH. Data was sorted and analyzed by occupation.
RESULTS: While 85% of the surveyed healthcare professionals (n=237) had never been victimized by CV, 82% had treated patients for CV-related injuries. Only 50% of interns had treated patients for CV-related injuries. Most respondents (92%) identified CV as a public health issue. Knowledge of CV was fair; 100% knew that violence is the major cause of death for Philadelphia teenagers and 38% knew the correct prevalence of adolescent fighting. A striking dichotomy was uncovered about CV screening attitudes and behaviors. Most respondents were supportive of CV screening (83%) feel CV screening is within their role, 50% feel comfortable discussing CV with families). Conversely, only 19% routinely asked about bullying, 10% ask about fighting, and 17% ask about guns. Two-thirds of respondents were uncomfortable discussing corporal punishment and only 33% routinely recommend nonviolent disciplinary alternatives. Major barriers to CV screening were institutional deficiencies (space, money, resources) (55%), time (6%) and inadequate training (10%). Most respondents (80%) wanted more training on CV prevention.
CONCLUSIONS: While health-care professionals recognize CV as a public health issue and have attitudes supportive of CV prevention, screening for CV is seldom performed. Major barriers included time, money, resources, and inadequate training. Institutional support should include an onsite CV social worker and improved CV training. Pediatric interns had little experience with CV-victimized patients, suggesting that CV training should begin during medical school.

Poster Session II

Saturday, March 27, 2010
6:00 PM-7:30 PM

146
Window Fall Trauma in Children
Alison B. McClone, Kathleen A. Lillis, Ali Ebrahimi, William Grant.
Department of Emergency Medicine, SUNY Upstate Medical University, Syracuse, NY; Department of Pediatric Emergency Medicine, SUNY at Buffalo School of Medicine and Biomedical Sciences, Buffalo, NY.

BACKGROUND: Over 46,000 children die every year worldwide as a result of injuries sustained from falls from windows.

OBJECTIVE: The objective was to describe the incidence, injuries and conditions which may lead to accidental window falls in children.

DESIGN/METHODS: A retrospective chart review of patients between 21 years presenting to a Level I trauma center for the period 1995 to 2006 with injuries related to an accidental fall from a window. Data were collected on patient demographics, details of the fall, event environment and health outcomes.

RESULTS: A total of 63 patients were identified, 68% were male, 43% were <3 years old, with 83% being 6 years or younger. This risk of falling from a window is increased if the child is less than 6 years of age (OR=2.21, 95%CI 1.16-4.21, P<.02), if the child is male (OR=5.77, 95%CI 2.6-12.7, P<.001), or if it is during a warmer month (May-August) (OR=1.86, 95%CI 0.99-3.4, P<.05). Most (89%) falls were from a second story. Among those evaluated, 87% were admitted for further evaluation. 88% had a head CT scan, and 70% of all patients had abdomen and pelvis CT. Of those admitted, 20% were admitted to the PICU for serious injuries. The most serious injuries were to the head with 16% of patients sustaining a skull fracture and 10% sustaining an intracranial hemorrhage. The most common injuries to the upper and lower extremities were fractures, presenting in 18% and 14% of patients respectively. In 19% of cases, CPS was contacted for further investigation.

CONCLUSIONS: Children who have access to unprotected windows are at an increased risk of suffering injuries due to falling from the window. Males and those 6 years of age and less are at the greatest risk, particularly during the summer months. To develop effective prevention programs, it is necessary to identify risk factors associated with accidental falls.

147
House Officer
Cervical Spine Injuries in Children: A 7-Year Review at St. Barnabas Hospital, Level 1 Trauma Center, Bronx, NY
Sheryl Grace R. Kho, Wipanchee Phuphukul.
Pediatrics, St. Barnabas Hospital, Bronx, NY; Pediatrics, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Pediatric spinal injuries comprise 1-10% of all cases of spinal injury; 60-80% of those injuries affect the cervical spine. Despite its relative rarity, cervical spine injuries result in significant morbidity and mortality. Timely identification and appropriate treatment of such injury is critical for the prevention of further neurologic damage and deformity. Prior studies have reported that characteristics of cervical spine injuries are strongly related and differ between infants, children and adolescents.

OBJECTIVE: To determine the incidence, age-related risk factors, and outcome of pediatric cervical spine injury in an urban Level 1 Trauma Center.

DESIGN/METHODS: Medical records of 932 patients seen in the St. Barnabas Hospital Emergency Department, a Level 1 trauma center in Bronx, NY, from June 2002 to June 2009 were reviewed based on their inclusion in the trauma registry; representing all the trauma patients seen during the time period. This also included all Pediatric trauma patients, age 0-18 years. Excluded from the study were those patients who pre-existing, congenital or known spinal injuries. Cases of cervical spine injuries were defined by either clinical or radiologic evidence.

RESULTS: 8 cases of cervical spine injuries were identified with incidence of 0.85%. The cases ranged from 23 days old to 17 years of age, with a mean SD of 6.9±6.5 years with equal sex distribution.

CONCLUSIONS: Falls were the most common mechanism of injury in this study. These data differ from prior studies in which motor vehicle accidents were the leading cause of injury. The incidence of cervical spine injuries was consistent with previous studies. While children under 10 were most commonly injured from accidental falls, adolescents were injured by nonaccidental causes. Providing anticipatory guidance on fall prevention and violence exposure in these age groups may reduce the incidence of cervical spine injuries.

148 Fellow in Training
The Tipping Point: Hidden Pockets of the Transition to Digital Television
Katherine E. Nicholson, Lei Chen.
Pediatric Emergency Medicine, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Televisions are ubiquitous in the American home. Injuries sustained by young children from falling TVs are common. The most common mechanism of tipping involves a child climbing the stand on which the TV is resting and pulling the TV down on top of her or himself. Recent mandatory switches to digital broadcasts have accelerated the transition from traditional cathode ray television systems (CRT) to digital flat panel televisions (FP). No data is available on the danger of tipping of these newer televisions.

OBJECTIVE: To describe the physical characteristics of common CRTs and FPWs (weight, size). To compare the forces necessary to reach the tipping point of common sized FPWs with those of conventional CRTs.

DESIGN/METHODS: A convenience sample of both types of TVs was analyzed. Standard data sheets from manufacturers were used to record sizes and weights. TVs were placed on stable platforms. A digital scale was attached to the top center of the TV screen. Horizontal force was applied, pulling it forward. The amount of force applied just as the TV began to topple forward was recorded. The two groups were compared using the Mann-Whitney U test. Physical characteristics were reported using descriptive statistics.

RESULTS: Based on consumer data, the most common sized screens were 20" for CRTs and 32" and 40" for FPWs. Twenty-two televisions were evaluated. Mean (range) weights were as follows: CRT: 59.4 lbs (48.5-65), 32" FP: 27.4 lbs (24-33); 40" FP:49.6lbs (35.9-68). The mean (SD) force to tip a CRT (n=8) was 9.2 pounds (+/-2.5); to tip a FP (n=14) was 6.03 pounds (+/-1.45). The force needed to tip a large-screen FP was significantly less than that needed to topple a CRT (p<.002).

CONCLUSIONS: Flat panel televisions are more susceptible to toppling than traditional CRTs when both are placed on a stable surface. Parents with young children should strongly consider alternate methods of securing these new televisions.

149 Fellow in Training
Interrater Reliability of the Clinical Examination in Pediatric Soft Tissue Infections
Department of Pediatrics, Division of Emergency Medicine, The Children’s Hospital of Philadelphia, Philadelphia, PA; Department of Biostatistics and Epidemiology, University of Pennsylvania School of Medicine, Philadelphia, PA.

BACKGROUND: In recent years, emergency departments have seen a dramatic rise in pediatric soft tissue (ST) infections. Currently, the clinical examination plays a key role in distinguishing a cellulitis, which is treated with antibiotics, from an abscess, which may require drainage. Due to the overlap in clinical signs and symptoms, difficulties exist in differentiating them.

OBJECTIVE: To determine the interrater reliability of the clinical examination by pediatric emergency medicine (PEM) physicians for the presence of a ST infection requiring drainage, and to identify patient characteristics that may be associated with poorer agreement, such as patient age, lesion size, and a history of prior drainage from the lesion.

DESIGN/METHODS: Cross-sectional study of pediatric patients with up to 3 isolated ST infections were evaluated by 2 PEM physicians between 6/08-10/09. Physicians, blinded to each other’s assessment, recorded their level of suspicion for whether the lesion required drainage (drainage indicated, not indicated, or uncertain). The primary outcome measure was agreement as measured by the kappa statistic. Secondary outcomes included agreement given covariates such as patient age, lesion size, and a history of prior drainage from the lesion, evaluated with stratified chi-square analyses.

RESULTS: A total of 376 lesions in 335 patients were evaluated. Mean patient age was 7.8 years ± 6 years (min 2 mos, max 19 yrs). 65% of lesions were in black patients, and 26% in white pts. 57% of lesions were in females. The majority of lesions were on the leg (30%) or buttock (25%). For 23 lesions, there was missing data from raters regarding their diagnosis. Therefore, a total of 353 lesions were analyzed for reliability. The kappa statistic for whether a lesion required drainage was 0.36 (95% CI: 0.28, 0.44). Physicians were not more likely to agree if lesions had 4 cm2 of either induration, fluctuance, or erythema compared with smaller lesions. Similarly, lesions with a history of previous drainage from the lesion were not more likely to be agreed upon. However, lesions in patients <4 years was 1.3 times more likely to be agreed upon compared to those <4 years old (95% CI: 1.08, 1.56).

CONCLUSIONS: Reliability among PEM physicians for diagnosing ST lesions requiring drainage is fair. Younger children may be more difficult to evaluate consistently. Evaluation of other, possibly more objective modalities to aid in diagnosis should be undertaken.

150 Capnography Improves Recognition of Endotracheal Tube Dislodgement by Prehospital Providers
Melissa L. Langhan, Kevin Ching, Paval Kadha, Michelle Alletage, Lei Chen.
Department of Pediatrics, Section of Emergency Medicine, Yale University, New Haven, CT.

BACKGROUND: Dislodgement of endotracheal tubes (ETT) during patient transport is not uncommon. Prehospital providers work in difficult and noisy environments in which intubated patients are routinely being moved and at risk of dislodgement. Capnography monitors patient ventilation and shows immediate changes with ETT dislodgement unlike pulse oximetry and cardiac monitors. However, this equipment is not routinely available to all prehospital providers.

OBJECTIVE: To determine the difference in time to recognition of endotracheal tube dislodgement with or without the use of capnography.
The Perception of Pediatric House Staff and Attendants on the Necessity of Specific Resuscitation Skills

Alison Gurtman, Daniel Fein, Sadiqa Edmonds-Myles, Kathryn Scharbach, Jacqueline Weinigarten-Aramo.

BACKGROUND: Despite being at the front lines of caring for acutely ill children during their inpatient training, pediatricians are not well prepared for managing pediatric emergencies. The ACGME mandates acquisition of “sufficient training in basic and advanced life support.” Aside from the Pediatric Advanced Life Support (PALS) course, there is no uniform structured training in resuscitation. To supplement PALS, many training programs employ simulation of critical situations as a component of the residency curriculum. In order to maximize the effectiveness of resuscitation training, it is crucial to focus on those aspects of resuscitation deemed most important by the pediatric community.

OBJECTIVE: To determine which cardiopulmonary resuscitation skills pediatric residents, fellows, and attendings consider essential for pediatric residents to master prior to graduation.

DESIGN/METHODS: Pediatric residents, fellows, and attendings in a tertiary care children’s hospital completed an anonymous questionnaire. Beliefs regarding the importance of proficiency in specific resuscitation skills were obtained. Differences among groups were assessed for significance using the Kruskal-Wallis test.

RESULTS: 91% of residents and 32% of fellows and attendings completed the survey. 77% of attendings were sub-specialty trained with 35% trained in either intensive care or emergency medicine. The knowledge-based resuscitation skills perceived to be most important by all respondents included knowing when to call for help, obtaining a relevant past medical history, and requesting appropriate medications. The technical skills deemed most important by respondents were performance of chest compressions, bag mask ventilation, and ability to connect the oxygen. Cardiopulmonary resuscitation skills were considered more important from a resident perspective than from a fellow/attending perspective, including endotracheal intubation, central line and chest tube placement and ventilator management (p<0.0001), and reading relevant imaging studies without a radiologist, managing arrhythmias and performing a cricothyroidotomy (p<0.007).

CONCLUSIONS: There is consensus between residents and fellows/attendings that the most important aspects of a resuscitation curriculum are basic life support skills. However, there are differences in the perceived importance of graduating with advanced resuscitation skills.
Mycoplasm Pneumonia Increases Symptom Severity in Children with Status Asthmaticus

Mimily Harsono, Won Baik-Han, Partha Chatterjee, Susana Rapaport, Rusly Harsono.

Pediatrics, Flushing Hospital Medical Center, Flushing, NY; Pediatrics, Jamaica Hospital Medical Center, Jamaica, NY.

BACKGROUND: Relationship between Mycoplasma pneumonia (MP) and bronchial asthma (BA) is not clear. Many studies reported association between MP and acute or chronic BA, yet few looked into the role of MP towards the severity of BA.

OBJECTIVE: To evaluate if MP worsen clinical severity of children with status asthmaticus (SA).

DESIGN/METHODS: We prospectively enrolled children from 0 to 18 years of age with established BA that were admitted for SA in two urban community hospital pediatric units from June to November 2009. Serologic tests for MP were performed in all children with SA. Acute MP infection was defined by positive serology specific immunoglobulin M (IgM) anti-MP. Demographic data, pediatric asthma symptom severity (PASS) scores at different interval of hospitalization (LOS), and laboratory data were collected and compared between children with acute MP infection (MP group) and those without MP infection (non-MP group). PASS score on admission was used to measure clinical severity.

RESULTS: Of 172 enrolled children, 24 were excluded for incomplete data. MP was confirmed in 70 children (47.3%). Mode age of children with MP and non-MP was 4 years. PASS scores on admission were 4.7 ± 2.2 and 3.7 ± 1.6 for MP and non-MP groups respectively (p = 0.03). With treatment, the LOS was 3.2 ± 0.9 and 3.2 ± 1.3 days for MP and non-MP groups respectively (p = 0.64).

CONCLUSIONS: MP infection worsens symptom severity and should be sought in children with severe acute asthmatic attack. We should consider empirical antibiotic treatment targeted towards MP infection.

156

Fellow in Training

The Association between Disease Beliefs and Indoor Environmental Control Practices among Children with Asthma

Angkana Roy, Lauren Steele, Juan Wisnivesky.

Pediatrics and Preventive Medicine, Mount Sinai School of Medicine, New York, NY; Internal Medicine and Pulmonary Critical Care, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Indoor allergens play an important role in asthma morbidity. Use of environmental control practices (ECPs) has been shown to improve asthma outcomes and is an important part of asthma management. Health beliefs can be significant predictors of disease management. However, little is known about how health beliefs influence ECP use for asthma.

OBJECTIVE: To examine the association between asthma disease beliefs and ECP use.

DESIGN/METHODS: Parents of children 2-17 years old with asthma in East Harlem were surveyed. Data regarding use of 25 ECPs was obtained. Participants were asked about disease beliefs regarding their child’s asthma: susceptibility to environmental triggers, perceived benefit to environmental changes, belief that asthma is a chronic disease, and belief that asthma significantly affects the child’s life. Responses were in Likert scale format, 1-5, with higher numbers indicating stronger agreement. We used the Wilcoxon rank sum test to examine the association between beliefs and ECP use. Multiple logistic regression models were built to control for demographic predictors including race, gender, age, and level of parental education.

RESULTS: We surveyed 129 parents. Mean scores for perceived susceptibility to environment, perceived benefit from environmental changes, belief of chronicity, and effect on life were 0.7, 3.6, 2.0, and 3.1 respectively. Overall, most ECPs were positively associated with higher beliefs score, but only some reached statistical significance. Perceived susceptibility was positively associated with wet dusting (p<0.03). Those who believed asthma had a significant impact on life were more likely to use a dehumidifier (p=0.001), remove mold (p=0.04), wash sheets in hot water (p=0.004), and wash stuffed toys (p=0.02). Increased perception in benefits was negatively associated with associating asthma triggers (p=0.001) and washing stuffed toys (p=0.02). Increased perception in benefits was negatively associated with using air purifiers (p<0.001). After controlling for confounders, results remained significant except association between perceived susceptibility and wet dusting as well as chronicity and washing toys.

CONCLUSIONS: Asthma disease beliefs were significantly associated with use of a number of ECPs. Disease beliefs are modifiable and can be targeted in potential interventions to improve asthma management.

157

Demonstration of Metered-Dose Inhaler and Spacer with Mouthpiece Administration Technique by Pediatric Asthma Patients

Patricia Vishal Edmondson, Rusly Harsono.

Pediatrics, Flushing Hospital Medical Center, Flushing, NY; Division of Pulmonology, Flushing Hospital Medical Center, Flushing, NY; Division of Critical Care, Flushing Hospital Medical Center, Flushing, NY.

BACKGROUND: We previously demonstrated that despite compelling data supporting the correct use of spacers (SP) with metered-dose inhalers (MDIs) in patients (pts) with asthma, health care providers (HCPs) at our institution demonstrate the use of MDI/SP incorrectly. We hypothesized that this would lead to incorrect use of MDI/SP by our asthma pts resulting in decreased aerosolized medication delivery with adverse outcomes. We predicted that pts referred by HCPs to our pulmonologist (PVE) would demonstrate incorrect use of MDI/SP and would improve significantly with adequate teaching.

OBJECTIVE: To compare the demonstration of MDI/SP with mouthpiece (MDI/SP/mp) administration technique by pts referred to our pulmonology clinics pre and post education on the correct technique of MDI/SP/mp use.

2010 ESPR Abstracts

158

Novel Mutation in the STK10 Gene Causing a Clinical Syndrome Associated with Juvenile Polyps and Tubular Adenoma

Patricia Galvin-Parton, Lowenheim Mark, Weiss Jody.

Pediatrics, SUNY Stony Brook, Stony Brook, NY.

BACKGROUND: Mutations in the STK11 gene have been identified as a major cause of Peutz-Jeghers Syndrome. Peutz-Jeghers Syndrome is an autosomal dominant disorder characterized by hamartomatous gastrointestinal polyps and mucocutaneous pigmentation. STK11 gene belongs to a family of the serine/threonine kinases. The STK10 gene is a member of this family but has never been associated with human disease. We report a deletion of the STK10 gene in a 10 year old boy which is associated with gastrointestinal juvenile polyps and tubular adenomas.

OBJECTIVE: To demonstrate for the first time that a mutation in the STK10 gene is associated with a clinical disorder similar to a disorder caused by mutations in the STK11 gene.

DESIGN/METHODS: Endoscopy was used to obtain surgical specimens for pathological examination. Chromosome microarray was used to look for any microdeletions. Sequencing and Deletion/Duplication studies of the SMAD4 (Juvenile Polyposis) gene were also performed.

RESULTS: Pathologic examination revealed tubular adenomas of the cecum and juvenile polyps in the proximal descending colon. Chromosome microarray identified a deletion of 5q15.1, approximately 103.6 Kb in size. This deletion is within the gene STK10. No deleterious mutations were detected in the SMAD4 gene.

CONCLUSIONS: Although not currently associated with disease in humans, this gene is related to the gene STK11, which is mutated in the autosomal dominant Peutz-Jeghers syndrome. This is the first time that a defect in the STK10 gene has been reported in association with clinical pathology of the gastrointestinal tract.

159

An Association of Vitamin D Deficiency and Anemia in the Pediatric Population

Anma Varajah, Ashok Valluri, Dominick Sabatino, Stephen P. Katz.

Pediatrics, Nassau University Medical Center, East Meadow, NY.


OBJECTIVE: To determine if Vitamin D deficiency is associated with anemia.

DESIGN/METHODS: To analyze data from the National Health and Nutrition Examination Survey (NHANES 2003-4) to determine if there is an association between Vitamin D deficiency and anemia. The survey consists of demographic, physical characteristics and laboratory values of a randomly selected non institutionalized civilian US population. The lab value “ LBXXVID=25ng/ml “ was used to assess the presence of low vitamin D. The presence of anemia was assessed by the question “ MCOQ53? Taking treatment for anemia for the past 3 months “. The analysis was done using statistical software SAS version 9.1 PROC SURVEY methods.

RESULTS: 5,289 participants were in the pediatric age group, 4,334 of them were used for the analysis. 955 were excluded because they were missing information for vitamin D and anemia. Vitamin D deficiency was more common in children with anemia with an odds ratio of 2.161 (1.404-3.318). Even after adjusting for age, gender and race the association remained significant with an odds ratio of 2.522 (1.406-3.926).

CONCLUSIONS: 1. Our results suggest a statistically significant association between Vitamin D deficiency and the incidence of anemia in children. 2. The possible role of Vitamin D deficiency as a causative factor for anemia maybe multifactorial and related to impaired hydrolyzation, loss of anti-inflammatory properties or low calcium levels. 3. More and larger studies need to be done to better define the association of Vitamin D deficiency and anemia.
Quantity or Quality: What Controls the Decision to Pause/Stop a NICU Bottle Feeding?

M. Kathleen Phiblin, Barbara Medoff-Cooper, Teesha Thomas, Soraya Abbasi.


BACKGROUND: Neonatal clinicians’ standards for bottle feeding safeguard infants’ physiologic stability and support organized, self-regulated feeding skills. Goals are to advance feedings in number and volume to achieve full feedings with steady weight gain for timely discharge.

OBJECTIVE: To determine whether quality or quantity has greater priority in NICU bottle feeding.

DESIGN/METHODS: Two large academic hospitals participated. A standardized infant behavior checklist (NIDCAP) was modified to include 24 feeding behaviors. Infant behaviors and nurses’ stated reasons for pausing/stopping a feeding were recorded by trained, reliable observers. Parents and nurses gave consent and were aware of study objectives. Inclusion criteria were 24 to 31 weeks post menstrual age (PMA) at birth and no anomalies or neurological problems affecting feeding. Feedings as usual on the infant’s own schedule were observed from first bottle feeding to discharge depending on observer and infant availability.

RESULTS: Twenty-six infants contributed data from 118 feedings. The mean PMA across feedings was 36.9 ± 2.6 SD weeks with PMA range 32.3 to 47.7 weeks.

Each reason/behavior scored once per feeding segment regardless of number of occurrences. * = physiologic instability

<table>
<thead>
<tr>
<th>Frequency of RN Reasons for Pausing a Bottle Feeding and of Same Items Observed</th>
<th>Frequency RN Report</th>
<th>Frequency Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason / Behavior</td>
<td>1 inefficient suck</td>
<td>10</td>
</tr>
<tr>
<td>2 break nipple seal</td>
<td>9</td>
<td>0.23</td>
</tr>
<tr>
<td>3 stilling around nipple</td>
<td>10</td>
<td>0.26</td>
</tr>
<tr>
<td>4 push nipple out</td>
<td>6</td>
<td>0.17</td>
</tr>
<tr>
<td>* 5 choking</td>
<td>5</td>
<td>0.13</td>
</tr>
<tr>
<td>6 O2 saturation low</td>
<td>9</td>
<td>0.23</td>
</tr>
<tr>
<td>7 HR &gt; 20% above typical</td>
<td>17</td>
<td>0.44</td>
</tr>
<tr>
<td>8 stopping (flow too fast)</td>
<td>7</td>
<td>0.18</td>
</tr>
<tr>
<td>9 3 swallows w/o breath</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>10 stoped sucking</td>
<td>2</td>
<td>0.05</td>
</tr>
</tbody>
</table>

CONCLUSIONS: With our limited sample size, only time from 1st enteral feed explained changes in ESV in each GA group. There was no significant difference between group, pre vs post feeds, though there was a positive trend. At study completion, (N=50) we will use logistic regression to determine the impact of GA-group specific mean SMA BFV, on the likelihood of intolerance to feeds.

Fellow in Training

Meconium Interferes with NIRS Measurements of the GI Tract in Premature Neonates


Pediatrics, Yale New Haven Hospital, New Haven, CT; CAS Medical Systems, New Haven, CT.

BACKGROUND: Near Infrared Spectroscopy (NIRS) has been successfully used as a monitor of oxygenation in neonates. There is increasing research and clinical interest in using NIRS to monitor gastro-intestinal (GI) tissue oxygen saturation (StO₂), particularly for premature neonates.

OBJECTIVE: We initiated a study to compare NIRS GI StO₂ with doppler measurements of superior mesenteric artery flow in neonatal patients. During the study, we found that the GI StO₂ measurements dramatically decreased or disappeared sporadically during the same evaluation period, in the same patient, leading us to investigate possible causes.

DESIGN/METHODS: A meconium sample was obtained and a portion was analyzed by a bench top spectrometer (EPP2000, Stellar Net, Inc, Tampa, FL USA). The remaining meconium sample was then placed in a clear plastic bag and thinned out to form a semi-translucent film. Two commercially available NIRS monitors, FORE-SIGHT (CASMED, Branford, CT USA) and INVOS S100C (Somanetics, Troy, MI USA) were tested with the sensors placed on an adult forearm to obtain a baseline reading. The meconium film was then inserted between the sensors and the forearm to detect possible changes in NIRS values measured.

RESULTS: The light absorption spectrum of the meconium was plotted along with oxy-hemoglobin (HbO₂) and deoxy-hemoglobin (Hb) for NIRS wavelengths 650-900 nm.

The meconium absorption spectra decreases with increasing wavelength in the NIRS range. When testing the semi-transparent meconium film on the forearm with both FORE-SIGHT and INVOS monitors, the measured StO₂ dropped significantly to either very low or no values, as a function of meconium film thickness.

CONCLUSIONS: The tests performed using meconium samples from a preterm infant in both a spectrometer and the available NIRS monitors demonstrated that meconium can interfere with NIRS StO₂ measurement, resulting in falsely low values. Caution is warranted in interpreting GI StO₂ NIRS results in neonates still passing meconium stools.

Fellow in Training

Superior Mesenteric Artery Blood Flow Velocity: Relationship to Increasing Gestational and Post-Natal Age


Pediatrics, NYHH, New Haven, CT; Pediatric Radiology, NYHH, New Haven, CT.

BACKGROUND: Data suggest that mesenteric blood flow stabilizes in newborns after two weeks of life and this is associated with tolerance of enteral feeding. Data on preterm infants, especially those less than 28 weeks gestational age (GA) is limited.

OBJECTIVE: To determine the normal ranges of the superior mesenteric artery flow in neonatal patients.

RESULTS: Thirty three neonates were studied: Group I N=2, Group II N= 11, Group III N= 11, in Group I patients (controls) for correlation with ESV.

We found time from first enteral feed to be significant, p=0.03. Differences in pre to post feeds ESV were not significant between GA groups, p=0.18.

CONCLUSIONS: With our limited sample size, only time from 1st enteral feed explained changes in ESV in each GA group. There was no significant difference between group, pre vs post feeds, though there was a positive trend. At study completion, (N=50) we will use logistic regression to determine the impact of GA-group specific mean SMA BFV, on the likelihood of intolerance to feeds.

Lack of Correlation of Nutritional Outcomes at 1 Year of Age with Bronchopulmonary Dysplasia (BPD) Severity in Premature Infants

Nathan Demars, Amanda McGeachey, Jaclyn Davis, Vincent Smith, Lawrence Rhein.

Boston Children’s Hospital, Boston, MA; Beth Israel Deaconess Hospital, Boston, MA.

BACKGROUND: In June 2000, the NICHD and NHLBI proposed a severity-based definition of BPD for infants <32 weeks’ gestational age (GA). Validation of this definition for respiratory and neurodevelopmental outcomes has been performed, but the correlation of severity of BPD with outpatient nutritional outcomes has not been described.

OBJECTIVE: The objective of this study is to determine whether severity of BPD correlates with nutritional outcomes at 12 months corrected gestational age (CGA).

DESIGN/METHODS: The population included a cohort of 423 ELBW infants followed in the Center for Healthy Infant Lung Development or the Infant Follow-up Program at Children’s Hospital Boston. The current study was a retrospective analysis of data on growth outcomes in an existing longitudinal database.
RESULTS: Over 35% of our patients had moderate or severe BPD by the NHLBI criteria. (Table 1), and approximately 30% were discharged home on oxygen.

![Table](image)

At time of NICU discharge, infants with all levels of BPD severity had similar, low weight Z-scores. At one year CGA, infants from all groups showed substantial improvement, with mean Z-scores that were within 2 standard deviations from the mean. (Figure 1)

Although there was a small trend of correlation with severity of BPD, differences between groups were not statistically significant.

CONCLUSIONS: Severity of BPD, as defined by the NHLBI criteria, did not seem to correlate with weight Z-score at 1 year CGA. Even children with severe BPD achieve good catch-up growth by this time point.

**164**

**Non-Invasive Arm Anthropometry Accurately Estimates Body Composition in Low Birth Weight Infants (Birth Weight <2500g, LBW)**

Rita P. Verma, Penny London.

Pediatrics, University of Maryland, Baltimore, MD; Pediatrics, Hahnemann University Hospital, Philadelphia, PA.

BACKGROUND: Assessment of nutrients accretion/nutritional status in sick LBW neonates is critical but technically difficult to accomplish. LBW infants tend to retain body fluids which may lead to PDA, NEC and BPD & complicate their nutritional status assessment & fluid/nutrients therapy.

OBJECTIVE: To evaluate a non-invasive bedside method for assessing nutritional status in LBW neonates.

DESIGN/METHODS: Mid-arm circumference (MAC,mm) & tricipital skinfold thickness (TSKF,mm) were measured by Harpenden’s caliper at 15 (TSKF15) & 60 (TSKF 60) seconds of application on days of life 10 & 21 in physiologically stable LBW (modified physiological stability index, Georgieff 1989). Arm anthropometry was calculated as follows (Saan 1988) Arm Area (AA,mm²) = MAC / 4π Arm Muscle Area (AMA,mm²) = [MAC-πTSKF15] / 4π Arm fat area (AFA,mm²) = AA - [AMA -πTSKF60] / 4π Arm Water Area (AWA,mm²) = AA -AMA-AFA. RESULTS: n =34, female=60%, black-90%.

1) AFA and AMA correlated with body weight (AFA=6.48±0.06X weight, r=8, p=0.00001, AMA=0.235X body weight-29.67, r=.7, p<.001). 2) AWA correlated with TSKF [AWA=16.58X TSKF +10.3, r=6, p=.001], AMA with MAC [AMA=7.93X MAC-252.9, r=86, p<.0001] & AFA with TSKF60 [AFA=48.9X TSKF60-34.6, r=.85, p<.0001]. Our values are consistent with those measured via Dual energy X ray absorbiometry.

CONCLUSIONS: In LBW infants 1)AMA and AFA can be predicted by body weight. 2)AMA, AFA and AWA can be estimated by MAC and TSKF measurements for their nutritional status evaluation.

**165**

**House Officer**

Neonatal Nursing Perceptions of Breastfeeding Support in the NICU

Vera J. Burton, Allison Falek.

Pediatries, University of Maryland, Baltimore, MD; Neonatology, University of Maryland, Baltimore, MD.

BACKGROUND: The AAP Section on Breastfeeding emphasizes the benefits of human milk feeding for preterm infants and the importance of maternal support and education in the hospital setting. However, there are barriers to both initiation of breast milk expression in the hospital environment and continued breastfeeding following discharge. Some of these barriers include insufficient maternal education regarding the importance of breast milk, lack of maternal guidance and education during the infant’s hospitalization, and the effect of stress and other factors on the mother’s milk supply. Despite attempts to encourage breastfeeding with lactation support by neonatal nurses and lactation specialists, establishment of consistent breastfeeding of preterm infants at The University of Maryland Medical Center (UMMC) has been unsuccessful. From June 2006 to June 2008, only 25% (269/1109) of all infants were receiving human milk feedings at the time of discharge.

OBJECTIVE: Concerned with the low number of infants receiving breastmilk at time of discharge, we surveyed the neonatal nurses to gain insight into practices regarding initiating human milk feedings in the NICU.

DESIGN/METHODS: A 12-question survey with a 5 point lickert scale was distributed to all neonatal nursing staff. Means and standard deviations were calculated for each question.

RESULTS: Initial results indicated belief that the staff provides moms with information and encouragement to initiate human milk feeding (M = 4.41 sd = 0.54). However, fewer nurses endorsed statements regarding knowing the contraindications to breastfeeding (M = 3.25 sd = 0.94) and that the lactation consultant saw new moms within 48 hours (M = 3.09 st 0.93). Nurses endorsed variation in support provided by the residents (M = 3.26 sd =0.79), attendings (M = 3.57 sd =0.89), nurses (M = 4.24 sd = 0.68), and nurse practitioners (M = 4.05 sd = 0.72).

CONCLUSIONS: Although overall the neonatal nursing staff felt that the NICU supported human milk feedings, fewer nurses were comfortable with the contraindications to breastfeeding, and fewer felt that the lactation consultant was able to see moms within 48 hour or that all staff was equally supportive of new mom’s proving human milk feedings. Armed with these concerns, we have developed a breastmilk checklist that may address some of these concerns. We will redistribute the survey following implementation of the checklist to look at change in nursing perceptions.

**166**

**Treatment of Asymptomatic Full Term Newborns for Presumptive Early Sepsis**

Tatvanya Gabinsky, Angela Badiwala, Simona Proteasa, Melvin Gertner.

Pediatrics, Elmhurst Hospital Center, Elmhurst, NY.

BACKGROUND: Asymptomatic newborns frequently treated with antibiotics for presumptive maternal chorioamnionitis or maternal fever during labor. Recommendations for duration of treatment vary from 72 hours to 5 days of negative blood culture based on non instrument manual methods. Newer technology and improved culture media have been integrated into blood culture systems that reduce the time to detection of positive blood culture systems that reduce the time to detection of positive blood culture results. OBJECTIVE: Find the average length of time for detection positive blood culture in newborns and decide if 48 hours of treatment is sufficient for asymptomatic infants with suspected sepsis.

DESIGN/METHODS: Retrospective chart review. Blood culture was processed using a computer-assisted, automated blood culture system, ESP (Trek Diagnostic Systems, Inc, Westlake, OH) and neonatologist was notified about positive result before complete identification of microorganism. Neonatologist was able to decide if 48 hours of treatment is sufficient for asymptomatic infants with suspected sepsis. Results: From 2006 to September 2009 106 babies born in the Elmhurst Hospital Center had positive blood culture. 48 (45.2%) infants were full term and 58 (54.8%) – preterm. 46 (43.4%) – had early onset of sepsis and 60 (56.6%) – late onset of sepsis. Median time for detection of positive blood culture in infants with early sepsis was 22 hours (range: 6 – 34), for late sepsis – 28

Philadelphia, PA • March 26-28 57
167 Medical Student

Birth Hyperoxia Alters Lung Levels of T-Lymphocytes in Gram-Negative-Infected Sprague-Dawley Rat Pups

Angeline Seah, J. Craig Cohen, Shetal Shah.

Pediatrics, Stony Brook University School of Medicine, Stony Brook, NY.

BACKGROUND: Hyperoxia causes excessive oxidant stress, inflammation, lung destruction and leads to simplified alveolarization, apoptosis and disrupted vascularization, leading to chronic lung disease. Gram-negative infection similarly increases lung inflammation, leading to fibrosis and lung remodeling. Recognition of gram-negative infection in the lung is mediated by the CD14-Toll-Like Receptor 4 complex, which has been shown to be hyperoxia-sensitive.

OBJECTIVE: To determine the effect of hyperoxia on the long-term levels of CD3, CD4, CD8, CD4/1 and CD45 T-lymphocytes in the lungs of Sprague Dawley rats with concomitant gram-negative infection.

DESIGN/METHODS: Four litters of time-pregnant Sprague-Dawley rats were exposed to room air or 100% hyperoxia for 24 hours with intraperitoneal injections of either saline or lipopolysaccharide (LPS). Immediately after hyperoxia, lungs were harvested and immuno-histochemistry was performed on frozen sections to assay for levels of CD3, CD4, CD8, CD4/1 and CD45. Pixel count was used for quantification and 20 microscopic images per antibody were obtained. One way ANOVA testing with Bonferroni Correction using GraphPad software were used to determine significance.

RESULTS: CD3 and CD4 levels were significantly lower in the Room-air-LPS, Hyperoxia-saline and Hyperoxia-LPS groups compared with control (p<0.0001). Compared with the Room-air-saline group, CD8 levels were lower in the Hyperoxia-saline group (p<0.0001). CD4/1 levels were increased in Hyperoxia-saline group compared to all other groups (p<0.0013). The Room-air-saline group demonstrated higher CD45 levels than the three remaining groups (p<0.0017).

CONCLUSIONS: Hyperoxia affects T-cell subsets in the lungs to levels associated with gram-negative infection. However, hyperoxia and gram-negative infection are not synergistic in altering T-cell populations within the lung, nor do they parallel CD41 levels, suggesting hyperoxia-induced alterations of T-cells are not solely regulated by TLR4. Further investigation into the role in hyperoxia on T-lymphocyte activation and recruitment may provide important information on the pathogenesis of infections in the hyperoxia-exposed infant.

168 Medical Student

Duration of Maternal Human Papillomavirus Infection and Risk of Spontaneous Preterm Birth


BACKGROUND: Viral infections, such as HIV, are associated with an increased risk of preterm birth. The exact mechanism between viral infection and preterm birth is unclear but the phase of infection may be an important determinant of pregnancy outcome. Longer duration of human papilloma virus (HPV) infection is associated with higher grade cervical lesions. OBJECTIVE: To determine the association between duration of HPV infection and the risk of spontaneous preterm birth (SPTB) using cervical cytology and colposcopy as surrogates for duration of infection.

DESIGN/METHODS: Retrospective cohort study of women referred to colposcopy for evaluation of abnormal cervical cytology during pregnancy from 2004-2008 at an urban university clinic. Shorter duration of infection was defined as atypical squamous cells of undetermined significance and high risk HPV (ASCUS-HR+) or low grade squamous intraepithelial lesions (LSIL) on a pap smear or a colposcopic impression of cervical intraepithelial neoplasia grade 1 (CIN1). Longer duration of infection was defined as high grade (HSIL) or atypical squamous cells favors high grade (ASC-H) on a pap smear or colposcopic impression of CIN 2 grade 2 or 3. The primary outcome was the incidence of SPTB <37 weeks. The incidence of SPTB was also compared of asymptomatic full term newborns to median time 390 hours (range: 36-48). Blood cultures continued to be monitored until final result. Mean length of the treatment decreased from 3.8 to 2.1 (95% CI: 3.55 – 4.04) to 2.3 ± 1.1 (95% CI: 2.12 – 2.40) days. Estimated difference was 1.5 days (95% CI: 1.1 – 1.8).

CONCLUSIONS: Positive blood culture in newborns with early and late sepsis can be detected in less than 48 hours. Treatment of asymptomatic full term infants can be reduced to 36 hours.
BACKGROUND: For many years, the Graseby capsule has been employed to identify the start of inspiration in infants, purportedly to facilitate the synchrony of respiratory support. However, few studies have adequately assessed the capsule’s ability to even accurately sense respiration.

OBJECTIVE: To evaluate the performance of the Graseby capsule to track respiratory effort in a group of spontaneously breathing preterm infants, by comparing it to an accepted standard, Respiratory Inductance Plethysmography (RIP).

DESIGN/METHODS: Six infants were studied. Mean birth weight was 1242gm (range 900-1530), study weight was 1276gm (1060-1495), gestational age was 31 weeks (28-32) and age at study was 10 days (3-24). Two infants were on nasal cannula. Chest and abdominal RIP was used to document the breathing pattern. The Graseby capsule was placed subxyphoid. The capsule was connected to a calibrated pressure transducer and all data were simultaneously collected for 10 minutes during a period of quiet breathing via computer using the Biopac data acquisition system. Detection of respiratory cycle for both RIP and capsule data was by zero crossing of the first derivative by FIR filter with a low pass of 2Hz.

RESULTS: Capsule not only accurately tracked respiratory efforts when compared to RIP (Figure), but the capsule waveforms were found to precede RIP waveforms (Figure insert). The difference between the onset of inspiration as determined by Graseby capsule vs RIP was calculated and the lead time was as much as 240 mS.

CONCLUSIONS: We conclude that with proper signal conditioning, the Graseby capsule provides a reliable respiratory phase indicator in spontaneously breathing preterm infants. In addition, when compared to the RIP signal we found that the Graseby capsule provides an earlier indication of the start of inspiration. Further investigation must now evaluate the use of the capsule to provide breathing synchrony with a respiratory support device in neonates.

172 House Officer
The Role of Pulmonary Follow-Up in Reducing Respiratory Rehospitalizations of Premature Infants
Liza Konnikova, Amanda McGeachey, Jaclyn Davis, Lawrence Rhein
Boston Children’s Hospital, Boston, MA.

BACKGROUND: Despite improvements in neonatal care, premature infants remain a high-risk population after discharge from the NICU. Reported rates of rehospitalization for respiratory causes in the first year of life range from 35 to 50%. The role of pulmonary follow-up in preventing rehospitalizations is unknown.

OBJECTIVE: The objective of this study is to describe respiratory outcomes in a large regional cohort of premature infants, and to determine whether pulmonary follow-up improves outcomes.

DESIGN/METHODS: The population included a cohort of 370 ELBW infants followed in the Center for Healthy Infant Lung Development or the Infant Follow-up Program at Children’s Hospital Boston until the age of 2 years corrected gestational age (CGA). Emergency room visits or hospitalizations were identified through database query, and verified through electronic medical records.

RESULTS: Rates of respiratory rehospitalization at both 1 year CGA and 2 years CGA were relatively low, compared to the literature. Severity of BPD did not correlate with rates of respiratory rehospitalization.

RESULTS: Rates of respiratory rehospitalization at both 1 year CGA and 2 years CGA were relatively low, compared to the literature. Severity of BPD did not correlate with rates of respiratory rehospitalization.

CONCLUSIONS: Rates of respiratory rehospitalization were substantially lower than expected, even in patients with more severe BPD. Pulmonary follow-up alone does not seem to account for the improved outcomes.

173 House Officer
Late Preterm Infants: Defining Criteria for Admission to Newborn Nursery
Mallula Kiran, Matam Ramesh, Shakir Taaha, Salvador Agnes
Pediatrics/Division of Neonatology, Albert Einstein Medical Center, Philadelphia, PA.

BACKGROUND: Late preterm infants (LPTI) are known to have more complications compared to term infants; however, there is little data on the influence of birth weight (BW) on postnatal morbidities. There are institutional variations regarding LPTI admission criteria to either NICU or regular newborn nursery (NBN). Some experts have suggested a cutoff of 2300 grams for admission to NBN.

OBJECTIVE: Determine the influence of BW on the incidence of early postnatal complications, length of stay (LOS) and NICU admissions in LPTI.

DESIGN/METHODS: This was a retrospective chart review conducted as part of larger QI effort. The study included postnatal complications, LOS and rate of NICU admissions. Hospital length of stay >3 days was used as cutoff.

RESULTS: Of 128 babies, 23% were 34 wks, 26% were 35 wks and 51% were 36 wks. NICU admission was 100% for 34 wks, 68% for 35 wks and 17% for 36 wks. Mean GA of Group A babies was 34.7 ± 0.8 wks and Group B 35.6 ± 0.6 wks (p=0.01). 34 (81%) of Group A vs. 29 (34%) of Group B were admitted to NICU (p=0.03). Of those admitted to the NICU, 94% in Group A stayed in the NICU >24 hrs compared to 69% in Group B (p=0.01). Mean length of hospital stay was 7 ± 4 days in Group A and 3 ± 2 days in Group B (p=0.0). Group A babies were more likely to have postnatal complications compared to Group B with the exception of hypoglycemia.

Postnatal complications and LOS
<table>
<thead>
<tr>
<th>Complication</th>
<th>Group A (N=86)</th>
<th>Group B (N=42)</th>
<th>p</th>
<th>LOS &gt; 3 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resp. Difficulty</td>
<td>26%</td>
<td>17%</td>
<td>0.01</td>
<td>64%</td>
</tr>
<tr>
<td>Septic Evaluation</td>
<td>52%</td>
<td>28%</td>
<td>0.00</td>
<td>64%</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>9%</td>
<td>17%</td>
<td>0.00</td>
<td>20%</td>
</tr>
<tr>
<td>Feeding difficulty</td>
<td>5%</td>
<td>2%</td>
<td>0.00</td>
<td>20%</td>
</tr>
<tr>
<td>Jaundice+Photo</td>
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<tr>
<td>Apnea</td>
<td>7%</td>
<td>2%</td>
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</tr>
</tbody>
</table>
CONCLUSIONS: This data provides support for admission of all asymptomatic 36 wk infants and asymptomatic 35 wk infants >2300 gm to the NBN. Further studies should confirm adding birth weight cutoff guidelines to the admission criteria for late preterm infants to the Newborn Nursery versus the NICU.

174 Fellow in Training

Expression of Caveolin-1 in Infants with Pulmonary Hypertension and Congenital Heart Defect

Narendra R, Dereddy, Jing Huang, John H. Wolk, Markus Erb, Michael H. Gewitz, Rajamma Muthukkaran

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BACKGROUND: Caveolin-1, a major scaffolding protein is found in caveolae of a variety of cells including endothelial and smooth muscle cells (SMC). It interacts with a number of transducing molecules and inhibits cell proliferation. Loss of endothelial caveolin-1 has been reported in experimental and clinical forms of pulmonary hypertension (PH). We have previously shown that monocrotaline induced PH is associated with progressive loss of endothelial caveolin-1 and reciprocal activation of proliferative and anti-apoptotic pathways. Recent studies have shown enhanced caveolin-1 expression in pulmonary arterial SMC obtained from patients with PH. Enhanced expression of caveolin-1 in SMC has been implicated in altered Ca2+ handling, increased DNA synthesis and cell proliferation.

OBJECTIVE: We sought to examine the expression of caveolin-1 in the pulmonary vasculature of infants diagnosed to have PH associated with congenital heart defect (CHD).

METHODS: We surveyed mothers at a Level 4 NICU and a WBN using CDC PRAMS questionnaire. Data was derived from 175 mothers (78 NICU, 41 WBN) but only includes mothers with a response to the question “Was your baby <34 weeks at birth?” With a level was set at p<0.05.

RESULTS: 75% of eligible mothers completed the survey (51/78 NICU and 38/41 WBN). Just 10% of mothers knew the effects of prematurity on their child (34/36wks, >70%). Interventions that can reduce the number of these deliveries will have the greatest impact on the incidence of prematurity. It is not known to what extent mothers are aware of the risk of mode of delivery as a cause of late preterm birth.

OBJECTIVE: To survey mothers at a Neonatal Intensive Care Unit (NICU) and a Well Baby Nursery (WBN) to assess their awareness of the definition of term gestation and risks of both cesarean section delivery (c/s) and scheduling a delivery at <39 weeks. Survey was distributed to 175 mothers (78 NICU, 41 WBN) but only includes mothers with a response to the question “Was your baby <34 weeks at birth?” With a level was set at p<0.05.

RESULTS: Pulmonary arteries in patients with left to right shunt demonstrated variable loss of endothelial caveolin-1, indicative of endothelial cell damage.PECAM-1 was found to colocalize with endothelial caveolin-1, and the loss of PECAM-1 occurred in parallel with that of endothelial caveolin-1. Arteries with extensive endothelial damage revealed enhanced expression of caveolin-1 in SMC. Both endothelial caveolin-1 and PECAM-1 were well preserved in pulmonary arteries of the patient with CHD without left to right shunt Importantly, SMC in this patient’s lung did not exhibit enhanced expression of caveolin-1.

CONCLUSIONS: Loss of endothelial caveolin-1 and PECAM-1 is indicative of endothelial damage. Since caveolin-1 maintains proliferative and anti-apoptotic factors in an inactive state, its loss may contribute to the activation of cell proliferative pathway. In addition, extensive damage may be a trigger for the enhanced expression of caveolin-1 in SMC, which may further facilitate progression of pulmonary vascular disease.

175 Fellow in Training

It’s Not What She Knows, It’s How Well She Knows It! The Hidden Problem in Perinatal Health Care

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BACKGROUND: A major contributor to the rising rate of prematurity is late preterm births (34-36wks, >70%). Interventions that can reduce the number of these deliveries will have the greatest impact on the incidence of prematurity. It is not known to what extent mothers are aware of the risk of mode of delivery as a cause of late preterm birth.

OBJECTIVE: To survey mothers at a Neonatal Intensive Care Unit (NICU) and a Well Baby Nursery (WBN) to assess their awareness of the definition of term gestation and risks of both cesarean section delivery (c/s) and scheduling a delivery at <39 weeks.

METHODS: We surveyed mothers at a Level 4 NICU and a WBN using CDC PRAMS questionnaire. Data was derived from 175 mothers (78 NICU, 41 WBN) but only includes mothers with a response to the question “Was your baby <34 weeks at birth?” With a level was set at p<0.05.

RESULTS: There was no difference in correct answers between WBN and NICU. Women <18 yrs have a higher proportion of errors. There was no difference in correct answers between WBN and NICU. Women <18 yrs have a higher proportion of errors. There was no difference in correct answers between WBN and NICU. Women <18 yrs have a higher proportion of errors. There was no difference in correct answers between WBN and NICU. Women <18 yrs have a higher proportion of errors.

CONCLUSIONS: There is a striking lack of understanding in women of childbearing age regarding the risks, benefits and alternatives to themselves or their newborns - independently of the physician. Care would improve if women were more aware of issues and could more effectively advocate for services.

Medical Student

Regulation of Age-Dependent Type II Cell EMT Behavior

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BACKGROUND: Endothelial-Mesenchymal Transition (EMT) is a histological process by which epithelial cells undergo multiple biochemical changes that enable them to assume a mesenchymal cell phenotype. EMT can be activated in association with tissue repair and remodeling after injury in multiple organs including the lung. In the adult lung EMT is associated with progression of fibrosis. In contrast, fetal tissue is capable of wound repair without scarring or fibrosis. We previously have shown that MLE12 cells, similar to primary adult type II cells, undergo EMT after transforming growth factor (TGF)β1 and to a lesser degree epidermal growth factor (EGF) treatment, resulting in the expression of mesenchymal cell phenotype. In contrast, fetal rat type II cells did not undergo EMT in response to those treatments.

OBJECTIVE: We hypothesize that ErbB receptors play a significant role in the age-related regulation of EMT.

METHODS: Isolated fetal type II (19-25%) were pretreated with cis-OH-proline to eliminate remaining fibroblasts, followed by a 5-day treatment of 2.5 mg/ml TGF-β1, 10ng/ml EGF, or the combination of both. Cells were harvested after 7d in culture for Western blot analysis. MLE12 cells were used as an adult lung epithelial cell model and treated similarly.

RESULTS: TGF-β1 treatment induced phosphorylation and protein content of ErbB2 receptor in MLE12 cells. In fetal rat type II cells, TGF-β1 induced a decrease in ErbB2 phosphorylation. This effect was less modest in EGF-treated cells. The results of EGF treatment are in agreement with the less prominent EMT induction seen after EGF stimulation in both cell types.

CONCLUSIONS: These data suggest that regulation of ErbB receptor expression has a mechanistic role in the age-related induction of EMT. Further analyses are required to fully understand the function of ErbB receptor regulation in TGF-β1-induced EMT in type II cells. Funding: NIH HL085648, Tufts Institutional Grant, Deutsche Forschungsgemeinschaft Da 3753-2.

177 Fellow in Training

Pulmonary Hypertension Secondary to CLD: A Cautionary Tale

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BACKGROUND: Preterm neonates with CLD are at risk of developing pulmonary hypertension (PH) secondary to altered angiogenesis, post natal lung growth and abnormal vasoactivity. The management of PH is still being refined, however a goal to maintain normal CO2 and alkalotic pH to decrease PVR, may necessitate invasive ventilation and all attendant interventions such as tracheostomy, gastrostomy and heavy sedation.

OBJECTIVE: To review the outcome of elective ventilation in PH associated with CLD.

METHODS: We present 4 extreme preterm with PH and CLD (GA 26wks in 3 & 24 in 1) with prolonged ventilation (>75 days) and subsequent in (46, 104, 46 & 161days). Subsequently all needed escalation of ventilatory support; with ventilator dependency for tracheostomy without significant improvement in PaCO2 and oxygenation, and worsening PH.

CONCLUSIONS: There were similar except more blacks and single mothers not living with a partner were at NICU.

Average NICU stay was 285 ± 52 (mean ± SD). Currently (chronological age 1, 2, 1.5 & 5.5 years) 2 are in chronic care facility and 3 are ventilator dependent with tracheostomies.

RESULTS: Management of CLD allows for permissive hypercapnea and hypoxia, but when associated with PH, approach is still debated. CLD patients have chronic compensated respiratory acidosis keeping pH close to normal. Animal studies have shown that PVR is affected by pH alone rather than changes in PaCO2. Combination of therapies targeting the PVR pathways have shown to be beneficial.

CONCLUSIONS: Elective mechanical ventilation in PH associated with CLD should be avoided as it may trigger pulmonary hypertension crisis with all attendant aforementioned morbidity. Low pH should be the guiding parameter in conjunction with modulators of vascular reactivity and optimizing somatic growth.
Type and Timing of Ventilation in the First Postnatal Week Determines the Outcome of Bronchopulmonary Dysplasia (BPD)/Death

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BACKGROUND: Although it is recognized that premature infants on endotracheal tube ventilation (ETT) after 7 days of postnatal life have increased risk of BPD/death, the type and timing of respiratory support during the first postnatal week affecting this outcome has not been evaluated.

OBJECTIVE: To compare outcomes of premature infants on nasal intermittent positive pressure ventilation (NIPPV) or nasal continuous positive airway pressure (NCPAP) to those on ETT, in the first postnatal week.

DESIGN/METHODS: Retrospective data were obtained (1/04 to 6/09) of infants ≤30 weeks gestational age (GA) who received NIPPV anytime in the first postnatal week. BPD was defined using NIH consensus definition. Infants were categorized into 3 groups based on their being on a particular mode for the majority of days in the first week. Generalized estimating equations (GEE) approach was used to model the probability of developing BPD/death by the type of breathing support, adjusting for the correlation between twins in the study.

RESULTS: There was no significant difference in the mean GA and birth weight (BW) in the 3 groups: ETT (n=64; 26.8w; 917g), NIPPV (n=65; 27.1w; 951g) and NCPAP (n=32; 27.4w; 971g). There were no significant differences in maternal demographics, use of antenatal steroids, gestational age, multiple births or SGA in the 3 groups. Use of surfactant was significantly different (91 vs. 83 vs. 50%; p<0.001). In multivariate analysis, after controlling for other significant predictors compared to ETT, NIPPV (p=0.02) and NCPAP (p=0.01) groups were less likely to have BPD/death. NIPPV and NCPAP groups were not different. Infants on ETT (n=97) during 1-3 days were significantly more likely to have BPD/death compared to those on NIPPV (n=38): 87 vs. 53%; p=0.003. There was no difference between infants extubated to NIPPV (n=52) during 4-7 days in terms of BPD/death versus those on NIPPV (n=23) during 1-3 days, and remained on NIPPV during 4-7 days. No differences were noted for infants extubated to NIPPV or NCPAP during 4-7 days vs. those on NIPPV or NCPAP during 1-3 days and then further changed to NCPAP during 4-7 days.

CONCLUSIONS: These data suggest that extubation to NIPPV or NCPAP in the first postnatal week decreases BPD/death.
DESIGN/METHODS: Census data for FY08 were abstracted: date/time of admission/discharge, emergent/scheduled, length of stay (LOS). Hourly census was calculated with a SAS macro; peak daily census were extracted. For pts with LOS ≤ 7 days, pt-hours generated by admit day = avg LOS (hrs) for each day x number of admissions. Coefficient of variation (CV; std dev/mean) assessed variability.

RESULTS: Among 22,310 admits (mean 1859/month, SD 150, CV 8.1%), 22% were scheduled. CVs on emergent & scheduled admissions per month were equal (98.8% vs. 97.5%). May, July, August had >1 SD fewer emergent admits than mean, while June had >1 SD more scheduled admits. By day of week, emergent admits had CV 12.0%, while scheduled admits had CV 65.3%, driven by lack of weekend admits (and fewer on Thurs-Fri). For LOS ≤ 7 days (84% pts), each day generated mean 1542 pt-hours of business (SD 33,816; CV 21.9%). Emergent pt-hours generated by admit day CV 9.6%, while scheduled CV 17.5%. Mondays generated 25.2% of all scheduled pt-hours; Tues, Wed 20% each. Median LOS for scheduled patients admitted on Mon was 2.1 days, while 1.2-1.3 on other weekdays (Fig 1). Wed and Thurs had highest peak census (1 SD above mean census).

**183** Does Early Onset of Necrotizing Enterocolitis Increase the Risk of Recurrent NEC?
Rubia Khalak, Jennifer Cerone, Upender Munshi.

Pediatrics, Albany Medical Center, Albany, NY.

**BACKGROUND:** Data on recurrent NEC are limited to a chart review from 1993 and a few case reports. Characteristics these infants may have in common have not been described.

**OBJECTIVE:** Determine if there are identifiable clinical characteristics in neonates who develop recurrent NEC.

**DESIGN/METHODS:** A retrospective chart review was done of NICU patients at our center from 1/2003-10/2009 who developed recurrent NEC. Episodes of recurrent NEC were defined as the finding of pneumatosis or perforation distinct from the previous episode of NEC and separated by a period of advancing feeds. Data collected retrospectively from single episode NEC patients from 1/2006-10/2009 were used for comparison. This chart review did not include 2003-2005 infants as their charts were not initially as accessible. Potential risk factors such as need for DR resuscitation, use of antibiotics, need for PDA treatment and PDA drug treatment used, use of feeding additives and type of feeding were reviewed.

**RESULTS:** Infants with recurrent NEC developed NEC 5 days earlier than those with a single episode NEC (p=0.02), GA, BW, sex and 5 minute Apgar score, for the infants with and without recurrent NEC are similar (Table). At the end of 2006, our center switched from exclusively using indomethacin to exclusively using ibuprofen. We have had an increased number of infants with recurrent NEC during the indomethacin era vs the ibuprofen era, 3 infants vs 6 infants.

**CONCLUSIONS:** Neonates with recurrent NEC developed NEC earlier than those with a single episode of NEC. Responsible etiologic factors, including the introduction of ibuprofen for treatment of patent ductus arteriosus remain to be further explored. As the total number of infants with recurrent NEC is small, we will seek to review charts of infants with single episode NEC vs recurrent NEC at other level 4 NICUs to validate our findings and identify risk factors.

**184** Fellow in Training
Meera Raagavan, Bhuvaneshwari Javaraman, Evan Fieldston.

Univ of PA, Philadelphia, PA; Childrens' Hospital of Philadelphia, Philadelphia, PA.

**BACKGROUND:** Optimization of patient flow is crucial to improving quality and value in healthcare, but variability comes from many sources, including artificial variability on scheduling patients to enter hospitals. In adult settings, artificial variability in scheduled (“elective”) admissions is greater than variability in emergents, leading to variation in crowding.

**OBJECTIVE:** Determine how admission/discharge and occupancy patterns vary over time at a large children’s hospital.

The lines intersect at approximately 41 weeks PMA.

**CONCLUSIONS:** Collections of exhaled gases from ventilated ELBW preterm infants revealed detectable levels of FENO. We speculate that there may be a maturational production of FENO and that patients who don’t develop BPD may produce higher levels at a younger PMA, thereby conferring protection from BPD. Further, FENO measurements may improve the assessment of ELBW preterm infants, particularly to pulmonary inflammatory conditions and BPD.

**185** House Officer
Telephone Triageing and Pediatric Residents: Where Are We?
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Pediatrics, Albert Einstein Medical Center, Philadelphia, PA.

**BACKGROUND:** Telephone triage is an important aspect of primary care training. Little is known about the experience of pediatric residents and their patients with telephone triaging.

**OBJECTIVE:** To examine the experience with telephone triaging among pediatric residents and their continuity clinic patients

**DESIGN/METHODS:** We conducted a 2-week (9/09) record review of all parent telephone calls to a 24/7 residents’ continuity clinic sick line at an urban academic medical center. Outcome measures were parental satisfaction and compliance with disposition. Using an edited version of HRSA’s Patient Satisfaction Survey, we called a systematic sample of parents to assess satisfaction with the telephone encounter. Patient compliance with ED/clinic appointment was verified with the hospital database. We also conducted an online anonymous survey of pediatric residents to assess their level of comfort with telephone triaging, perceived educational value and recommendations for improving the experience with telephone triaging.

**RESULTS:** A total of 214 calls were made to the sick line, 55% were answered by the residents. The highest concentration of calls (43%) was between 8-10 AM, 7% were afterhours, half were for children <1 year. Cough, congestion, fever and skin problems were the most common complaints. Most parents (89%) were satisfied with the advice and felt the provider had taken enough time. The majority of children (69%) were given the same or next day sick clinic appointment and 8% were referred to the ED. Compliance was 77% with the clinic appointment and 38% with the ED referral. Among the 25 residents who participated in the survey, 44% felt comfortable with telephone triaging at the beginning of residency. Now, 50% of PL-1 and 100% of PL-2 felt comfortable doing telephone triage. The majority (60%) felt it was important to have telephone triage during residency training. Residents felt more frequent feedback and a formal curriculum would enrich the experience.

**CONCLUSIONS:** Parental experience with residents’ telephone triage was very positive. Residents valued telephone triage as an important educational experience. Frequent feedback and a formal curriculum would enhance the learning experience and improve their level of comfort.

**186** Resident
Bottled or Tap Water: What Are Parents and Children Drinking?
Lina Huerta, Matilde Irigoyen.

Pediatric & Adolescent Medicine, Albert Einstein Medical Center, Philadelphia, PA.

**BACKGROUND:** Fluoridation of tap water has proven a very effective public health measure for decreasing tooth decay in children. In the last decade, the sales of bottled water have shown a dramatic increase. Most bottled waters are not fluoridated and this may have an adverse impact on children’s oral health.

**OBJECTIVE:** To assess current water preferences in children and adolescents, perceptions of the quality of tap and bottled water, and awareness of fluoride content in tap and bottled water in an urban pediatric patient population.
**Parental Attitudes and Experience with Infant Swaddling in an Inner City Population**

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**Pediatric and Adolescent Medicine, Albert Einstein Medical Center, Philadelphia, PA.**

**BACKGROUND:** Sudden infant death syndrome (SIDS) is the leading cause of death in infants in the US. Its prevalence is highest among African Americans (AA). Swaddling, an ancient practice, enhances infant comfort and sleeping and decreases the likelihood of SIDS. The use and acceptance of swaddling in US populations has not been explored.

**OBJECTIVE:** To explore the attitudes and experiences with infant swaddling in an inner city population.

**DESIGN/METHODS:** We conducted a survey of a convenience sample of parents of infants 2 weeks-3 months at an inner city pediatric practice. The survey was adapted from the Infant Feeding Practices II (IFPS II) and the Advocate Health Care Sleep Questionnaire, and included questions on infant feeding and sleeping. Additional questions were created to assess parental knowledge of, experience with, and attitudes regarding swaddling.

**RESULTS:** 43 parents participated: mean age was 24 years, SD 7.8 (14-53); infants mean age was 6.8 weeks; 67% were AA, 21% Hispanic, 12% other. 77% had a successful delivery and 7% had a cesarean. 61% of parents always put their babies to sleep on their back, 12% never did. Half the infants (51%) slept in bed with their parents at least some of the time. When shown a picture of a swaddled infant, 43% of parents recognized the term swaddling, others used a variety of terms, ie burrito, mummy or cocoon wrap. Most mothers (88%) remembered seeing the nursery nurses swaddle their baby, 60% also remembered being taught how to swaddle. Most mothers continued to swaddle their babies after discharge, 23% used it for calming the baby, 74% to put the baby to sleep (26% often, 48% sometimes). Half the parents (55%) felt their baby liked to be swaddled. Most parents (81%) had no concerns with swaddling. Those with concerns (19%) most commonly feared the blanket would overheat the face or the baby would be wrapped too tightly and unable to move. The correlation coefficient for swaddling and belly sleeping was -0.28 (P=0.07) and for swaddling and co-sleeping was -0.27 (P=0.08). Although not statistically significant, it showed a trend towards safe sleeping practices associated with infant swaddling.

**CONCLUSIONS:** Swaddling is a common practice among inner city parents, although they were frequently unaware of the term. This study suggests infant swaddling has a positive effect on safe infant sleeping practices. Future studies should explore the strategies to increase swaddling as a means to decrease SIDS.

**Infant Formulas 2010: Claims and Clinical Evidence**

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**BACKGROUND:** A highly competitive infant formula market in the U.S has resulted in direct-to-consumer marketing campaigns intended to promote the sales of modified formulas that claim to ameliorate common infant feeding problems. Commercially produced term infant formulas, catalog the clinical benefits they claim to produce, assess the evidence basis of these claims and assess the formulas’ statements regarding breast-milk.

**DESIGN/METHODS:** Data on 20 formulas’ composition and claims were gathered from formula inspection on visits to 3 popular chain stores and from the websites of the three major formula manufacturers. We excluded pre-term, next step, generic, and specialized formulas. These statements were classified as being neutral or making indirect or clinical claims. The evidence basis for the claims was sought in Cochrane reviews and Clinical Evidence. Statements about breast-milk were classified as either neutral or favoring breast-milk. The evidence basis for the claims was sought in Cochrane reviews and Clinical Evidence. Statements about breast-milk were classified as either neutral or favoring breast-milk.

**RESULTS:** Of the 20 commonly sold formulas 9 are lactose-free, or reduced, 8 contain either partially or fully hydrolyzed protein, 2 are thickened with rice starch. Of 57 statements from the cans, 19 make either direct or indirect claims. Examples of direct claims are “For fussiness and gas due to lactose sensitivity” (for a lactose-free formula) and “For fussiness, gas, and spit-up” (for an unthickened soy formula). Direct claims for fully hydrolyzed formulas are “For food allergies and colic due to protein sensitivity” and “For babies with colic due to cow’s milk protein allergies”. Indirect claims include “easy to digest” for a lactose-free formula and “with comfort proteins for easy digest” for 3 partial hydrolysates. There is insufficient evidence or no evidence to support the claims that removing or reducing lactose, milk protein, or using hydrolyzed protein benefits infants with fussiness, gas, or typical colic. Claims regarding the use of thickened formula for spit up are categorized as “may be effective”. Of 11 statements about breast milk 2 are favorable, e.g., our “closest formula to breast milk” and 9 were neutral.

**CONCLUSIONS:** The majority of the U.S. commercially marketed infant formula products are either lactose reduced or contain hydrolyzed protein. There is little to no evidence for the vast majority of the clinical claims they make. Favorable mentions of breast milk on formula cans are greatly outnumbered by other statements. Increased regulation of formula marketing claims in the U.S. is warranted.
PCPs' perception of P
measures during VI. Further study is needed to determine why there is a persistent gap between the
demographic data, PCPs were asked to rate their perception of P
OBJECTIVE: The objective of this study is to determine primary care providers' (PCPs')
(11%) of PCPs order any P
consuming [23 (33%)], too expensive [11 (16%)] or require too much manpower [17 (24%)].
average 4-6 year old using a validated visual analog scale, 0 (no pain/anxiety)-10 (very severe
associated with VI was 5.7 (95%CI: 5.3-6.1) and perceived anxiety was 7.7 (95%CI: 7.2-8.1).
CONCLUSIONS: Adolescent males living in an urban environment are vulnerable to adverse outcomes and have high rates of risky behaviors. Furthermore, significant deficits exist in the preventive care and counseling for this population.

192
Fellow in Training
Perception and Attitude of Caregivers toward Pain and Anxiety Associated with Pediatric Vaccine Injection
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BACKGROUND: Most children will receive a minimum of 20 vaccine injections (VI) by age 6 years. While the pain associated with VI is brief, the associated anxiety and fear can be significant and may lead to non-compliance with vaccination as well as prime the child for increased anxiety during future health care visits. Despite the many options available for control of the pain and anxiety (A) during VI, they are not often used.
OBJECTIVE: The objective of this study is to determine primary care providers’ (PCPs’) perceptions of the pain and anxiety (A) experienced by 4 to 6 year-old children during VI, and to investigate barriers to the use of A&A control measures in the office setting.
DESIGN/METHODS: We surveyed PCPs (pediatricians, housestaff) from two clinics affiliated with a large urban medical center who provide primary care to pediatric patients. In addition to demographic data, PCPs were asked to rate their perception of A&A associated with VI in an average 4-6 year-old using a validated visual analog scale, 0 (no pain/anxiety)-10 (very severe pain/anxiety). PCPs also rated their attitudes, and perceived barriers, toward providing control for A&A.
RESULTS: Of the 70 PCPs surveyed, 48 (69%) were trainees. The mean PCP perception of pain associated with VI was 5.7 (95%CI: 5.3-6.1) and perceived anxiety was 7.7 (95%CI: 7.2-8.1). There was no difference in PCP perception of pain when compared for provider sex, age, level of training, having children of their own, or number of vaccines ordered per week. Trainees recorded higher anxiety than attending physicians [8.0 vs. 6.9 (p =0.01)]. In terms of barriers to the use of A&A control measures, a minority of respondents felt that A&A control measures were too time consuming [23 (33%)], too expensive [11 (16%)] or too much manpower [17 (24%)]. In fact, 63 (90%) felt that A&A control is achievable in their office setting. Nevertheless, only 8 (11%) of PCPs order any A&A control measures during VI.
CONCLUSIONS: In our study group, PCPs believed that the average 4-6 year old child is very anxious about VI and that the injection is moderately painful. Although the vast majority (90%) of respondents agreed that A&A control is achievable, only 11% attempted to provide A&A control measures during VI. Further study is needed to determine why there is a persistent gap between the PCPs’ perception of A&A and practice of A&A control measures during VI.

193
Graduate Student
Twenty Years of Ethics Consults in a Pediatric Hospital
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BACKGROUND: As pediatric medicine has evolved over the years, the kinds of ethical conflicts encountered by children’s hospitals potentially also change. An understanding of the ethical conflicts that occur in pediatrics can help inform efforts to improve the delivery of family-centered care.
OBJECTIVE: To describe ethics consults at an academic children’s hospital.
DESIGN/METHODS: Our multidisciplinary hospital ethics committee has provided consultation services for the past 20 years, that can be requested by any staff member, patient, or family. After obtaining IRB exemption, we reviewed written consult summaries to extract: year of consult, child age, gender, diagnosis, and person requesting consult. Two investigators read through all summaries to code for themes about the reason for the consult, and the nature of the conflict.
RESULT: Data was available for 80/82 consults performed between 1992-2009. Overall, 42 (54%) involved adolescents; 24(30%) infants and 12(16%) newborns. Consults regarding newborns increased over the years, and involved a wide variety of diagnoses included prematurity, chromosomal, and oncologic disorders. Consults were requested by medical staff (n=65, 81%), nurses (n=10, 12%), and families (n=5, 6%). We coded 49(62%) consults as interprofessional conflicts- differing opinions among a medical team; 27(34%) conflicts were between medical staff and the patient/family; and 3(4%) were among family members. Outcomes of the consultation included 17(21%) recommendations supporting a patient/parent position; 11(14%) recommendations supporting a hospital position, 9(11%) recommendations supporting decisions to withdraw or withhold care; 14(17%) recommendations supporting provision/continuation of care. In 11(14%) cases, the ethical issues were outlined but no specific recommendation was made; in 12(15%) cases, education to family or staff was recommended; and 67(55%) cases were deemed not ethical issues.
CONCLUSIONS: Nearly 40% of consultations involved family-staff or inter-family conflicts; however, only 6% were requested by families. Advertising the ethics consultation service may be an important mechanism to promote more family-centered care. Also, over half of consultations involved adolescents; issues of autonomy, capability and emerging independence are critical to consider in responding to ethical issues in this group. 
10:00 AM
Blood Lactate Levels in Potential ECMO Candidates with Persistent Pulmonary Hypertension of the Newborn (PPHN)
Ashaki M. Brown, Kabir M. Abubakar, Jennifer Berg, Margaret Rodan, Martin Kezler.
Neonatology, Georgetown University Hospital, Washington, DC.
BACKGROUND: Criteria for initiation of neonatal ECMO have been based primarily on gas exchange parameters. In some infants, circulatory failure may lead to the need for ECMO even when gas exchange is acceptable. Elevated blood lactate levels are associated with higher mortality in adults with shock, but the value of lactate as an index of impaired tissue oxygenation in newborns has not been established. Elevated lactate levels may identify neonates with PPHN with worsening tissue oxygenation and impending circulatory failure who may need ECMO.
OBJECTIVE: To determine if blood lactate levels are elevated in infants with PPHN who required ECMO.
DESIGN/METHODS: Blood lactate measurements, available as part of blood gas analysis in our neonatal intensive care unit, were obtained in 63 infants >34 wks gestation treated for PPHN at Georgetown from 2006-2009. Data were abstracted from medical records on admission and every 2 hours until resolution of PPHN (FiO2<28% or initiation of ECMO). Lactate levels, oxygenation index (OI), pH, and mean BP were compared between infants who did and did not require ECMO. Data were analyzed using t-test, chi-square and logistic regression.
RESULTS: A total of 128 TA samples were collected from 51 infants (mean±SD, GA 25.5±1.4w, BW 762±174g). Eleven infants (GA 26.0±1.8w, BW 931±287g) survived without ECMO through 36 weeks PMA and 40 infants (GA 25.4±1.4w, BW 741±148g) died before 36 weeks PMA or developed ECMO. SIRT1 was localized in the cytoplasm and nuclei of mononuclear (MONO) as well as polymorphonuclear (PMN) cells. There was no significant difference in SIRT1 localization in the cytoplasm of MONO or PMN cells in two groups. SIRT1 was significantly more localized in the nuclei of mononuclear cells in infants with no BPD compared to infants who developed BPD or died before 36 weeks PMA.
CONCLUSIONS: SIRT1 is expressed in MONO as well as PMN cells from ventilated premature infants. The localization of SIRT1 was more pronounced in the nuclei of MONO cells in infants with no BPD compared to infants who developed BPD or died before 36 weeks PMA. We speculate that SIRT1 has an important role protecting premature infants in acute lung injury.

10:15 AM
Blood Lactate Levels in Potential ECMO Candidates with Persistent Pulmonary Hypertension of the Newborn (PPHN)
Ashaki M. Brown, Kabir M. Abubakar, Jennifer Berg, Margaret Rodan, Martin Kezler.
Neonatology, Georgetown University Hospital, Washington, DC.
BACKGROUND: Criteria for initiation of neonatal ECMO have been based primarily on gas exchange parameters. In some infants, circulatory failure may lead to the need for ECMO even when gas exchange is acceptable. Elevated blood lactate levels are associated with higher mortality in adults with shock, but the value of lactate as an index of impaired tissue oxygenation in newborns has not been established. Elevated lactate levels may identify neonates with PPHN with worsening tissue oxygenation and impending circulatory failure who may need ECMO.
OBJECTIVE: To determine if blood lactate levels are elevated in infants with PPHN who required ECMO.
DESIGN/METHODS: Blood lactate measurements, available as part of blood gas analysis in our neonatal intensive care unit, were obtained in 63 infants >34 wks gestation treated for PPHN at Georgetown from 2006-2009. Data were abstracted from medical records on admission and every 2 hours until resolution of PPHN (FiO2<28% or initiation of ECMO). Lactate levels, oxygenation index (OI), pH, and mean BP were compared between infants who did and did not require ECMO. Data were analyzed using t-test, chi-square and logistic regression.
RESULTS: A total of 128 TA samples were collected from 51 infants (mean±SD, GA 25.5±1.4w, BW 762±174g). Eleven infants (GA 26.0±1.8w, BW 931±287g) survived without ECMO through 36 weeks PMA and 40 infants (GA 25.4±1.4w, BW 741±148g) died before 36 weeks PMA or developed ECMO. SIRT1 was localized in the cytoplasm and nuclei of mononuclear (MONO) as well as polymorphonuclear (PMN) cells. There was no significant difference in SIRT1 localization in the cytoplasm of MONO or PMN cells in two groups. SIRT1 was significantly more localized in the nuclei of mononuclear cells in infants with no BPD compared to infants who developed BPD or died before 36 weeks PMA.
CONCLUSIONS: SIRT1 is expressed in MONO as well as PMN cells from ventilated premature infants. The localization of SIRT1 was more pronounced in the nuclei of MONO cells in infants with no BPD compared to infants who developed BPD or died before 36 weeks PMA. We speculate that SIRT1 has an important role protecting premature infants in acute lung injury.

196 Fellow in Training
10:15 AM
Blood Lactate Levels in Potential ECMO Candidates with Persistent Pulmonary Hypertension of the Newborn (PPHN)
Ashaki M. Brown, Kabir M. Abubakar, Jennifer Berg, Margaret Rodan, Martin Kezler.
Neonatology, Georgetown University Hospital, Washington, DC.
BACKGROUND: Criteria for initiation of neonatal ECMO have been based primarily on gas exchange parameters. In some infants, circulatory failure may lead to the need for ECMO even when gas exchange is acceptable. Elevated blood lactate levels are associated with higher mortality in adults with shock, but the value of lactate as an index of impaired tissue oxygenation in newborns has not been established. Elevated lactate levels may identify neonates with PPHN with worsening tissue oxygenation and impending circulatory failure who may need ECMO.
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CONCLUSIONS: SIRT1 is expressed in MONO as well as PMN cells from ventilated premature infants. The localization of SIRT1 was more pronounced in the nuclei of MONO cells in infants with no BPD compared to infants who developed BPD or died before 36 weeks PMA. We speculate that SIRT1 has an important role protecting premature infants in acute lung injury.
Risk factors that were not significantly different include sex, race, BW, IUGR and delivery room complications. Pre-diagnosis clinical findings were not significantly different.

CONCLUSIONS: We detected differences between the NEC-T and NEC non-T preterm population. However lack of a difference in pre-diagnosis clinical findings reflect the difficulty in identifying patients who will succumb to their disease rapidly, despite full intervention.

199
Fellow in Training
11:00 AM
Pilot Study of Antibiotic Usage across Four NICUs for Early and Late Onset Sepsis
Pediatrics, Thomas Jefferson University School of Medicine, Philadelphia, PA; Pediatrics, Columbia University, NY, NY; Center for Interdisciplinary Research to Reduce Antimicrobial Resistance, Columbia University, NY, NY; Pediatrics, The Children's Hospital of Philadelphia; The University of Pennsylvania School of Medicine, Philadelphia, PA; Pediatrics, Christiana Care Health Services, Christiana Hospital, Newark, DE.
BACKGROUND: Antibiotic resistance has emerged in the NICU due to prolonged and frequent use of broad spectrum antibiotics. While antibiotic usage is common, Antibiotic Stewardship Programs and studies of prescribing practices are infrequent in the NICU setting.
OBJECTIVE: To prospectively study antibiotic prescribing patterns for early and late onset sepsis in the NICU.

DESIGN/METHODS: Data were prospectively obtained as part of a larger study of antibiotic stewardship in four tertiary care NICUs. Eligible infants were hospitalized 4 or more days during the period May - October 2009. Study variables included initiation of antibiotics < 72 hrs of age (early onset sepsis) vs. ≥ 72 hrs of age (late onset sepsis), choice of antibiotics, duration of treatment and treatment results.
RESULTS: 66

Table: Demographic and Clinical Characteristics of Infants with Early and Late Onset Sepsis
<table>
<thead>
<tr>
<th>Variable</th>
<th>Early Onset Sepsis</th>
<th>Late Onset Sepsis</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of infants</td>
<td>276</td>
<td>402</td>
<td></td>
</tr>
<tr>
<td>Mean Birth Weight (grams)</td>
<td>2254</td>
<td>2308</td>
<td></td>
</tr>
<tr>
<td>BW &gt;2500gms (n)</td>
<td>144</td>
<td>122</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Bilious output (v no output)</td>
<td>6.97</td>
<td>3.16</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Abdominal tenderness</td>
<td>2.09</td>
<td>1.01</td>
<td>0.047</td>
</tr>
<tr>
<td>Xray findings on day of dx</td>
<td>2.67</td>
<td>1.35</td>
<td>0.006</td>
</tr>
</tbody>
</table>

During this pilot study, 1098 infants were enrolled of whom 681 (62%) were treated for early onset sepsis. Most (636, 93%) were treated with ampicillin and gentamicin with a mean duration of 3.7 days. In all, 215 (32%) were treated for 4 or more days, but only 6 (2.8%) of these infants had positive cultures. Group B streptococci, E. coli and Listeria were isolated from 2, 1 and 2 infants respectively. In contrast, 152 infants (14%) were evaluated for late onset sepsis which had positive cultures. Group B streptococci, E. coli and Listeria were isolated from 2, 1 and 2 infants respectively.

CONCLUSIONS: Our pilot study shows a significant decrease in PICC infection after nosocomial infection control measures, including reorganization of NICU infection control task force, hand washing campaign, IV practice guidelines with sterile techniques for IV insertion and maintenance, sterile techniques for hanging intravenous fluid, implementation of mandatory infectious disease RN staff education, having certified PICC team and PICC insertion checklist. Statistical analysis: T-test to compare means and Chi squares for ratios using SPSS 12.0. P< 0.05 was significant.
RESULTS: There were 314 and 282 neonates with 443 and 398 PICCs in pre-intervention and post-intervention periods respectively. Neonates in post-intervention period were sicker based on their prolonged length of stay, more ventilator days and prolonged use of PICC lines. PICC infection rate decreased significantly after intervention from 15/1000 to 4/1000 catheter-days, p<0.05.
CONCLUSIONS: There was significant decrease in PICC infection after nosocomial infection control measures. Having a well coordinated PICC team is essential in every high acuity NICU.

201
Fellow in Training
11:30 AM
Feeding Difficulties in Infants with Hypoxic Ischemic Encephalopathy (HIE) Treated with Selective Head Cooling (SHC)
Erlita Gadin, Susan Adeniyi-Jones, Shobhana Desai,
Neonatology, Thomas Jefferson Univ/duPont Hospital for Children, Philadelphia, PA.
BACKGROUND: There is very little published literature on the achievement of feeding milestones in infants with HIE after SHC. Lack of motor abilities puts these infants at risk for growth failure and may adversely affect their developmental outcome.
OBJECTIVE: 1) To describe the natural course of feeding in infants with HIE treated with SHC. 2) To examine factors contributing to feeding failure and 3) to evaluate the presence of MRI abnormalities in HIE infants with feeding dysfunction.

DESIGN/METHODS: Retrospective data analysis for all infants treated with SHC at TJUH from 11/2006-03/2009. Demographic data, perinatal course, feeding milestones, and MRI studies were noted. The cohort was divided into infants who achieved successful oral feeds by 2 months, and infants with feeding dysfunction (FD), defined as the ability to take optimal oral feeds by 2 months, and infants with feeding dysfunction (FD), defined as the inability to attain successful oral feeds and need for long-term gavage feeding (G-tube/NG). The groups were compared using an unpaired Student’s t test. Results are shown in the table.

Table: Infant Characteristics and Feeding Milestones
<table>
<thead>
<tr>
<th>Variable</th>
<th>Successful Oral Feeds</th>
<th>Feeding Dysfunction</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA (wks)</td>
<td>39±1.7</td>
<td>39±1.6</td>
<td></td>
</tr>
<tr>
<td>BW (g)</td>
<td>3072±548</td>
<td>5805±513</td>
<td></td>
</tr>
<tr>
<td>Initiation of Feeds</td>
<td>5.6±4.5</td>
<td>8.8±4.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Lactate</td>
<td>81±64</td>
<td>85±71</td>
<td></td>
</tr>
<tr>
<td>Initial pH</td>
<td>6.9±0.18</td>
<td>6.8±0.15</td>
<td></td>
</tr>
<tr>
<td>Basic defecat</td>
<td>10.2±4.8</td>
<td>9.6±4.6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Start Feeds</td>
<td>10±2.9</td>
<td>6.2±2.8</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Ad lib</td>
<td>14.8±10.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

80 surviving infants formed the study sample. 34/68 (50%) SOS infants had normal MRI. In 3 (4%) basal ganglia/thalamic ischemia were noted. 18 (26%) had white matter abnormalities, 12 (18%) had global injuries, and 1 (2%) had an intraparenchymal bleed. Among the FD infants (n=12), 2 were discharged on NG feeds and 10 were discharged with G-tube. These infants underwent G-tube placement an average age of 46 days. MRI abnormalities noted involved global (58.3%) and white matter (16.7%) ischemia. 3/12 had normal MRI.
CONCLUSIONS: The majority of infants with HIE treated with SHC achieve successful oral feeding skills. However, 15% have feeding dysfunction. The presence of feeding dysfunction is associated with increased resource utilization, which is reflected by the need for gastrostomy tube placement and prolonged hospitalization.
Are Temporal Artery and Axillary Temperatures Accurate for Clinical Decision-Making in the Well Baby Nursery?

Michael Bruno, Amy Mackley, John Stefano, Robert Locke.

Neonatology, Christiana Care Health System, Newark, DE; Neonatology, Thomas Jefferson University, Philadelphia, PA.

BACKGROUND: Temperature variations of 0.5°C may have clinical care implications in newborns. The accuracy of axillary (AT) and temporal artery (TAT) thermometry compared to rectal (RT) measurements in the newborn nursery has not been established.

OBJECTIVE: To determine the accuracy of the axillary and temporal artery measurements in stable newborns of ≤35 weeks gestation during the first day of life.

DESIGN/METHODS: AT, TAT, RT were obtained at the same time in 100 clinically stable infants ≤24 hrs age on a well baby floor. Bland-Altman analysis for comparative accuracy and clinical predictive values for the detection of hyper/hypothermia were determined, using RT as the gold standard.

RESULTS: Accuracy of Axillary vs Rectal: 2.5SD variance demonstrated that AT that ranged from 0.6 above to 0.4°C below RT measurement. Accuracy of Temporal vs Rectal: 2.5SD difference of TAT was ranged from 0.8 degrees above to 0.6 degrees below RT measurement. Table 1: Clinical reliability in using AT or TAT compared to RT with respect to the detection of hypo and hyperthermia.

CONCLUSIONS: Compared to the gold standard of rectal thermometry, axillary or temporal artery thermometry demonstrated variability that may exceed clinical acceptable standards. For both axillary and temperature artery temperature, the mean values measured by AT and TAT had two standard deviations > 0.5°C. The sensistivity and positive predictive value of axillary and temporal artery temperatures to detect hypo- or hyperthermia compared to rectal thermometry demonstrated variability than may exceed clinical acceptable standards. For both axillary and temporal artery temperatures to detect hypo- or hyperthermia compared to rectal thermometry remains low. This raises the concern that axillary and temporal artery thermometry may be unacceptable as a screening tool for detection of temperature abnormalities and subsequent clinical decision determinations in the newborn time period. There was not consistent enough variation for either the AT or TAT to be used with a “correction factor”.

Clinical Reliability of Axillary and Temporal Artery Temperatures

<table>
<thead>
<tr>
<th>Rectal Temp Value</th>
<th>Hypothermia ≤37.0°C</th>
<th>Hyperthermia &gt; 37.5°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV</td>
<td>98%</td>
<td>50%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>86%</td>
<td>60%</td>
</tr>
<tr>
<td>Specificity</td>
<td>89%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Neonatology - Pulmonary Injury Platform Session

Sunday, March 28, 2010
9:45 AM-12:00 PM
203

9:45 AM

Hydroxy-induced NFkB Activation Alters the Expression of Rev-ERBα and Differentiation of Mouse Lung Fibroblasts

Maurice D. Hinson, Guang Yang, Ping La, Clyde A. Wright, Phyllis A. Dennery.

Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA; Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, PA.

BACKGROUND: The transcription factor NFκB (NFκB) regulates the cellular response to oxidant stress, and NO is known to inhibit NFκB activation in adult pulmonary endothelial cells. The role of NO in modulating NFκB activation in response to oxidant stress in the newborn lung remains unknown.

OBJECTIVE: Using neonatal human pulmonary microvascular endothelial cells (HPMEC), we sought to evaluate the effect of NO plus hyperoxia on NFκB activation.

METHODS: HPMEC were exposed to normoxia (21% O2, 5% CO2) or hyperoxia (>95% O2, 5% CO2) for 24 hrs. The mRNA levels of p65 were determined by Western analysis. Nuclear protein NFκB consensus sequence binding was evaluated by electrophoretic mobility shift assay (EMSA). Real-time PCR for ICAM-1 was performed. Apoptosis was evaluated by measuring caspase-3 activity, cell death by trypan blue exclusion, and cellular proliferation by BrdU ELISA. Experiments were performed in duplicate and repeated 3 times.

RESULTS: After 24 hr, levels of ICAM in O2 exposed cells were significantly lower than NO/ O2(p<.05). In cells exposed to O2, nuclear NFκB consensus sequence binding was significantly increased at 24 hrs(p<.001), and abrogated by exposure to NO/O2. ICAM-1 mRNA and protein levels were significantly higher(p<.05 and p<.001) in cells exposed to O2, while cells exposed to NO/O2 showed no increase in ICAM-1 protein and significant decreases in mRNAP65(p<.001) vs. control. Cells exposed to O2(NO48 hr) showed significant decreases in caspase-3 activity(p<.05) and cell death as measured by trypan blue exclusion vs. O2(p<.05). Finally, cellular proliferation inhibited by hyperoxia(p<.05) was rescued by concurrent exposure to NO.

CONCLUSIONS: NO prevents hyperoxia-induced NFκB activation in HPMEC, resulting in less adhesion molecule expression and decreased cellular toxicity. Through inhibition of this important pro-inflammatory pathway and its effect on dysregulated proliferation, nitric oxide may provide protection to the neonatal lung exposed to oxidant stress.

205

10:15 AM

Neonatal Hyperoxia Increases Leukotriene B4 (LTB4) Production in Room Air Recovered Adult Mice

Vasanth H. Kumar, Serquei V. Kishikuro, Lori Nielsen, Huamei Wang, Rita M. Ryan, Dept of Pediatrics, University at Buffalo, Buffalo, NY.

BACKGROUND: Prolonged exposure of newborn mice to room air (RA) following neonatal hyperoxia exposure increases airway hyper responsiveness (AHR) at baseline and following methacholine challenge in 12 week old mice (E-PAS 2009:3859.160).

OBJECTIVE: We hypothesize that increased leukotriene production might contribute to AHR in adult mice recovered in room air (RA) following neonatal hyperoxia exposure.

METHODS: On postnatal day 3, newborn mice litters were randomized to 85% O2 or RA for 12 days. On day 15 half of the mice litters in both the groups were sacrificed and the other half was recovered in RA until sacrifice at 14 wks of age. Leukotriene B4 (LTB4) and cysteinyl leukotrienes (CysLTs) were assayed in whole lung and in bronchoalveolar lavage (BAL) by competitive EIA (Cayman Chemicals, Ann Arbor, MI). Results were analyzed by ANOVA. RESULTS: LTB4 was significantly higher in the lung both at 2 weeks and at 14 weeks of age.

3.00 PM

AHR and Lung Cysteine Leukotrienes in Neonatal Hyperoxia

Vasanth H. Kumar, Serquei V. Kishikuro, Lori Nielsen, Huamei Wang, Rita M. Ryan, Dept of Pediatrics, University at Buffalo, Buffalo, NY.

BACKGROUND: Prolonged exposure of newborn mice to RA following neonatal hyperoxia exposure increases airway hyper responsiveness (AHR) at baseline and following methacholine challenge in 12 week old mice (E-PAS 2009:3859.160).

OBJECTIVE: We hypothesize that increased leukotriene production might contribute to AHR in adult mice recovered in RA following neonatal hyperoxia exposure.

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CONCLUSIONS: The duration and severity of early oxygen exposure predisposes the lung to injury via Rev-ERBα and NFκB, demonstrating that NFκB regulates the expression of pro-inflammatory genes, including the CysLTs. The expression of these genes is upregulated by Rev-ERBα, which is upregulated by NFκB. Future studies should focus on the role of Rev-ERBα in the regulation of CysLTs expression in the lung.
**Heme Oxygenase-1 Is Important in Lung Recovery after Neonatal Mice Exposed to Hyperoxia**

Guang Yang, Tiangang Zhuang, Phyllis A. Denney, Qing Lin.

Neonatology/Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA; Pediatrics, University of Pennsylvania, Philadelphia, PA.

BACKGROUND: The inducible form of heme oxygenase (HO-1, encoded in the HMOX-1 gene) is highly expressed in neonatal mice lung as compared to adults. We have previously shown that adult null mutant HMOX-1 mice are not more susceptible to hyperoxic injury than WT. It is not known whether disruption of HO-1 affects neonatal hyperoxic lung injury since the newborn lung has high levels of HO-1 and neonatal lung cells are actively proliferating. OBJECTIVE: To determine whether HO-1 regulates lung morphology and gene expression in the developing lung exposed to hyperoxia.

**RESULTS:** Littermates of HMOX-1 (+/+) and (-/-) neonatal mice (<12 h old) were exposed to hyperoxia for 72 h. Some pups were allowed to recover in room air for up to 2 weeks. Lungs were collected for mRNA, protein and lung slices were evaluated for lung architecture by radial alveolar counts (RAC). Levels of surfactant protein, SPA, SPB, SPC and SPD, mRNAs were measured using qRT-PCR. The abundance of genes belonging to cell cycle regulation and associated pathways was assessed using a cell cycle array (PAMM-020, SABiosciences).

**CONCLUSIONS:** Absence of HO-1 protein in the neonatal lung was verified by Western analysis while endogenous HO-1 expression was unchanged. In hyperoxia, HO-1 protein levels did not increase in the HMOX-1 (+/+) lung as compared to age matched air exposed controls. RAC and cell cycle genes (ccna2, ceh2b and Ki67) were similarly decreased in HMOX-1 (+/+) and (-/-) lung after hyperoxia whereas DNA damage response genes (Ddit3, 14-3-3 sigma, Npm2 and p21) were similarly increased between the two groups. However after room air recovery, RAC was worsened and mRNA levels of SPA, SPB, SPC and SPD were decreased in the HMOX-1 (+/+) compared to the HMOX-1 (-/-) lung. While 44 cell cycle genes were moderately decreased (2 fold) in the HMOX-1 (+/+) lung, these genes were altered by 10-500 fold in the HMOX-1 (-/-) lung. These changes in T-cell subsets in the lung may be related to duration of hyperoxia exposure, independent of cumulative oxygen exposure. We speculate hyperoxia-induced inflammation in the lung increases naive and T-cell recruitment via a TLR-4-independent pathway.

**207 Fellow in Training**

**10:45 AM**

**Biphasic Pattern of Inflammatory Response in Neonatal Mice Exposed to Inhaled LPS**

Ogechukwu R. Menkiti, Huayan Zhang, Honghong Sun, Junjie Mei, Yuhong Liu, George S. Worthen.

Children’s Hospital of Philadelphia, Philadelphia, PA; Hospital of University of Pennsylvania, Philadelphia, PA.

BACKGROUND: At birth, the neonate transitions from a sterile environment to one in which irritants and pathogens are inhaled. The initial response to pathogens involves activation of the innate immune system which regulates inflammation. While the magnitude and quality of this response is crucial, termination of this process in a timely fashion is also critical for survival. While the neonate has been described as immunodeficient, little is known about control of inflammation at this crucial age. OBJECTIVE: Define the inflammatory response to inhaled LPS induced lung injury in neonatal mice.

**METHODS:** neonatal C57/B6 mice were exposed to 0.3 mg/ml concentrations of aerosolized LPS on post-natal age 3, 5, 7, 10, 14 and 21 (n=8). Controls were air-exposed matched unexposed mice. These mice were sacrificed at 0.5, 2, 4, 8 and 24 hours post exposure. Bronchoalveolar lavage (BAL) was obtained while lung tissue samples were obtained. Samples were used to determine patterns of intrapulmonary neutrophil (PMNL) recruitment, chemokine/cytokine levels in lavage fluid and quantification of mRNA levels for cytokines/chemokines via real time PCR of whole lung tissue. Cytokines and chemokines of interest include TNF α, IL-6, G-CSF, Mip-1β, Mip 2 and KC.

**RESULTS:** While day three mice demonstrated rapid intrapulmonary neutrophil recruitment as early as 4 hours post exposure (neutrophils count 40% of total leukocyte in BAL). Day seven recruitment was slower with 8% neutrophil (P=0.05) at 4 hrs and 32% neutrophil accumulation at 24 hrs. Lowest neutrophil accumulation at 24 hours (23%) was noted on day 5 (day 3 versus 5 P=0.01). The day 14 response was significantly higher, and adult type response was reached by 21 P=0.001. Compared to adults, day 3 mice had equal or higher levels of inflammatory proteins in whole lung tissue. Chemokines and cytokines of interest include TNF α, IL-6, G-CSF, Mip-1β, Mip 2 and KC.

**CONCLUSIONS:** In this model of LPS-induced lung inflammation, neonatal mice demonstrated a biphasic inflammatory response with a nadir at day 7. Our data demonstrates that pathways involved in signal transduction for bacterial products acting via TLR4 are intact in neonatal mice compared to adults. In the neonatal mouse lung, these genes were altered by 10-500 fold in the HMOX-1 (-/-) lung. While 44 cell cycle genes were moderately decreased (2 fold) in the HMOX-1 (+/+) lung, these genes were altered by 10-500 fold in the HMOX-1 (-/-) lung. These changes in T-cell subsets in the lung may be related to duration of hyperoxia exposure, independent of cumulative oxygen exposure. We speculate hyperoxia-induced inflammation in the lung increases naive and T-cell recruitment via a TLR-4-independent pathway.

**208 Medical Student**

**11:00 AM**

**Duration of Birth Hyperoxia Alters Levels of T-Lymphocytes in the Lungs of Month-Old Sprague-Dawley Rats**

Angeline Seah, J. Craig Cohen, Shetal Shah.

Pediatrics/Neonatology, Stony Brook University School of Medicine, Stony Brook, NY.

BACKGROUND: Hyperoxia exposure predisposes adult rats to develop T-cell mediated apoptotic lung injury and death. Duration of exposure to hyperoxia at birth over different durations (47% for 3 days, 60% for 2 days, and 100% for 1 day) and subsequently recovered in room air. At one month of age, lungs were harvested and immunohistochemical stains performed on frozen sections to assay for levels of CD3, CD4, CD8, CD14 and CD45. Pixel count was used for quantification and 20 microscopic images per antibody were obtained. One way ANOVA testing with Bonferroni Correction and linear regression for trend analysis using GraphPad software were used to determine significance.

**RESULTS:** CD3 levels were significantly altered after hyperoxia exposure (p<0.007). Compared with neonatal hyperoxia group, CD3 levels were decreased after two and three days of hyperoxia exposure (p<0.05 respectively). Trend analysis demonstrated decreased CD3 levels with increased duration of hyperoxia exposure (p<0.01 Linear Regression). CD4 levels were increased in the 100% hyperoxia groups (p<0.05) and decreased linearly with increased oxygen duration (p<0.004 Linear Regression). CD8 levels were increased in the 100% and 75% hyperoxia groups (p<0.001, p<0.01 respectively). CD14 levels were decreased in all hyperoxia groups compared to control (p<0.05). Levels of CD45 were increased in the 60% oxygen groups compared to the 47% oxygen group (p<0.03).

**CONCLUSIONS:** Hyperoxia at birth increases the number of naïve and mature T-Cells in the lungs of Sprague Dawley rats, as well as affecting levels of the TLR4-complex protein CD14. These changes in T-cell subsets in the lung may be related to duration of hyperoxia exposure, independent of cumulative oxygen exposure. We speculate hyperoxia-induced inflammation in the lung increases naive and T-cell recruitment via a TLR-4-independent pathway.

**209 House Officer**

**11:30 AM**

**The Effects of Hyperoxia and Lipo-Poly Saccaride (LPS) on Inflammatory Mediators in the Lungs of Sprague-Dawley Rat Pups**

Elizabeth Ruescher, J. Craig Cohen, Shetal Shah.

Obstetrics and Gynecology, Stony Brook University School of Medicine, Stony Brook, NY; Pediatrics, Stony Brook University School of Medicine, Stony Brook, NY.

BACKGROUND: Supplemental oxygen is a mainstay of neonatal care. Hyperoxia causes short-term inflammation, apoptosis, and increased susceptibility to infection. Hyperoxia alters lung levels of Heat Shock Protein 27, Interleukin 6, Interleukin 8, Interleukin 10, and Tumor Necrosis Factor (TNF). Although as co-stimulatory molecules of Toll-like Receptors 2 and 4, Nodules can be infected with gram-negative bacteria undergo a similar pro-inflammatory response. However the interactive effects of both these pro-inflammatory states, which together often occur clinically, has not been well characterized.

**OBJECTIVE:** To determine levels of known pro-inflammatory markers in the lung and serum of animals treated with both hyperoxia and LPS.

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**68 Eastern Society for Pediatric Research 2010 Annual Meeting**
211
11:45 AM
Alveolarization and Cytokine Responses Are Altered in Adult Mice Exposed to Neonatal Hyperoxia
Sergeui V. Kishkurova, Rita M. Ryan, Lori Nielsen, Huaneci Wang, Vasanth H. Kumar
Pediatrics, University at Buffalo, Buffalo, NY.
BACKGROUND: Bronchopulmonary dysplasia (BPD), chronic lung disease of prematurity, predisposes to asthma and other respiratory diseases. We hypothesized that neonatal hyperoxia induces lung structural and cytokine changes that persist into adulthood.
OBJECTIVE: We compared alveolarization and several immunoregulatory cytokines at 14wk in mice exposed to neonatal hyperoxia vs. room air (RA).
RESULTS: The hyperoxia group showed alveolar simplification, a significantly lower RAC and IL-12, a proinflammatory cytokine, and IFNγ were significantly elevated soon after hyperoxia exposure (2wk) but not at 14wk.
CONCLUSIONS: The hyperoxia group showed alveolar simplification, a significantly lower RAC and higher MLI (alveolar enlargement) both at 2wk and 14wk.

<table>
<thead>
<tr>
<th></th>
<th>2 weeks</th>
<th>14 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Room Air (RA)</td>
<td>Neonatal Hyperoxia</td>
</tr>
<tr>
<td>IL-12</td>
<td>148.19 (18)*</td>
<td>148.19 (18)*</td>
</tr>
<tr>
<td>IFNγ</td>
<td>84.13 (33)*</td>
<td>84.13 (33)*</td>
</tr>
<tr>
<td>IL-10</td>
<td>40 (13)</td>
<td>40 (13)</td>
</tr>
<tr>
<td>IFNγ</td>
<td>532 (153)</td>
<td>532 (153)</td>
</tr>
</tbody>
</table>

IL-12, a proinflammatory cytokine, and IFNγ were significantly elevated soon after hyperoxia exposure (2wk) but not at 14wk.

RESULTS: Exposure to hyperoxia in the neonatal period produced alveolar simplification that persisted despite prolonged room air recovery, suggesting that oxygen may induce permanent lung structural changes. One possible mechanism involves modulating the immune response in the lung. IL-10 and IL-4, cytokines that induce a Th2 cell type, were higher in the RA group. However, a Th1 preference (higher IL-12 & IFNγ) noted after 2wk hyperoxia did not persist at 14wk. These relationships among oxygen, cytokines and alveolar simplification need to be explored further.
A Comparison of Physical Activity Levels between Asthmatic and Non-Asthmatic Inner City Children

Nita Vangeepuram, Susan L. Teitelbaum, Maida Galvez, Barbara Brenner, John Doucette, Mary S. Wolff.

Community and Preventive Medicine and Pediatrics, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Low-income minority children living in inner cities have higher rates of both asthma and obesity. While physical activity levels are clearly associated with obesity, few studies have looked at asthma diagnosis in relation to level of physical activity.

OBJECTIVE: To study the association between asthma diagnosis and various measures of physical activity and sedentary activity in inner city minority children.

DESIGN/METHODOLOGY: Cross-sectional data from Growing Up Healthy, a community based study of 6-8 year old NYC children, were used. Pedometers were utilized as objective tools for assessing physical activity. Participation in physical activities and time spent each day in sedentary activities was reported by parents in a questionnaire. Asthma was defined as parental report of physician-diagnosed asthma. Physical activity and pedometer measurements among asthmatics and non-asthmatics were compared using T-tests.

RESULTS: 505 children were included with 79% female, 26.5% non Hispanic Black, and 73.5% Hispanic. 26% of children had physician-diagnosed asthma. Overall, 67.8% of children had no participation in organized recreational activities. The average time spent in gym class per week was one hour. 46.8% of children had more than two hours per day of sedentary activity (television, video game and computer time combined). Asthmatic children were more likely than non-asthmatic children to report that health problems limited their physical activity (17.4% compared to 1.1%, p<0.001). Asthmatic children also had significantly higher total sedentary hours compared to non-asthmatic children (4.6 versus 4.0 hours, p=0.039). There were no differences between asthmatic and non-asthmatic children in mean hours of non-scheduled activities, gym class, sleep, television or mean number of pedometer steps. Proportions of children with any versus no metabolic hours per week of organized physical activity did not vary between asthmatic and non-asthmatic children.

CONCLUSIONS: There were increased levels of sedentary activity in asthmatics compared to non-asthmatics in this sample of inner city minority children. Sedentary activity may lead to increased exposure to indoor environmental asthma triggers and reduce available time for physical activity. Strategies are needed to educate families about the importance of limiting sedentary activities among children with asthma.
Breathing Easy: The Economic Implications of Outdoor Air Pollution and Pediatric Asthma Hospitalizations

Angkana Roy, Perry Sheffield, Kendrew Wong, Leonardo Trasande

Background: Exposure to outdoor air pollutants such as particulate matter of diameter <2.5 μm (PM2.5) has been associated with numerous markers of increased asthma morbidity. However, the impact of such exposures on healthcare utilization is largely unknown.

Objective: To examine the association between PM2.5 exposure and pediatric asthma hospitalization charges

Design/Methods: We combined national air quality data from the EPA’s Aerometric Information Retrieval System with hospital discharge data from the Nationwide Inpatient Sample. We included hospital discharges from 1999-2006 with a primary diagnosis of asthma among children 2-17 years of age. Hospitals with no air quality data within 10 miles were excluded. Our main predictor was average PM2.5 concentration in proximity of the hospital during the month of admission. Bivariate analysis was conducted using a Spearman correlation. The outcome variable was then log-transformed and multivariable analysis was conducted, creating a linear regression model. We controlled for other air pollutants known to contribute to asthma severity (O3, NO2, and SO2) as well as patient demographics, hospital characteristics, admission month, and year of hospitalization. Interaction terms for PM2.5 with age, income, and month of admission were considered in the final multivariable model based on significance (p<0.1).

Results: Spearman correlation with total hospital charges yielded r=0.2 (p<0.0001). Multivariable analyses (N=53,879 unweighted) identified no significant interaction terms. In the final model, a 1 unit increase in PM2.5 was associated with a 0.0071 increase in log total charges (p<0.0001). O3, NO2, and SO2 were not significant predictors. Translated into dollars, a 1 unit PM2.5 increase represented a 1.64% or average $117 rise in charges per hospitalization. Extrapolated to the total weighted number of hospitalizations examined in this study (N=272,157), PM2.5 represented an annual preventable economic burden of $54.8 million per year.

Conclusions: PM2.5 appears to play a role in increasing healthcare utilization among children hospitalized with asthma. The increase in hospital charges seen with higher PM2.5 levels suggests that air pollution reduction efforts may lead to substantial healthcare savings.

Psychosocial Stress and Asthma: The Role of Neighborhood

Angkana Roy, Lauren Steele, Emily Blanchard, Atray Dixit, Juan Wisnivesky, Pediatrics and Preventive Medicine, Mount Sinai School of Medicine, New York, NY; Internal Medicine and Pulmonary Critical Care, Mount Sinai School of Medicine, New York, NY.

Background: Asthma morbidity rates in East Harlem, New York are significantly higher than national averages. Indoor environmental triggers may play a role. Many educational interventions have been implemented in East Harlem to improve asthma management. Environmental control practices (ECPs) to reduce indoor triggers have been an area of focus for these interventions.

Objective: To examine the association between exposure to different educational interventions and 1) knowledge of ECPs and 2) use of ECPs.

Design/Methods: Parents of children 2-17 years old with asthma in East Harlem were surveyed. Data regarding knowledge and use of 25 ECPs recommended by the NIH guidelines was obtained. Participants were asked about sources of education regarding environmental control of asthma including: no advice, physician advice only, social work/asthma counselor advice but no home visit, and home visit. ANOVA was used to assess differences among the four groups in mean number of ECPs they knew about and mean number used. Linear regression models were built to control for demographic confounders including race, gender, income, and level of parental education.

Results: We surveyed 129 participants. Mean number of ECPs parents reported knowledge of was 12.8, 16.0, 17.8, and 19.0 (p<0.001) for the groups who received no advice, physician advice only, social work advice but no home visit, and home visit, respectively. The mean number of ECPs used was 9.6, 9.8, 10.6, and 11.9 (p<0.05) for those same groups. In multiple regression analyses, those with only physician advice knew of 2.5 more ECPs (p<0.04), those with social work advice but no home visit knew of 4.6 more ECPs (p<0.001), and those with home visits knew of 5.5 more ECPs compared to those who received no advice (p<0.001). However, type of intervention was not significantly associated with use of ECPs after adjusting for confounders.

Conclusions: Intensive interventions such as asthma counselors and home visits appear to result in increased awareness of environmental asthma control, an important step towards implementing such controls. Further research is needed to assess barriers in translating knowledge of ECPs into implementation of these practices in the home.
RESULTS: There were 41 courses of gentamicin in each group. Before training, only 26% of calculated Crmax levels were in the therapeutic range. After PK training, this number rose to 100% (p < 0.0001). Pharmacokinetic calculations and dosage changes performed by physicians were done correctly. Most common barriers to PK-derived dosage calculations were time to perform calculations and delay in laboratory reporting of SGC.

CONCLUSIONS: PK education of house-staff education was successful and resulted in improved gentamicin levels.

222
10:00 AM
Post-Simulation Debriefing Is Crucial to Residents’ Disaster Triage Performance and Patient Outcomes
Mark X. Cicero, Jason Zigmont, Marc Auerbach, Kevin Ching, Carl R. Baum.
Pediatrics, Yale University School of Medicine, New Haven, CT; Yale-New Haven Hospital, New Haven, CT.

BACKGROUND: Because of its potential effect on patient outcomes, pediatric disaster medicine (PDM) triage is a critical skill for pediatricians. The ACGME now requires residency disaster training. Ideal training is learner-centered and experiential.

OBJECTIVE: We planned to measure the efficacy of a multiple-victim simulation in facilitating learners’ acquisition of PDM skills, including the JumpSTART triage algorithm. We hypothesized that a structured debriefing would improve triage performance.

DESIGN/METHODS: We created a 10-victim school-shooting scenario to facilitate learning a PDM triage algorithm. Victims were portrayed by adult volunteers, and by high and low fidelity simulation manikins that responded physiologically to airway maneuvers. Learners were pediatrics residents at our institution. Pre-course learner knowledge was measured with previously derived psychometrically tested multiple-choice questions. Expected responses were not revealed. After a didactic session, learners assigned triage levels to all victims, and recorded responses on a standardized form. A structured debriefing allowed learners to review the victims and discuss triage rationale. A new 10-victim trauma disaster scenario was presented one week later. Learners again assigned triage levels to victims, and completed a different version of the multiple-choice test. Wilcoxon sign rank tests were used to compare pre- and post-tests scores and performance on pre- and post-debriefing simulations.

RESULTS: 51 learners completed the educational intervention. Mean scores on pre- and post-tests improved significantly [p < 0.0001], and were 68.8% [range 25-100%] and 86.3% [62.5-100%] respectively. Initial triage mean performance was 7/10 patients accurately triaged [5-10, SD 1.3], and after the structured debriefing, mean performance improved [p < 0.0001] to 8/10 patients [5-10, SD 1.37]. Over-triage of an injured child with special healthcare needs (CSHNC) [67.8% of learners pre-debriefing, 49.0% post-debriefing] and under-triage of head-injured, unresponsive patients [41.2% of learners pre-debriefing, 37.5% post-debriefing] were the most common errors.

CONCLUSIONS: Structured debriefings are a key component to PDM simulation education, and resulted in greater triage accuracy. Our educational intervention improves disaster triage knowledge and skills. Future curricula should emphasize assessment of CSHCN and head-injured patients.

223
10:15 AM
Impact of Implementing Family Centered Rounds (FCR) in a Neonatal Intensive Care Unit
Kelly A. Voos, Anne-Lise Yohay, Gail Ross, Mary J. Ward, S. Nena Osorio, Jeffrey Perlman.
Pediatrics, New York Presbyterian Hospital Weill Cornell Medical College, New York, NY.

BACKGROUND: Family-centered care is intended to strengthen the doctor-patient-parent relationship, improve patients and parents experience of health care, and decrease stress. Physician and parent communication skills are associated with improved health status, recall, treatment adherence, and satisfaction. In a previous needs assessment in our NICU, 44% of parents stated that improved physician communication would reduce their stress (Voos, PAS 2009). Redesigning curriculum to teach family communication skills is associated with improved health status, recall, treatment adherence, and decrease stress.

OBJECTIVE: To test the relationship between FCR and 1) duration of rounds and 2) satisfaction of families, trainees, nurses and attending physicians.

DESIGN/METHODS: An investigator attended rounds, compiling data using a structured observation tool. After rounds, all participants, including families, completed an anonymous satisfaction survey. Family satisfaction data was linked to patient observation data. We defined ‘FCR’ as rounds with a parent and nurse present. We used Spearman’s correlation to test the relationship between FCR and time rounding. Using chi-square we compared the link between family satisfaction questions and FCR. We also tallied an overall family satisfaction score and compared median satisfaction with FCR. Staff data was linked to the day of observation. For each day, we recorded the proportion of patients receiving FCR. We used Spearman’s correlation to test the relationship between FCR and staff responses. For nurses, we summed responses to two questions to reflect satisfaction: “gained an understanding of the plan” and “felt able to raise concerns easily.”

RESULTS: We collected 26 days’ data (208 patients). FCR occurred in 45 (22%) patients. We collected 182 staff surveys and 80 parent surveys. Increased FCR was associated with shorter rounding time per patient (rho = 0.22, p = 0.002). Family satisfaction was high and, while unaffected by FCR (median 51 vs. 51, p = 0.91), families who experienced FCR more often strongly agreed that they knew team members’ roles (58% vs. 48%, p = 0.027). With more FCR, trainees reported less autonomy (rho = 0.18, p = 0.05) FCR were associated with a stronger perception that managing the length of rounds (rho = 0.22, p = 0.01) was easy, especially among attending physicians (rho = 0.47, p = 0.04). FCR was associated with increased nurse satisfaction (rho = 0.32, p = 0.056).

CONCLUSIONS: FCR improved efficiency, family understanding of team members’ roles, and nurse satisfaction. Trainees’ perception of decreased autonomy requires attention. Continued faculty and staff development will be critical to furthering engagement in FCR.

225
10:45 AM
Impact of an Evidence-Based Medicine Curriculum on Residents’ Medical Literature Use
Kathryn Scharbach, Philip O. Ozuah.
Pediatrics, Children’s Hospital at Montefiore/Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Evidence-Based Medicine (EBM) refers to the conscientious and explicit use of the current best evidence in making decisions about the care of individual patients. The majority of studies of teaching EBM focus on knowledge of EBM and developing critical appraisal skills. We sought to investigate the impact of teaching EBM on resident use of the EBM skills of searching for and applying the best information.

OBJECTIVE: To evaluate the effect of an EBM curriculum on resident use of MEDLINE and medical literature for the purposes of performing historical and current research.

DESIGN/METHODS: We conducted a repeated measures survey of pediatric residents at an urban tertiary care academic children’s hospital. 84 residents completed anonymous questionnaires over two academic years to assess their use of MEDLINE and medical literature over the preceding week. Four cycles of questionnaires were completed in the first academic year and one cycle in the second year. Descriptive statistics were performed, repeated-measures ANOVA was used to determine whether use of MEDLINE or medical literature increased over time, and Mann Whitney U tests were used to assess whether increased total exposure to EBM sessions was associated with increased use of MEDLINE or medical literature.

28/45 parent surveys (62%) were completed, 12 pre & 16 post. Parents’ satisfaction scores increased significantly (p < 0.01) on survey items regarding communication including meeting with physicians and obtaining information about their infant.

CONCLUSIONS: Implementation of FCR has enhanced collaboration among team members predominantly for NNPs and fellows. Since the latter are the primary communicators with parents, this satisfaction may reflect the avoidance of miscommunication due to FCR. This open dialogue may also contribute to the increased parent satisfaction.

224
10:30 AM
Satisfaction with Family-Centered Rounds: Perspectives of Families, Nurses, Trainees, and Attending Physicians
General Pediatrics, Nemours/AI duPont Hospital for Children, Wilmington, DE; Residency Program, Nemours/AI duPont Hospital for Children, Wilmington, DE.

BACKGROUND: Family-centered rounds (FCR) involve multidisciplinary rounds with families. FCR may improve family participation and staff satisfaction. In 2006, we implemented FCR on general pediatrics inpatients but noted inconsistent adoption, perhaps due to their perceived length. We sought to study interactions on FCR and their impact on participant satisfaction.

OBJECTIVE: To test the relationship between FCR and 1) duration of rounds and 2) satisfaction of families, trainees, nurses and attending physicians.

DESIGN/METHODS: An investigator attended rounds, compiling data using a structured observation tool. After rounds, all participants, including families, completed an anonymous satisfaction survey. Family satisfaction data was linked to patient observation data. We defined ‘FCR’ as rounds with a parent and nurse present. We used Spearman’s correlation to test the relationship between FCR and time rounding. Using chi-square we compared the link between family satisfaction questions and FCR. We also tallied an overall family satisfaction score and compared median satisfaction with FCR. Staff data was linked to the day of observation. For each day, we recorded the proportion of patients receiving FCR. We used Spearman’s correlation to test the relationship between FCR and staff responses. For nurses, we summed responses to two questions to reflect satisfaction: “gained an understanding of the plan” and “felt able to raise concerns easily.”

RESULTS: We collected 26 days’ data (208 patients). FCR occurred in 45 (22%) patients. We collected 182 staff surveys and 80 parent surveys. Increased FCR was associated with shorter rounding time per patient (rho = 0.22, p = 0.002). Family satisfaction was high and, while unaffected by FCR (median 51 vs. 51, p = 0.91), families who experienced FCR more often strongly agreed that they knew team members’ roles (58% vs. 48%, p = 0.027). With more FCR, trainees reported less autonomy (rho = 0.18, p = 0.05) FCR were associated with a stronger perception that managing the length of rounds (rho = 0.22, p = 0.01) was easy, especially among attending physicians (rho = 0.47, p = 0.04). FCR was associated with increased nurse satisfaction (rho = 0.32, p = 0.056).

CONCLUSIONS: FCR improved efficiency, family understanding of team members’ roles, and nurse satisfaction. Trainees’ perception of decreased autonomy requires attention. Continued faculty and staff development will be critical to furthering engagement in FCR.
RESULTS: A total of 268 questionnaires were completed and analyzed, of which 34%, 33% and 33% were from PGY-1, PGY-2 and PGY-3s, respectively. Compared to residents who had attended two or fewer EBM sessions, residents who attended three or more sessions were significantly more likely to use medical literature for general learning (median 2 vs. 3; IQR 1-3 vs. 2-5; p<.005). In contrast, a statistically significant difference was not detected based on exposure to EBM sessions for the use of medical literature for patient care questions (median 1; IQR 0-2 for both; p>0.30) or the use MEDLINE (median 0; IQR 0-2 vs. 0-3; p=.66).

CONCLUSIONS: In our study, residents who participated in three or more EBM sessions were significantly more likely to use medical literature for general learning than those who had participated in fewer sessions. These findings have implications for the notion that residents will use medical literature more with greater exposure to EBM.

226
11:00 AM
A Novel Approach to Residents’ Scholarly Activities (RRC Requirement IV B)
Pediatrics, Flushing Hospital Medical Center, Flushing, NY; School of Health Sciences, Touro College, NY, NY.

BACKGROUND: The Accreditation Council for Graduate Medical Education (ACGME) requires residents to participate in scholarly activities such as research that will contribute to their comprehensive lifelong learning experience.

OBJECTIVE: To evaluate whether our Novel Research Curriculum (NRC) improves residents’ scholarly activities, helping them to fulfill their research project requirement.

DESIGN/METHODS: In 2007, a research team leader was appointed to develop a NRC to teach and support research activities. The NRC includes early involvement of residents in post graduate year (PGY) 1 level into research activities: literature review, research question, mentor selection, objective, hypothesis, study design, data management, basic statistics, ethics, IRB submission, and creation of scientific posters and oral presentations. Each resident’s progress is reviewed weekly and individual mentoring is provided. Residents are entitled to a 3-week research elective. The final project presentation was advanced to December prior to graduation year. All new abstracts are submitted to local, regional and national scientific meetings. We compared the number of resident’s research projects accepted at local, regional and national scientific meetings before (PGY 3 in or prior to year 2006, group 1, G1), at initiation (PGY 3 in year 2007, group 2, G2) and after full implementation (PGY 3 in year 2008, group 3, G3) of our NRC. Satisfaction surveys were collected from graduated residents. Data was reported in percentage, mean ± SD and analyzed using ANOVA.

RESULTS: G3 showed the highest number of presentations at regional and national meetings. ANOVA was significant for regional (p=.007), national (p=.037), and total number of presentations (p=.037). No difference among the 3 groups was found for local presentations (p=.626). Of 315 residents, 24 (69%) completed the satisfaction survey (G1 = 59%; G2 = 78%; G3 < 89%). Most G3 residents responded that the NRC provided a positive educational experience (90%) and would recommend it to others (92%).

CONCLUSIONS: The implementation of NRC helps residents to improve their research skills, and to successfully meet the scholarly activity required as part of RRC, requirement IV B.

227
11:15 AM
Pediatric Resident Knowledge of Sport-Related Conussion (SRC) (POISE)
Katherine E. Nicholson, Lei Chen.
Pediatric Emergency Medicine, Yale University School of Medicine, New Haven, CT.

BACKGROUND: Concussions are common injuries sustained by young athletes. General pediatricians will increasingly find themselves responsible for providing follow-up care for sports-related concussion (SRC). The consequences of returning to play before fully recovering from a concussion or sustaining multiple concussions can be serious, ranging from second impact syndrome to chronic neurocognitive problems. It is imperative that graduates of pediatric residency programs be able to evaluate young athletes and provide guidance to return them to play safely.

OBJECTIVE: To examine pediatric residents’ knowledge of return to play (RTP) recommendations after SRC.

DESIGN/METHODS: We designed a survey consisting of 12 questions addressing demographics, previous instruction in the management of sport related concussion, general knowledge of concussion and clinical scenarios. A Likert scale was used to assess knowledge and confidence. The definitions and recommendations outlined in the Summary and Agreement Statement of the 2nd International Symposium on Concussion in Sport as developed by the Concussion in Sport Group (CISG) were used as the standard for the purposes of this study. The survey was distributed to pediatric residents in the New England Region of the United States using an Internet survey tool. RESULTS: Eighty residents from 11 residency programs responded. Participants were from all levels of training, with PGY1-3 equally represented. Fewer than 50% reported receiving formal training in management of SRC. This was consistent across all levels of training. When asked about performing immediate sideline evaluations, 60% were comfortable. However, when confronted with a clinical scenario, only 39% answered correctly. One-third would return a child who had been dazed and disoriented to play in the same game. Seventy-five percent or participants reported feeling comfortable managing post-concussive symptoms. When making return to play decisions, 70% felt comfortable. Yet, only 36-62% were able to answer clinical scenarios correctly.

CONCLUSIONS: Pediatric residents receive inconsistent formal training in the management of SRC. They report feeling somewhat to very comfortable in the management of SRC. However, they performed poorly on clinical scenarios.
CONCLUSIONS: Pediatric interns have minimal LP training or experience during medical school. Knowledge and confidence with infant LP is low at the start of internship. Both clinical exposure and simulator experience are associated with procedural confidence. The impact of simulator experience on clinical outcomes should be studied prospectively.

Emergency Medicine Platform Session

Sunday, March 28, 2010
9:45 AM-12:00 PM

230 9:45 AM
Fellow in Training

Ultrasound Evaluation of Skull Fractures in Children
Antonio Riera, Lei Chen
Pediatric Emergency Medicine, Yale-New Haven Children’s Hospital, New Haven, CT.

BACKGROUND: Closed head injury (CHI) is a common condition in the pediatric emergency department (PED). Skull fractures are the most common radiographic findings after CHI. Skull fractures are associated with intracranial injury. Exposures to radiation have the potential to cause malignancies. Decision rules for obtaining computed tomography (CT) scans after CHI yield high sensitivity but lack specificity for intracranial injuries. A disproportionate number of CTs are normal in the evaluation of pediatric CHI. Bedside ultrasound can be used to detect long bone fractures. No research to date describes the potential application of ultrasound in the diagnosis of skull fractures.

OBJECTIVE: To investigate the test characteristics of bedside ultrasound for the detection of skull fractures in children with CHI.

DESIGN/METHODS: This is a prospective observational study involving a convenience sample of patients seen in a tertiary care children’s hospital. Children less than 18 years of age were enrolled if they were evaluated for an acute CHI and a CT scan was performed. Subjects with open skull fractures, suspected non-accidental trauma or requiring urgent intervention were excluded. Ultrasounds were performed by PED attendings or fellows with at least 1 month of training in skull fractures.

RESULTS: There were 8,446 children between the ages 1 month and 6 years seen in the ED and 236 (2.8%) had a head CT. Indications for head CT included: trauma 58%, seizure 10% (of which 21% had a previous diagnosis of epilepsy), 50% an atypical seizure, and 29% a febrile seizure), and headache 8%. Less common indications included altered mental status, pre-existing neurological diagnoses (e.g. VP shunt), suspected non-accidental trauma, and ataxia. Abnormalities on CT were found in 38% (89 children): 56 incidental findings, 10 pre-existing abnormalities, and 23 significant findings. Only 3 of the 23 required immediate intervention and all 3 had red flags in both history and physical exam. Only 2 of the 23 lacked a red flag, both of whom were admitted for observation and discharged within 24 hours with outpatient follow-up. A total of 40% lacked a red flag.

Red Flags vs Head CT Results

<table>
<thead>
<tr>
<th>Finding</th>
<th>Normal</th>
<th>Incidental Finding</th>
<th>Significant Finding</th>
<th>Pre-Existing Abnormality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Red Flag</td>
<td>64</td>
<td>23</td>
<td></td>
<td></td>
<td>87</td>
</tr>
<tr>
<td>Red Flag in History</td>
<td>40</td>
<td>6</td>
<td>6</td>
<td>56</td>
<td>102</td>
</tr>
<tr>
<td>Red Flag in Physical Exam</td>
<td>16</td>
<td>10</td>
<td>3</td>
<td>29</td>
<td>39</td>
</tr>
<tr>
<td>Red Flag in Both</td>
<td>23</td>
<td>17</td>
<td>14</td>
<td>57</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
<td>56</td>
<td>23</td>
<td>236</td>
<td>Total</td>
</tr>
</tbody>
</table>

Of note, 20% received more than one head CT scan to date, and 8% had between 3 and 12 scans.

CONCLUSIONS: A significant number of children receiving head CT scans in the ED did not appear to have clinical justification for the procedure. Abnormalities on head CT scans in this sample were almost always predicted by history and physical examination, and every child requiring emergent intervention had red flags.

232 10:15 AM
Fellow in Training

The Association of Weight Percentile and Motor Vehicle Crash Injury among 3 to 8 Year Old Children
Mark R. Zonfrillo, Kyle A. Nelson, Michael J. Kallan, Dennis R. Durbin, Division of Emergency Medicine, Children’s Hospital of Philadelphia, Philadelphia, PA; Center for Injury Research and Prevention, Children’s Hospital of Philadelphia, Philadelphia, PA; Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania School of Medicine, Philadelphia, PA.

BACKGROUND: In the United States (US), motor vehicle crashes (MVCs) injure nearly 60,000 children ages 3-8 years annually. The use of age-appropriate child restraint systems significantly reduces injury and death associated with MVCs. Pediatric obesity has become a global epidemic. Although recent reported analyses from national crash databases suggests an association between pediatric obesity and MVC-related injury, there are potential misclassifications of body mass index from under-estimated height in younger children. Given this limitation, age- and sex-specific weight percentiles can be used as a proxy of weight status.

OBJECTIVE: The specific aim of this study was to determine the association between weight percentile and the risk of significant injury for children 3-8 years in MVCs.

DESIGN/METHODS: This is a cross-sectional study of children aged 3-8 years in MVCs in 16 states in the US, with data collected via insurance claims records and a telephone survey from 12/1/08-11/30/07. Parent-reported injuries with an abbreviated Injury Scale (AIS) score of ≥2 indicated a clinically significant injury. Age- and sex-specific weight percentiles were calculated using pediatric norms.

RESULTS: The study sample included 9,402 children aged 3-8 years (sample weighted to represent 158,928 children), of which 99% sustained clinically significant injuries. There was no association between age and sex-specific weight percentiles and clinically significant injury when adjusting for restraint type (p=0.73). There was a higher risk of clinically significant injury for those children in seat belts (OR=2.99, 95% CI: 2.11-4.23) or unrestrained (OR=7.90, 95% CI: 4.83-12.90) as compared to children in child restraint systems, regardless of weight percentile.

CONCLUSIONS: Of note, the weight percentile did not have a meaningful association with weight status. Parents should continue to properly restrain their children in accordance with published guidelines. Specifically, children of this age should be in a belt-positioning booster seat until they are at least 57 inches (145 centimeters) tall.

233 10:30 AM
Undergraduate Student

Impact of the CARES Psychiatric Assessment Unit on Patient Management in the Emergency Department
Lauren T. Griffin, Peter J. Maisel, Lauren Mancini, Michael Stevens, Sharon R. Smith, Molecular and Cell Biology, University of Connecticut, Storrs, CT; Psychiatry, Connecticut Children’s Medical Center, Hartford, CT; Pediatric, Connecticut Children’s Medical Center, Hartford, CT.

BACKGROUND: Pediatric psychiatric emergencies are a nationwide crisis, and have contributed to an increase in behavioral health Emergency Department (ED) visits. A collaborative response to this crisis by Connecticut Children’s Medical Center (CCMC) and Hartford Hospital/Institute of Living was the creation of the Child & Adolescent Rapid Emergency Stabilization Program (CARES).

OBJECTIVE: To determine how the introduction of the CARES unit has influenced length of stay for behavioral health patients in the ED.
OBJECTIVE: To evaluate the efficacy of the PSI. Secondarily, to assess whether improved PSS correlate with traditionally measured quality indicators.

RESULTS/DISCUSSION: We performed an analysis of PSS returned from guardians who visited our ED from 1/06-3/09. All 42 questions in the PSS were included. Responses used a 5-point Likert scale 1-5 (highest). Besides descriptive statistics, Pearson Chi-square test and two sample t-test were used to examine the distribution of other influential variables by group (before and after PSI initiation). Multiple ordinal logistic regressions were used to determine the effect of the PSI after the adjustment of influential covariates (such as patient race, gender, age, acuity, insurance etc).

RESULTS: 2601 surveys were analyzed. 1087 (42%) were before the PSI. There was no significant difference in regard to gender, age, or insurance when comparing the two groups.

Table 1: Adjusted Ordinal Logistic Regression (Comparison of Satisfaction Before and After PSI)

<table>
<thead>
<tr>
<th>Response Variables</th>
<th>p-value</th>
<th>Odds Ratio</th>
<th>95% CI of OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood to Recommend</td>
<td>0.004</td>
<td>1.297</td>
<td>0.881-1.548</td>
</tr>
<tr>
<td>Overall Care</td>
<td>0.000</td>
<td>1.040</td>
<td>1.011-1.065</td>
</tr>
<tr>
<td>Pain Control</td>
<td>0.019</td>
<td>1.218</td>
<td>1.032-1.436</td>
</tr>
<tr>
<td>Nurse Courtesy</td>
<td>0.012</td>
<td>1.206</td>
<td>1.016-1.429</td>
</tr>
<tr>
<td>Doctor Care</td>
<td>0.316</td>
<td>1.118</td>
<td>0.799-1.619</td>
</tr>
<tr>
<td>Informed about Delays</td>
<td>0.023</td>
<td>1.199</td>
<td>1.024-1.394</td>
</tr>
</tbody>
</table>

Responses are adjusted for patient race, acuity, financial info, location, LOS, and arrival time of first MD.

CONCLUSIONS: Implementing a PSI using a few simple steps was an effective tool to increase PSS, despite no change in LOS, arrival time of first MD, or rating of doctor care. This indicates that families’ perception of care does not necessarily correlate with the traditionally measured indicators.

236 11:15 AM Detection of Hypoventilation by Capnography and Its Association with Hypoxia in Children Undergoing Sedation with Ketamine

Melissa L. Langhan, Lei Chen, Clement Marshall, Karen A. Santucci, Department of Pediatrics, Section of Emergency Medicine, Yale University School of Medicine, New Haven, CT; Columbia University, College of Physicians and Surgeons, New York, NY.

BACKGROUND: Procedural sedation is commonly performed in the Emergency Department (ED) and is not without risks such as hypoventilation or hypoxia. Ketamine is a drug of choice in this setting, however the frequency of hypoxic hypoventilation with this agent have not been established. Hypoventilation, a decrease in tidal volume without a change in respiratory rate, is not easily detected by standard monitoring practices during sedation, but can be detected by capnography.

OBJECTIVE: To determine the frequency of hypoxic hypoventilation, defined as an end-tidal carbon dioxide (ETCO2) <30mmHg with a concomitant rise in respiratory rate and its association with hypoxia, defined as pulse oximetry <95%, in patients undergoing sedation with ketamine. To determine the temporal relationship between capnography and changes in pulse oximetry during these events.

DESIGN/METHODS: In this observational study, children who received intravenous ketamine in the ED for sedation were prospectively enrolled. Heart rate, respiratory rate, pulse oximetry and ETCO2 were recorded every 30 seconds. Providers were blinded to the ETCO2 monitor.

RESULTS: Fifty-eight subjects were included in this study. 50% had ETCO2 values <30mmHg without a rise in respiratory rate. 28% had a decrease in pulse oximetry <95%. Patients who experienced a persistent decrease in ETCO2 (>30 seconds in length) were much more likely to have a persistent decrease in pulse oximetry (>30 seconds) than those with normal or transient decreases in ETCO2 (RR 6.6, 95% CI 1.4-30.5).

OBJECTIVE: To determine the frequency of hypoxic hypoventilation, defined as an end-tidal carbon dioxide (ETCO2) <30mmHg with a concomitant rise in respiratory rate and its association with hypoxia, defined as pulse oximetry <95%, in patients undergoing sedation with ketamine. To determine the temporal relationship between capnography and changes in pulse oximetry during these events.

Primary outcome is end-tidal carbon dioxide (ETCO2) <30mmHg without a concomitant rise in respiratory rate and its association with hypoxia, defined as pulse oximetry <95%, in patients undergoing sedation with ketamine. To determine the temporal relationship between capnography and changes in pulse oximetry during these events.

RESULTS: 58 Subjects

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<td>Hypoxia N=5</td>
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72% of episodes of hypoxia were preceded by low ETCO2 levels. Decreases in ETCO2 occurred on average 3.7 minutes prior to decreases in pulse oximetry.

CONCLUSIONS: Hypoxic hypoventilation, as detected by capnography, is common in children undergoing sedation with ketamine. Further studies are needed to determine if the addition of capnography to routine monitoring can reduce the frequency of hypoxia in children undergoing sedation.
Impact of an Economic Disaster on Access to Child Healthcare and Utilization of the Pediatric Emergency Department

Mark X. Cicero, Veronika Northrup, Fangyong Li, Karen Santucci,
Yale University School of Medicine, New Haven, CT.

BACKGROUND: The recent global economic crisis has threatened the financial security of many families in the United States. Job loss often means loss of child healthcare benefits, interruption in preventative care, and anxiety about payment when illness or injury occurs.

OBJECTIVE: We hypothesized that job loss and low annual household income (AHI) are associated with insurance loss and decreased access to child healthcare, and sought to measure the strength of these associations.

DESIGN/METHODS: We conducted a retrospective, case-control study of a sample of children aged 8 weeks to 5 years. Subjects were children presenting to the ED from June 1 to July 27, 2009. A survey was designed to assess parents' demographics, AHI, insurance status, and attitudes and anxiety about paying for healthcare in the last six months. Staff recorded patient triage level. Household income was categorized in categories based on the 2007 US Census Bureau Survey. Data analysis was performed via SAS software, with the t-test used for continuous variables, chi square test for categorical variables, and logistic regression to measure associations between variables.

RESULTS: 467 subjects were enrolled. Among subjects, 29.5% had an AHI <$17,000, vs. 18.5% reported in the 2007 census data. Insurance discontinuation had occurred for 9.4% of children, vs. 5.4% for the US census data. Families with AHI < twice the FPL were more likely to have child insurance discontinuation in the last 6 months (OR=3.92, 95% CI 1.06, 14.54). Parent job loss was reported by 22.1% of respondents. Job loss for a parent was associated with loss of the child’s health insurance (OR=3.2, 95% CI 1.65, 6.20), avoiding the primary care pediatrician’s (PCP) office due to the cost of an office visit (OR=2.43, 95% CI 1.25,4.71), and anxiety about paying for the ED visit (OR=1.86, 95% CI 1.23, 2.80). There was an association between low acute triage level with both parent job loss (p=0.036) and AHI < twice FPL (P=0.004).

CONCLUSIONS: Compared to the general population, parent job loss and child health insurance loss are more prevalent in families of children presenting to the emergency department. Job loss is associated with low-acuity ED presentation, and avoidance of the PCP. Recognition of job loss and low income in the ED can lead to enrolling eligible children in public health insurance programs.

238
designed discharge instructions, may be helpful in decreasing unplanned return visits to the ED for common illnesses.

Conclusions: Among children with fever seen in the ED, those who did not return within 48 hours were more likely to have received specifically designed instructions for fever. Specifically designed discharge instructions, may be helpful in decreasing unplanned return visits to the ED for common illnesses.

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<th>Demographics</th>
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<td>Average Temp F (SD)</td>
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<td>Antipyretics Given (%)</td>
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Table 1

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Sunday, March 28, 2010
9:45 AM-12:00 PM

Detection of Pepsin in Mouth Swab, a Noninvasive Method of Detecting Gastroesophageal Reflux in Preterm Infants

Sabeena Farath, Judy G. Saslow, Sam Sounder, Zhopping He, Barbara Amendolia, Sulaiman Sannoh, Vishwanath Bhat, Kee H. Pyon, Gary E. Stahl, Dev Mehra, Zubair H. Aghai,
Pediatrics, Cooper University Hospital-UMDNJ-Robert Wood Johnson Medical School, Camden, NJ; Pediatric Gastroenterology, Alfred I duPont Hospitalfor Children-Thomas Jefferson University, Wilmington, DE.

BACKGROUND: Gastroesophageal reflux (GER) is very common in premature infants. The currently available methods for the diagnosis of GER are invasive and unreliable in premature infants. Detection of pepsin in a mouth swab may correlate with GER in premature infants.

OBJECTIVE: To study the relationship between pepsin in a mouth swab and clinical GER in preterm infants.

RESULTS: Seven premature infants were enrolled in this study. Subjects where enrolled from the ED from June 1 to July 27, 2009. A survey was designed to assess patients' demographics, AHI, insurance status, and attitudes and anxiety about paying for healthcare in the last six months. Staff recorded patient triage level. Household income was categorized in categories based on the 2007 US Census Bureau Survey. Data analysis was performed via SAS software, with the t-test used for continuous variables, chi square test for categorical variables, and logistic regression to measure associations between variables.

RESULTS: 202 medical charts were audited. 120 (59.4%) did not return to the ED and 82 (40.6%) did return within 48 hours of index ED visit. 74.2% of children who did not return to the ED for an unrelated complaint and patients that left without being seen. Exclusion criteria included: admission to the hospital, chronic medical conditions, returned to the ED from June 1 to July 27, 2009. A survey was designed to assess parents' demographics, AHI, insurance status, and attitudes and anxiety about paying for healthcare in the last six months. Staff recorded patient triage level. Household income was categorized in categories based on the 2007 US Census Bureau Survey. Data analysis was performed via SAS software, with the t-test used for continuous variables, chi square test for categorical variables, and logistic regression to measure associations between variables.

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RESULTS: Three types of cellular population with potential to generate EPC were studied. The
OBJECTIVE: To estimate the percentage of EPC in human umbilical cord blood of preterm and
BACKGROUND: EPC are present in peripheral circulation and may play roles in pathogenesis of

CONCLUSIONS: It is known that poor bowel motility is one risk factor for premature neonates to
develop NEC. As demonstrated, the 4-wavelength NIRS monitor used has the potential to evaluate
bowel motility by monitoring meconium movement under the NIRS sensor. More data are needed to
properly assess the relationship between NIRS detected bowel motility and outcomes.

241
Fellow in Training
10:15 AM
Effect of Antenatal Erythromycin in Establishing Feeding in Preterm Neonates
Venkata S. Majjiga, James Smith, Boriana Parvey.

OBJECTIVE: To assess if antenatal erythromycin has an adverse effect on establishing feeding in
preterm neonates.

DESIGN/METHODS: All preterm neonates with birth weight (BW) ≤5150g born at or transferred within 24 hours of birth to MFCH who received antenatal erythromycin are compared to age
matched controls without antenatal erythromycin. Data regarding GA, BW, days to establish full feeds, amount of residuals per day, NEC and duration of TPN is collected. Maternal
data for cumulative dosage and route of erythromycin, mode of delivery, medication and other
factors, including demographic characteristics is collected. A Chi square test (P < 0.05).

RESULTS: Three types of cellular population with potential to generate EPC were studied. The

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CONCLUSIONS: DHA induces anti-inflammatory activity in adult neutrophils, but these responses are attenuated or absent in neonatal cells. EPA-induced inflammatory activity in both adult and neonatal neutrophils, and neonatal cells are more sensitive to these effects. These findings indicate that EPA/DHA exert diverse effects in neutrophils, suggesting that they act via multiple signaling pathways. Decreased anti-inflammatory responses in neonates may be related to a possible expression or participation of PPAR-γ. The possibility of unexpected inflammatory effects should be accounted for in considering potential therapeutic uses for PUFAs in neonates. Supported by NIH HD058019, ES004738 and ES005022.

**Medical Student**

11:15 AM

**CD34** Stem Cell Selection and CD3 Addback for Matched Unrelated Donor (MUD) Peripheral Blood Stem Cell Transplantation (PBSC) in Pediatric Recipients

Mark B. Geyer, Judith S. Jacobson, Lauren Harrison, Joseph Schwartz, Mitchell S. Cairo, Pediatric Blood and Marrow Transplantation, Morgan Stanley Children’s Hospital of NewYork-Presbyterian, Columbia University, New York, NY; Epidemiology, Herbert Irving Comprehensive Cancer Center, and Joseph L. Mailman School of Public Health, Columbia University, New York, NY; Pathology, Columbia University, New York, NY; Medicine, Columbia University, New York, NY.

BACKGROUND: Positive selection of CD34 stem cell depletes T cells responsible for severe acute graft versus host disease (aGVHD). CD34-selected haploidentical SCT in children with leukemia and non-malignant diseases is associated with sustained engraftment and low risk of aGVHD but limited by delayed immune reconstitution (IR). Myeloablative conditioning (MAC) followed by CD34-selected MUD PBSC with a CD3 dose of 5x10^5/kg carries high risk of chronic GVHD (cGVHD) (Bunin et al., BMT, 2006).

OBJECTIVE: To determine engraftment, overall survival (OS), IR and frequency of PTLD and GVHD in pediatric pts at risk of severe aGVHD following CD34-selected MUD PBSC.

DESIGN/METHODS: An Isolox 300 (Nexell, Irvine, CA) was used for CD34 selection with a goal of 2x10^6 CD34/kg PBSCs. T-cells were added back to reach a total CD3 dose of 1.0-2.6x10^5/kg. Conditioning was MAC in 59% vs reduced intensity (RIC) in 41%. GVHD prophylaxis consisted only of tacrolimus.

RESULTS: 17 pts, median follow-up 347 days, median age 15 yrs (8-23); 59/41% M/F; HLA match 29% 10/10, 29% 9/10, 41% 8/10; 71% malignant (58/42% poor/avg risk); median CD34 x10^5/kg 245 (1-2450). 1-yr OS was 84% (50-96%). Of 12 pts with acute leukemia, 3 died from progressive disease. CD3, CD4, CD8, CD19, CD56, IgG, IgM and IgA levels at day +180/365 were normal in 7% (1-41%). 1-yr OS was 84% (50-96%). 12, range 9-27). 85% of evaluable pts engrafted platelets (median day 32, range 21-44). No pts developed PTLD. One pt developed CMV infection. Probabilities of grade II-IV aGVHD and high 1-yr OS were observed following CD34 selection and T-cell addback. Indirect T-cell depletion during CD34 selection may slow T-cell recovery post-transplant. T-cell addback may maintain graft versus leukemia effect and prevent PTLD and opportunistic infections. These results support further investigation of CD34-selected MUD PBSC in pediatric recipients.

**Medical Student**

11:30 AM

**Immune Reconstitution (IR) and Acute GVHD (aGVHD) Following Myeloablative (MAC) or Reduced Toxicity Conditioning (RTC) Prior to Unrelated Cord Blood Transplantation (UCBT) in Pediatric Recipients**

Mark B. Geyer, Judith S. Jacobson, Jason Freedman, Diane George, Mitchell S. Cairo, Pediatric Blood and Marrow Transplantation, Morgan Stanley Children’s Hospital of NewYork-Presbyterian, Columbia University, New York, NY; Epidemiology, Herbert Irving Comprehensive Cancer Center, and Joseph L. Mailman School of Public Health, Columbia University, New York, NY; Pathology, Columbia University, New York, NY; Medicine, Columbia University, New York, NY.

BACKGROUND: IR appears to be delayed following MAC and UCBT in pediatric recipients, compared to matched-sibling allogeneic stem cell transplantation (AlloSCT). RTC vs. MAC prior to AlloSCT is associated with decreased transplant-related morbidity and mortality; the effect of RTC on long-term IR in pediatric UCBT recipients remains unknown.

OBJECTIVE: To determine time to and predictors of IR and risk factors for aGVHD and chronic GVHD in pediatric UCBT recipients following MAC vs RTC.

DESIGN/METHODS: In 88 consecutive pediatric UCBT recipients, lymphocyte subset counts and Ig levels were quantified using FACs and ELISA at days +100, 180 and 365 and characterized as normal or low by age-specific norms.

RESULTS: 88 pts, median age 6.5 yrs (range 0.5-22), 59/41% M/F, 56/44% MAC/RTC, HLA match 19%/6%, 28%/56%, 52%/4%/66% malignant, median TNC x10^6/kg 3.8 (0.9-22.6) and CD34 x10^5/kg 2.1 (0.3-9.6). Lymphocyte subsets, Ig levels and percentages of children achieving normal counts did not differ significantly between MAC vs RTC groups; T cell recovery was similarly delayed.

In a multivariable Cox model that included conditioning regimen, risk status, HLA matching, CMV status, time of transplant and TNC dose to analyze predictors of aGVHD, MAC vs RTC recipients had a significantly higher risk of grade II-IV aGVHD (HR 6.1, CI 2.0-19, p=0.002) as did recipients of 4-6 HLA-matched CBT (HR 3.1, CI 1.1-8.6, p=0.03). In a similar Cox model, pts receiving a 4-6 HLA-matched graft had a significantly higher risk of chronic GVHD (HR 18.5, CI 1.3-275, p=0.04).

CONCLUSIONS: RTC vs MAC is associated with significantly lower risk of grade II-IV aGVHD. Regardless of conditioning intensity, T cell IR is delayed following UCBT in pediatric pts, while NK and B cell IR is relatively robust. Therapies designed to enhance early T cell IR post-UCBT warrant further investigation.

**Eastern Society for Pediatric Research 2010 Annual Meeting**
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