Eastern SPR
Officers & Council

President 2011-2014
Vineet Bhandari, MD, DM
Yale University School of Medicine
New Haven, CT
Email: vineet.bhandari@yale.edu
Phone: (203) 785-2613

Secretary 2011-2016
Michael Posencheg, MD
Division of Neonatology and Newborn Services
Hospital of the University of Pennsylvania
Philadelphia, PA
Email: posencheg@email.chop.edu
Phone: (215) 615 - 4376

Treasurer 2011-2016
Jason Z. Stoller, MD
Children’s Hospital of Philadelphia
Philadelphia, PA
Email: stoller@email.chop.edu
Phone: (215) 590-4393

Chairperson, Planning Committee
Sharon R. Smith, MD
Connecticut Children’s Medical Center
Hartford, CT 06106
Email: srsmith@ccmckids.org
Phone: (860) 545-9295

Director of Sponsorship 2004-2013
Ian R. Holzman, MD
Professor of Pediatrics, Obstetrics and
Reproductive Science
Mount Sinai School of Medicine
New York, NY
Email: ian.holzman@mssm.edu
Phone: (212) 241-5446

Planning Committee
Kirsten Bechtel, MD
Joseph Bliss, MD, PhD
Sharon R. Smith, MD

Councilors
Sharon McGrath-Morrow, MD 2009-2013
Sharon R. Smith, MD 2009-2013
Kirsten Bechtel, MD 2009-2013
Iraj Rezvani, MD 2009-2013
Kate G. Ackerman, MD 2010-2014
Joseph Bliss, MD 2011-2015
Vasanth Kumar, MD 2011-2015
Jeffrey S. Shenberger, MD 2012-2016
Murli Purswani, MBChB, FAAP 2012-2016

Past Presidents
2008-2011 Lawrence M. Nogee, MD
2005-2008 Bruce D. Gelb, MD
2002–2005 Luc P. Brion, MD
1999–2002 Mitchell J. Kresch, MD
1996–1999 Ira H. Gewolb, MD
1993–1996 Alan R. Fleischman, MD
1991–1993 Marc Yudkoff, MD
1989–1991 Joseph B. Warshaw, MD
1988–1989 Laurence Finberg, MD

Nominations Committee
Heber Nielsen, MD (Chair)
Tufts Medical Center and Tufts School of
Medicine
Boston, MA
Email: heber.nielsen@tufts.edu
Phone: (617) 636-5053

Contents

Abstracts 18–95
Author Index 96
Faculty 5
Friday Programming 6-8
Hotel Maps inside back cover
Meeting Services & CME Accreditation 5
Note Pages 97-98
Press Guidelines 4
Recognition of New Members 2
Saturday Programming 8-15
Schedule-at-a-Glance 6
Sponsorship Honor Roll 2
Sunday Programming 15-17
Dear Colleagues,

Welcome to the 25th 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, the highly popular Lunch with the Professor educational program for trainees, and the brand new Fellow’s Clinical Case Presentation Competition. 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 2013 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!

Vineet Bhandari, MD, DM
President

Michael Posencheg, MD
Secretary

Sharon Smith, MD
Chair, Planning Committee
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 22, 2013. Once again, congratulations and welcome to the Eastern Society for Pediatric Research.

Anne Ades, M.D., Children’s Hospital of Philadelphia
Andrew Adesman, M.D., Cohen Children’s Medical Center of New York
Anita Bhandari, M.D., Connecticut Children’s Medical Center
Andrew Blaufox, M.D., Cohen Children’s Medical Center of New York
Kathleen Gibbs, M.D., Mount Sinai School of Medicine
Shadi Malaeb, M.D., St. Christopher’s Hospital for Children
Upender Munshi, M.D., Albany Medical Center
Ursula Nawab, M.D., Thomas Jefferson University
Rakesh Sahni, M.D., Columbia University
Shetal Shah, M.D., SUNY Stony Brook
Nancy Spector, M.D., St. Christopher’s Hospital for Children/Drexel University College of Medicine
Dawn Wetzel, M.D., Yale University School of Medicine

AAP CREDITS

This continuing medical education activity has been reviewed by the American Academy of Pediatrics and is acceptable for a maximum of 11.25 AAP credits. These credits can be applied toward the AAP CME/CPD Award available to Fellows and Candidate Members of the American Academy of Pediatrics.

Process for Attendees to Receive AAP Credit:
AAP Credit for attendees is recorded only when an attendee submits a copy of his/her certificate of attendance (pick up at the registration desk), with AAP ID number, to the American Academy of Pediatrics. The address to mail the certificate is:

American Academy of Pediatrics
Attn: Transcript Coordinator
141 Northwest Point Blvd.
Elk Grove, IL 60007-1098
Fax: 847-434-8387
Thank you for your interest in covering pediatric topics offered at the annual meeting of the Eastern Society for Pediatric Research (ESPR). The annual meeting is a private meeting of the ESPR. The granting of media credentials for the meeting is at the sole discretion of the ESPR program committee.

Please note the following ESPR Press guidelines and media credentialing policies for the meeting.

**Press Badges**

Only individuals who are working for and representing a recognized news organization may register as press. To receive a press badge, working journalists must provide identification such as a business card, letter of assignment and published samples of bylined work, preferably stories relating to pediatric health. All freelance journalists must provide a letter of assignment on company letterhead from an editor of a recognized news organization certifying you are covering the ESPR annual meeting for the organization. Press badges are available only to working journalists who can show evidence that their attendance will result in coverage of the ESPR meeting. You may register at the ESPR Registration Desk at the Doubletree Hilton Philadelphia beginning Friday, March 22 at 4:00 pm.

Based on space requirements, ESPR retains the right to limit the number of press badges issued to a single media organization. ESPR does not issue press badges to: publishers or a publication’s advertising, marketing, public relations or sales representatives; publishers, editors or reporters from manufacturers’ house organs or promotional publications; public relations staff of exhibitors or educational institutions; or other individuals or their representatives who are not actually reporting on the meeting. Any Press badge holder who sells, markets or represents a company or organization for the purpose of obtaining advertising or subscriptions from any meeting registrant or exhibitor immediately forfeits press credentials.

A press badge allows media to attend all ESPR sessions being held during the dates of March 22 – 24, 2013. It must be worn at all times and obtained before attending and session. A press badge is not to be shared.

Registration fees for working press are waived. ESPR considers working press to be editorial staff of newspapers or magazines, medical or health care publications and broadcast or Web-based media.

**Photography and Video**

Television crews, documentary film crews, video crews and photographers covering the meeting are required to check in immediately at the ESPR Registration Desk each day, and must be accompanied at all times by a ESPR Officer or staff member when shooting inside the hotel. Shooting schedules and on-camera interview requests must be provided in writing in advance to ensure staff availability. As a courtesy to presenters, television and video crews, photographers, and radio reporters must obtain permission from the speaker and moderator before recording or filming an interview. Media may not photograph or videotape an exhibit booth or other display without the permission of the exhibitor and ESPR. This includes use of camera phones, personal digital cameras and other handheld devices.

**Scientific Papers**

In order to help maintain their eligibility for peer-reviewed journal publication, some researchers may not want to make themselves available for media interviews. Journalists who want to use slides, graphs and other visuals to illustrate coverage must have the presenter’s permission.

ESPR appreciates your interest in child health issues. We hope that you have an instructive and enjoyable time at our meeting and encourage you to join us at future meetings. Please let us know if we can help you in any way.
The overall goal of this meeting is to improve patient care by increasing learner competence in evaluating the emerging translational and clinical research in pediatrics and determining parameters for expansion and modification of promising research developments.

Learner Objectives: At the conclusion of this activity, participants 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.

Predicted Outcomes

Predicted Changes in Practice as a result of participating in this activity include the ability to:

- Determine whether appropriate changes need to be recommended in patient protocols as indicated in the emerging research data.
- Implement new tools for teaching, research and medical practice.
- Apply appropriate evidence based recommendations in my research, teaching and/or medical practice.
- Present research in a national forum
- Establish collaborations to expand or address barriers which are identified

Accreditation:

This activity has been planned and implemented in accordance with the Essentials Areas and Policies of the Accreditation Council for Continuing Medical Education 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 (ACME) to provide continuing medical education for physicians.

Tulane University Health Sciences Center designates this live activity for a maximum of 11.25 AMA PRA Category 1 Credits™. Physicians should claim only the 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 use 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.

Tulane 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 Essentials Areas and Policies to ensure balance, independence, objectivity and scientific rigor. In accordance with the ACCME’s Standards for Commercial Support, Tulane requires everyone who is in a position to control the content of an educational activity certified for AMA PRA Category 1 Credit™ to disclose all financial relationships with any commercial interests within the past 12 months that create 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 from Tulane.edu. 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, May 1, 2013. If you do not receive it then, please notify Tulane University at cme@tulane.edu.
Eastern SPR Schedule-at-a Glance

**Friday, March 22**

| 6:00pm–7:30pm | Poster Session I & Reception  
— Symphony Ballroom - 3rd Floor — |

**Saturday, March 23**

| 7:00am–8:00am | Continental Breakfast  
— Symphony Ballroom - 3rd Floor — |
| 8:00am–9:30am | Cardiopulmonary Development  
— Aria A - 3rd Floor —  
Developmental & Behavioral Pediatrics  
— Maestro A - 4th Floor —  
General Pediatrics I - Obesity  
— Concerto A/B - 3rd Floor —  
General Pediatrics II - Underserved  
— Maestro B - 4th Floor —  
Infectious Diseases & Immunology  
— Minuet - 4th Floor —  
Neonatology I  
— Overture - 3rd Floor — |
| 9:30am–9:45am | Coffee Break  
— Symphony Ballroom - 3rd Floor — |
| 9:45am–10:45am | Adolescent Medicine  
— Concerto A/B - 3rd Floor —  
Cardiology  
— Aria A - 3rd Floor —  
Fetal Nutrition  
— Minuet - 4th Floor —  
Medical Education  
— Overture - 3rd Floor —  
Neonatal Pharmacology  
— Maestro B - 4th Floor —  
Neonatal Resuscitation  
— Maestro A - 4th Floor — |
| 10:50am–11:50am | Plenary Session I  
PLENARY LECTURE  
Joel Hirschhorn, MD, PhD  
“Genetics of Height, Obesity and Other Human Complex Traits”  
— Overture - 3rd Floor — |

**Sunday, March 24**

| 7:45am–8:45am | Continental Breakfast  
— Symphony Ballroom - 3rd Floor — |
| 8:30am–9:30am | Plenary Session III  
PRESENTATION OF THE YOUNG INVESTIGATOR AWARDS  
PLENARY LECTURE  
Nancy Messonnier, MD  
Why are we Not Controlling Pertussis in the United States?  
— Overture - 3rd Floor — |

**Eastern SPR Business Meeting**  
— Rhapsody - 4th Floor —
Friday, March 22, 2013

Poster Session I

General Pediatrics I

6:00pm–7:30pm  Symphony Ballroom

1  Priapism as a Complication of Herbal Supplement Use: A Case Report
   Subha Battu, Caterina Tiozzo, Steven Katz, David Fagan.
   – Abstract 1

   Karen Ginsburg, Andrew Adesman.
   – Abstract 2

3  Disordered Eating in Inner City Adolescent Males
   Rashmi S. Bhopi, Paulo Pina, David H. Rubin.
   – Abstract 3

4  Latino Caregiver Experiences with Asthma Health Communications: A Qualitative Evaluation
   – Abstract 4

5  Intravenous Magnesium Sulfate in the Treatment of Acute Asthma
   Chiara Galvez, Paulo Pina, Kathleen Asas.
   – Abstract 5

6  Seasonal Variation in Viral Bronchiolitis Severity
   Kelly N.F. Fradin, Gabriella Azzarone, Nora Esteban-Cruciani, Joanne Nazif.
   – Abstract 6

7  Enhancing the Patient Centered Medical Home for Children with Asthma through Quality Improvement (QI)
   Melissa Donohue, Sara R. Slovin, Iman Sharif.
   – Abstract 7

8  Prevalence and Correlates of Left Ventricular Hypertrophy in the Pediatric Hypertensive Population
   Diana E. Drogalis, Anna Tsirka, Jennifer Friderici.
   – Abstract 8

9  Diminished Exercise Response of Tissue Doppler Velocities in Pediatric Patients with Aortic Stenosis
   – Abstract 9

10 Central Venous Catheter Use and Thrombophrophylaxis in Critically Ill Children
    E. Vincent S. Faustino.
    – Abstract 10

11 Hospital-Acquired Hyponatremia in Children Following Hypotonic Versus Isotonic Intravenous Fluids Infusion: A Single Center Experience
    Panagiotis Kratimenos, Ioannis Koutoulis, Dante Marconi, Joseph Jaeger, Andrew McInnes.
    – Abstract 11

Developmental Pediatrics

6:00pm–7:30pm  Symphony Ballroom

12 Clinical Criteria for Pharmacotherapy in Preschool Children with ADHD
    Jaeah Chung, Suzanne Sunday, David Meryash, Andrew Adesman.
    – Abstract 12

13 Performance on the NICU Network Neurobehavioral Scale (NNNS) by Preterm Twins
    Jennifer J. Bragg, Robert Green, Annemarie Stroustrup.
    – Abstract 13

14 Effects of Intraventricular Hemorrhage (IVH), Bronchopulmonary Dysplasia (BPD) and Sepsis on Neurobehavioral Functioning as Measured by System Scoring of the Assessment of Preterm Infants’ Behavior (APIB) at 41-43 Weeks Post Conceptual Age (PCA)
    Gretchen Lawhon, Olayemi Ola, Jaime Jump, Krystal Hunter, Nicole Kemble, Vishwanath Bhat, Gary E. Stahl.
    – Abstract 14

15 Evaluation of a Sibling Support Group for Families of Children with Autism Spectrum Disorders
    Elaine Lin, Patricia Hametz, Maureen McSwiggen-Hardin, Katherine Sullivan, Mary McCord.
    – Abstract 15

16 Autism Spectrum Disorders and Age of Diagnosis in an Urban Inner-City Pediatric Clinic
    – Abstract 16

17 Distractibility, Vigilance and Delay in Children Attending the Pediatric Rheumatology Clinic
    Lakshmi N. Moorthy, Muffaddal Dahodwala, Margaret Peterson, Thomas Lehman, Barbara M. Ostfeld.
    – Abstract 17

Medical Education

6:00pm–7:30pm  Symphony Ballroom

18 Inter-Professional Training Program for Health Professional Learners in Southern Belize
    Denise A. Sofits, Susan M. Leib.
    – Abstract 18

19 Barriers to Patient- and Family-Centered Care in the Era of Resident Work Hours Restrictions
    Matthew P. Kusulas, Joanne Nazif.
    – Abstract 19

20 A Learner-Based Evaluation of Varied Formats of Chief Resident Led Educational Sessions
    Blair Dickinson, Darshita Bhatia, Elizabeth Maxwell, Matthew B. McDonald.
    – Abstract 20

21 Somebody Tell the Students: Dichotomy between Standardized Patients’ and Medical Students’ Assessments of Professionalism
    Hai Jung H. Rhim, Ilir Agalliu, Miriam Schechter.
    – Abstract 21

22 Evaluating and Implementing a Residency Training Program on Breaking Bad News
    Anthony Orsini, Patricia Eaton, Maryann LoFramento.
    – Abstract 22

23 Impact of a Novel Training Curriculum for Pediatric Residents in the Prevention of Intimate Partner Violence among Adolescents
    Anil Kumar Swayampakula, Cynthia Lewis, Alexandra Smith, Christina Alex, Richard Neugebauer, Ayoade Adeniyi, Stefan Hagmann, Ram Kairam.
    – Abstract 23

24 Giving Bad News: Pediatric Resident Opinions Regarding Communication Skills
    Gail S. Cameron, Alexander Agthe, Pamela Donohue, Brenda Hussey-Gardner, Alison J. Falck.
    – Abstract 24
Neonatal - General

6:00pm–7:30pm Symphony Ballroom

25 Objective Assessment of a Formal Handoff Curriculum for Pediatric Residents
Lawrence E. Fried, David Rappaport. – Abstract 25

26 Histologic Chorioamnionitis and Severe Intraventricular Hemorrhage in Very Low Birthweight Infants
Jennifer L. Maher, Robert Locke, Amy Mackley, David A. Paul. – Abstract 26

27 Interindividual Expression of BCRP/ABCG2 Efflux Transporter mRNA in Term Human Placentas
Naureen Memon, Kristin M. Bircsak, Faith Archer, Barry Weinberger, Anna Vetano, Lauren M. Aleksunes. – Abstract 27

28 Are Routine Cord IgM and Urine CMV Cultures Warranted in the Initial Evaluation of Small-for-Gestational Age Neonates?
Samuel Ajayi, Teena Sebastian, Ramesh Matam, David Schutzman, Allan Arbetor. – Abstract 28

29 Hemodynamic and Echocardiographic Variables Influencing SVC Flow in the VLBW Infants
Jagdish Desai, Laya Weichbrod, Riddhiben Patel, Roger Kim, Sarita Dhuper. – Abstract 29

30 Concurrent Administration of Apoptotic Inhibitors and Hypothermia Attenuates Further Hypoxic Cerebral Injury in Newborn Piglets
Shadi Malae, Endla Anday, Anli Zhu, Maria Delivoria-Papadopoulos. – Abstract 30

31 Assessing the Cardioprotective Properties of Controlled Hypothermia in Neonates with Moderate to Severe Hypoxic Ischemic Encephalopathy Utilizing Cardiac Troponin I
Ogechukwu R. Menkiti, Jennifer P. Alexander, Jenni Wallace, Nicholas Ohiri. – Abstract 31

Jonathan Blau, Edmund F. La Gamma. – Abstract 32

33 Getting to Zero: Development of a NEC QI Initiative To Decrease Progression in NEC Severity
Jenny R. Fox, Tazuddin A. Mohammed, Russell R. Moors, Jr., Archana Jayaram, Sharon A. Cone, Karen D. Hendricks-Munoz. – Abstract 33

34 Does Vitamin D Deficiency at Birth Affect the Risk and or Severity of Bronchopulmonary Dysplasia (BPD) among VLBW Infants
Sreenivas Karnati, Subhash Puthuraya, Marwan Zidan, Nitin Chouthai, S. Nadya J. Kazi. – Abstract 34

35 Long Term Effect of Hypoxia on the Eya3 (Eyes Absent Homolog 3) Protein Expression in the Cerebral Cortex of Newborn Piglets
Margaret Nguyen, Angelica Penninti, Anli Zhu, Maria Delivoria-Papadopoulos. – Abstract 35

36 Is Pulse Oximetry (SpO2) Screening for Critical Congenital Heart Disease (CCHD) Applicable among Low Birth Weight (LBW) Infants in a NICU Setting?
Devaraj Sambalingam, Peter Beshay, Satyan Lakshminrusimha, Vivien Carrion. – Abstract 36

37 Long Term Effect of Src Kinase Inhibition on Caspase-1 Activity Following Hypoxia in the Cerebral Cortex of Newborn Piglets
Dimitrios Angelis, Tania D. Fontanez-Nieves, Qazi M. Ashraf, Maria Delivoria-Papadopoulos. – Abstract 37

Neonatal Epidemiology

6:00pm–7:30pm Symphony Ballroom

38 Mechanism of Caspase-8 Activation Following Hypoxia in the Newborn Piglet Brain
Tania D. Fontanez-Nieves, Dimitrios Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulos. – Abstract 38

39 Postnatal Growth in Infants with Neonatal Abstinence Syndrome
Jennifer Hesler, Janet Larson. – Abstract 39

40 The Use of the Laryngeal Mask Airway in the Difficult Neonatal Airway
Ulysses Mustaki, Helen M. Towers, Rakesh Sahni, Jen-Tien Wung. – Abstract 40

41 MCHAT Screen for Autism in Preterm Infants...Take the Next Step
Jordan S. Kase, Sensa Gogcu, Paul F. Visintainer, Rajeswari Sengutuvan. – Abstract 41

42 Improved Survival of Extremely Preterm Infants Is Dependent on the Level of Birth Hospital and the Timing of Transfer to the Regional Perinatal Center
Y. Malhotra, D. Aboudi, E.F. LaGamma, H.L. Brumberg. – Abstract 42

43 Health Illiteracy in the NICU
Michael Winter, Robert Locke, Amy Mackley, Rachel Joseph, David A. Paul, Ursula Guillon. – Abstract 43

44 Outborn Very Low Birth Weight Infants Have Higher Rates of Early Intervention Enrollment Than Inborns
Senssa Gogcu, David Aboudi, Jordan Kase, Edmund LaGamma, Heather Brumberg. – Abstract 44

45 Perinatal Factors Associated with Increased Length of NICU Stay in Late Preterm Infants
Jessica M. McGovern, Amy B. Mackley, Robert G. Locke, David A. Paul. – Abstract 45

46 Assessment of Perinatal Regionalization: Antenatal Transfer of Mothers between 23 and 32 Weeks Gestation
Misty Melendi, Michelle Macheras, Scott Lorch. – Abstract 46

47 Early Introduction of Solid Foods to Premature Infants and Impact on Feeding Behaviors
Jaeh Chung, Regina Spinazzola, Janet Lee, Rithika Ramakrishnan, Karen Ginsburg, Ruth Milanai. – Abstract 47

48 Failure To Adjust for Gestational Age When Plotting Premature Infant Growth and Its Impact on Parental Satisfaction
Jaeh Chung, Regina Spinazzola, Janet Lee, Anna Krevskaya, Maria Mendoza, Ruth Milanai. – Abstract 48

49 Correlation of Growth Trajectory between Appropriate and Small for Gestational Age Infants to Their Neuro-Cognitive Outcome
Sri Narayana, Sensa Gogcu, Jordan Kase. – Abstract 49

50 Cost-Effectiveness of Interventions To Improve Neonatal Mortality in Ghana
Tawia Apenteng, Scott Lorch. – Abstract 50

51 Clustering and Periodicity of Necrotizing Enterocolitis in a Single NICU over Two Decades
Naveed Hussain, Elizabeth Brownell. – Abstract 51
Saturday, March 23

Neonatal Infectious Diseases
6:00pm–7:30pm Symphony Ballroom

52 Role of Perinatal Factors and Genital Mycoplasmas (GM) in Necrotizing Enterocolitis (NEC)
Naveed Hussain, Lulu Rahman, Elizabeth Brownell.  
– Abstract 52

53 Reduced Neonatal Anti-Viral CD8+ T Cell Responses Are Due to Intrinsic Defects of Neonatal CD8+ T Cells
Alison J. Carey, Donald Gracias, Yvonne Mueller, Peter D. Katsikis.  
– Abstract 53

54 Salivary Cytokine Analysis in Preterm Infants: Relationship to Early Delivery and Levels in the Well Full Term Infant
Truc Hoang, Pradeep V. Mally, Jie Xu, Karen D. Hendricks-Munoz.  
– Abstract 54

55 T-Cells Are Preferentially Expressed Following Neonatal Hyperoxia in Adult Mice
Vasanth H.S. Kumar, Huamei Wang, Lori Nielsen.  
– Abstract 55

56 Outcomes Associated with Different Antibiotic Regimens for Necrotizing Enterocolitis
– Abstract 56

57 Predictors of Infections with Gram-Negative Bacilli in Neonatal Intensive Care Units and Antibiotic Susceptibility Patterns
Nicole Green, Sarah A. Clock, David Paul, Jeffrey Perlman, Theoklis Zaoutis, Yu-hui Ferg, Luis Alba, Elaine Larson, Lisa Saiman, Sameer Patel.  
– Abstract 57

58 Effect of Hyperoxia Exposure on T-Lymphocyte Maturation, Differentiation and Function in Neonate Mice
– Abstract 58

59 Central Line Associated Blood Stream Infections (CLABSI)s in Neonates: A Comparison of Tunneled, Peripherally Inserted and Umbilical Lines
Mogan Ghazirad, Lamia Soghir, Khodayar Rais Bahrami, Xiaoyan Song.  
– Abstract 59

60 A Mouse Model for Adhesion of Candida Parapsilosis to Endothelial Cells
Diana P. Vargas, Sonia S. Laforce-Nesbitt, Sunil S. Shaw, Joseph M. Bliss.  
– Abstract 60

61 Decreased Central Line Associated Blood Stream Infection Rate after Addition of a Disinfecting IV Access Port Cap to a Central Line Bundle
Erik Brandsma, Linda Wicker, Judy Saslow, Jacqueline George, Joanne Fox, Robyn Harvey, Gary Stahl.  
– Abstract 61

Neonatal Fetal Nutrition
6:00pm–7:30pm Symphony Ballroom

62 Methicillin Resistant Staphylococcus Aureus (MRSA) and the Individual Room Neonatal Intensive Care Unit
Tazuddin A. Mohammed, Jose L. Munoz, Russell R. Moores, Jr., Jie Xu, Sharon A. Cone, Janis Faye Ober, Susan Collins Lewis, Michael B. Edmond, Karen D. Hendricks-Munoz.  
– Abstract 62

63 Growth Patterns in Extremely Low Birth Weight Infants Fed Donor Breast Milk: A Single-Center Study
Laura Madore, Tina Jumani, Sarbattama Sen.  
– Abstract 63

Saturday, March 23, 2013 Platform Session

Cardiopulmonary Development
8:00am–9:30am Aria A
Moderator: Andrew Blaufox

8:00am TBF1 Interacts with JUN and a Dominant Negative JUN Missense Mutation Is Associated with Congenital Heart Disease
Hua Pan, Tao Zhang, Cary A. Krah, Indu Subbaraj, Julie De Mesmaeker, Brande C. Latney, Elizabeth Goldmuntz, Shoumo Bhattacharya, Jason Z. Stoller.  
– Abstract 67

8:15am The Matricellular Protein CCN5 Is Coordinatey Regulated with Proliferation of Murine Alveolar Epithelial Cells during Development and in Response to Hypoxic Injury
– Abstract 68

8:30am Pigment Epithelium Derived Factor (PEDF) Regulates Inhibition of Vascularization and Alveolarization in Neonatal Oxygen Injury
Michelle Bennett, Linh Dang, Sana Mujahid, MaryAnn Volpe, Anne Chetty, Heber Nielsen.  
– Abstract 69

8:45am ErbB4 JmaCyt1 Isoform Drives Fetal Mouse Lung Type II Cell Proliferation and Differentiation
– Abstract 70

9:00am Regulation of Alternative Splicing of ErbB4 during Fetal Mouse Type II (T2) Cell Differentiation
Dorothea Wiegel, Arlene Reyna, Christiane E.L. Dammann, Heber C. Nielsen.  
– Abstract 71

9:15am TTF1 Signals Negative Feedback to ErbB4 in Mouse Type II Epithelial Cells
– Abstract 72

Developmental & Behavioral Pediatrics
8:00am–9:30am Maestro A
Moderator: Ruth Milanak

8:00am Predictors of Completed Early Intervention Evaluation
Manuel Jimenez, James Guevara, Marsha Gerdes, Susmita Pati, Alexander Fiks.  
– Abstract 73

8:15am Docosahexaenoic Acid Can Mitigate Some Ethanol-Induced Behavioral Changes
Finney George, Kristen A. Wellmann, Sandra M. Mooney.  
– Abstract 74
8:00am The Effect of Regular Exercise on Exposure to Violence in Inner City Youth
Noe D. Romo, Melissa Dupont-Reyes, Deborah Fry, Leslie Davidson.
– Abstract 85

8:15am Socioeconomic Status and Hospitalization Costs for Common Pediatric Conditions
– Abstract 86

8:30am Pediatric Readmission within 1 Month of Discharge: An Insight from an Inner City Community Hospital in New York
– Abstract 87

8:45am Disparities in Functional Outcomes by Race, Ethnicity, and Insurance Status Following Injury-Related Inpatient Rehabilitation
Jennifer N. Fishe, Margaret G. Stineman, Mark R. Zonfrillo.
– Abstract 88

9:00am Implications of MRI in Children with Autism Spectrum Disorder
Alison S. Gurtman, Eron Friedlaender, Susan E. Levy, Cynthia Mollen, Karuna V. Sheddak, Andrea L. Bennett.
– Abstract 77

9:15am Assessment of Preterm Infants with the NICU Network Neurobehavioral Scale
Jennifer J. Bragg, Robert Green, Annemarie Stroustrup.
– Abstract 78

9:45am Near-Infrared Spectroscopy (NIRS) Evaluation of Sodium Bicarbonate (NaHCO3) Corrections in Very Low Birth Weight (VLBW) Neonates
– Abstract 100

9:00am Childhood Predictive Factors of Young Adult Employment in Low-SES Inner-City African Americans
Kelvon Clark, Laura M. Betancourt, Nancy L. Brodsky, Hallam Hurt.
– Abstract 75

8:45am Medication Management of Preschool ADHD by Pediatric Sub-Specialists: Non-Compliance with AAP Clinical Guidelines
Jacah Chung, Suzanne Sunday, David Meryash, Alyson Gutman, Andrew Adesman.
– Abstract 76

9:00am Implications of MRI in Children with Autism Spectrum Disorder
Alison S. Gurtman, Eron Friedlaender, Susan E. Levy, Cynthia Mollen, Karuna V. Sheddak, Andrea L. Bennett.
– Abstract 77

9:15am Assessment of Preterm Infants with the NICU Network Neurobehavioral Scale
Jennifer J. Bragg, Robert Green, Annemarie Stroustrup.
– Abstract 78

General Pediatrics I: Obesity

8:00am Obesity is a Risk Factor for Symptomatic Cholelithiasis in Childhood
Kelly N.F. Fradin, Andrew D. Racine, Peter F. Belamarich.
– Abstract 79

8:15am Measuring Fatness and Fitness: The 6 Minute Walk Test in a Pediatric Setting
– Abstract 80

8:30am Effect of a School Based Intervention on Parents’ Nutrition and Exercise Attitudes and Behaviors
John C. Rausch, Evelyn Berger-Jenkins, Andres Nieto, Mary McCord, Dodi Meyer.
– Abstract 81

8:45am Association between Neighborhood Physical Activity Resources and Route to School and Time Outdoors in Inner-City Minority Children
Leigh Goldstein, Maida P. Galvez, Kathleen McGovern, Susan Teitelbaum, Barbara Brenner, Mary Wolff.
– Abstract 82

9:00am Modifiable Cardiovascular Risk Factors in Middle and High School Students in Quito–Ecuador
Ramiro W. Lizano Santamaria, Marco Fornasini, Ivan Sisa.
– Abstract 83

9:15am To Assess the Correlation between Obesity and Risk for Urinary Tract Infections in the Pediatric Population
– Abstract 84

General Pediatrics II: Underserved

8:00am The Effect of Regular Exercise on Exposure to Violence in Inner City Youth
Noe D. Romo, Melissa Dupont-Reyes, Deborah Fry, Leslie Davidson.
– Abstract 85

8:15am Socioeconomic Status and Hospitalization Costs for Common Pediatric Conditions
– Abstract 86

8:30am Pediatric Readmission within 1 Month of Discharge: An Insight from an Inner City Community Hospital in New York
– Abstract 87

8:45am Disparities in Functional Outcomes by Race, Ethnicity, and Insurance Status Following Injury-Related Inpatient Rehabilitation
Jennifer N. Fishe, Margaret G. Stineman, Mark R. Zonfrillo.
– Abstract 88

9:00am Infant Sleeping Practices at Nap and Night Time in an Inner City Population
Barbara A. Kelly, Matilde Irigoyen, Monique M. Mondesir, Natalia Isaza Brando.
– Abstract 89

9:15am Can You Fill This out? Caregiver, Clinician and Staff Perspectives on Pre-Visit Questionnaires Prior to Well-Child Care
Sara R. Slovin, Tashi L. Rowe, Kristin Mmari, Ashish Joshi, Cynthia S. Minkovitz.
– Abstract 90

Infectious Diseases & Immunology

8:00am–9:30am Minuet

Moderator: Elijah Paintal

8:00am Hepatitis B Vaccination Practices in the NICU for Term and Late Preterm Short-Stay Infants
– Abstract 91

9:15am National Trends and Resource Utilization in the Management of Infants with Urinary Tract Infections
– Abstract 92

8:30am The Incidence and Clinical Characteristics of Acute Bronchiolitis with Urinary Tract Co-Infection among Children under 2 Years of Age Admitted to Urban Inner City Community Hospital
– Abstract 93

8:45am Frequency of APOL1 Risk Alleles among a US Cohort of Children with Perinatal HIV-1 Infection and Associations with Renal Phenotypes
– Abstract 94

9:00am Assessing Current Physician Practices in the Management of Children Hospitalized for Community-Acquired Pneumonia
Zunaira Choudhary, Russell J. McCulloh, Crystal-Rose Cuellar, Michael Koster, Brian K. Alvison.
– Abstract 95

9:15am Does Viral Coinfection Impact Bronchiolitis Severity?
Kelly N.F. Fradin, Gabriella Azzarone, Nora Esteban-Cruciani, Joanne Nazif.
– Abstract 96

Neonatology I

8:00am–9:30am Overture

Moderator: Alexander Aghte

8:00am Trials of Persistent Pulmonary Hypertension of the Newborn Are Heterogeneous and Often Stopped Early
Annie Giacone, Elizabeth Foglia, Haresh Kirpalani.
– Abstract 97

8:15am Natural History of Pulmonary Artery Pressure (PAP) Changes in Preterm Infants
– Abstract 98

8:30am Pulmonary Hypertension in Preterm Infants: Prevalence and Associations with BPD
– Abstract 99

8:45am Near-Infrared Spectroscopy (NIRS) Evaluation of Sodium Bicarbonate (NaHCO3) Corrections in Very Low Birth Weight (VLBW) Neonates
– Abstract 100
Saturday, March 23

9:00am  Resting Energy Expenditure in Survivors of Congenital Diaphragmatic Hernia
Kimberly M.R. White, Penny Bamford, Min He, Ningfeng Tang, Cynthia F. Bearer.
– Abstract 101

Fetal Nutrition
9:45am  Intravenous Fat Emulsion (IFE) for the Prevention of Parenteral Nutrition Associated Liver Disease (PNALD) in Preterm Neonates
– Abstract 111

9:00am  Early Parenteral to Enteral Nutritional Transition Does Not Affect Weight Growth Velocity or Length of Hospitalization in Very Low Birth Weight Infants
Eleanor Estebanez, Lakshmi Vaithilingam, Inga Gukhman, Lisa Saiman, Rakesh Sahni.
– Abstract 112

9:15am  Quality of Diet and Central Nervous System Activity in Low Birth Weight Infants
Jacquelyn Piraquive, Philip Grieve, Kashyap Sudha, Michael Myers, Raymond Stark, Rakesh Sahni.
– Abstract 113

9:30am  Resting Energy Expenditure in Survivors of Congenital Diaphragmatic Hernia
Heather B. Howell, Christiana Farkouh-Karoleski, Rakesh Sahni.
– Abstract 114

Cardiology
9:45am  Impact of Adolescent Age on Graft Survival in Patients with Congenital Heart Disease Versus Myocarditis
– Abstract 107

9:00am  Care for Infants with Hypoplastic Left Heart Syndrome: A Shift in Provider Attitudes between 1995 and 2012
Erin A. Paul, Kristina Orfali, Thomas J. Stace.
– Abstract 108

9:15am  Doppler Parameters of Pulmonary Vascular Resistance in the Mid and Third Trimester Fetus: A Study of 51 Prospectively Studied Pregnancies
– Abstract 109

9:30am  The Effect of Modified Ultrafiltration on Angiopoietins in Pediatric Cardiothoracic Surgery
Sean M. Lang, Mansoor Syed, James Dziura, Vineet Bhandari, John Giuliano, Jr..
– Abstract 110

Neonatal Pharmacology
9:45am  Long-Term Effect of Src Kinase Inhibition on Caspase-8 Activity Following Hypoxia in the Newborn Piglet Brain
Tania D. Fontanez-Nieves, Dimitris Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulos.
– Abstract 119

9:00am  Mechanism of Caspase-2 Expression during Hypoxia in Cerebral Cortex of Newborn Piglets
Bhavi Patel, Dimitrios Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulos.
– Abstract 120

9:15am  Long Term Effect of Hypoxia on Caspase-1 Activation in the Newborn Piglet Brain
Dimitris Angelis, Tania D. Fontanez-Nieves, Qazi M. Ashraf, Maria Delivoria-Papadopoulos.
– Abstract 121

9:30am  Long Term Effect of Src Kinase Inhibition on Phosphorylation of CaM Kinase IV Following Hypoxia in the Cerebral Cortex of Newborn Piglets
Matthew Furst, Olia Lynch, Anli Zhu, Maria Delivoria-Papadopoulos.
– Abstract 122
Neonatal Resuscitation

9:45am–10:45am Maestro A

Moderator: Kathleen Gibbs

9:45am Umbilical Catheter Placement without Formulas
Ashish O. Gupta, Morarjee Peesay, Jayashree Ramasethu.

– Abstract 123

10:00am Quality of Neonatal Chest Compressions in a Simulated Environment
Elizabeth E. Foglia, Jay Patel, Dana Niles, Per Helge Aslænd, Anne Ades.

– Abstract 124

10:15am In-Hospital Outcomes after Implementation of Evidence-Based Guidelines for the Delivery Room Management of Very Preterm Infants
Sara B. DeMauro, Kelley Karp, Michael Posencheg.

– Abstract 125

10:30am National Variability in Neonatal Resuscitation Practices at the Limit of Viability
Bonnie H. Arzuaga, William Meadow.

– Abstract 126

Plenary Session I

10:50am–11:50am Overture

10:50am Plenary Lecture - Genetics of Height, Obesity and Other Human Complex Traits
Joel Hirschhorn, MD, PhD, Children’s Hospital of Boston, Harvard Medical School, Boston, MA

Lunch with the Professor

12:00pm–1:00pm Concerto A/B

Public Health Careers at CDC after Residency
Nancy Messonnier, MD, Centers for Disease Control, Atlanta, GA

Fellows’ Clinical Case Presentation Competition

12:00pm–1:00pm Aria A

Fellows’ Clinical Case Presentation Competition: In honor of the 25th anniversary of ESPR, we have introduced the Fellows’ Clinical Case Presentation Competition, in which a pediatric fellow will present an interesting and complex clinical case as an unknown, and then a second fellow will discuss the differential and most likely diagnosis. A total of 3 unknown cases will be presented, and an award for the best case presentation and best case discussion will be announced Sunday morning.

Moderators: Kirsten Bechtel and Raylynn Mailland

The fellows presenting the unknown cases are:
Heather Becker, Yale-New Haven Children’s Hospital
Kirti Sivakoti, Albert Einstein Medical Center
Hasan Merali, Harvard University

The fellows presenting the case discussions:
Beth Emerson, Yale-New Haven Children’s Hospital
Russell McCulloh, Hasbro Children’s Hospital
Henry Chicaiza, Connecticut Children’s Medical Center

Plenary Session II

Mentor of the Year

1:15pm Mentor of the Year Presentation
Turning a Jaundiced Eye on Basic Research in Neonatology
Phyllis Denney, MD, Children’s Hospital of Philadelphia, University of Pennsylvania, PA

2:15pm–3:00pm Overture

2:15pm Potential Applications of Multiplex Amplification Respiratory Viral Panel (RVP) Testing in Antimicrobial Stewardship: A Retrospective Analysis
Russell J. McCulloh, Sarah Andrea, Steven Reinert, Kimberle Chapin.

– Abstract 127

2:30pm Novel Non-Animal Simulation Trainer for Chest Tube Insertion in Infants
Ashish O. Gupta, Jayashree Ramasethu.

– Abstract 128

2:45pm Neutralizing IL-4 Rescues Inflammation in Neonatal Islets and Prevents β-Cell Failure in Adult IUGR Rats
Lane J. Jaeckle Santos, Rebecca A. Simmons.

– Abstract 129

3:00pm Break

Plenary Session II

Faculty Young Investigators

3:15pm–4:00m Overture

3:15pm Can Capnography Improve Pediatric Sedation Safety in the Emergency Department?
Melissa L. Langhan, Veronika Shabanova.

– Abstract 130

3:30pm Identification of RNA Biosignatures in Adolescent Girls with Pelvic Inflammatory Disease Presenting to a Pediatric Emergency Department: A Pilot Study
Fran Balamuth, Zhe Zhang, Eric Rappaport, Katie Hayes, Cynthia Mollen, Kathleen Sullivan.

– Abstract 131

3:45pm Optimal Heart Rate Cut-Off for Initiation of Chest Compressions during Neonatal Resuscitation
Bobby Mathew, Jayasree Nair, Daniel D. Swartz, Changxing Ma, Vinay Sharma, Sylvia F. Gugino, Carmon Koenigsknecht, Satyan Lakshminrusimha.

– Abstract 132

Platform Session

Breast & Infant Feeding

4:15pm–5:45pm Concerto A/B

Moderator: Dawn Wetzel

4:15pm Impact of Natural Breast Milk Oligosaccharides on the Premature Infant Microbiota and Adaptive Immunity
M. Susan Latuga, J. Christopher Ellis, Lars Bode, C. Micheal Cotten, Ronald Goldberg, Yiting Yu, Robert B. Jackson, Patrick C. Seed.

– Abstract 133

4:30pm Do Thawing and Warming Affect the Integrity of Human Milk?

– Abstract 134

4:45pm Prevalence and Duration of Breastfeeding in ADHD vs. Non-ADHD Children Ages 3-5: Analysis of 2007 National Health Survey Data
Rachel M. Goldberg, Suzanne Sunday, Andrew Adesman.

– Abstract 135

5:00pm Infant Formula: A Descriptive Study of National Sales Data
Peter F. Belamarich.

– Abstract 136
Saturday, March 23

5:15pm Barriers to Breastfeeding in an Urban Inner-City Population
– Abstract 137

5:30pm Formula Supplementation in Breast Feeding (BF) Mothers and Suggestions for Intervention by the Pediatric Community
Joanna Pierro, Virteeka Sinha, Bdair Abulaimoun, Philip Roth, Jonathan Blau.
– Abstract 138

Emergency Medicine I

4:15pm–5:45pm Aria A
Moderator: Matt Laurich

4:15pm Usage Characteristics of a Children’s Hospital Safety Center
Sadiqa A. Edmonds, Kristy B. Arbogast, Gina P. Duchossois, Mark R. Zonfrillo.
– Abstract 139

4:30pm Sick or Not Sick: Using I-PASS To Identify Patients at Risk for Clinical Deterioration
Genevieve London, Mutiat T. Onigbanoju, Kathleen Brennan, Steve Paik.
– Abstract 140

4:45pm Measles Vaccination Rates in Pediatric Emergency Department Patients
– Abstract 141

5:00pm Postpartum Depression Screening in a Pediatric Emergency Department
Beth L. Emerson, Ellen R. Bradley, Antonio Riera, Linda Mayes, Kirsten Bechtel.
– Abstract 142

5:15pm Simulated Disasters To Assess the Accuracy of Three Pediatric Disaster Triage Strategies
Mark X. Cicero, Frank Overly, Linda Brown, Jorge Yarzubeski, Barbara Walsh, Veronika Shabanova, Marc Auerbach, Antonio Riera, Garth Meckler, Carl R. Baum.
– Abstract 143

5:30pm Abdominal CTs Do Not Improve Outcomes for Children with Suspected Acute Appendicitis
Danielle J. Miano, Renee M. Silvis, Jill Popp, Marvin C. Culbertson, Brendan Campbell, Sharon R. Smith.
– Abstract 144

General Pediatrics III: Prevention

4:15pm–5:45pm Maestro B
Moderator: Ingrid Walker-Descartes

4:15pm Impact of an Intensified Anticipatory Guidance Program in the Nursery on Non-Urgent Emergency Department Use in the First Month of Life: A Randomized Controlled Trial
– Abstract 145

4:30pm Post-Discharge Follow-Up of Newborn Infants: Impediments to Compliance with American Academy of Pediatrics Guidelines
Vaneet K. Kalra, Lindsay B. DeVries, Girija Natarajan, Sanjay Chawla.
– Abstract 146

4:45pm Comparative Management of Neonatal Hyperbilirubinemia Using Transcutaneous and Serum Bilirubin-Specific Nomograms
Imeline Troncales, Alfred Troncales, Anoop Rao, Monique Mondesir, Cynthia DeLago.
– Abstract 147

5:00pm Usefulness of Universal Pre-Discharge Serum Bilirubin Risk Stratification as a Predictor of Admission for Phototherapy
Dennise Chrisselle C. Amado, Paulo R. Pina, David H. Rubin, Bianca A. Noronha, Maria L. Bautista, Ronald P. Arevalo.
– Abstract 148

5:15pm Making “Meaningful Use” Meaningful: The Readability of Electronic Health Record Visit Summaries
Shareen F. Kelly, Bruce A. Berstein, Lorri L. Collins, Lee M. Pachter.
– Abstract 149

5:30pm Psychopharmacology in Pediatric Primary Care: An ePROS Study of Electronic Health Records
– Abstract 150

Hematology/Oncology

4:15pm–5:45pm Maestro A
Moderator: Carolyn Felix

4:15pm Obinutuzumab (GA101) Significantly Enhances Cell Death and ADCC Compared to Rituximab Against CD20+ Rituximab-Sensitive and -Resistant B-Cell Non-Hodgkin Lymphoma (NHL) and Lymphoblastic Leukemia (BLL)
Anthony Sabulski, Aradithana Awashti, Janet Ayello, Carmella van de Ven, Matthew J. Barth, Mitchell S. Cairo.
– Abstract 151

4:30pm Transcription Activator-Like Effector Nucleases Mediated DLEU1 Gene Knockdown Suppresses Apoptosis in Burkitt’s Lymphoma
Brandon Madris, Changhong Yin, Janet Ayello, Carmella van de Ven, Sanghoo Lee, Mitchell S. Cairo.
– Abstract 152

4:45pm Natural Killer (NK) Cells Successfully Transduced with an Anti-CD20 Chimeric Antigen Receptor (CAR) by mRNA Nucleofection Have Significant Cytotoxicity Against Poor Risk B-Cell (CD20+) Leukemia/ Lymphoma (B-L-L)
Ashlin Yahr, Yaya Chu, Janet Ayello, Lowrence Lo, Jared Katz, Mitchell S. Cairo.
– Abstract 153

5:00pm Low Day 100 Transplant-Related Mortality (TRM) and Relapse Rate Following Clofarabine (CLO) in Combination with Cytarabine, Total Body Irradiation (tbi) and Allogenic Stem Cell Transplantation (ALLSCT) in Children, Adolescents and Young Adults (CAYA) with Poor-Risk Acute Leukemia
– Abstract 154

5:15pm Elevated Cotinine Levels Are Associated with More Frequent Hospitalizations in Children with Sickle Cell Disease
Sara C. Sadreameli, Kayin T. Robinson, John J. Strouse.
– Abstract 155

5:30pm Hyperuricemia: An Unappreciated Risk Factor for Acute Hypertension in Pediatric Tumor Lysis Syndrome
Lydia Pecker, Shulamit Kulak, Mimi Kim, Adam Levy, Beatrice Goilav.
– Abstract 156

Neonatal Neurology

4:15pm–5:45pm Minuet
Moderator: Noah Cook

4:15pm Effects of Post Hypoxic-Ischemic Hypothermia on Hemispheric Preference in the Immature Rat
Leslie M. Pierce, Jeffrey Perlman, Holly Moore, Susan Vannucci.
– Abstract 157

4:30pm Seizure vs Non-Seizure Behaviors in Hypoxic and Hypoxic-Ischemic Neonatal Rat Pups
Aimee M. Parow, Murray Engel, Jeffery Perlman, Susan J. Vannucci.
– Abstract 158
4:45pm Arginine and Levo-Dopa Stimulation in Children: Association of Peak 1 Obesity, Unsustained Early Puberty, and Hypothyroidism:
   A Variant of VanWyk-Grumbach Syndrome
   Arslan Arshad, Praveen Ballabh. – Abstract 159

5:00pm Neurofunctional Tests in Neonatal Rats after Focal Cerebral Ischemia
   Gregory L. Gedman, Shuang Xu, Javier Pacheco-Quinto, Elizabeth A. Eckman, Ben H. Lee. – Abstract 160

5:15pm Indomethacin Prophylaxis (IP) for Intraventricular Hemorrhage (IVH) in Extremely Low Birth Weight (ELBW) Infants: Effects of Time of Administration
   Hussain Mirza, Abbot R. Laptook, Sarah Kanderf, William Oh, Betty R. Vohr, Barbara Stoll, Barbara S. Stonestreet, Generic Database Subcommittee. – Abstract 161

5:30pm Choline Prevents Bilirubin Induced Neuronal Injury through a Lipid Raft Dependent Mechanism
   Gail S. Cameron, Ningfeng Tang, He Min, Cynthia F. Bearer. – Abstract 162

Neonatology II

4:15pm–5:45pm Overture
   Moderator: James Padbury

4:15pm Impact of Postnatal Antibiotics on Diversity of the Preterm Intestinal Microbiota
   Majd Dardas, Steven Gill, Gloria Pryhuber, Yi-Hrong Lee, Ann Gill, Ronnie Guillet. – Abstract 163

4:30pm Risk of Lead Exposure in Preterm Infants Receiving Red Blood Cell Transfusions
   Hijab Zubairi, Paul Visintainer, Jennie Fleming, Matthew Richardson, Rachana Singh. – Abstract 164

4:45pm Buccal Swabs: A Non-Invasive Method for Genetic Analysis in Premature Neonates
   Mariam Said, Clint Cappiello, Zohreh Tatari-Calderon, Joseph M. Devanean, Stanislav Vukmanovic, Khodayar Rais-Bahrami, Naomi Luban, Anthony Sandler. – Abstract 165

5:00pm Extent of High Oxygen Satuations in VLBW Neonates with Respiratory Distress Syndrome and Associated Factors
   Jenda M. Arawisan, Jeanne M. Curry, Lorna Welde, Gad Alpan. – Abstract 166

5:15pm Laser Therapy for Retinopathy of Prematurity in Extremely Premature Infants: Frequency after the Revised Guidelines
   Elizabeth O’Donnell, Sharon Kirkby, Ursula Nawab, Kevin C. Dysart, Linda Genen, Jay S. Greenspan, Zubair H. Aghai. – Abstract 167

5:30pm Do the Signs and Symptoms of Gastroesophageal Reflux (GER) Correlate with the Reflux Episodes as Detected by Multiple Intraluminal Impedance (MII) Study?
   Apryle Y. Funderburk, Ursula Nawab, Zubair H. Aghai. – Abstract 168

Poster Session II
Endocrine II

6:00pm–7:30pm Symphony Ballroom

1 Obesity, Unsustained Early Puberty, and Hypothyroidism: A Variant of VanWyk-Grumbach Syndrome?
   Evan Graber, Dennis Chia, Robert Rapaport. – Abstract 169

2 Arginine and Levo-Dopa Stimulation in Children: Association of Peak Growth Hormone Response with Body Fat Percentage
   Elizabeth Chacko, Molly Regelman, Rachel Annunziato, Evan Graber, Amy Buono, Elizabeth Wallach, Michelle Klein, Dennis Chia, Robert Rapaport. – Abstract 170

General Pediatrics II

6:00pm–7:30pm Symphony Ballroom

14 Parental Preference of Educational Handouts in an Urban Academic Pediatric Clinic
   Aarti Patel, Jennifer P. Alexander, Kristel Tafoya, Danielle Mercurio, Alan Salas, Thomas J. Killeen, Bruce A. Bernstein, Daniel Taylor. – Abstract 182

15 Effect of Chronic Constipation on Children’s Quality of Life
   Keshavadhana Balakrishnan, Hanh Vo, Upendra Mahat, Peter Kant Sandipag, Richard Neugebauer, Laura Debro, Bolale Akinsola, Ronald Bainbridge, Stefan Hagmann, Ayoade Adeniyi. – Abstract 183
Saturday, March 23

16 Practical Parenting: A Reproducible Curricular Module for Pediatric Residents on Infant Consumer Products
Kristel Tofoya, Shrutti Roy, Ada Davidoff, Mario Cruz.
– Abstract 184

17 Evaluation of the Utility of a Sleep Screener in the Primary Care Setting
Michelle S. King, Stefan A. Mandakovic, Hilda K. Kabali, Casandra M. Arevalo, Matilde M. Iriogoyen.
– Abstract 185

18 Provider’s Experience with a Self-Administered Written Screening Tool for Intimate Partner Violence
Cynthia DeLago, Matilde Iriogoyen.
– Abstract 186

19 Care Transitions: Communication Challenges between a Hospitalist Service and a Primary Care Pediatric Network
Ishminder Kaur, Anna Marie Carr, Cynthia W. DeLago, Matilde Iriogoyen.
– Abstract 187

20 Integration of Domestic Violence Screening in a Resident Continuity Clinic
Malgorzata Skarzynska, Cynthia DeLago, India Azzinaro.
– Abstract 188

21 Predictors of New Inhaled Corticosteroid Prescription to Children Hospitalized for Status Asthmaticus
Meera S. Meerkov, Jessica M. Gold, Gabriella Azzarone, Alyssa H. Silver, Katherine O’Connor.
– Abstract 189

22 Pediatric Hospitalist Preoperative Evaluation of Children with Neuromuscular Scoliosis
Samantha Cerra, David I. Rappaport, Iman Sharif, David M. Pressel.
– Abstract 190

23 Specialist-Hospitalist in Pediatric Endocrinology: Qualitative Assessment and Resource Utilization
Adam Stoller, Andrew Palladino, Sarah Brewer, Oludolapo Fakaye, Evan Fieldston.
– Abstract 191

24 Parent and Caregiver Education on Management of Choking in Infants and Children
Yaron Ivan, John Snyder, Jane L. Garb.
– Abstract 192

25 Use of Focus Groups To Inform a New Youth Diabetes Prevention Program
Nita Vangeepuram, Jane Carmona, Guedy Arniella, Deborah L. Burnet, Carol R. Horowitz.
– Abstract 193

26 Clinical Versus Community-Based Recruitment for an Adolescent Diabetes Prevention Study
Nita Vangeepuram, Kenya Townsend, Guedy Arniella, Carol R. Horowitz.
– Abstract 194

27 Does Dietician Diversity Impact Outcomes in Pediatric Weight Management?
Thao-Ly T. Phan, George A. Datto.
– Abstract 195

28 The Family Safe Zone: A Needs Assessment for a Multi-Level Parenting Intervention in the Pediatric Setting
Maria McColgan, Sally Kuykendall, Martha Davis, Stephen Sandelich, Stacy Ellen.
– Abstract 196

29 Needs Assessment of Parents in a Multi-Level Parenting Intervention in the Pediatric Setting
Maria D. McColgan, Sally Kuykendall, Martha Davis, Stephen Sandelich, Stacy Ellen.
– Abstract 197

30 Community Acquired MRSA: Does Anatomical Location Matter?
Catalina Ruiz Mesa, Jonathan Arciniegas, David Listman, Uri Belkind, David Perlstein.
– Abstract 198

31 Clinical Information Gleaned from Written Domestic Violence Screens in a Primary Care Setting
Cynthia DeLago, India Azzinaro, Matilde Iriogoyen.
– Abstract 199

32 Pilot Methodological Study on Defining Adolescent Menstrual Regularity
– Abstract 200

33 Do Parents Read the Label? An Assessment of Parents’ Use and Understanding of Nutrition Labels
Chloe Turner, Kathryn Scharbach, Sandra F. Braganza.
– Abstract 201

34 The Feasibility and Utility of Using a Brief Dietary Screener in the Pediatric ED
Meaghan Roy-O’Reilly, Danielle Miano, Renee Silvis, Carly Heynes, Valerie B. Duffy, Sharon R. Smith.
– Abstract 202

35 Diagnostic Utility of Neuroimaging in Evaluation of Headache in Children Presenting to the Emergency Department
– Abstract 203

Infectious Diseases

6:00pm–7:30pm Symphony Ballroom

36 Reduction in New York State Infant Influenza Rates Associated with Passage of the 2009 Neonatal Influenza Protection Act (NIPAP)
Shetal Shah, Catherine Messina.
– Abstract 204

37 Continuous Versus Intermittent Pulse Oximetry Monitoring of Children Hospitalized for Bronchiolitis
Russell J. McCullough, Brian K. Alverston, Kristin L. Koehn.
– Abstract 205

38 Clinical Screening for HAART Induced Mitochondrial Toxicity in HIV-Infected Children in Ghana
– Abstract 206

39 Prescriber Perceptions of an Antimicrobial Stewardship Program (ASP)
Dustin Flannery, Sanjeev Swami, Shannon Chan, Stephen Eppes.
– Abstract 207

Neonatal - General II

6:00pm–7:30pm Symphony Ballroom

40 Enteral Feeding Tube Design and Differential Bacterial Overgrowth: An In Vitro Comparison
Amy Presti, Ruth Snyder.
– Abstract 208

41 Comparison of Multiple Combination Methods of Analgesia for Neonatal Circumcision
Sammir Perez, Fernanda Kupferman, Susana Rapaport, Kelly Cervellione, Lourdes Cohen.
– Abstract 209

42 Abstract Withdrawn
– Abstract 210

43 Initiation and Attainment of Full Nipple Feeding (FNF) Is Influenced by Post Menstrual Age (PMA) and Gestational Age (GA)
Abigail C. Wellington, Jeffrey M. Perlman.
– Abstract 211
Management of Patient Ductus Arteriosus (PDA) with Two Different Protocols: A 10-Year Retrospective Study of Outcomes in Premature Babies with Birth Weight (BW) ≤ 1250 grams
Arpit Agarwal, Sathish Chikkabyrappa, Alok Bhutada, Prema Ramaswamy, Marina Osmolovsky, Mary Rojas, Hemalatha Murugan, Panayot Filipov. — Abstract 212

Wielding Technology To Transform NICU Model of Care: Large Scale Operations Testing Is Feasible with Little Prior Simulation Experience
Jesse Bender, Robin Shields, James Maryman, James Padbury. — Abstract 213

Communication Intervention in the NICU: Can It Backfire?
J.P. Clarke-Pounder, R.D. Boss, D. Roter, S. Larson, P.K. Donohue. — Abstract 214

Early Caffeine Therapy for Prevention of Bronchopulmonary Dysplasia in Preterm Infants
Dalal Taha, Sharon Kirkby, Ursula Nawab, Kevin C. Dysart, Linda Genen, Jay S. Greenspan, Zubair H. Aghai. — Abstract 215

Ear Drainage and the Role of Sepsis Evaluations in the Neonatal Intensive Care Unit
Mona Khattab, Matthew Bizzarro. — Abstract 216

Cumulative Diagnostic Imaging Radiation Exposure in Premature Neonates
Mona Khattab, Thomas R. Goodman. — Abstract 217

Utilization of Photographic Images during Prenatal Consultation to Potentially Alleviate Parental Stress and Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)
Mona Khattab, Lindsay Johnston. — Abstract 218

Factors and Outcomes Associated with the Speed of Rewarming Hypothermic VLBW Infants
Alexander M. Feldman, Brian C. De Benedictis, Jordan S. Kase. — Abstract 219

Respiratory Morbidity in Infants with Myelomeningocele
Maria Victoria Fraga, Annie Giaconne. — Abstract 220

Defining Successful Extubation in Very Preterm Infants: What Is the Evidence?
Annie Giaconne, Erik Jensen, Peter Davis, Barbara Schmidt. — Abstract 221

Does Extremely Preterm Infants Needs Screening for Retinopathy of Prematurity Earlier Than 31 Weeks Post Menstrual Age?
Elizabeth O’Donnell, Ursula Nawab, Kathryn A. Ziegler, Zubair H. Aghai. — Abstract 222

LPS Induced Chorioamnionitis Decreases Sirtuin1 and HDAC2 in Fetal Membranes and Lungs of Neonatal Rats
Suhita Gayen nee Betal, Dalal Taha, Ursula Nawab, Janet Larson, Zubair H. Aghai. — Abstract 222

Hyperoxia Regulates the Circadian Rhythm Gene Rev-ERBa in the Neonatal Lung
Shao Sengupta, Guang Yang, Namba Fumihiko, Phyllis A. Dennery. — Abstract 228

Using Lung Ultrasound To Diagnose TTN and HMD in Neonates ≥ 28 Weeks Gestation
Claudia T. Cadet, James Tsung, Ian Holzman. — Abstract 229

Anti-Gastroesophageal Reflux Surgery in Infants with Severe Chronic Lung Disease

Monitoring Tidal Volume (VT) on Neonatal Transport: Opportunity for Improvement in Ventilator Management

Isolation of Urinary Exosomes in Neonates To Determine Presence and Development of Renal NA+ Transporters

Relationship of Urinary Excretion of Magnesium, Potassium, Sodium and Calcium with Arterial Blood Pressure
Ameya P. Patil, Susana Rapaport, Kelly Cervellione, Fernanda Kupferman, Robert P. Woroniecki. — Abstract 233

Abstract Withdrawn
— Abstract 234

Plenary Session III
Presentation of Young Investigator Awards
8:30am–9:30am Overture

Platform Session
Emergency Medicine II
9:45am Analgesia for Appendicitis in Children in Pediatric and General Emergency Departments
Kristen Delaney, Alexis Pankow, Jeffrey Avner, Joni Rabiner. — Abstract 235
10:00am Randomized Controlled Trial of the Efficacy of Nebulized 3% Saline without Bronchodilators for Infants Admitted with Bronchiolitis: Preliminary Data

10:15am Comparing the Clinical Severity of RSV+ and RSV– Bronchiolitis
Kelly N.F. Fradin, Gabriella Azzaroni, Nora Esteban-Cruciani, Joanne Nazif.

10:30am Does New Prescription of Inhaled Corticosteroids on Hospital Discharge Decrease Hospitalizations and ED Visits for Asthma? Preliminary Data from a Retrospective Chart Review
Jessica M. Gold, Meera S. Meerkov, Gabriella Azzaroni, Alyssa H. Silver, Katherine O’Connor.

10:45am Hospitalist and Non-Hospitalist Adherence to Evidence-Based Guidelines for the Management of Community-Acquired Pneumonia
Clota Snow, Russell McCulloh, Zanaria Choudhary, Crystal-Rose Cuellar, Michael Koster, Brian Alverson.

11:00am Relationship between Asthma Control and Depression among Adolescents in an Urban Community
Vanessa Camino, Fernando Kupferman, Kelly Cervellione, Vinod Dhar, Susana Rapaport, Won Baik-Han, Parthu Chatterjee.

11:15am Children with Asthma in the Emergency Department; What Did the Chest X-Ray Change?

11:30am Cognitive and Emotional Morbidity Following Youth Concussions
Daniel J. Corwin, Christina L. Master, Kristy B. Arbogast, Mark R. Zonfrillo.

11:45am Symptom Guided Emergency Department Discharge Instructions for Children with Mild Traumatic Brain Injury
Adam Bartholomeo, Danielle Miano, Emily Ly, Sharon R. Smith.

Neonatal Pulmonary
9:45am–12:00pm Maestro B
Moderator: Gloria Pryhuber

9:45am Tracheal Suctioning Does Not Alter Pulmonary Vascular Resistance (PVR) in Asphyxiated, Non-Vigorous Lambs with Meconium Aspiration Satyan Lakshminrusimha, Bobby Mathew, Sylvia F. Gugino, Carmon Koenigsknecht, Jayasree Nair, Devaraj Sambalingam, Melissa Carmen, Daniel D. Swartz.

10:00am TRPV4 Regulates Fetal Lung Development and Injury
Sujir Pritha Nayak, Yulian Wang, Xiaodi Chen, Barbara Stonestreet, Juan Sanchez-Esteban.


10:30am B Type Natriuretic Peptide Levels in Preterm Neonates: A Marker of Severe Bronchopulmonary Dysplasia?
Vaneet K. Kalra, Sanjeev Aggarwal, Prem Arora, Girija Natarajan.

10:45am Single-Course Antenatal Betamethasone Alters Lung Morphometry in Late Preterm Lambs
Sushma Krishna, Shetal Shah, Sylvia Gugino, Satyan Lakshminrusimha.

11:00am HO-1 Nuclear Localization Enhances DNA Repair by Increasing Availability of the DNA Repair Enzyme OGG1
Monica L. Williams, Amal P. Fernando, Phyllis A. Dennery.

11:15am Effect of Nitric Oxide with Vitamin A on Altered Lung Airway and Microvasculature Development during O2-Induced Lung Injury
Sana Mujahid, Courtney Thomas, Heber Nielsen, MaryAnn Volpe.

11:30am Optimizing HFNC and Nasal CPAP Support in Preterm Infants Using Respiratory Inductive Plethysmography
Soraya Abbasi, Emidio M. Sivieri, Jeffrey S. Gerdes.

11:45am Respiratory Mechanics Measurements by Respiratory Inductive Plethysmography in Infants on Non-Invasive Respiratory Support
Emidio M. Sivieri, Jeffrey S. Gerdes, Soraya Abbasi.

Neonatology III
9:45am–12:00pm Overture
Moderator: Jeff Shenberger

9:45am The Profile of Endothelial Progenitor Cells in the Peripheral Blood of Preterm and Term Neonates: Are There Any Differences?
Prem Arora, Sala Sadaps, Meena Sadaps, Vaneet Kalra, Steven Buck, Ranjan Monga, Nitin Chouthai.

10:00am Coagulopathy in Newborns with Hypoxic Ischemic Encephalopathy (HIE) Treated With Therapeutic Hypothermia

10:15am Protection Against Neonatal Candidiasis by a Monoclonal Antibody Targeting the Candida albicans Adhesin, Als3p
Anoop S. Pulickal, Sonia S. Laforce-Neshitt, Lois L. Hoyer, Joseph M. Bliss.

10:30am Aquaporins as Possible Autoimmune Effectors of Preeclampsia
Nisreen S. Maari, Surendra Sharma.

10:45am CXC Chemokine Inhibitor Can Delay Preterm Delivery Induced by Chorioamnionitis and Reduce Neonatal Mortality and Morbidity Ranjith Kamity, Hardik Patel, Sharif Younis, Edmund Miller, Mohamed Ahmed.

11:00am Risk Factors for Oropharyngeal Aspiration in Newborns with Congenital Diaphragmatic Hernia
Kara L. LaBarge, Rebecca A. Neth, Ann Liu, Natalie L. Davis, Catherine A. Theils, Lawrence M. Rhein.

11:15am Are Bone Morphogenetic Proteins Involved in Bronchopulmonary Dysplasia?
Jenda M. Arawiran, Johanna Calo, Lance Parton, Susan Olson.

11:30am Standardized Early Transition from Parenteral-to-Enteral Nutrition Will Decrease Central Line Utilization in Preterm Infants ≤1500 grams
Lakshmi Vaithilingam, Lisa Saiman, Inga Gukhman, Jenda M. Arawiran, Johanna Calo, Lance Parton, Susan Olson.

11:45am Effects of Wharton’s Jelly Mesenchymal Stem Cells on Neonatal Neutrophil Activity
In the hospital sometimes it’s hard to find translators. And they don’t translate it the same.

Regarding “sex under the influence”, 12th grade males were more likely to report having had sexual intercourse (SI) before last SI in 2011 (31.2% vs. 25.8%, p=0.04). The only other difference noted was white 9th grade females were less likely to have recently had sexual activity under the influence (22.0% vs. 32.7%, p=0.04). Regarding sexual activity in general, Asian 12th graders were significantly more likely to report ever having had SI (43.7% vs. 24.7%, p<0.01) whereas black 11th graders (63.6% vs. 71.3%, p<0.04) and Hispanic 12th grade males (61.0% vs. 68.4%, p<0.04) were significantly less likely to report ever having had SI. When asked about sex with 4 or more partners (lifetime), a decrease was noted for black 12th grade males (41.4% vs. 56.5%, p<0.01), but a very substantial increase was noted in Asian 12th graders (19.6% vs. 5.6%; p<0.04) and smaller but significant increase was noted in 12th grade white females (24.0 vs. 17.3%; p=0.02). Changes in condom use were only noted for 12th grade Hispanics, where males (73% vs. 42%; p<0.02) and females (49% vs. 58%; p<0.05) were less likely to have SI without a condom in 2011.

CONCLUSIONS: 2011 YRBS data suggest that sexual health interventions targeted at high-risk racial/ethnic groups (e.g., blacks and Hispanics) have been somewhat successful. Conversely, an increase in some SRTB is noted among Asians, a previously low risk ethnic group and, to a lesser extent, whites.

3

House Officer

Disordered Eating in Inner City Adolescent Males
Rashani S. Bhopi, Paulo Pina, David H. Rubin, Pediatrics, St. Barnabas Hospital, Bronx, NY; Pediatrics, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Studies have shown an increasing incidence of eating disorders in adolescent males. Inner city populations living in poverty tend to be vulnerable and an important target of the obesity epidemic, factors that could be associated with disordered eating behaviors like binge-eating and self-induced vomiting as a measure of weight control. Little is known about the epidemiology of disordered eating behaviors in inner city males.

OBJECTIVE: To determine the risk of eating disorders in healthy adolescent males using a validated questionnaire.

DESIGN/METHODS: We enrolled a convenience sample of 108 12-18 year old males (14.9 years, +/- 1.9; 77% Hispanic) seeking medical care at an ambulatory clinic of an inner city hospital. Most participants sought care for an acute illness or a physical exam. Participants completed the Eating Attitudes Test-26 (EAT-26), a validated measure of symptoms and behaviors characteristic of eating disorders. A retrospective chart review was done to note BMI and sexual preference when documented.

RESULTS: The EAT-26 was a reliable assessment of eating disorders in our population (Cronbach alpha = 0.698). 17.6% responded to using binging, 6.5% to vomiting, 4.6% to laxative use as weight control measures. 7.4% males were found to be at risk of eating disorders. 12% were found to be overweight (BMI=18.5) and 32% were found to have BMI more than 25 with 16% being obese. 4.7% were identified as having same-sex attractions. We did not find a statistically significant association between age, BMI, sexual preference and risk for eating disorder. However, there were relationships amongst specific behaviors. Overweight or obese males were more likely to use laxatives as a weight control measure (OR 1.39, 95%CI 1.16-1.67). Using non-parametric testing, those boys that reported same-sex attractions were also more likely to use laxatives (p=0.034).

CONCLUSIONS: Our data show a high prevalence of disordered eating behaviors in inner city adolescent males. Furthermore there are no clear predictors of these behaviors, which could warrant universal screening.

4

Latino Caregiver Experiences with Asthma Health Communications: A Qualitative Evaluation
Antonio Riera, Aguenda Ocasio, Gunjan Kamdar, Lauren Kremeich, Kyle Ragins, Sandra Trevino, Federico E. Vaca, Pediatric Emergency Medicine, Yale University School of Medicine, New Haven, CT; Emergency Medicine, Yale University School of Medicine, New Haven, CT; Junta for Progressive Action, New Haven, CT; Yale University School of Medicine, New Haven, CT.

BACKGROUND: Latino children experience disparate asthma outcomes. Research on asthma health communication between limited English proficiency caregivers (LEPC) and healthcare providers is scarce.

OBJECTIVE: Characterize how asthma health communications are perceived and experienced by LEPC.

DESIGN/METHODS: A purposeful sample of LEPC of children 2-12 years old with asthma was chosen. An ethnically concordant researcher performed and digitally recorded semi-structured in-depth Spanish interviews at a local community organization or the participant’s home. Caregiver acculturation was measured. Interviews were professionally transcribed. A bilingual research team independently coded Spanish transcripts. Codes were inductively derived and iteratively refined until thematic saturation was reached. Qualitative analysis software was used to facilitate data organization and review.

RESULTS: Twenty LEPC with an ability to speak English not well (70%) or not at all (30%) were interviewed. English reading ability (60% not at all, 40% not well) contrasted Spanish reading ability (70% very well, 20% well and 10% not well). Most were mothers age 24-50 (65%) and grandmothers age 50-63 (25%). Latino subgroups included Puerto Rican (35%), Colombian (20%), Mexican (15%), Dominican (15%), Ecuadorian (10%) and Cuban (5%). All LEPC measured to be “less acculturated”. Major themes emerged:

1) LEPC confront significant emotional, physical (for child) and communication burdens.
2) Language discordant communications with health care providers are common. Perceptions of interpreter availability (“In the hospital sometimes it’s hard to find translators”), delays in care (“I always have to wait”), lack of trust (“And they don’t translate it the same”) and emotional responses (“It’s frustrating, it’s difficult, it’s a desperate situation”) act as facilitators. A pervasive use of untrained interpreters, often a child is described.
3) Language discordant asthma education, exposure to learning opportunities and suitable action
House Officer

5

Intravenous Magnesium Sulfate in the Treatment of Acute Asthma

Chiara Galvez, Paulo Pina, Kathleen Asas, Pediatrics, St. Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Intravenous magnesium sulfate (IVMS) has proven to be beneficial in the treatment of severe acute asthma in children, particularly in preventing hospital admission and improving bronchodilatation; however, it is unclear how frequently IVMS is used in this population. Knowledge regarding the frequency and indications for use of IVMS in children is important to evaluate adherence to evidence based recommendations, demonstrate care gaps in the ED setting, and in developing tools such as clinical practice guidelines for EDs.

OBJECTIVE: To determine the prevalence, therapeutic goals, and barriers to IVMS use in children with severe acute asthma exacerbations.

DESIGN/METHODS: An email was sent to area emergency physicians inviting them to participate in an online questionnaire (Survey Monkey) regarding the use of IVMS in the treatment of children with acute asthma. The questionnaire included questions regarding demographic information and specific questions regarding use of IVMS. Results were analyzed using SPSS.

RESULTS: 43 responses were received and analyzed for the study. 25 (58.1%) respondents were between 25 and 35 years of age. 20 (46.5%) were in practice less than 10 years. 33 (77.2%) were pediatric or EM residents. 18 (42.6%) worked at Pediatric EDs. 21 (48.8%) respondents use IVMS. 31 (72%) use it to improve breathlessness, 17 (40%) to avoid PICU admission, and 7 (16%) to avoid hospital admission. 25 (58%) use it if there is no response to albuterol, ipatropium and steroids. No respondents used it as first line treatment. Those who have been in practice less than 10 years are more likely to use IVMS if there is no response to initial treatment within the first hour. There was no relation between reason and timing of use and respondents’ age, gender, level of training, or ED setting. No barriers to IVMS use were reported.

CONCLUSIONS: IVMS is commonly used for acute asthma in the pediatric age group, usually to improve symptoms and mostly for patients who have not responded to initial treatment within the first hour. It is more commonly used to avoid PICU admission than to avoid hospital admission and does not appear to be given as part of any ED guidelines. Those early in their careers are more likely to follow recommendations of when to use IVMS.

House Officer

6

Seasonal Variation in Viral Bronchiolitis Severity

Kelly N.F. Fradin, Gabriella Azzarone, Nora Esteban-Cruciani, Joanne Nazif, Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Acute viral bronchiolitis is responsible for over 150,000 admissions per year in the United States. The differences in severity by bronchiolitis admissions during different seasons have not been well described in our region.

OBJECTIVE: To assess whether severity of viral bronchiolitis varies seasonally as measured by length of stay (LOS), use of supplemental oxygen, and rate of intensive care unit (ICU) admission.

DESIGN/METHODS: We conducted a retrospective cohort study involving electronic chart review of patients 0-24 months of age hospitalized between January 2007 and December 2010 by length of stay (LOS), use of supplemental oxygen, and rate of intensive care unit (ICU) admission.

RESULTS: 1246 children admitted with bronchiolitis met inclusion criteria: 1043 (83.7%) of these were admitted during the spring and summer months had a less severe course of illness than those admitted during the winter, as determined by LOS and oxygen use. This may reflect epidemiologic variation in the causative virus or clinical differences in admission practices.
Diminished Exercise Response of Tissue Doppler Velocities in Pediatric Patients with Aortic Stenosis
Division of Pediatric Cardiology, Penn State Children’s Hospital, Hershey, PA.

BACKGROUND: In adult patients with aortic stenosis (AS) studies have shown a diminished ability to augment long axis wall motion on stress echocardiography using color tissue Doppler imaging (TDI). Little is known about TDI stress echocardiography in children with AS.

OBJECTIVE: To use TDI exercise stress echocardiography to study the effect of AS on regional wall motion in children with and without AS.

DESIGN/METHODS: Eighteen patients with AS and 33 normal controls were prospectively recruited at clinically indicated stress echocardiography. Color TDI cine loops were acquired as digital echocardiographic raw data before and after Bruce exercise stress test. During offline analysis, the peak systolic (S) TDI velocity was measured from parasternal short axis in the basal posterior LV wall and from apical in the tricuspid, septal and lateral mitral ring.

RESULTS: Patients and controls were matched for age (13.7±2.8 y vs. 13.2±3.4 y; NS), height and weight. AS was mild in 9 cases, moderate in 7 and severe in 2 patient. Exercise times were similar for AS and control at 13.1±2.6 v. 12.4±2.9 min (NS). All subjects reached at least 85% of predicted heart rate (AS 93±5 v. 93±7%; NS). Baseline and peak heart rate and peak MET were similar. On TDI, baseline systolic velocities were similar but AS patients had significantly lower peak S velocities in the lateral and posterior LV wall and in the RV free wall than controls.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal</th>
<th>AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV short axis S velocity</td>
<td>4.2±1.1</td>
<td>3.4±1.0</td>
</tr>
<tr>
<td>LV lateral mitral ring S velocity</td>
<td>8.1±2.0</td>
<td>7.3±1.9</td>
</tr>
<tr>
<td>LV septal mitral ring S velocity</td>
<td>6.7±0.8</td>
<td>6.3±1.0</td>
</tr>
<tr>
<td>RV tricuspid ring S velocity</td>
<td>10.1±1.4</td>
<td>10.3±2.2</td>
</tr>
<tr>
<td>Heart rate (bpm)</td>
<td>89.2±16.8</td>
<td>88.1±15.7</td>
</tr>
</tbody>
</table>

Mean±SD. * p<0.05. ** p<0.01. S peak systolic velocity on color tissue Doppler imaging.

This result held true when mild AS group was analysed alone.

CONCLUSIONS: In pediatric patients with AS, TDI revealed a diminished capacity to augment LV and RV wall motion with exercise stress, although conventional testing had shown normal exercise times on the Bruce protocol. These findings are in accordance with previous studies in adults with AS. As such, TDI increases the sensitivity of the exercise stress test and could potentially be useful in risk stratification in children.

10

Venous Catheter Use and Thromboprophylaxis in Critically Ill Children
E. Vincent S. Faustino.
Department of Pediatrics, Yale School of Medicine, New Haven, CT.

BACKGROUND: The use of central venous catheters (CVC) is the single most significant risk factor for deep venous thrombosis (DVT) in critically ill children.

OBJECTIVE: To ascertain which clinical factors influence the decision by medical specialists for deep venous thromboprophylaxis in critically ill children with CVC compared to those without CVC.

DESIGN/METHODS: We conducted a prospective multinational cross-sectional study on thromboprophylaxis in critically ill children. To replicate the eligibility criteria of the proposed trial, we included children hospitalized in pediatric intensive care units (ICU) on 3 study dates spread across the year who were <18 years old, not on therapeutic anticoagulation, not coagulopathic and did not have a recent or planned surgery. We collected data on known risk factors for DVT and use of thromboprophylaxis. We determined the associations between the DVT risk factors and CVC use with a nonlinear mixed effects model and reported the associations as odds ratio (OR) and 95% confidence interval (CI). Descriptive statistics were used to characterize CVC use and thromboprophylaxis practice.

RESULTS: A total of 1,104 (50.5% of 2,185) children from 59 ICUs in 7 countries were included in the analysis. Of these, 518 (46.9%) children had at least one CVC. Children with CVC were more likely to have other risk factors for DVT, such as congenital heart disease (OR: 3.14, 95% CI 2.30-4.28), cancer (OR: 4.53, 95% CI: 2.85-7.19), sepsis (OR: 3.01, 95% CI: 2.04-4.43), mechanical ventilation (OR: 3.80, 95% CI: 3.02-4.77) or vasopressor support (OR: 6.96, 95% CI 4.65-10.40). A total of 570 CVCs were inserted of which the peripherally inserted type (244, 42.8%) was the most common. Of the unmeasured type (235, 41.2%), the femoral vein (120, 51.1%) was the most common site of insertion. Although pharmacologic thromboprophylaxis was associated with CVC use (OR: 2.65, 95% CI: 1.75-4.01), only 78 (15.1%) children with CVC were receiving thromboprophylaxis. Low molecular weight heparin (36, 6.9%) was the most commonly used agent in children with CVC.

CONCLUSIONS: CVC use is commonly used in critically ill children. Those with CVC are more likely to have additional risk factors for DVT. Pharmacologic thromboprophylaxis is not commonly used in these children. These findings suggest that there are a significant number of critically ill children who may be eligible for an intervention trial to reduce the incidence of CVC-related DVT.
in finding significant effects in motor, state, attentional and regulatory systems of the APIB. The clinical complications showing significant effects were: any IVH; any IVH with BPD; any IVH with sepsis; IVH > grade II; IVH > grade II with BPD and IVH > grade II with sepsis.

CONCLUSIONS: Preterm infants who have had IVH alone or IVH with BPD and/or sepsis demonstrate less well organized motoric, state, attentional and regulatory behavior than those preterm infants who have not had an IVH with or without BPD and/or sepsis when evaluated at 41-43 weeks PCA or term.

15
House Officer
Evaluation of a Sibling Support Group for Families of Children with Autism Spectrum Disorders
Pediatrics, New York Presbyterian - Columbia University Medical Center, New York, NY; Pediatrics, Columbia University College of Physicians & Surgeons, New York, NY; Child & Adolescent Psychiatry, New York Presbyterian - Columbia University Medical Center, New York, NY; Pediatrics, Medical College of Wisconsin, Milwaukee, WI.
BACKGROUND: Literature exists to suggest that siblings of children with autism spectrum disorders (ASD) experience less intimacy with their brother/sister, decreased parental attention, and increased responsibilities. Interventions such as sibling support groups have been shown to benefit families of children with chronic illnesses but data is limited for siblings of children with ASD.
OBJECTIVE: To assess the feasibility and impact of a pilot support group for siblings of children with ASD in an underserved community.

DESIGN/METHODS: Siblings and parents were recruited from schools and clinics located in a low-income community and that serve ASD families. We implemented four peer group sessions designed to help children understand ASD and explore their sibling relationships. Children completed an assessment of sibling knowledge of illness that included ability to name (0-3) and explain (0-5) their siblings’ disorder. Parents and children completed a pre & post Sibling Perception Questionnaire (SPQ) using a Likert Scale (1-5) adapted from Sahler & Carpenter covering domains of interpersonal, intrapersonal, communication, fear of disease, and connectedness. Both groups also completed pre & post semi-structured interviews to further explore their family relationships, as well as expectations and feedback of the group. Changes in mean scores were compared for the sibling knowledge interview and SPQ using paired t-test. Thematic analysis was performed by two coders for the qualitative portions.
RESULTS: We enrolled nine families with children ages 7-10 who had a sibling with ASD. Children showed an increased ability to name (1.9 vs 2.3, p=0.17) and explain (2.8 vs 3.6, p=0.05) their sibling’s disorder approaching statistical significance despite small sample size. Parents and children did not report a significant difference on any domains of the SPQ (parents: 2.7 vs 2.7, children: 2.5 vs 2.5). The most frequently described benefits of the group from both parents and children include increased understanding of autism, feelings of connectedness, and learning more coping skills.
CONCLUSIONS: In this study, we found that it is possible to create a support group for siblings of children with ASD. Our pilot data suggests that children gained knowledge about their siblings’ illness and developed skills and relationships that could benefit families. Future study is warranted to assess the long-term impact of these groups.

16
House Officer
Autism Spectrum Disorders and Age of Diagnosis in an Urban Inner-City Pediatric Clinic
Pediatrics, Bronx Lebanon Hospital Center, Bronx, NY.
BACKGROUND: Early diagnosis of Autism Spectrum Disorder (ASD) is desirable in order to initiate appropriate therapy which may lead to improved outcomes. Despite the AAP recommendation for screening at 18 months with the Modified Checklist for Autism in Toddlers (M-CHAT), current national average age of diagnosis for Autism, PDD and Asperger syndrome is 48 months, 53 months, 75 months respectively.
OBJECTIVE: To identify the average age of first concern and time of diagnosis of Autism and to delineate factors associated with age of diagnosis.

DESIGN/METHODS: Retrospective chart review of children with a diagnosis of ASD receiving routine pediatric care at Bronx-Lebanon Hospital Center from 01/2008-12/2010.
RESULTS: 142 children (53% males) were diagnosed with ASD. Most were hispanics (58%) or blacks (21%), and were enrolled into medicaid (49%) or an HMO-plan (43%). Median age (IQR) of first clinical concern was 23 months (12-36 months), initiated mostly by caregivers (79%). Leading reasons were speech delay (76%), no social interaction (27%), stereotypy (25%) and self-injurious behavior (15%). Diagnosis of ASD was established at a median age (IQR) of 30 months (22-36 months), and mostly by primary care provider (PCP) (30%) and neurologist (17%)
17

Distractibility, Vigilance and Delay in Children Attending the Pediatric Rheumatology Clinic
Lakshmi N. Moorthy, Muffaddal Dahdowala, Margaret Peterson, Thomas Lehman, Barbara M. Ostfeld, Pediatrics, UMDNJ RWJMS, New Brunswick, NJ; Hosp for Special Surgery, NY, NY; Univ. of Michigan, Ann Arbor, MI.

BACKGROUND: Children with rheumatic diseases are likely to have problems with attention due to disease and biopsychosocial factors. The Gordon Diagnostic System (GDS) is a portable assessment device that aids in the diagnosis of attention deficits with three game-like-9-minute-long tasks, namely Vigilance, Distractibility and Delay.

OBJECTIVE: In this pilot study, we will preliminarily test children attending the rheumatology clinic (without a diagnosis of ADHD) for attention deficits using the GDS.

DESIGN/METHODS: We administered the GDS to a cross-sectional sample of children attending the pediatric rheumatology clinic and recorded Vigilance, Distractibility and Delay responses. We assessed quality of life (QOL) with parent reports of Pediatric QOL inventory; and disability with parent reports of the Childhood Health Assessment Questionnaire (CHAQ). Scores were examined for data distribution and compared with age-specific norms. Independent samples t-test and Mann Whitney U tests were used to compare the scores of patients with and without rheumatic diseases.

RESULTS: Out of 11 patients (6 girls), 6 patients had a rheumatic disease: systemic lupus (3); juvenile arthritis (2); dermatomyositis (1). Others had past-streptococcal reactive process (4) and livedo (1). Seven were non-White. The median school grade was 8 (range 3-10). Table below shows the scores of children with without rheumatic diseases. Distractibility correct scores were lower in children with rheumatic diseases (p=0.04, independent t-test; p=0.08-Mann Whitney U test). Children with rheumatic diseases had a lower QOL.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subcategory</th>
<th>No rheumatic disease (5)</th>
<th>Rheumatic disease (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, mean/SD (median)</td>
<td>14±2 (14)</td>
<td>12±3 (12)</td>
<td></td>
</tr>
<tr>
<td>GDS-Distractibility</td>
<td>Correct, mean/SD</td>
<td>40±2</td>
<td>29±10 (below normative values)</td>
</tr>
<tr>
<td>Commissions, mean/SD (median)</td>
<td>2±2 (2)</td>
<td>5±5 (3)</td>
<td></td>
</tr>
<tr>
<td>GDS-Vigilance</td>
<td>Correct, mean/SD</td>
<td>43±2</td>
<td>41±4</td>
</tr>
<tr>
<td>Commissions, mean/SD (median)</td>
<td>2±1 (3)</td>
<td>5±4 (5)</td>
<td></td>
</tr>
<tr>
<td>GDS-Delay</td>
<td>Efficiency Ratio, mean/SD</td>
<td>0.7±0.4</td>
<td>0.7±0.2</td>
</tr>
<tr>
<td>%Responses, mean/SD</td>
<td>86±34</td>
<td>69±8</td>
<td></td>
</tr>
<tr>
<td>%Correct, mean/SD</td>
<td>49±23</td>
<td>49±11</td>
<td></td>
</tr>
<tr>
<td>QOL, mean/SD</td>
<td>88±5</td>
<td>74±15</td>
<td></td>
</tr>
<tr>
<td>Disability index, median (range)</td>
<td>0 (0-10.12)</td>
<td>0 (0-0.25)</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS: In our small sample, children with rheumatic diseases performed worse on the distractibility task of the GDS. This study emphasizes the need for routine screening for attention deficits in children with rheumatic diseases and assessing these scores prospectively in relation to disease status and well being.

19

House Officer
Barriers to Patient- and Family-Centered Care in the Era of Resident Work Hours Restrictions
Matthew P. Kusulas, Joanne Nazifi, Pediatrics, Children’s Hospital at Montefiore, Bronx, NY.

BACKGROUND: Patient- and family-centered care (PFCC) recognizes that the family is a child’s primary source of support and is essential to clinical decision making. Acknowledging the importance of PFCC, the Accreditation Council for Graduate Medical Education identified barriers to PFCC in the learning environment. However, in the current era of restrictive work hours, new obstacles to consistent PFCC may have emerged.

OBJECTIVE: To assess pediatric residents’ perceptions of their understanding of PFCC, assess residents’ perceptions of the benefits of PFCC, and identify barriers to providing consistent PFCC at an urban academic children’s hospital, the Children’s Hospital at Montefiore (CHAM).

DESIGN/METHODS: We conducted a focus group of 8 residents in which participants were asked to identify barriers to providing PFCC. All CHAM pediatric residents were subsequently invited to complete a survey that assessed their perceived understanding of PFCC as well as their attitudes regarding PFCC. The survey also asked participants to rate how often they encounter each identified barrier in their practice. Data was analyzed using descriptive statistics.

RESULTS: Ten barriers were identified by the focus group. 57 of 84 residents (68%) completed the survey, 72% of which had experience with PFCC prior to starting their training. 95% agreed or strongly agreed that they understand what PFCC means, while 87% agreed or strongly agreed that they understand how to put PFCC into practice as a resident. The majority of respondents believe that PFCC can increase family satisfaction (100%), increase patient satisfaction (99%), improve patient outcomes (77%), and increase staff satisfaction (51%), while the majority did not believe PFCC decreases cost of care (60%) or improves staff satisfaction (51%). Most have experienced increased family (69%) and patient (55%) satisfaction first hand. Of the 10 barriers, the majority of responders felt the following 3 frequently or always create an obstacle to PFCC: difficulty balancing time with patients and families with administrative tasks (82%); physical environment (58%).

CONCLUSIONS: While residents at our institution feel they understand what PFCC entails and agree that PFCC can provide important benefits, resident responsibilities and daily schedules need to be planned in ways that are more conducive to PFCC in order to make it the standard of care.

Poster Session I
Medical Education

Friday, March 22, 2013
6:00pm–7:30pm

18

Inter-Professional Training Program for Health Professional Learners in Southern Belize
Denise A. Soltes, Susan M. Leib, College of Pharmacy and Health Sciences, Drake University, Des Moines, IA; Department of Pediatrics, Einstein Medical Center, Philadelphia, PA.

BACKGROUND: Inter-professional collaboration has been shown to improve patient care outcomes yet few health professional learners have experience working in inter-disciplinary settings. Less than 15% of medical and nursing schools in the US have interdisciplinary programs. Little information is available as to how medical learners perceive working in inter-professional teams.

OBJECTIVE: To determine how health professional learners respond to working in inter-professional teams and how this approach alters their attitudes about professionals from other health disciplines.

19

House Officer
Barriers to Patient- and Family-Centered Care in the Era of Resident Work Hours Restrictions
Matthew P. Kusulas, Joanne Nazifi, Pediatrics, Children’s Hospital at Montefiore, Bronx, NY.

BACKGROUND: Patient- and family-centered care (PFCC) recognizes that the family is a child’s primary source of support and is essential to clinical decision making. Acknowledging the importance of PFCC, the Accreditation Council for Graduate Medical Education identified barriers to PFCC in the learning environment. However, in the current era of restrictive work hours, new obstacles to consistent PFCC may have emerged.

OBJECTIVE: To assess pediatric residents’ perceptions of their understanding of PFCC, assess residents’ perceptions of the benefits of PFCC, and identify barriers to providing consistent PFCC at an urban academic children’s hospital, the Children’s Hospital at Montefiore (CHAM).

DESIGN/METHODS: We conducted a focus group of 8 residents in which participants were asked to identify barriers to providing PFCC. All CHAM pediatric residents were subsequently invited to complete a survey that assessed their perceived understanding of PFCC as well as their attitudes regarding PFCC. The survey also asked participants to rate how often they encounter each identified barrier in their practice. Data was analyzed using descriptive statistics.

RESULTS: Ten barriers were identified by the focus group. 57 of 84 residents (68%) completed the survey, 72% of which had experience with PFCC prior to starting their training. 95% agreed or strongly agreed that they understand what PFCC means, while 87% agreed or strongly agreed that they understand how to put PFCC into practice as a resident. The majority of respondents believe that PFCC can increase family satisfaction (100%), increase patient satisfaction (99%), improve patient outcomes (77%), and increase staff satisfaction (51%), while the majority did not believe PFCC decreases cost of care (60%) or improves staff satisfaction (51%). Most have experienced increased family (69%) and patient (55%) satisfaction first hand. Of the 10 barriers, the majority of responders felt the following 3 frequently or always create an obstacle to PFCC: difficulty balancing time with patients and families with administrative tasks (82%); physical environment (58%).

CONCLUSIONS: While residents at our institution feel they understand what PFCC entails and agree that PFCC can provide important benefits, resident responsibilities and daily schedules need to be planned in ways that are more conducive to PFCC in order to make it the standard of care.
respondents rated McChief Rounds and Progressive Chief Rounds as interactive, respectively, compared to 69% for Traditional Chief Rounds. McChief Rounds were rated as effective by 100% of respondents and Progressive Chief Rounds were found to be effective by 94% of respondents, compared with 84% for Traditional Chief Rounds. Only 16% of respondents prefer the Traditional Chief Rounds style over the other two styles, and overall, 97% of the respondents prefer having a variety of formats.

CONCLUSIONS: Learners rated small group, team-based styles as more effective and interactive than traditional large-group Chief Rounds. Learners prefer a variety of formats in this educational venue. Based on this data, we will continue to offer a variety of small, team-based educational sessions.

21 Somebody Tell the Students: Dichotomy between Standardized Patients’ and Medical Students’ Assessments of Professionalism
Hai Jung H. Rhim, Ilir Agalliu, Miriam Schechter.
Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Professionalism is a core competency in medical training, which is best evaluated by collecting formative assessments in varied settings from multiple evaluators, including students themselves. Students’ self-assessments are typically compared to faculty or peer evaluations, but anchoring them to patients’ perceptions should be the ultimate goal. As a surrogate, standardized patients (SP) trained to evaluate students may provide a more consistent method to capture the patient perspective.

OBJECTIVE: To determine the correlation and agreement between SPs’ assessments and students’ self-assessments on professionalism during a pediatric Objective Structured Clinical Exam (OSCE).

DESIGN/METHODS: Since 2011, all 3rd year students at Albert Einstein College of Medicine were invited to participate in an OSCE during the pediatrics clerkship. SPs portray an apathetic adolescent who opens up only if the student is able to negotiate a nonjudgmental rapport in a professional manner. SPs trained to assess professionalism complete a checklist and students complete an identical self-assessment. SPs give verbal feedback on communication skills and professionalism. Students complete an anonymous survey rating their experience. Intraclass correlation coefficients (ICC) between SP and student evaluations were computed using two-way random ANOVA models.

RESULTS: N=217 students

<table>
<thead>
<tr>
<th>Professionalism Attributes</th>
<th>p-value ICC</th>
<th>p-value IRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>0.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.02</td>
<td>0.004</td>
</tr>
<tr>
<td>Courtesy</td>
<td>0.16</td>
<td>0.05</td>
</tr>
<tr>
<td>Patient Preferences</td>
<td>0.12</td>
<td>0.03</td>
</tr>
<tr>
<td>Empathy</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>Word Choice</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Verbal Tone</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Medical Jargon</td>
<td>0.58</td>
<td>0.001</td>
</tr>
<tr>
<td>Mannerisms</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Composition</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Establishing Confidentiality</td>
<td>0.85</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Very Useful: 78% Somewhat Useful: 20% Not Useful: 2%

CONCLUSIONS: There was fair to poor inter-rater reliability and agreement between SP and student assessments of professionalism attributes, except establishment of confidentiality. A dichotomy exists between SPs’ and medical students’ perceptions. Immediate feedback by SPs can play a key role in improving trainees’ awareness, which our students found very useful. SP feedback may prove an invaluable educational tool in the upcoming era of AHRQ national benchmarks for patients’ experiences with health care.

22 Evaluating and Implementing a Residency Training Program on Breaking Bad News
Anthony Orsini, Patricia Eaton, Maryann LoFrumento.
Neonatology, Mid-Atlantic Neonatology Associates, Morristown, NJ; General Pediatrics, Goryeb Children’s Hospital at Atlantic Health System, Morristown, NJ.

BACKGROUND: One of the greatest challenges for healthcare professionals is learning how to effectively and compassionately communicate emotionally and medically devastating information. Although communicating or “breaking bad news” (BBN) to patients is ubiquitous for medical professionals, less than 10% of clinicians report having received formal training in BBN. Typically, medical residents (Res) indirectly acquire BBN skills via observation of senior faculty and/or didactic lectures, educational methods which can leave Res inadequately prepared, apprehensive and anxious when they directly provide BBN as attending physicians.

OBJECTIVE: To create and evaluate a BBN program for pediatric Res which provides education on how to effectively and compassionately communicate emotionally and medically devastating information to parents of an ill child.

DESIGN/METHODS: Res at a single institution (n=34) were randomly assigned into 4 study groups. Each group experienced a learner-centered BBN program utilizing an institutional multidisciplinary team which consisted of improvisational role-play (RP) sessions with professional actors, followed by either an individualized video-based review session or five hours of didactic lectures, and concluded with a second RP experience and a self-assessment. All RP sessions were reviewed and scored by a panel of BBN physicians. BBN physicians RP scores, actor RP scores, and Res self-assessments were analyzed for changes pre and post-BBN interaction.

RESULTS: Res RP scores improved after BBN education (p<0.05). Residents who initially indicated they were uncomfortable with BBN showed the greatest improvement and had the best overall scores in the second RP. In contrast, residents who were comfortable with BBN only marginally improved after involvement in the BBN program. Overall, 82% reported that the BBN

23 House Officer Impact of a Novel Training Curriculum for Pediatric Residents in the Prevention of Intimate Partner Violence among Adolescents
Anil Kumar Swayampakula, Cynthia Lewis, Alexandra Smith, Christina Alex, Richard Neugebauer, Ayaoade Adeniyi, Stefan Hagmann, Ram Kairam.
Pediatrics, Bronx-Lebanon Hospital Center, Bronx, NY; Columbia University, Bronx, NY.

BACKGROUND: The AAP recommends Intimate Partner Violence (IPV) screening during adolescent office visits, and supports IPV-specific training during residency.

OBJECTIVE: To assess the impact of a novel IPV specific training module on pediatric residents’ IPV relevant knowledge and attitude.

DESIGN/METHODS: A seven-hour IPV training program on IPV relevant screening, educational materials and resources was offered in July/August of 2010, and again in July/August of 2011. Residents completed a pre and post-training survey consisting of 60 questions that were arranged into 12 distinct themes/competencies and mean score was calculated for each. Paired sample t-tests with a p-value set at <0.05 were used to evaluate participants’ change in survey responses before and after the training. After the 2011 training, a convenience sample of caregivers and adolescents were assessed with another questionnaire focusing on IPV and provider interview.

RESULTS: Of 36 residents trained and surveyed in 2010 (PGY-1, 2 and 3), 18 (50%) received a second training module in 2011. Baseline survey showed that 60% of the residents lacked prior IPV-specific training, and 50% were unaware of relevant community resources. Mean values for 12 out of the 14 IPV-relevant themes improved significantly after the initial training module.

<table>
<thead>
<tr>
<th>Theme/Competency</th>
<th>Mean Scores Before</th>
<th>Mean Scores After</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim Identification</td>
<td>8.00</td>
<td>9.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Health Care Role</td>
<td>5.50</td>
<td>6.66</td>
<td>0.00</td>
</tr>
<tr>
<td>Screening</td>
<td>5.50</td>
<td>7.50</td>
<td>0.001</td>
</tr>
<tr>
<td>Workup</td>
<td>1.00</td>
<td>2.24</td>
<td>0.000</td>
</tr>
<tr>
<td>Too Busy/Can’t Help</td>
<td>3.00</td>
<td>3.50</td>
<td>0.004</td>
</tr>
<tr>
<td>Limitations</td>
<td>7.80</td>
<td>8.27</td>
<td>0.003</td>
</tr>
<tr>
<td>Legal Requirements</td>
<td>9.00</td>
<td>11.80</td>
<td>0.000</td>
</tr>
<tr>
<td>Don’t Need Training</td>
<td>9.00</td>
<td>10.16</td>
<td>0.024</td>
</tr>
<tr>
<td>Victims Understanding</td>
<td>7.00</td>
<td>12.20</td>
<td>0.016</td>
</tr>
<tr>
<td>Identify and Document</td>
<td>10.86</td>
<td>12.14</td>
<td>0.002</td>
</tr>
<tr>
<td>Fetal Autonomy</td>
<td>10.93</td>
<td>12.13</td>
<td>0.004</td>
</tr>
<tr>
<td>Fetal Preparation</td>
<td>9.57</td>
<td>12.97</td>
<td>0.000</td>
</tr>
<tr>
<td>Relationship of Alcohol and Drugs</td>
<td>11.83</td>
<td>12.07</td>
<td>0.482</td>
</tr>
</tbody>
</table>

In response to the 2nd training module, further improvement was noted in these themes/competencies. Among studied teenagers (n=113), 86% indicated that they would ask for help if they were victims of IPV, while 80% of the caregivers (n=110) would discuss “healthy relations” with their teenagers.

CONCLUSIONS: This IPV-specific training module for residents improved significantly their competencies. IPV-specific training may need to be incorporated into the residency residency-training curriculum.

24 Giving Bad News: Pediatric Resident Opinions Regarding Communication Skills
Gail S. Cameron, Alexander Agthe, Pamela Donohue, Brenda Hussey-Gardner, Alison J. Falek.
Pediatrics, University of Maryland, Baltimore, MD; Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD.

BACKGROUND: Giving bad news is a challenging task that requires effective communication skills which should be developed during pediatric residency. The ACCME identifies interpersonal and communication skills as a core competency. Methods described to teach and assess this competency include observation, role modeling and didactic teaching. However, the educational experience of pediatric trainees varies.

OBJECTIVE: To examine pediatric resident opinions regarding the importance of developing proficiency disclosing bad news, and explore resident confidence with skills used when giving bad news.

DESIGN/METHODS: During 2011-12, pediatric residents at University of Maryland Medical Center completed the Pediatric Housestaff Communication Skills Survey (Rider et al.). This 5-point Likert scale survey explores the importance of developing skill and confidence with effective parent communication. Five questions were highlighted, which focus on effective communication when giving bad news. Data was analyzed to identify trends based on POY.
RESULTS: 35/42 residents participated (PGY1=14, PGY2=11, PGY3=10). 98% expressed high or very high importance of developing effective communication skills, but 49% felt rather or very confident with their ability. All felt it was highly or very highly important to develop skills necessary when giving bad news, but 11% were rather or very confident. 98% expressed high or very high importance of developing skills to discuss end of life issues, but none felt rather or very confident with their ability. 98% reported high or very high importance of building rapport with parents, but 65% felt rather or very confident. 94% reported high or very high importance of showing empathy, and 80% felt rather or very confident with these affective skills. Only 13% of those who were confident showing empathy felt rather or very confident disclosing bad news and none felt rather or very confident discussing end of life issues. Confidence was not affected by PGY. CONCLUSIONS: Pediatric residents value the development of advanced communication skills necessary to disclose bad news. However, residents express a lack of confidence in giving bad news, which is not affected by PGY. Exposure of residents to a communication skills curriculum specifically targeted at giving bad news and discussing end of life issues may improve resident confidence. Funded by Mead Johnson Nutritional's Training Grant.

OBJECTIVE: To objectively evaluate the effectiveness of a formal handoff curriculum. DESIGN/METHODS: Senior residents were asked to complete a structured evaluation while observing evening intern sign-outs of their inpatient pediatrics teams. The itemized questionnaire assessed three aspects of handoff: (1) whether key elements of clinical information were conveyed; (2) accuracy of the information being transferred; (3) whether the intervention was beneficial. Each patient was a specific data point (pre-intervention n=33, post-intervention n=44). The intervention was a formal lecture with audience participation given during a noon conference during which the majority of residents were present. Data collection occurred over 4 weeks, with intervention occurring halfway through. The data were then analyzed using SAS statistical software.

RESULTS: Chi-square analysis demonstrated that post-intervention, there was statistically significant increase in reporting of patient's age (p<0.05), past medical history (p<0.05), relevant diagnostic results (p<0.05), treatments(p<0.05) consults (p<0.05), and diagnoses (p<0.05). There was no statistically significant change in the post-intervention group with regard to opportunity for questions, identifying ill patients, contingency planning, or providing information.

CONCLUSIONS: A formalized handoff curriculum for pediatric residents is associated with a statistically significant improvement in certain aspects of handoff, such as reporting of certain demographic data. However, it was not associated with other aspects such as contingency planning. The tool itself demonstrated content validity and face validity owing to the introduction of an unbiased observer who was able to identify the presence or absence of certain components of the handoff.

Poster Session 1
Neonatology - General

Friday, March 22, 2013
6:00pm–7:30pm

26
Fellow in Training
Histologic Chorioamnionitis and Severe Intraventricular Hemorrhage in Very Low Birthweight Infants
Jennifer L. Maher, Robert Locke, Amy Mackley, David A. Paul.
Neonatology, Children's Hospital of Wisconsin, Milwaukee, WI.

BACKGROUND: Severe intraventricular hemorrhage (IVH) is an early indicator for adverse neurodevelopmental outcomes. Past studies have shown conflicting results when trying to determine if there is an association between chorioamnionitis, fetal infection, and severe IVH. These studies have been limited by small sample size, and the inclusion of grades I and II IVH. OBJECTIVE: To determine if there is an association between histologic chorioamnionitis, fetal inflammation, and severe IVH.

METHODS: Data were retrospectively obtained from singleton, inborn infants < 1500 grams at Children's Hospital of Wisconsin from July 2002 through July 2011. IVH was diagnosed by head ultrasound in the 1st week of life and severe IVH was classified as grade III-IV. Histologic chorioamnionitis and funisitis were diagnosed by placental pathology. To further evaluate early inflammatory response from histologic chorioamnionitis, CBCs from the first 48 hours of life were evaluated for leukocytosis, defined as a WBC ≥ 30,000/ml. Statistical analysis included ANOVA, Chi-Square and logistic regression.

RESULTS: The study sample included 1003 infants of which nine percent (n=93) were diagnosed with severe IVH. Infants found to have severe IVH were of lower gestational age (25.2 ± 2.1 vs 28.2 ± 2.8 weeks; p<0.001), had less preeclampsia (12% vs 38%; p<0.001), and fewer received antenatal steroids (61% vs 76%; p=0.005) compared to those without severe IVH. On unadjusted analysis, histologic chorioamnionitis and funisitis were associated with increased odds of severe IVH.

<table>
<thead>
<tr>
<th>Histologic Chorioamnionitis (n=458)</th>
<th>Severe IVH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted OR (95% CI)</td>
<td></td>
</tr>
<tr>
<td>2.9 (1.8-4.5)</td>
<td>1.1 (0.6-2.9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Funisitis (n=226)</th>
<th>Severe IVH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted OR (95% CI)</td>
<td></td>
</tr>
<tr>
<td>1.8 (1.1-2.9)</td>
<td>0.84 (0.5-1.4)</td>
</tr>
</tbody>
</table>

Histologic Chorioamnionitis with Leukocytosis (n=78)

0.73 (0.34-1.6) 0.44 (0.2-1.1)

After adjusting for gestational age, preeclampsia, antenatal steroids, C-section delivery, and race, neither histologic chorioamnionitis nor funisitis were associated with severe IVH. There was no association between leukocytosis and severe IVH on adjusted and unadjusted analysis.

CONCLUSIONS: In our large sample of VLBW infants, there was no evidence of a relationship between histologic chorioamnionitis, funisitis, or leukocytosis increased the odds of severe IVH. Our data suggest that histologic chorioamnionitis and perinatal inflammation, as measured by funisitis and leukocytosis, do not have a major role in the pathophysiology of severe IVH.

27
Fellow in Training
Interindividually Expression of BCRP/ABCG2 Efflux Transporter mRNA in Term Human Placentas
Naureen Memon, Kristin M. Bircsak, Faith Archer, Barry Weinberger, Anna Vetrano, Lauren M. Alexsunes.
Department of Pediatrics, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ; Department of Pharmacology, Rutgers University, Piscataway, NJ.

BACKGROUND: Breast cancer resistance protein (BCRP) is an ATP-binding cassette transporter that is expressed in placental syncytiotrophoblasts and plays a crucial role in extruding a wide range of substances, thereby protecting the fetus from chemical exposure. A number of drugs, including antiretrovirals, antitumor, and glyburide, are commonly administered to pregnant women and BCRP has been suggested to limit fetal accumulation of these drugs as part of the placental barrier. Polymorphisms in the gene encoding BCRP have been described and are associated with interindividual variation in BCRP expression and transporter activity in a variety of tissues. These findings suggest that there may be differences in fetal drug exposure due to variation of BCRP expression between placentas.

OBJECTIVE: The purpose of this pilot study was to evaluate the variability of BCRP mRNA expression in healthy, term placentas.

METHODS: Ten full-term placentas were collected after elective caesarean sections from healthy mothers with uncomplicated pregnancies. Subject-specific information (including maternal age, gestational age, and parental ethnicity) was obtained prior to the delivery. Regionally-defined tissue samples (medial, intermediate, and peripheral) were collected from each placenta. Each sample was analyzed for the expression of BCRP mRNA by quantitative real-time polymerase chain reaction (qPCR). BCRP expression was normalized to the expression of housekeeping genes. To investigate intraplacental variation, regional samples were normalized to median BCRP mRNA levels.

RESULTS: Individuals from diverse ethnic backgrounds were recruited for this study. A five-fold difference in BCRP mRNA expression was noted between the lowest and highest expressing placenta. Intraplacental variability in BCRP mRNA expression was less than nine percent and this was statistically insignificant (p=0.615). Histology confirmed that samples were comprised mainly of villous tissue.

CONCLUSIONS: There is notable interindividual variation in the expression of placental BCRP mRNA. Since BCRP protects the fetus against the accumulation of its substrates, certain individuals, due to genetic polymorphisms, may be at an increased risk for fetal exposure to BCRP-transported drugs prescribed during pregnancy (Supported by E02050522 and E060052).

28
House Officer
Are Routine Cord IgM and Urine CMV Cultures Warranted in the Initial Evaluation of Small-for-Gestational Age Neonates?
Samuel Ajayi, Teena Sebastian, Ramesh Matam, David Schatzman, Allan Arber.
Einstein Medical Center, Philadelphia, PA; Children's National Hospital, Washington, DC; Reading Hospital Medical Center, Reading, PA.

BACKGROUND: Cytomegalovirus (CMV) is the commonest perinatal viral infection in developed countries. It has a wide variety of clinical presentations and results in many sequelae including birth defect for gestational age (SGA). Routine evaluation for SGA babies often includes serum cord IgM and urine culture for CMV. With newer drugs to treat CMV available, determining the efficacy of using birth weight (BW) to screen for congenital CMV is important. However, other maternal, placental and fetal factors play a significant role in the etiology of SGA births. We therefore examined the relevance of routine CMV screening in the evaluation of SGA neonates. METHODOLOGY: 1. To assess the yield of cord IgM and urine CMV culture for identifying congenital infection in SGA neonates; 2. To determine the effect of common maternal risk factors on birth weight.

METHODS: We conducted a retrospective chart review of consecutive SGA babies admitted to the NICU between Jan 2005 and Jul 2011 in an urban hospital serving an inner city community. Neonates with a BW below the 10th percentile for gestational age and/or neonates presenting with signs and symptoms of congenital infections were included. We also collected data on maternal risk factors for SGA. RESULTS: 122 SGA neonates were admitted to the NICU during the study period. Male-to-female ratio was 1:1. Mean BW was 1577g (SD 571g). About 50% of the mothers were ≥24 years; and 65% were African Americans. 83% of the mothers had at least 1 prenatal visit. Preterm delivery (< 37 weeks) comprised 71% of all the SGA babies. Urine culture for CMV was sent for 94 babies and only 1 was positive. Four of the 50 cord/serum samples sent for IgM were positive (≥20mg/dl). Sixty four had cranial ultrasound; none showed intracranial calcifications. Regression analysis
CONCLUSIONS: The yield of newborns with congenital CMV obtained by screening SGA infants is very low. The use of routine cord/serum IgM and urine culture in SGA babies to screen for CMV may not be warranted. Maternal hypertensive disorders are much more highly correlated with SGA birth than CMV status.

29
Fellow in Training
Hemodynamic and Echocardiographic Variables Influencing SVC Flow in the VLBW Infants
Jagdish Desai, Laya Weichbrod, Riddhiiben Patel, Roger Kim, Sarita Dhuper, Pediatrics, Brookdale University Hospital & Medical Center, Brooklyn, NY; The Carman and Ann Adams Department of Pediatrics, Wayne State University School of Medicine, Children’s Hospital of Michigan, Detroit, MI.

BACKGROUND: SVC flow measured by echocardiography has been shown to correlate well with effective systemic, especially cerebral blood flow and is a more reliable measure than mean arterial blood pressure (MAP) in hemodynamically compromised VLBW infants. However variables affecting SVC flow in these infants with constantly changing hemodynamics are still unknown.

OBJECTIVE: To study the associations of SVC flow with age, gestational age (GA), weight, hemodynamic and echocardiographic variables in VLBW infants in the first two weeks of life.

DESIGN/METHODS: Prospective, observational cohort study. SVC flow was obtained by a previously validated method (Kluckow et al., 2000) when echocardiography was performed in VLBW infants < 1500 Gms according to the unit PDA protocol. Data for 2011-2012 is reported.

RESULTS: Total of 50 echocardiograms from 31 babies are included. Mean age and weight at echocardiogram were 6.6±0.7 days and 1107±43.4 grams respectively. Mean GA was 29.15±0.43 weeks. There was a significant positive correlation between SVC flow and age in days (r=0.33, p=0.01) and negative correlations with serum pBNP levels (n=19) (r=−0.44, p=0.043) and left ventricular end diastolic diameter (r=0.30, p=0.03) within 72 hours of life. Left ventricular mass and shortening fractions were positively correlated with SVC flow but were not statistically significant. There was a positive correlation of SVC flow and MAP for all patients (r=0.40, p=0.004) but this association was not significant in patients without inotropes. Patients with a large PDA had lower SVC flow compared to those with no PDA but was not statistically significant. Weight at echocardiography was negatively correlated with SVC flow (r=−0.40, p=0.016). Infants on Dopamine had significantly lower SVC flow compared to those on Dobutamine at the time of the study (100.48±43.92 vs. 144.53±27.12, p=0.012). There was no correlation with HR or Base Excess in this cohort. There were 2 babies who developed late onset of IHI under low SVC flow (<40 ml/kg/min) and normal MAPs at less than 24 hours of life.

CONCLUSIONS: SVC flow estimates systemic blood flow but is influenced by the age, weight, left ventricular function and filling, and use of inotropes. Dobutamine is associated with higher SVC flow in these compromised infants compared to Dopamine. Functional echocardiography including SVC flow is a useful tool to assess the changing hemodynamic interactions in VLBW infants.

30
Concurrent Administration of Apoptotic Inhibitors and Hypothermia Attenuates Further Hypoxic Cerebral Injury in Newborn Piglets
Shadi Malach, Endla Anday, Anli Zhu, Maria Deliorvia-Papadopoulos, Department of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: Hypothermia (HT) is used to treat infants with hypoxic ischeamic encephalopathy but neurologic outcome of survivors remains guarded. We have previously shown that hypoxic (Hx) cerebral injury is associated with decreased Na+,K+-ATPase activity, an index of neuronal cell membrane integrity, and increased expression of proapoptotic pathways mediators SIRT6, Nrf2, and caspase-9 in the newborn piglet brain. Selective inhibitors for Src kinase (PP2) and caspase-9 (LEHD-fmk) reduced hypoxic cerebral injury.

OBJECTIVE: The present study tests the hypothesis that concurrent hypothermia and administration of inhibitors of Src kinase or caspase-9 after hypoxia is associated with added neuroprotection compared to hypothermia alone.

DESIGN/METHODS: Newborn piglets were exposed to hypoxia (FiO₂ 0.07 for 1 hr) then returned to FiO₂ 0.21±0.37. They received either saline (n=2), PP2 (1 mg/kg iv; n=4), or LEHD-fmk (1 mg/kg iv; n=2) immediately after hypoxia and then were cooled to 33°C for 4 hrs. Na+,K+-ATPase activity in cell membranes of the cerebral cortex was measured spectrophotometrically as an index of neuronal cell membrane integrity.

RESULTS: Na+,K+-ATPase activity was 23% higher 4 hours after hypoxia in hypoxic piglets receiving caspase-9 inhibitor compared to saline (80.16±2.8 vs 65.5±1.0, p=0.06; NS vs ANOVA and Bonferroni i-test; p=0.05). We noted a trend towards higher Na+,K+-ATPase activity with hypothermia and Src kinase inhibitor compared to hypothermia alone (71.6±5.1 vs 65.5±0.6; NS vs Fig.1).

CONCLUSIONS: We conclude that concurrent administration of caspase 9 inhibitor (LEHD-fmk) with hypothermia is associated with improved neuronal cell membrane integrity compared to hypothermia alone after hypoxia. We propose that caspase 9 inhibition further decreases neuronal cell death and preserves cell membrane integrity in the newborn piglet brain. We suggest that concurrent treatment with anti-apoptotic agents augments neuroprotection by hypothermia. (NHI-HD20337).

31
Assessing the Cardioprotective Properties of Controlled Hypothermia in Neonates with Moderate to Severe Hypoxic Ischemic Encephalopathy Utilizing Cardiac Troponin I
Ogechukwu R. Menkiti, Jennifer P. Alexander, Jenni Wallace, Nicholas Obiri, St. Christopher’s Hospital of Children, Philadelphia, PA; Pediatrics, Drexel University College of Medicine, Philadelphia, PA.

BACKGROUND: Myocardial injury is a common sequel of perinatal asphyxia, but little is known about the effects of hypothermia on the heart. Cardiac troponin I (cTnl) is a good biomarker in diagnosing acute myocardial infarction in adults but limited data exists for neonates.

OBJECTIVE: This study aims to test the hypothesis that hypothermia achieves cardioprotection in infants with moderate to severe Hypoxic-ischemic encephalopathy (HIE) utilizing concentrations and trends of serum cTnl. We further hypothesize that cTnl has predictive value in assessing cardiac injury.

DESIGN/METHODS: Retrospective review of cTnl concentrations in neonates admitted to our institution with moderate to severe HIE from June 2009- August 2012. We compared concentrations and trends of cTnl to clinical or echocardiography evidence of cardiac dysfunction.

RESULTS: Forty neonates were admitted with median GA: 38 wk; birth weight 3049g and 5 min Apgar score:3. Median cTnl values (ng/ml) are shown in the table.

All infants demonstrated elevated cTnl post-HI injury with subsequent decline during controlled hypothermia (lowest at 72h) suggestive of cardioprotection. cTnl levels increased in all infants following re-warming (96h to 120h) with infants treated with inotrope experiencing less increase compared to no inotrope treatment. Infants with ECHO evidence of cardiac dysfunction had minimal cTnl decline during hypothermia and a rapid rebound following re-warming.

CONCLUSIONS: Therapeutic hypothermia in setting of neonatal HIE achieves cardioprotection that is transiently followed by re-warming as evidenced by the trends in cTnl levels. We deduce that cardioprotection from hypothermia is attenuated earlier in infants with prior inotropic support compared to infants without inotropic support.

32
Jonathan Blau, Edmund F. La Gamma, Pediatrics, Staten Island University Hospital, Staten Island, NY; Pediatrics, New York Medical College, Valhalla, NY.

BACKGROUND: TRAGI is documented in multiple reports where proposed etiologic factors include: extreme prematurity, permissive anemia, feeding during transfusion, disrupted angiogenesis, blood storage lesions & dysfunctional immunologic barrier defense (reviewed in Sem Perinatal 36(4):294, 2012). All reports are retrospective & limited by small numbers of affected neonates at one center. Two consecutive Users’ Groups met at both the 2011 and 2012 PAS meetings. They concluded that a multicenter database was needed to better characterize TRAGI & to help foster a clinical trial targeted at prevention; the group will reconvene at PAS 2013.

OBJECTIVE: To develop an online database: i) to capture data from a diverse group of institutions with different clinical practices to help identify common features of TRAGI & ii) to identify clinicians interested in a future multicenter trial.

DESIGN/METHODS: We asked neonatologists to submit cases they encountered. TRAGI is of interest to clinicians at the following institutions: CHLA, UCSF, Emory, UCLA, UTMB, and the University of Michigan. TRAGI is defined as the development of NEC Stage Ib <48h after a PRBC transfusion.
RESULTS: TRAGI cases reported on www.tragiregistry.com

TRAGI N=24

<table>
<thead>
<tr>
<th>Mean SEM (Median, Minimum-Maximum)</th>
<th>TRAGI N=24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (grams)</td>
<td>934 ± 70 (904, 590-2200)</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>27 ± 1 (27, 24-35)</td>
</tr>
<tr>
<td>Age at onset of NEC (days)</td>
<td>32 ± 3 (29, 9-72)</td>
</tr>
<tr>
<td>Postconceptual age at onset of NEC (weeks)</td>
<td>32 ± 1 (31, 26-38)</td>
</tr>
<tr>
<td>Full feeds at onset of NEC</td>
<td>88%</td>
</tr>
<tr>
<td>Hematocrit before NEC</td>
<td>26 ± 1 (26, 20-36)</td>
</tr>
<tr>
<td>Males N/G for transfusion</td>
<td>17%</td>
</tr>
<tr>
<td>Hrs after PRBCs to 1st signs of NEC</td>
<td>33 ± 1 (38, 3-48)</td>
</tr>
<tr>
<td>Majority of feeds EBM prior to onset of NEC</td>
<td>35%</td>
</tr>
</tbody>
</table>

Since the registry’s debut in Oct 2011, HIPAA-compliant, de-identified demographic & clinical data was collected from TRAGI patients from 10 institutions. As we and others previously reported, TRAGI cases were generally characterized by prematurity, significant anemia, & a curious centering of disease around 32 wks PCA. The role of EBM and NPO status during transfusion did not appear related to the pathogenesis of TRAGI. Clinicians had no difficulty in using the registry.

CONCLUSIONS: This online database has allowed clinicians using different clinical strategies to compare their experiences which continue to show consistency in case presentation. We speculate that 1) the consistent pattern of affected cases will contribute to formation of hypotheses & 2) clinicians are willing to self-identify as participants in a future, prospective, multicenter trial of disease prevention.

33

Fellow in Training

Getting to Zero: Development of a NEC QI Initiative To Decrease Progression in NEC Severity

Jenny R. Fox, Tanzuddin A. Mohammed, Russell R. Moores, Jr., Archana Javaram, Sharon A. Cone, Karen D. Hendricks-Munoz, Pediatrics, Division of Neonatal Medicine, Children’s Hospital of Richmond at VCU, Richmond, VA.

BACKGROUND: Clinical symptoms and signs of Necrotizing Enterocolitis (NEC) are non-specific and disease progression is associated with significant morbidity and mortality. OBJECTIVE: Staff education using an alert system of unhealthy intestinal function that will specific and disease progression is associated with significant morbidity and mortality. Hospital of Richmond at VCU, Richmond, VA.

DESIGN/METHODS: Education of staff in importance of change in baseline physiology, gut impact on progression to severe NEC.

OBJECTIVE: Staff education using an alert system of unhealthy intestinal function that will decrease progression in NEC severity.

CONCLUSIONS: These findings support the use of a multifaceted approach and early warning score tool that will reduce the incidence of severe NEC.

Acknowledgements: Gail Barker RN, JACKS Summer Scholars Fund and JACKS Summer Scholars Brian Wentworth and Melissa Haslam.

34

Fellow in Training

Does Vitamin D Deficiency at Birth Affect the Risk and or Severity of Bronchopulmonary Dysplasia (BPD) among VLBW Infants

Sreenivas Karnati, Subhash Puthuraya, Marwan, Zidan, Nittin Chouthai, S. Nadya J. Kazzi.

Pediatrics, Wayne State University/Children’s Hospital of Michigan, Detroit, MI.

BACKGROUND: Animal studies have highlighted a crucial role for vitamin D regulation of lung growth and alveolar cell differentiation. Vitamin D is a mediator of epithelial mesenchymal cell interaction. In vitro studies demonstrated a role for vitamin D in synthesis and release of surfactant. Mice deficient in vitamin D had smaller lung volume and reduced number of alveoli compared to mice replete with vitamin D. Similarly, vitamin D was shown to play an important role in promoting alveolar type II cell proliferation, reducing apoptosis, and increasing alveolar count among rat pups who received postnatal supplements of vitamin D.

OBJECTIVE: To examine the effect of vitamin D deficiency on risk and severity of BPD in a cohort of VLBWI.

DESIGN/METHODS: VLBWI (BW ≤1250g) who had respiratory distress in the first 24 hrs of life were included. Serum levels of total 25 OH vitamin D were determined at birth and 21 days with HPLC tandem mass spectrometry method. Jobe and Bancalari’s definition of BPD was used. Infants were divided into 2 groups based on presence (BPD+) or absence (BPD-) of BPD. All infants received daily IV vitamin D supplementation through parenteral nutrition. Vitamin D sufficiency was defined as >30 ng/ml, insufficiency as 10-30 ng/ml and deficiency as <10 ng/ml.

RESULTS: Thirty one infants were included; 7 infants died prior to 36 wks PMA. Mean ± (SD) vitamin D levels increased significantly from day 1 (n=31) to 21 d of life (n=26) (15.90 ±7.43 ng/ml vs 40.54 ±21.64 ng/ml, p<0.000). At 21 days, 65% of infants (17/26) were vitamin D sufficient. Twelve infants developed BPD: 4 had mild BPD, 7 moderate BPD and 1 severe BPD. Infants in BPD + group (n=12) had similar BW but lower gestational age compared to infants in BPD - group (n=12), [mean ± (SD) 941.58 ±15.55 gm vs 854.58±31.25 gm, p=0.379 and 26±2 weeks vs 28±2 weeks, p=0.001, respectively]. Mean ± (SD) levels of vitamin D on day 1 were comparable among infants without BPD (12.42 ± 7.12 ng/ml vs 16.83 ±8.13 ng/ml, p=0.388). Similarly, vitamin D levels on day 21 were similar between infants groups (mean±SD: 37.92±16.98 ng/ml vs 39.23±5.56ng/ml, p=0.900). Logistic regression analysis failed to reveal an association between vitamin D levels on day 1 and risk and or severity of BPD (OR=0.228).

CONCLUSIONS: There was no association between levels of vitamin D at birth and risk and severity of BPD in this cohort.

35

House Officer

Long Term Effect of Hypoxia on the Eya3 (Eyes Absent Homolog 3) Protein Expression in the Cerebral Cortex of Newborn Piglets

Margaret Nguyen, Angelica Penninti, Anli Zhu, Maria Delivoria-Papadopoulos, Dept. of Pediatrics, Drexel University College of Medicine, Philadelphia, PA.

BACKGROUND: EYA3 Tyrosine phosphatase specifically dephosphorylates Tyr1152 of histone H2AX (H2AXY1152p). Tyr14 phosphorylation of histone H2AX plays a central role in DNA repair and acts as a mark that distinguishes between apoptotic and repair responses to genotoxic stress. Loss of Eya activity results in increased apoptotic cell death. Src kinase is linked to cell proliferation and differentiation. Previously we have shown that hypoxia results in increased activation of Src kinase in the cortex of newborn piglets. OBJECTIVE: The present study aims to investigate the longitudinal effect of inhibiting the hypoxia-induced increased expression of Eya3 protein and tests the hypothesis that administration of a selective inhibitor of Src kinase, prior to hypoxia, will attenuate the hypoxia-induced expression of Eya3.

DESIGN/METHODS: Piglets were divided into 6 groups: normoxia (Nx, n=3), acute hypoxia (Hx, n=3), hypoxia followed by 1 day (Hx+PP2-1D, n=3) and 14 days (Hx+PP2-14D, n=3) in FiO2 0.21, hypoxia-pretreated with selective Src kinase inhibitor (PP2, 1mg/kg i.v. 30 min prior to hypoxia) followed by 1 day (Hx+PP2-1D, n=3) and 14 days (Hx+PP2-14D, n=3) in FiO2 0.21. Nuclear were isolated and expression of Eya3 was determined by Western blot using Eya3 antibodies. Band density was expressed as absorbance (OD/mm²).

RESULTS: The expression of Eya3 was 108.9±10 in normoxia and 213.48±12 in hypoxia (p <0.05). During recovery, expression of Eya3 was 253.5±39 in Hx+PP2-1D, 278.4±2 in Hx+PP2-14D (p <0.05 vs Hx). The data show that following 1 day and 14 day after hypoxia, expression of Eya3 attenuated by the administration of Src kinase inhibitor.

CONCLUSIONS: Src kinase mediated expression of Eya3 following hypoxia persists for 1 day and 14 days in the Hx group, however, the hypoxia-induced increased expression in Eya3 was prevented by Src kinase inhibition on day 1 to day 14 in the hypoxia-pretreated with the Src kinase inhibitor group. Increased expression of Eya3 by dephosphorylation Tyr14 on histone protein H2AX will facilitate binding of DNA repair factors and increase the potential for DNA repair in the hypoxic newborn brain. (NIH-HD-20337).
Is Pulse Oximetry (SpO2) Screening for Critical Congenital Heart Disease (CCHD) Applicable among Low Birth Weight (LBW) Infants in a NICU Setting?

Devaraj Sambamohank, Peter Beshay, Satyan Lakshminrusima, Vivien Carion.

Pediatrics, The Women and Childrens Hospital at Buffalo, Buffalo, NY.

BACKGROUND: Pulse-oximetry screening for CCHD is recommended by AAP and focuses on screening term neonates in well-baby nurseries. There are no data on SpO2 screening values among LBW infants in a NICU setting.

OBJECTIVE: To assess feasibility and compliance of CCHD screening in a NICU setting and compare SpO2 results between LBW and normal birth weight (NBW=2500g) infants.

DESIGN/METHODS: Routine SpO2 screening for CCHD was implemented in the NICU in March 2012. An analysis of SpO2 screening values was conducted over a 6 month period as a QA project. Patients were screened at the time of discharge and was considered positive if any SpO2 value was < 90% < 95% in both extremities or if there was a >3% absolute difference between right hand and foot.

RESULTS: A total of 358 infants were discharged in the 6 month period. Results were available for 270 babies (75.4%). The completion rate for this newly introduced screening in the NICU was 68% in the first month of introduction and improved to 92% by 6th month. Two infants failed the screening test, but had normal echo (false positive rate of 0.7%). Almost half of LBW infants had an echo performed for clinical indications. LBW infants had lower prediual SpO2 values but similar false positive rate compared to NBW infants.

CONCLUSIONS: Prediual SpO2 range at discharge is lower in LBW infants compared to NBW infants. This QA project did not identify any new cases of CCHD but demonstrated a low false positive rate among LBW infants. Screening compliance improved over a 6 month period with nursing education. A significant number of LBW patients in the NICU are evaluated with an echo for clinical indications. SpO2 screening may be a beneficial tool to screen patients without an echo during their NICU course and needs to be validated in a large cohort of preterm/LBW neonates.

Fellow in Training

Mechanism of Caspase-8 Activation Following Hypoxia in the Newborn Piglet Brain

Tania D. Fontanez-Nieves, Dimitrios Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulou.

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

BACKGROUND: Caspase-8 is a Class I initiator caspase that is activated in the early phase of apoptosis. Caspase-8 can activate downstream caspases that participate in programmed cell death. Previously we have shown that hypoxia results in increased activation of caspase-8 and increased activity of Src kinase in the cerebral cortex of newborn piglets.

OBJECTIVE: We tested the hypothesis that increased activation of caspase-8 in brain following hypoxia is mediated by Src kinase.

DESIGN/METHODS: Piglets were divided into 3 groups: Normoxic (Nx, n=5), Hypoxic (Hx, n=5), and hypoxia+PP2 (Hx+PP2, n=5). PP2 (4-aminophenyl-2H-chromol)-7H-dimethylthiphylazine[3,4-d]pyrimidine) is a selective inhibitor of Src kinase. Hx+PP2 piglets received 1mg/kg i.v. of PP2 30 min prior to hypoxia. Piglets in the Hx and Hx+PP2 group were exposed to hypoxia (FiO2 0.07) for 1 hr. Hypoxia was confirmed by levels of ATP and phosphocreatinine (PCr).

Caspase-8 activity in cytosol was determined spectrofluorometrically. Expression of caspase-8 was assessed by Western blot. The bands were measured by densitometry as optical density (OD/mm²) and expressed as % of a standard Ntx control.

RESULTS: ATP (µmol/g brain) was 5.07±0.72 in Nx, 1.95±1.01 in Hx (p<0.05 vs Nx), and 3.21±0.65 in Hx+PP2 group (p<0.05 vs Nx; p=NS vs Hx). Pcr (µmol/g brain) was 3.45±0.51 in the Ns group, 1.23±0.58 in the Hx group (p=0.05 vs Nx), and 1.91±0.62 in the Hx+PP2 group (p=0.05 vs Nx; p=NS vs Hx). Caspase-8 activity (µmol/mg protein/hr) was 1.84±0.73 in the Nx group, 3.39±0.46 in the hypoxic group (p<0.05 vs Nx), and 2.05±0.45 in the Hx+PP2 group (p=NS vs Nx). Caspase-8 expression % of control was 113±16 in Nx, 189±8 in Hx (n=2) (p=0.05 vs Nx), and 109±20 in the Hx+PP2 group (p=0.05 vs Hx; p=NS vs Nx). The data show that caspase-8 activity and expression are significantly decreased after hypoxia in the presence of the Src kinase inhibitor, PP2.

CONCLUSIONS: We conclude that the hypoxia-induced increased activation of caspase-8 in the cerebral cortex after hypoxia is mediated by Src kinase. Src kinase inhibition, by preventing CaM kinase IV activation and CREB phosphorylation, potentially decreases caspase-8 expression. In addition to blocking caspase-9 mediated caspase-3 activation, Src kinase inhibition, can prevent caspase-3 mediated activation of caspase-8. Thus, Src kinase inhibition presents a multimodal strategy for neuroprotection following hypoxia.

Fellow in Training

Postnatal Growth in Infants with Neonatal Abstinence Syndrome

Jennifer Hasler, Janet Larson.

Department of Neonatology, Nemours/Thomas Jefferson University Hospital, Philadelphia, PA.

BACKGROUND: While methadone is the treatment of choice for management of opioid dependence in pregnant women, methadone maintenance during pregnancy is associated with adverse infant outcomes such as preterm birth and low birth weight. Few studies have examined the effects of methadone and illicit substances on the post-natal growth of these infants.

OBJECTIVE: To examine the growth patterns in infants hospitalized for Neonatal Abstinence Syndrome (NAS).

DESIGN/METHODS: Retrospective analysis was performed of hospitalized infants over a four year period. The study included newborns exposed to either methadone or illicit substances in utero and who required treatment for NAS with Neonatal Morphine Solution. All infants were hospitalized for their care at Thomas Jefferson University Hospital (TUH) for the duration of their treatment. Prenatal drug and medication use, duration of infant treatment and infant growth parameters until time of discharge were examined. Birth weight was analyzed in a multiple linear regression model. Postnatal weight (repeated measures per infant at 0, 7, 14, 30, 45, and 60 days) was analyzed in a linear mixed effects model.

RESULTS: There were 214 infants included over a time period of January 1, 2007 to December 31, 2010. Prenatally, 90% of mothers were on methadone, 14% of mothers used heroin, 15% cocaine, 9% marijuana, 24% benzodiazepines, and 43% were smokers. Infant birth weight was significantly affected by prenatal smoking (p<0.010) and heroin use (p<0.004) in the mothers. Postnatal weight gain was significantly affected in infants whose mothers had used benzodiazepines during pregnancy. This difference decreased during the hospital stay (p=0.001). While infants exposed to prenatal heroin showed poorer weight gain during the early part of their hospitalization, this difference decreased during the course of their stay. An initial significant difference in weight gain between infants treated and not treated with phenobarbital (an adjunct to neonatal morphine solution) decreased to zero (p<0.001) from day 0 to day 60.

CONCLUSIONS: Infants with NAS are at increased risk of low birth weight and poor weight gain in the postnatal period, particularly when maternal methadone use is combined with benzodiazepines, heroin, and smoking. While the rate of postnatal weight gain can recover with some substances, the use of prenatal benzodiazepines may put the infant at higher risk for poor weight gain during the first few months of life. Close follow up is warranted in this high risk population.

Fellow in Training

Long Term Effect of Src Kinase Inhibition on Caspase-1 Activity Following Hypoxia in the Cerebral Cortex of Newborn Piglets

Dimitrios Angelis, Tania D. Fontanez-Nieves, Qazi M. Ashraf, Maria Delivoria-Papadopoulou.

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

BACKGROUND: It has been shown previously that hypoxia results in increased activation of caspase-8 and increased activity of Src kinase in the cerebral cortex of newborn piglets.

OBJECTIVE: To examine the growth patterns in infants hospitalized for Neonatal Abstinence Syndrome (NAS).

DESIGN/METHODS: Piglets were divided into: Normoxic (Nx, n=5), Hypoxic (Hx, n=5). Hypoxia day 1 (HxD1, n=5), Hypoxia day 14 (HxD14, n=5). Hypoxia pretreated with PP2 (1 µg/ kg, IV 30 min prior to Hx) acute (Hx+PP2, n=5), day 1 (Hx+PP2-D1, n=2), day 14 (Hx+PP2-D14, n=5). Hypoxia piglets were exposed to FiO2 0.07 for 1 hour. Tissue hypoxia was determined by ATP and phosphocreatinine (PCr) levels. Caspase-1 activity in the cytosol was determined by spectrophotometry, using a specific substrate (Ac-Asp-Glu-His-Asp-AMC) for caspase-1.

RESULTS: ATP (µmol/g brain) was 5.05±0.72 in Nx, 1.94±0.55 in Hx (p<0.05 vs Nx), 3.23±0.65 in Hx+PP2 (p<0.05 vs Nx, NS vs Hx) and PCr (µmol/g brain) was 3.44±0.58 in the Nx group, 1.23±0.38 in Hx (p<0.05 vs Nx), 1.90±0.61 in Hx+PP2 (p<0.05 vs Nx, NS vs Hx). Caspase-1 activity (µmol/mg protein/hr) was 0.62±0.05 in the Nx group, 1.23±0.58 in the Hx group (p<0.05 vs Nx, NS vs Hx), 1.22±0.09 (p<0.05 vs Nx, NS vs Hx) in Hx+PP2 group (p=0.05 vs Nx vs Hx), 0.83±0.16 in IV+PP2 (p<0.05 vs Hx, NS vs Hx), 0.96±0.009 in Hx+PP2-D1 (NS vs Hx, NS vs D1), 1.07±0.92 in Hx+PP2-D14 (NS vs Hx). The data show that caspase-1 was attenuated by the administration of Src kinase inhibitor following hypoxia but was not maintained on day 1 and day 14.

CONCLUSIONS: We concluded that hypoxia results in increased activity of caspase-1 in the cytosolic fraction of the cerebral cortex of the newborn piglets and the hypoxia-induced activation of caspase-1 is mediated by Src kinase. Since blockade by Src kinase inhibitor was not effective long term, we propose that multiple doses of the inhibitor will extend the effect of Src kinase inhibition on long term activation of caspase-1. (NIH 20337)

Fellow in Training
The Use of the Laryngeal Mask Airway in the Difficult Neonatal Airway
Ulviyes Mustaki, Helen M. Towers, Rakesh Sahni, Jen-Tien Wung, Royal College of Surgeons in Ireland, Dublin, Ireland; Department of Pediatrics, Division of Neonatology, Columbus University Medical Center, New York, NY.

BACKGROUND: The Laryngeal Mask Airway (LMA) is a non-invasive airway device used to deliver respiratory support. It can be used for the delivery of anesthesia, serve as a conduit for so-called continuous positive airway support and can be used for both resuscitation and maintenance of the newborn airway.

OBJECTIVE: This retrospective study characterizes the use of the LMA in 14 neonates admitted to a tertiary Neonatal Intensive Care Unit during a ten period (2002 to 2011).

DESIGN/METHODS: All infants in whom the LMA was utilized for airway resuscitation or maintenance were included in the study. The study was approved by the IRB. The following parameters were evaluated: Indication for use of the LMA, Use of the LMA as resuscitation or maintenance, median gestational age and birth weight, length of stay, need for intubation or tracheostomy and outcome.

RESULTS: Of the 14 study patients 93% of patients had micrognathia, 43% had Pierre Robin Sequence, 43% had multiple congenital anomalies, 5% had RDS, and 36% presented with skeletal deformities likely to affect respiration. The LMA was used for resuscitation in 37% of the patients, for maintenance of the airway in 42% and both in 21% patients. Median Birth Weight was 2333g (1045-4045), Median Gestational Age was 33 weeks (29-41) and median length of stay was 74 days (21-265). 36% of these patients did not require intubation or tracheostomy. Median Length of use for resuscitation was 2 hours 10 minutes (15 mins - 9 hours). Median use for Maintenance of airway was 5 days (5 hours - 16 days). 86% of patients survived to discharge.

CONCLUSIONS: The use of LMA in infants with difficult airway may delay or avoid more invasive respiratory interventions such as intubation or tracheostomy. It is possible to maintain airway patency and ventilation for long periods of time and in smaller airways. The use of the LMA in the difficult neonatal airway allows tailoring of respiratory support to the individual patient based on their specific ventilation requirement. Because of the small number of patients in this study, further studies are needed to evaluate the efficacy of the use of the LMA in the difficult neonatal airway.
OBJECTIVE: To determine the neurodevelopmental delay significant enough to require therapeutic services of inborn vs. outborn very low birth weight infants (≤500 g, VLBW) and morbidities associated with their developmental delays at 12±2 months (corrected age) (CA).

DESIGN/METHODS: This is a retrospective cohort study of former preterm children who were discharged from Maria Fareri Children’s Hospital NICU (MFCH) and evaluated at the Follow-Up Program at 12±2 m CA between February 2002 and September 2011. Chi square, Fisher’s exact and t-tests were used. A p value <0.05 was considered significant.

RESULTS: Of the 1142 infants evaluated, 517 were VLBW infants. Of these, 375 were discharged from MFCH with 306 inborns and 69 outborns. Mean birth weight was not significantly different (1242±447 g vs. 1128±440 g), but gestational age (GA) was (28±5.2 vs. 27±2.4 w, p<0.01) between the inborns and outborns respectively. The inborn group, qualified for and received significantly less early intervention services (EI, 58%) at one year of age than the outborn group (74%, p<0.02). There was no difference in receipt of EI services between singleton and multiple gestations. However the outborn multiple subgroup had higher rates of requiring EI (92%) than the inborn multiple group (53%). Maternal age, GA, 5 min APgar score, caffeine treatment, infection, necrotizing enterocolitis, postnatal steroids and retinopathy of prematurity were significantly higher in patients who required EI (p<0.05).

CONCLUSIONS: Our data suggest that VLBW outborn infants require more early intervention services than that of inborn babies. These findings support the importance for VLBW infants to be delivered at a tertiary care center for not only better survival but also better long term neurodevelopmental outcomes.

45 House Officer
Perinatal Factors Associated with Increased Length of NICU Stay in Late Preterm Infants
Jessica M. McGovern, Amy B. Mackley, Robert G. Locke, David A. Paul. Pediatrics, AI duPont Hospital for Children, Wilmington, DE; Pediatrics and Neonatology, Christiana Care Health System, Newark, DE; Pediatrics, Jefferson Medical College, Philadelphia, PA.

BACKGROUND: Nearly half a million neonates are born prematurely each year and 70% of these neonates will be considered late preterm, born between 34 – 36 6/7 weeks gestation. Though these newborns are near-term, they require admission to the NICU and some for prolonged periods.

OBJECTIVE: To identify factors associated with increased length of stay (LOS) in the NICU in the late preterm population.

DESIGN/METHODS: Data were retrospectively obtained from infants between 34 – 36 6/7 weeks gestation at Christiana Care Health System, a regional level 3 NICU, from January, 2005 through December, 2009. A prolonged LOS was defined as those infants with a LOS greater than the interquartile range 9 – 13 days). Infants with prolonged LOS (n=398) had a lower gestational age (34±6 ± .8 years vs. 35 ±1 ± .8 wks, p<0.001), lower birthweight (2162 ±467 vs 2448 ± 479grams, p<0.001), and were more likely to be born by cesarean delivery (59% vs 51%, p<0.01) compared to infants without prolonged LOS. There was also an increase in parity (2.4 ± 1.4 vs 2.2 ± 1.3, p<0.003), maternal smoking (22% vs 16%, p=0.004) and maternal drug use (13% vs 8%, p=0.004) in the prolonged LOS group compared to infants without prolonged LOS. After adjusting for gestational age, race, cesarean section, parity, clinical chorioamnionitis, smoking, drug use, antenatal antibiotics, antenatal steroids, and 5 minute Apgar ≤ 3, only gestational age (OR 0.43, 95% CI 0.37-0.51), cesarean section (OR 1.4, 95% CI 1.1-1.8), and maternal drug use (OR 1.6, 95% CI 1.0-2.6) remained independently associated with prolonged LOS.

CONCLUSIONS: In our large sample of late preterm infants, associations were identified between decreased gestational age, cesarean section, and maternal drug use with prolonged LOS. As late preterm infants are frequently admitted to the NICU, our data are useful for counseling parents regarding length of NICU stay and provide a sub-population to target for optimizing LOS.

46 Fellow in Training
Assessment of Perinatal Regionalization: Antenatal Transfer of Mothers between 23 and 32 Weeks Gestation

BACKGROUND: Previous data suggest delivery of premature infants at higher-level hospitals continues to decline over time after peaking in 2004. These results suggest more preterm infants are born in lower level hospitals and regionalization continues to weaken.

13% in 2004, rates declined to 2.3% in 2009. After multivariable regression controlling for socio-demographic factors and medical conditions, the odds of transfer for a 23-32 week patient was 2.27 higher pre-2005 (95% CI 2.17, 2.44). At 23 weeks, we observed decreased odds of transfer (OR 0.76, CI 0.67, 0.86) with no statistical difference among other gestational ages. Many medical conditions were associated with transfer, including preterm labor (OR 2.89, 95% CI 2.12, 3.70) and premature rupture of membranes (OR 2.67, 95% CI 2.69, 6.92), while abortion was associated with lower odds of transfer (OR 0.34, 95% CI 0.26, 0.43). Hispanic mothers had significantly decreased odds of infant transfer as compared to white mothers (OR 0.81, 95% CI 0.76, 0.87).

CONCLUSIONS: Antenatal transfer of mothers between 23 and 32 weeks gestation from lower level hospitals continued to decline over time after peaking in 2004. These results suggest more preterm infants are born in lower level hospitals and regionalization continues to weaken.

47 Fellow in Training
Early Introduction of Solid Foods to Premature Infants and Impact on Feeding Behaviors
Behavioral and Developmental Pediatrics, Cohen Children’s Medical Center of New York, New Hyde Park, NY.

BACKGROUND: AAP recommends introducing solid food to infants at 6 months and premature infants advance when developmentally ready. Studies show preterm infants who start solids early are more likely to have feeding difficulties.

OBJECTIVE: To assess the importance of developmental readiness for solid food in premature infants and its impact on feeding behaviors and parental perception.

DESIGN/METHODS: Parents of premature infants completed the Feeding Behavior Questionnaire (FBQ; DeMaure et al) at NICU follow-up. The FBQ focused on demographics, developmental readiness, feeding avoidance behaviors, duration of feeding, age of solid introduction, and parental perception of infant feeding patterns. Parental perception was measured using the Andrews & Wilhey’s Delighted-Terrible Scale. Data was analyzed using Student’s t-test and chi test.

RESULTS: Of 87 subjects, 41 were “developmentally ready” (DR) – no problems with head/neck control, sitting with support, sucking, swallowing and/or choking. 46 were “not developmentally ready” (NDR). Significant differences were noted in duration of feeding, parental comfort, parental stress and parental perception of child’s eating habits. NDR infants displayed significant food avoidance behaviors.

DR and NDR Premature Infants

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age recommended to start solids by pediatrician</td>
<td>3.81±1.8</td>
<td>0.75</td>
</tr>
<tr>
<td>Duration of feeding &gt; 35 min, n(%)</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td>Parental perception of feeding pattern</td>
<td>0.5(25%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Parental comfort with feeding</td>
<td>4.3(25%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Parental stress with feeding</td>
<td>2.6(25%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Food Avoidance Behavior, n(%)</td>
<td>0.9(10%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Pushing food away</td>
<td>0.93</td>
<td>0.001</td>
</tr>
<tr>
<td>Leaning back</td>
<td>0.53</td>
<td>0.001</td>
</tr>
<tr>
<td>Holding food in mouth</td>
<td>0.96</td>
<td>0.001</td>
</tr>
<tr>
<td>Spitting</td>
<td>0.96</td>
<td>0.001</td>
</tr>
<tr>
<td>Crying</td>
<td>0.96</td>
<td>0.001</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Pediatricians need to assess developmental readiness when considering introduction of solid foods for premature infants.

48 Fellow in Training
Early Introduction of Solid Foods to Premature Infants and Impact on Feeding Behaviors
Jaeh Chung, Regina Spinazzola, Janet Lee, Anna Krevskaya, Maria Mendoza, Ruth Milanaik.
Behavioral and Developmental Pediatrics, Cohen Children’s Medical Center of New York, New Hyde Park, NY.

BACKGROUND: AAP recommends introducing solid food to infants at 6 months and premature infants advance when developmentally ready. Studies show preterm infants who start solids early are more likely to have feeding difficulties.

OBJECTIVE: To assess the importance of developmental readiness for solid food in premature infants and its impact on feeding behaviors and parental perception.

DESIGN/METHODS: Parents of premature infants (3.5 – 24 months, chronologic age) were shown their infant’s gestation-adjusted growth plots (GAGP) at NICU follow-up visits. They were then asked to complete a questionnaire about their impressions of their infant’s growth. Specifically, parents were asked if, at their most recent pediatrician (PCP) visit, they were informed about their child’s growth percentiles and if these percentiles were based on GAGP. Parents then rated how they felt about their child’s growth after the PCP visit and at the NICU follow-up using their child’s growth percentiles and if these percentiles were based on GAGP. Parents then rated how they felt about their child’s growth after the PCP visit and at the NICU follow-up using their child’s growth percentiles and if these percentiles were based on GAGP.

RESULTS: 70 parents completed the questionnaire. 45 were informed of GAGP by their PCP.
CONCLUSIONS: To be born AGA appears to be protective when maintaining normal postnatal growth. Babies born SGA had a significantly lower mean cognitive score. If a patient was born SGA they had a morbidities such as IVH, BPD, sepsis, ROP and an abnormal neurological exam at the time of Bayley evaluation. If a patient was born AGA they had a significantly lower mean cognitive score with normal postnatal growth. Conditions which may impact cognition were compared between SGA and AGA children utilizing chi square analysis.

CONCLUSIONS: Contrary to CDC recommendations, many pediatricians (37%) did not provide parents with gestation adjusted growth data; this was associated with significantly lower parent satisfaction.

CONCLUSIONS: To be born AGA appears to be protective when maintaining normal postnatal growth. Babies born SGA had a significantly lower mean cognitive score with normal postnatal growth. Conditions which may impact cognition were compared between SGA and AGA children utilizing chi square analysis.

CONCLUSIONS: To be born AGA appears to be protective when maintaining normal postnatal growth. Babies born SGA had a significantly lower mean cognitive score with normal postnatal growth. Conditions which may impact cognition were compared between SGA and AGA children utilizing chi square analysis.
Reduced Neonatal Anti-Viral CD8+ T Cell Responses Are Due to Intrinsic Defects of Neonatal CD8+ T Cells
Alison J. Carey, Donald Gracias, Yvonne Mueller, Peter D. Katsikis
Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA; Microbiology and Immunology, Drexel University College of Medicine, Philadelphia, PA.
BACKGROUND: There is little data on what controls immature immune responses and why neonates exhibit increased mortality to influenza virus. We have established an animal model using day 3 old mice to investigate the neonatal immune response to influenza.
OBJECTIVE: We have shown previously that primary CD8+ T cell responses are reduced and delayed in neonates. Thus, we sought to determine if an intrinsic defect in neonatal CD8+ T cells or the neonatal environment were responsible for the reduced anti-influenza virus CD8+ T cell responses in neonates.
DESIGN/METHODS: Three day old neonatal mice were infected intranasally with WSN-OVA influenza virus, a virus that expresses the OVA_{325-335} peptide; adult mice served as controls. At the time of infection, mice were given an intraperitoneal injection of purified OT-I cells, CD8+ T cells that express a transgenic T cell receptor specific for the OVA_{325-335} peptide. These OT-I cells were isolated from adult mice that were congenically mismatched with the neonatal mice so that donor cells could be distinguished from host cells. Mice were harvested at day 7 post infection, pulmonary lymphocytes were isolated and analyzed using flow cytometry. In addition, survival was tracked in comparison to control neonates who did not receive adult T cells.
RESULTS: Neonatal mice infected with influenza virus exhibited reduced anti-influenza CD8+ T cell responses on day 6, 10 and 14 postinfection. In contrast, neonatal mice that received adult OT-I cells had a robust expansion of the OVA_{325-335} specific CD8+ T cells (51.4% versus 19.6% in the adults). Despite this expansion of virus-specific CD8+ T cells in the neonate, the mortality remained the same as the control group.
CONCLUSIONS: We sought to demonstrate whether intrinsic defects in the neonatal CD8+ T cells or extrinsic factors in the neonatal environment were responsible for a reduced and delayed expansion of virus-specific neonatal CD8+ T cells, and ultimately, the high associated mortality after influenza infection. Our studies indicate that intrinsic defects of CD8+ T cells in neonates are responsible for the reduced expansion of these cells. Further studies are needed to investigate the mechanisms responsible for these defects, which may allow us to develop novel therapeutic strategies against viral respiratory infections that enhance viral clearance, and reduce morbidity and mortality in neonates.
### 55
**T-Cells Are Preferentially Expressed Following Neonatal Hyperoxia in Adult Mice**

Vasanth H.S. Kumar, Huamei Wang, Lori Nielsen.

**Pediatrics, University at Buffalo, Buffalo, NY.**

**BACKGROUND:** Prolonged exposure of newborn mice to O<sub>2</sub> produces changes similar to bronchopulmonary dysplasia (BPD) in infants. We have shown that neonatal hyperoxia alters cytokine response & induce lymphocyte infiltration of the lung in adult mice. Infants who survive BPD are susceptible to infections. We plan to test the hypothesis that oxidant stress from hyperoxia disrupts immunoregulation & produces changes in adaptive immune response in adult mice.

**OBJECTIVE:** To assess the adaptive immune response gene expression following neonatal hyperoxia in adult mice.

**DESIGN/METHODS:** Newborn litters were randomized at 3d to 85% O<sub>2</sub> or room air (RA) for 12d. On d15 following exposure, half were sacrificed & the rest were recovered in RA until 3 months (M). Whole lung mRNA was isolated in all the groups (N=4 in each group; RA & O<sub>2</sub> at 12d & 3 M). Gene expression by RT-qPCR was performed on a panel of genes representing T-cell / B-cell activation (SA Biosciences, MD). Data was analyzed by PCR array data analysis web portal. A fold change of 4 & p < 0.05 was considered significant.

**RESULTS:** 12d hyperoxia increased p21 expression & decreased expression of 23 genes representing T/B activation (Fold change > 4 fold; three of them significantly (cd1d, Il4 & ragl) compared to the RA group (Table 1). However, no differences were noted between the RA & O<sub>2</sub> groups at 3 M. Adult mice at 3 months decreased expression of p21 & increased expression of 11 genes, 6 of them significantly (cd28, cd40lg, cd36, cd3e, it2).

**CONCLUSIONS:** Adult mice exposed to neonatal hyperoxia, preferentially increased expression of genes involved in T-cell activation, differentiation & proliferation. Selective T-cell proliferation may be due to decreased expression of p21, an inhibitor of cell proliferation. This suggests that p21, a cell cycle regulator may play a critical role in immune function, conferring proliferation advantage to T-cells over B-cells in adult mice following prolonged stimulation by O<sub>2</sub> in the newborn period. This may have implications following BPD in premature newborns prone to infections.

### 56
**House Officer Outcomes Associated with Different Antibiotic Regimens for Necrotizing Enterocolitis**


**Pediatrics, Columbia University Medical Center, New York, NY; Infection Prevention & Control, NY-Presbyterian Hospital, New York, NY; Pediatrics, Cornell Medical Center, New York, NY; Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA; Pediatrics, The New York Care Health Services, Newark, DE.**

**BACKGROUND:** Necrotizing enterocolitis (NEC) is a serious disease in the neonatal intensive care unit (NICU). Complications include bacteremia, stricture formation and neurodevelopmental impairment. There is limited evidence about the efficacy of various antibiotic regimens in the treatment of NEC and the prevention of this disease.

**OBJECTIVE:** To describe the outcomes associated with different antibiotic regimens for NEC.

**DESIGN/METHODS:** A retrospective study of antibiotic use for NEC was conducted in four level III NICUs from May 2009-April 2012. NEC classification was based upon attending neonatologist documentation of diagnosis and of treatment for NEC, or fulfillment of the National Healthcare Safety Network criteria for NEC. Management was analyzed based upon number of drugs, days of therapy, anerobic coverage, dual coverage for Gram negative bacteria, and use of vancomycin and 3<sup>rd</sup> generation cephalosporins. Outcomes analyzed were mortality, progression to surgery, and blood stream infection (BSI) that occurred from initiation of therapy until 10 days of the end of treatment for NEC. Univariate analysis was performed using chi-squared or Fisher’s exact test for categorical variables and Wilcoxon rank sum test for continuous variables. Multivariable analysis was performed using logistic regression. Differences between centers were also compared.

**RESULTS:** 144 patients with NEC were identified, of whom 100 had birth weight <1500g. Common regimens included ampicillin or vancomycin with gentamicin, +/- use of anerobic coverage, or use of vancomycin and piperacillin/tazobactam. In univariate analysis, no single or combination of antibiotics was associated with death or subsequent BSI. In multivariable analysis, no single or combination of antibiotics was associated with death, progression to surgery or subsequent BSI. As expected, sicker infants, as indicated by both surgical intervention and duration of antibiotic for >7 days, had an increased odds of death independent of antibiotic regimen used.

**CONCLUSIONS:** We found great diversity in antibiotic prescribing practices for NEC, both within and between sites. Choice of regimen was not associated with decreased incidence of blood stream infection, progression to surgery, or death. Evidence-based guidelines remain an elusive goal for antimicrobial treatment for infants with NEC.

### 57
**Medical Student Predictors of Infections with Gram-Negative Bacilli in Neonatal Intensive Care Units and Antibiotic Susceptibility Patterns**

Nicole Green, Sarah A. Clock, David Paul, Jeffrey Perlman, Theoklis Zaoutis, Yu-hui Feng, Luis Alba, Elaine Larson, Lisa Saiman, Sameer Patel.

**Pediatrics, Columbia University, New York, NY; Christiana Neonatal Associates, Christiana Care Health System, Newark, DE; Weill Cornell Medical Center, New York, NY; The Children’s Hospital of Philadelphia, Philadelphia, PA; Columbia University School of Nursing, New York, NY.**

**BACKGROUND:** Antibiotic resistance among gram-negative bacilli (GNB) is of increasing concern in neonatal intensive care units (NICUs).

**OBJECTIVE:** Determine predictors of GNB infections in the Neonatal ICU and antibiotic susceptibility patterns.

**DESIGN/METHODS:** We performed a prospective study of GNB infections in 4 level III NICUs from May 2009 to April 2012. Eligible infants were admitted <7 days of age and hospitalized ≥ 4 days. Eligible GNB infections were those that occurred ≥3 days of age in a sterile body site or a non-sterile site with clinician documentation of infection plus treatment with intravenous antibiotics.

Each site performed microbiologic identification and susceptibility testing. Multivariable Cox proportional hazards regression was used to identify predictors of time to first gram-negative infection.

**RESULTS:** Among 5398 eligible infants, 172 GNB infections occurred in 141 (2.6%) infants. The rate among infants birth weight (BW) ≥2500 grams, 1500-2499 grams (low BW), < 1500 grams (very LBW), and <1000 grams (extremely LBW) were 1.27, 0.84, 1.00, and 2.09 per 1000 patient-days, respectively. Blood stream infections (BSIs) and urinary tract infections (UTIs) were most common (n=65, 38% and n=81, 47%, respectively). Respiratory (n=17, 10%), skin/wound (n=10, 5.8%) and central nervous system (n=1, 0.6%) infections were rare. Few isolates were non-susceptible to gentamicin, third generation cephalosporin agents, piperacillin/tazobactam, or carbapenem agents (13.9%, 9.8%, 8.2% and 0% respectively) and the proportions of non-susceptible isolates were similar among sites. Independent predictors for GNB infections were birth weight (BW) < 1000 grams or extremely low birth weight (ELBW) [HR 1.82, p=0.02] and use of mechanical ventilation [HR 3.50, p<0.01]. Low birth weight (LBW) [HR 0.73, p<0.01], very low birth weight (VLBW) [HR 0.88, p=0.01], and antibiotic exposure (per day) [HR ≤0.99, p≥0.03] had decreased risk for gram-negative infection.

**CONCLUSIONS:** In this study population, GNB infections were relatively rare as was non-susceptibility to selected agents. ELBW infants and full term infants with comorbid conditions requiring NICU hospitalization were at greatest risk of GNB infections. Future efforts should continue to monitor antimicrobial resistance.

### 58
**Fellow in Training Effect of Hyperoxia Exposure on T-Lymphocyte Maturation, Differentiation and Function in Neonate Mice**


**Pediatrics/Neonatology, Cohen Children Hospitals at New York, Manhasset, NY; Neonatal-Perinatal Lab., Feinstein Institute, Manhasset, NY; Pediatrics, Cohen Children Hospitals at New York, Manhasset, NY; Immunology & Inflammation Center, Feinstein Institute, Manhasset, NY.**

**BACKGROUND:** The immune response in premature infants has been proving to be defective at different levels. T cell response in neonates is suboptimal with a reduced ability to proliferate and a diminished response to mitogens. Very early in gestation, the down regulation of the innate immune response is significantly greater than in term infants and contributes to the greatly increased infection rate, which contribute to the pathogenesis of common adverse outcomes of prematurity, including chronic lung disease and neuro-developmental impairment. Oxygen is the most common therapy used in NICU and the potential effect of hypoxia exposure has become a focus of concern. To our knowledge, the relation between hyperoxia and T-lymphocytes differentiation and function in neonatal period has not been evaluated before.

**OBJECTIVE:** Studying hyperoxia impact on thymus micro-environment development and T cells differentiation and function.

**DESIGN/METHODS:** Neonatal mice (P2) were housed either at room air (FiO<sub>2</sub>, 21%), or hyperoxia (FiO<sub>2</sub>, 95%) for five days. After exposure, thymus was extracted, stained with specific T Cells markers (CD45, CD4, CD8) and analyzed using Flow Cytometry. For T cell proliferation, neonate mice in both environment were injected with BrdU on 4<sup>th</sup> day after exposure (0.5mg/animal IP), and 24h later, thymus was extracted, fixed, stained with anti-BrdU and appropriate specific antibodies and analyzed using flow cytometry. To assess T-reg cells maturation, neonate mice were injected with anti-CD3 antibody (1mg/kg IP) on 2nd day of exposure, thymus was harvested 3 days later. CD4+ve cells were stained for internal protein FoxP3 and analyzed using flow cytometry.

**RESULTS:** There was no significant difference in total number of T cells between studied groups. Among T cell subpopulation, there was significant decrease of CD4+ cells in hyperoxic compared to normoxic group (P<0.05). For T cell proliferation, there was significant reduction of BrdU incorporation in all T cell population (CD4+, CD8+ and double +veCD4/CD8 cells). T-reg cells (CD4+/FoxP3+) was also significantly lower in hyperoxic neonate mice compared to normoxic ones (P<0.05).

**CONCLUSIONS:** Acute hyperoxia has direct inhibitory effect on T-cell proliferation, differentiation and maturation which directly impact on T-cell functional maturation in neonates.
Central Line Associated Blood Stream Infections (CLABSIs) in Neonates: A Comparison of Tunneled, Peripherally Inserted and Umbilical Lines

Moizgan Ghazirad, Lamia Soghiert, Khodayar Rais Bahrami, Xiaoyan Song, Children's National Medical Center, Washington, DC.

BACKGROUND: CLABSI is a major health problem with high morbidity and mortality in sick newborns. Despite successful preventive measures, eliminating CLABSI remains a challenge nationwide. Identification of risk factors and the population at risk is useful in preventing CLABSi.

OBJECTIVE: To study patients’ characteristics and CLABSI rates based on CL type in neonates admitted to NICU.

DESIGN/METHODS: We followed a cohort of neonates admitted to CNMC NICU from 01/2008 to 06/2010, who had at least one CL. These neonates were monitored for development of lab confirmed CLABSI as defined by CDC National Healthcare Safety Network. Patient characteristics including sex, gestational age (GA), birth weight (BW), NICU stay, CL type and dwell time were collected. In patients who had BSI, cultured organisms were documented. CLs were divided into 3 groups (tunneled/Broviacs), peripherally inserted central catheters (PICCs), and umbilical lines (UL). BSI rates were calculated for each CL based upon 1000 days of CL.

RESULTS: There were 1450 CLs in 851 neonates during the study. There were 55.8% males, median GA was 35 weeks (mean 33.3 ± 5.8 SD). Median BW was 2245.5 grams (2176.1 ± 1136.4). Median CL dwell time was 11 days (19.2 ± 23.8). No BSI was reported in 97.5% of CLs. There were 36 cases of BSI in 21 patients. Neonates with BSI had smaller GA (28 ± 4.2 vs. 33.4 ± 5.8 weeks, p<0.009), lower BW (1376.5 ± 1089.1 vs. 2195.9 ± 1131 grams, p<0.001), longer CL dwell time (42.8 ± 34.5 vs. 22.1 ± 26.8 days, p<0.001), and longer NICU stay (96.5 ± 88.4 vs. 39.2 ± 43.5 days, p<0.0001). PICC dwell time was significantly longer in BSI group in comparison to the rest of cohort (43.3 ± 29.3 vs. 24.9 ± 22.6 days, p<0.0001). Kaplan-Meier Analysis showed no statistically significant difference between time to CLABSI in neonates who had Broviacs or PICCs (Log Rank=0.31, p=0.576). BSI rate was 1.23/95% CI 0.74-1.92) for PICCs, 1.23(0.50-2.54) for ULs, and 1.55(0.74-2.86) for Broviacs. Gram Negative Rods (GNR) consisted 36.1% of BSI cases, followed by Staphylococcus (33.3%).

CONCLUSIONS: CLABSI occurred more frequently in premature, LBW neonates, who had lengthy NICU stay. PICC lines stayed significantly longer in neonates who had BSI in comparison to neonates who did not. There was no statistically significant difference between time to CLABSI in neonates who had Broviacs or PICCs. GNRs were associated with 1/3 of BSI episodes.

Fellow in Training

A Mouse Model for Adhesion of Candida Parapsilosis to Endothelial Cells

Diana P. Vargas, Sonia S. Laforce-Nesbitt, Sunil S. Shaw, Joseph M. Bliss, Pediatrics, Brown University, Women and Infants Hospital of Rhode Island, Providence, RI.

BACKGROUND: Systemic candidiasis is the third most common cause of neonatal sepsis and leads to substantial morbidity and mortality. Candida albicans is the most frequent species involved, but Candida parapsilosis is uniquely prevalent in this population, having been identified in up to 50% of cases in some centers. Adhesion of C. albicans to endothelial surfaces is key in the pathogenesis of candidiasis, but little is known about C. parapsilosis interaction with endothelial cells. Preliminary data from clinical isolates suggest that different strains of C. parapsilosis exhibit different adhesive phenotypes when in contact with human endothelial cells in vitro.

OBJECTIVE: We evaluated the utility of a mouse model to interrogate the adhesion profile of C. parapsilosis by studying the early distribution of fungal elements in different organs after simulated hematogenously disseminated infection.

DESIGN/METHODS: A clinical isolate of C. parapsilosis that exhibits efficient adhesion to human endothelial cells in vitro was administered by tail vein injection to 4-6 week old BALb/c female mice. Mice were euthanized 15 minutes after the injection to capture the initial phases of adhesion to endothelium. Organs including spleen, kidney, liver, lung, brain and ears were harvested, homogenized and plated and the fungal load was quantified in each organ. Tissue burden was compared and histological analysis is underway to determine the distribution of fungal elements.

RESULTS: After intravenous injection, the adhesive strain of C. parapsilosis was easily detected in all organs, but the fungal burden varied widely. The highest fungal loads were detected in the lung and the spleen of mice with the brain being relatively spared. Fungal colony counts in the brain were 100-fold lower than the rest of the organs with intermediate counts for kidney and liver. Yeast were also detected in the ear.

CONCLUSIONS: These observations provide the basis for a novel animal model to study the adhesive properties of C. parapsilosis in vivo and the early interaction of C. parapsilosis with endothelial cells. Additionally, the presence of yeast elements in the ear and the ear’s transparent nature provide the opportunity for real-time investigation of yeast-endothelium interactions using intravital microscopy.

Fellow in Training

Methicillin Resistant Staphylococcus Aureus (MRSA) and the Individual Room Neonatal Intensive Care Unit

Tazuddin A. Mohammed, Jose L. Munoz, Russell R. Moores, Jr., Jie Xu, Sharon A. Cone, Janis Faye Ober, Susan Collins Lewis, Michael B. Edmond, Karen D. Hendricks-Munoz, Pediatrics, Division of Neonatology, Children’s Hospital of Richmond at VCU, Richmond, VA; Pediatrics, Division of Infectious Diseases, Children’s Hospital of Richmond at VCU, Richmond, VA; Pediatrics/Neonatology, Cooper University Hospital, Camden, NJ; Patient Care Services, Cooper University Hospital, Camden, NJ.

BACKGROUND: MRSA and late bacterial infections are significant clinical risks in the Neonatal Intensive Care Unit with associated morbidity. In 2008 the NICU moved from the large commungal NICU to a 40 bed individual room NICU design. Additionally, in an effort to address central line associated blood stream infection and MRSA colonization, a sequence of hospital wide initiatives were introduced.

OBJECTIVE: To determine whether a single bed construction NICU design coupled with an intensive quality infection reducing initiative decreases MRSA and overall nosocomial infections.

DESIGN/METHODS: A prospective infection events that occurred pre and post move to a single construction NICU with an intensive quality initiative that included hand hygiene, hygiene monitors, staff education and weekly MRSA and nosocomial infection surveillance of all infants admitted to the CHoR NICU at VCU between 1/2007 and 10/2012. RESULTS: During the study period 1789 infants were admitted to the CHoR NICU of which 55% were preterm <37 weeks gestation, 85% were inborn and 96% received prenatal care. There was no significant change in acuity in the NICU. (% acquisition=# that acquired MRSA after initial negative screen).

Decreased Central Line Associated Blood Stream Infection Rate after Addition of a Disinfecting IV Access Port Cap to a Central Line Bundle

Erik Brandisma, Linda Wicker, Judy Saslow, Jacqueline George, Joanne Fox, Robyn Harvey, Gary Stahl, Pediatrics/Neonatology, Cooper University Hospital, Camden, NJ; Patient Care Services, Cooper University Hospital, Camden, NJ.

BACKGROUND: Central line associated blood stream infection (CLABSI) is a complication of the use of central lines in neonatal intensive care units (NICU) and is a major contributor to mortality, morbidity, length of stay and cost in this population. The use of central line care bundles has been shown to decrease CLABSi. We report on our CLABSI rate after the introduction of a comprehensive central line bundle and after addition of a disinfecting IV access port cap to the bundle. The port cap is impregnated with 70% isopropyl alcohol (Curos® Port Protector Caps, Ivera Medical Corp, San Diego, CA).

OBJECTIVE: To determine if the addition of a disinfecting IV access port cap would decrease the CLABSI rate when combined with a comprehensive central line care bundle.

DESIGN/METHODS: Retrospective cohort study in a single, 35 bed level III NICU comparing the CLABSI rate per 1000 line days prior to and after the introduction of a comprehensive central line bundle and before and after the addition of a disinfecting IV access port cap to the care bundle.

RESULTS: In the three years prior to the introduction of the central line care bundle (2009-11), there were 27 CLABSi in 6654 line days for a CLABSI rate of 4.1/1000 days. The comprehensive central line care bundle was introduced at the beginning of 2012. During the first 3 months of 2012, there were 2 CLABSi in 411 line days for a rate of 4.9/1000 line days. In the 7 months since the addition of the disinfecting IV access port caps on 4/1/12, there have been no CLABSi in 691 line days for a rate of 0/1000 line days. Although the trend is encouraging, the decreased CLABSI rate during the 7 months since the addition of the caps is not statistically significant (Chi-square, p=0.092) compared to the CLABSI rate during the 39 months before introduction of the caps. Prior to the use of the caps, 29 of 372 infants with a central line had a CLABSI compared to 0 of 67 infants since cap use began (RR 0.10, 95% CI 0.006 to 1.62, p=0.105, NNT=13.8).

CONCLUSIONS: The addition of a disinfecting IV port access cap to a comprehensive central line care bundle appears to have decreased the CLABSI rate in our NICU. Since a NICU CLABSI costs between $6,000 and $12,000, disinfecting IV access port caps, which cost about $1 per line per day if changed daily, may be a cost-effective means of decreasing CLABSi. Data collection is ongoing.
CONCLUSIONS: An integrated focused quality initiative aimed at reducing infections coupled with the use of an individualized diet in NICU facility has been associated with a decrease in MRSA colonization and late clinical bacterial infection in the NICU. These findings will be used to assess initiatives to sustain bacterial reductions in the NICU.

Poster Session I  
Neonatal Fetal Nutrition  
Friday, March 22, 2013  
6:00pm–7:30pm

63  
Fellow in Training  
Growth Patterns in Extremely Low Birth Weight Infants Fed Donor Breast Milk: A Single-Center Study  
Laura Madore, Tina Jumani, Sarbattama Sen.  
Dept of Pediatrics, Div of Newborn Medicine, Tufts Floating Hospital for Children, Boston, MA; Dept of Pediatrics, Mother Infant Research Institute, Boston, MA.

BACKGROUND: Breast milk (BM) is the recommended form of nutrition for preterm infants. Human donor breast milk (DBM) is an alternative when BM is unavailable. DBM may offer many of the same benefits as mother’s own milk, but may not adequately support infant growth. Slow weight gain in premature infants has been linked to poorer neurodevelopmental outcomes. In 2010 our NICU implemented a donor milk policy; eligibility guidelines include infants born ≤1,000g, or multiples when at least one is ≤1,000g, in whom mother’s BM is unavailable or in low quantities.

OBJECTIVE: The objective of this study was to determine the effects of DBM on growth patterns in extremely low birth weight infants compared to infants that were fed either mother’s own milk or preterm formula.

DESIGN/METHODS: This study was a retrospective, single-center cohort study approved by Tufts Medical Center IRB. Twenty-six preterm infants were fed DBM. Birth-weight and gestational age matched controls were then divided into two feeding cohorts: contemporaneously fed mother’s own milk (MOM, n=26) and historical formula fed (FF, n=26). Growth rates, time to full feeds, time to regain birth weight, and any associated morbidities were compared using t test and chi squared analysis.

RESULTS: DBM infants gained less weight compared to infants fed MOM or FF in the first 30 days of life (mean in grams/kg/day ± SD): DBM 15.9 ± 4.0 vs. MOM 23.3 ± 4.0 and FF 21.7 ± 4.6.

CONCLUSIONS: Without use of specific EBM protein analysis, preterm infants will accumulate significant protein debt over time, potentially compromising growth and neurodevelopment. We speculate that individualized EBM fortification may better optimize nutrition and facilitate ideal growth and neurodevelopmental outcomes in preterm infants. A prospective, randomized, blinded and gestational age stratified trial is underway to test this hypothesis.
Cardiac & Pulmonary Development Platform Session

Saturday, March 23, 2013
8:00am–9:30am

67
8:00am

TBX1 Interacts with JUN and a Dominant Negative JUN Missense Mutation Is Associated with Congenital Heart Disease
Hua Pan, Tao Zhang, Gary A. Kraft, Indu Subbaraj, Julie De Mesmaeker, Brande C. Latney, Elizabeth Goldmuntz, Shoumo Bhattacharya, Jason Z. Stoller.

Pediatrics/Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA; Cardiovascular Medicine, Wellcome Trust Centre for Human Genetics, Univ. of Oxford, Oxford, United Kingdom.

BACKGROUND: Mice missing the proto-oncogene Jun have a thin right ventricle, prominent endocardial cushions, and a 100% incidence of persistent truncus arteriosus. Although Jun is critical for proliferation, cell cycle regulation, differentiation, and cell death, all biologic functions crucial for embryogenesis, there is little known about its role during cardiac development. Similar outflow tract defects are commonly seen in DiGeorge syndrome (DGS). DGS (aka 22q11 deletion syndrome) patients are hemizygous for more than 30 genes including the transcription factor TBX1. Accruing evidence points to a causative role for TBX1 in the pathogenesis of DGS although exact mechanisms remain unclear.

OBJECTIVE: To elucidate the role of Jun during heart development and in DiGeorge syndrome.

DESIGN/METHODS: TBX1-interacting proteins were discovered in a high throughput mammalian coactivator trap. Functional and physical interactions were determined in luciferase and protein complementation assays, respectively. Cre-loxP mouse models were utilized for tissue-specific knockout studies. Human DNA was screened for mutations by conventional sequencing.

RESULTS: The screen revealed multiple transcription factors, including the proto-oncogene Jun, which mediate a significant increase in TBX1-dependent transcriptional activity. TB1 and Jun physically and functionally interact and are used in the embryonic mouse. A cell-specific knockout of Jun recapitates cardiac defects reminiscent of the DGS phenotype. A screen of patients with congenital heart defects similar to those seen in Jun mutant mice revealed a patient with interrupted aortic arch who harbors a novel dominant negative JUN mutation that alters the TBX1 interaction.

68
8:15am

The Matricellular Protein CCN5 Is Coordinately Regulated with Proliferation of Murine Alveolar Epithelial Cells during Development and in Response to Hyperoxic Injury

Program in Pharmacology, Tufts University, Boston, MA; Pediatrics, Floating Hospital at Tufts Medical Center, Boston, MA; Cell, Molecular and Developmental Biology, Tufts University, Boston, MA; Anatomy and Cell Biology, Tufts University, Boston, MA.

BACKGROUND: Lung immaturity is the major cause of morbidity and mortality in premature infants, especially those born <28 weeks gestation. Proper lung development from 23-28 weeks requires coordinated cell proliferation and differentiation. Infants born at this age are at high risk for Bronchopulmonary Dysplasia (BPD), a chronic lung disease characterized by arrested alveolarization and airway hyperreactivity. The mechanisms regulating normal alveolar development and BPD are not well understood. Of novel interest is the role of matricellular protein CCN5 in alveolar epithelial cell differentiation.

OBJECTIVE: To define the role of CCN5 in alveolar epithelial development and hyperoxic injury.

DESIGN/METHODS: Five-day-old neonatal C57B6 mice were exposed to room air (RA) or 90% O2 (hyperoxia) from days 5-13 of life (the major period of murine alveolarization). On day 13, pups were sacrificed. The right lung was fixed and used for immunofluorescence staining. The left lung was used for protein analysis.

RESULTS: In RA pups at postnatal day 13, immunofluorescence showed prominent CCN5 expression in alveolar type I cells (T1) (identified by a T1-specific antibody). Double labeling with Ki67 showed active proliferation of CCN5-positive T1 cells. In contrast, immunofluorescence analysis of surfactant protein C (SPC) staining showed that type II alveolar cells (T2) are not proliferating and do not express CCN5. Western Blot analysis showed that CCN5 expression is greatly reduced in hyperoxic versus normoxic lungs.

CONCLUSIONS: CCN5 expression correlates positively with proliferation in T1 and T2 cells during normal alveolarization and in hyperoxic injury where proliferation is reduced. This contrasts strongly with our data in SMCs in which CCN5 is highly expressed in non-proliferating cells and is poorly expressed in proliferating SMCs. We speculate that CCN5 is a functional regulator of alveolar epithelial proliferation during development and response to injury.

CONCLUSIONS: Our results suggest that Jun has reiterates roles in different tissues important for heart development and tissue-specific mouse knockouts of Jun phenocopy important aspects of the DGS phenotype. JUN physically and functionally interacts with TBX1 and this interaction may play a role in the pathogenesis of DGS. The overall contribution of JUN to human congenital heart disease remains to be determined.

69
8:30am

Graduate Student

Pigment Epithelium Derived Factor (PEDF) Regulates Inhibition of Vascularization and Alveolarization in Neonatal Oxygen Injury
Michelle Bennett, Linh Dang, Sana Mujahid, Mary Ann Volpe, Anne Chetty, Heber Nielsen.

Sackler School of Biomedical Sciences, Tufts University, Boston, MA; Pediatrics, Floating Hospital for Children at Tufts Medical Center, Boston, MA.

BACKGROUND: BPD is a chronic lung disease of preterm infants characterized by arrested microvascular and alveolar development. CCN5 is known about pro-angiogenic factors in lungs microvascular development and BPD, very little is known about the role of angiostatic factors. PEDF is a potent angiostatic factor important in retinal vascular injury.

OBJECTIVE: Hypothesis: PEDF, produced by developing type II cells in response to hyperoxia, inhibits lung microvascular and alveolar development.

DESIGN/METHODS: In Vivo: Wild type (WT) and PEDF (-/-) mice (postnatal day 5 to 13) were exposed to room air (RA) or 0.9 FiO2. The mean linear intercept (inverse proportionally to alveolar surface area) was measured in 5µ sections (5 non-overlapping fields per section, 20X Mag) from inflation fixed lungs. PECAM immunofluorescence identified lung microvasculature.

In Vitro: E18 fetal mouse lung Type II (T2) cells were cultured in RA or 0.9 FiO2 (24 hrs) and conditioned medium (CM) collected. The effect of CM from RA or O2-exposed T2 cells on angiogenesis was analyzed by exposing mouse lung endothelial (MFLM) cells grown on matrigel to CM with and without PEDF antibody. Angiogenesis was analyzed by quantifying endothelial tube formation.

RESULTS: Lungs from 0.9FiO2-exposed WT mice had reduced alveolar surface area (increased ML) compared to RA-exposed mice (p <0.05). This alveolar loss was reversed in 0.9FiO2-exposed PEDF (-/-) mice. Vascular development was impaired in WT hyperoxic mice (fewer PECAM-1+ vessels) compared to RA-exposed mice. A screen of surfactant protein C, CCN5, and Ki67 expression showed that type II alveolar cells (T2) are not proliferating and do not express CCN5. Western Blot analysis showed that CCN5 expression is greatly reduced in hyperoxic versus normoxic lungs.

CONCLUSIONS: CCN5 expression correlates positively with proliferation in T1 and T2 cells during normal alveolarization and in hyperoxic injury where proliferation is reduced. This contrasts strongly with our data in SMCs in which CCN5 is highly expressed in non-proliferating cells and is poorly expressed in proliferating SMCs. We speculate that CCN5 is a functional regulator of alveolar epithelial proliferation during development and response to injury.
CONCLUSIONS: The importance of PEDF in mediating \( \Delta F \)-induced lung injury in developing lung is shown by the findings that PEDF knockdown restores \textit{in vivo} alveolarization and vasculogenesis in 0.9F\( \alpha \) - and anti-PEDF antibody abolishes \( \Delta F \)-induced impaired angiogenesis \textit{in vitro}. We propose that BPD results from an altered balance between pro- and anti-angiogenic factors. Intervention with anti-angiostatic agents may be an effective strategy for BPD prevention.

70
8:45am
Graduate Student
ErbB4 JmaCyt1 Isoform Drives Fetal Mouse Lung Type II Cell Proliferation and Differentiation
Arlene E. Reyna, Dorothea Wiegel, Heber C. Nielsen, Christiane E.L. Dammann, Sackler School for Biomedical Sciences, Tufts University, Boston, MA; Newborn Medicine, Floating Hospital for Children at Tufts Medical Center, Boston, MA; Hannover Medical School, Hannover, Germany.

BACKGROUND: Neuregulin (NRG) is the ligand of J-ma receptor, a major regulator of alveolar type II (T2) cell differentiation and proliferation. ErbB4 undergoes alternative splicing, producing 4 isoforms. Isomorph-specific roles are important in diseases such as cancer and schizophrenia. The ErbB4 JmaCyt1 (JmaCyt1) form is distinguished by differential inclusion of peptide sequences (Jma) that are cleavage targets for tumor necrosis factor conversion enzyme followed by gamma secretase. These cleavage events release an intracellular ErbB4 fragment that traffics to the nucleus to drive transcription in cooperation with transcription factors. JmaCyt1 also has a PI3K binding site (Cyt1), allowing PI3K-Akt induced signaling, which we found is prominent in mature fetal T2 cells. We reported that JmaCyt1 is the major isoform in fetal T2 cells at the onset of surfactant synthesis, and that it is the major driver of surfactant synthesis in MLE12 cells. These studies suggest JmaCyt1 is critical in lung development.

OBJECTIVE: Determine ErbB4 JmaCyt1 effects on fetal T2 cell proliferation and differentiation.

DESIGN/METHODS: Each ErbB4 isoform was overexpressed in MLE12 cells. Primary fetal T2 cells lacking ErbB4 expression were isolated from ErbB4 transgenic mice at embryonic day E17. ErbB4 expression was rescued by transfection with human JmaCyt1. T2 cell differentiation was determined as choline incorporation into disaturated phosphatidylcholine (DSPC) and proliferation as thymidine incorporation into DNA.

RESULTS: NRG induces proliferation primarily in Cyt2 isoforms in MLE12 cells. This appears Jm-independent. JmaCyt1 rescue of ErbB4-negative T2 cells decreased thymidine incorporation ~3-fold and increased DSPC synthesis ~3-fold compared to non-rescued ErbB4-negative fetal T2 cells. These results suggest that JmaCyt1 drives the switch from type II cell proliferation to cell differentiation at this time point in gestation.

CONCLUSIONS: The ErbB4 JmaCyt1 isoform, which allows ErbB4 nuclear localization plus PI3K signaling, promotes fetal mouse T2 cell differentiation. Further studies of how alternative splicing-induced ErbB4 Jm-Cyt signaling regulates lung T2 cell differentiation and proliferation are needed to determine ErbB4's exact role in lung development. Eventually, manipulation of ErbB4 JmaCyt1 expression could be used to treat neonatal surfactant deficiency.

71
9:00am
Medical Student
Regulation of Alternative Splicing of ErbB4 during Fetal Mouse Type II (T2) Cell Differentiation
Dorothea Wiegel, Arlene Reyna, Christiane E.L. Dammann, Heber C. Nielsen, Newborn Medicine, Floating Hospital for Children at Tufts Medical Center, Boston, MA; Hannover Medical School, Hannover, Germany; Sackler School for Biomedical Sciences, Tufts University, Boston, MA; Pediatrics, Floating Hospital for Children at Tufts Med Ctr, Boston, MA.

BACKGROUND: Protein isoforms created by alternative splicing (AS) are important mechanisms regulating cell-specific function. Despite the importance of AS very little is known about AS mechanisms in the developing lung. In fetal T2 cell development, ErbB4 isoforms have specific actions. Mutually exclusive AS that includes either exon 15 or exon 16 produces the Jma or Jnb isoforms of ErbB4, respectively. The Jma isoform contains a γ-secretase binding sequence important for T2 cell differentiation.

OBJECTIVE: Determine the identity of alternative splicing factors that may regulate AS of Erbb4 Jma and Jnb isoforms and define their developmental expression in fetal mouse T2 cells.

DESIGN/METHODS: A mouse lung mRNA expression array database was analyzed to identify AS factors expressed in fetal lungs from embryonic (E)17 T2 cells. Cultures were transfected with EGFP, ErbB4, and TTF1 plasmids without or with NRG treatment. TTF-1, ErbB4, and Sftp2 expression, determined by western blots signals, were quantified by densitometry and normalized to actin. TTF-1 expression was also studied in ErbB4-deleted adult T2 cells isolated from ErbB4 transgenic animals.

RESULTS: TTF1 overexpression decreased ErbB4 protein and downregulated NRG-induced upregulation of ErbB4 protein. However, increased Sftp2 levels were maintained (Figure 1).

CONCLUSIONS: There is a negative feedback loop between TTF-1 and ErbB4 in both ME-L2 and primary fetal T2 cells. We propose this is an important control element in T2 cell Sftp2 production. Further studies elucidating the exact interactions are needed.
Saturday, March 23, 2013
8:00am–9:30am

73 8:00am  
Fellow in Training  
Predictors of Completed Early Intervention Evaluation  

Background: Policies recommend referral to early intervention (EI) for children with developmental delay but many referred children are not evaluated. Objective: To identify child, family, provider and community factors associated with completed EI evaluation. Design/Methods: We conducted a secondary analysis of prospectively collected data on children referred to EI from urban pediatric practices. Using logistic regression, we tested whether child (age, gender), parent (age, race, income, education, depression symptoms), provider (clinic site, referral method), and community factors (trust in neighbors, neighbors willing to help, neighbors care about child) were associated with completed EI evaluation. Factors with p<0.2 were included in the multivariable model. We used the Bonferroni correction to account for multiple comparisons. We conducted subgroup analyses of children based on the type and number of developmental concerns, and assessed the impact of the referral method within these groups.

Results: Of 331 subjects referred to EI, 169 (49%) were not evaluated. 85% of families were African American and 67% had income <$20k. The only significant predictor of completed EI evaluation was whether the physician faxed the referral form to EI rather than asking the family to call (AOR: 3.78, 95%CI: 2.1–6.74).

Multivariable Logistic Regression Analysis (n=331)

<table>
<thead>
<tr>
<th>Referral Method</th>
<th>Adjusted OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>Referent (R)</td>
</tr>
<tr>
<td>Fax</td>
<td>3.78(2.1-6.74)*</td>
</tr>
<tr>
<td>Clinic</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>1.49(0.64-3.46)</td>
</tr>
<tr>
<td>2</td>
<td>0.62(0.32-1.22)</td>
</tr>
<tr>
<td>3</td>
<td>0.10(2.6-9.7)</td>
</tr>
<tr>
<td>Child Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
<td>0.65(0.4-1.07)</td>
</tr>
<tr>
<td>Race</td>
<td>African American</td>
</tr>
<tr>
<td>Other</td>
<td>1.60(71.3-6)</td>
</tr>
<tr>
<td>Income ($)</td>
<td>&lt;$20k</td>
</tr>
<tr>
<td>$20k-60k</td>
<td>1.0 (0.73-2.29)</td>
</tr>
<tr>
<td>People around my neighborhood are willing to help their neighbors.</td>
<td>Agree</td>
</tr>
<tr>
<td>Not Agree</td>
<td>0.83(0.5-1.36)</td>
</tr>
<tr>
<td>Respondent Age</td>
<td>&lt;30</td>
</tr>
<tr>
<td>≥30</td>
<td>0.17(0.66-2.07)</td>
</tr>
<tr>
<td>Child Age at 1st Referral (mos)</td>
<td>≤18</td>
</tr>
<tr>
<td>18-24</td>
<td>0.68(0.38-1.2)</td>
</tr>
<tr>
<td>≥24</td>
<td>0.90(0.32-1.1)</td>
</tr>
</tbody>
</table>

Variables with p<0.2 in bivariate analysis included in model. *Significant after Bonferroni correction (P<0.005)

When stratified by developmental domain, faxed referral was associated with completed evaluation only for children with language concern (OR: 3.08, 95%CI: 1.62–5.86). Faxed referral predicted completed evaluation for children with one developmental concern (OR: 3.48 95%CI: 1.59-7.62) but not ≥2.

Conclusions: Pediatricians may improve EI referral success by simplifying the referral process for families and faxing referral forms. This may be especially important for children with language delay and 1, as opposed to ≥2 delays.

74 8:15am  
Fellow in Training  
Docosahexaenoic Acid Can Mitigate Some Ethanol-Induced Behavioral Changes  
Finney George, Kristen A. Wellmann, Sandra M. Mooney. Pediatrics, University of Maryland, Baltimore, MD.

Background: Prenatal ethanol exposure disrupts social behavior in humans and in rodents. One system that is particularly important for social behavior is the somatosensory system, and ethanol also causes alterations in the structure and function of this area. Docosahexaenoic acid (DHA), an omega-3 polyunsaturated fatty acid, is necessary for normal brain development. Ethanol inhibits the activity of desaturase enzymes that are required for generation of DHA, which may be one mechanism whereby tissue from ethanol-exposed animals (or humans) is DHA deficient. Thus, we determined whether intervention in the form of DHA supplementation in the postnatal period ameliorated the ethanol-induced behavioral deficits.

Objective: To determine if DHA can ameliorate some of the ethanol induced changes in rat behavior.

Design/Methods: Timed pregnant Long-Evans rats were assigned to one of three groups: one received ad libitum access to an ethanol-containing liquid diet, the second was pair fed an isocaloric isonitutive non-alcohol liquid diet, and the third had ad libitum access to chow and water. Pups born to dams from these three prenatal treatment groups were assigned to one of three postnatal treatment groups: 1) received DHA (10g/kg in artificial rat milk) intragastrically once per day between postnatal day P11 and P20, 2) received artificial rat milk intragastrically, 3) were untreated (NTC). Our sample size was 5 to 9 rats per group in each of the 9 treatment groups. Social behavior was tested using a modified social interaction test that was administered on P28. Somatosensory performance was tested with a gap crossing test, performed on a single day between P30 and P35.

Results: Animals exposed to ethanol prenatally showed fewer pins and tags (nape attacks) during social interaction and crossed a significantly (p<0.05) shorter gap than control-treated animals. DHA-treated animals did not show any improvement in the number of pins. In contrast, both number of tags and the distance crossed in the gap crossing test improved significantly (p<0.05) after treatment with DHA, such that the ethanol/DHA treated animals were no longer statistically (p<0.05) different to control-treated animals.

Conclusions: Rat pups prenatally exposed to ethanol show marked deficits in social behavior and in a test of somatosensory system function, and some of these deficits are mitigated by later administration of DHA.

75 8:30am  
Medical Student  
Childhood Predictive Factors of Young Adult Employment in Low-SES Inner-City African Americans  
Kehvon Clark, Laura M. Betancourt, Nancy L. Brodsky, Hallam Hurt. Perelman School of Medicine of the University of Pennsylvania, Philadelphia, PA; Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA.

Background: Employment is a developmental marker of successful transition to adulthood. Unemployment rates for African Americans ages 20-24 are higher than rates for those ages 25-54 (15% vs 8%). Rates are even higher for African Americans ages 20-24 (25%). In a time of high unemployment, understanding factors associated with employment in young adulthood is needed. Objective: The aim of this project was to identify childhood factors associated with employment in young adults.

Design/Methods: Participants were 111 inner-city African American young adults ages 21-23 of low SES (59% female), enrolled at birth and followed annually in a longitudinal study of the effects of gestational cocaine exposure (GCE) (45% GCE). The dependent variable was young adult employment (YAE), defined as any employment reported at least annual visits from ages 19-23. Independent variables were: age 18 IQ (WAIS - 4th Edition); adolescent employment (any employment reported at ages 15-18); caregiver employment (percentage of visits caregiver reported employed [minimum of 7 visits from ages 3-18]); caregiver receipt of public or medical assistance (PMA, percentage as above); quality of the early home environment (age 8, Elementary School Home Observation for Measurement of the Environmt inventory [HOME]); Independent t-tests and Chi-square tests were used for bivariate comparisons. Backward logistic regression was used for multivariate analyses.

Results: Rate of YAE was 69.4% (77/111), higher than the national average for job-seeking African Americans ages 20-24 (49.7%). Using bivariate analyses, YAE group had higher HOME scores (49.5±4 vs 46.7±4, p<0.01), higher rate of adolescent employment (35% vs 3%, p<0.01), higher rate of college experience (47% vs 18%, p<0.01), was more likely living with family (82% vs 59%, p<0.01), and less likely arrested (26% vs 47% p<0.03). YAE group was similar to unemployed in sex, GCE, IQ, caregiver employment, and PMA (all p>0.05). By backward logistic regression, only HOME score predicted YAE (B=0.15, p<0.01). Results were similar when 6 unemployed young adults with some college were included in employed group.

Conclusions: Better childhood home environment increases the likelihood of YAE, of particular interest in the current economic climate. Caregiver employment or PMA did not affect YAE in our cohort, suggesting that unemployed caregivers who create a high quality home environment increase likelihood of YAE during the transition to adulthood.

76 8:45am  
Fellow in Training  
Medication Management of Preschool ADHD by Pediatric Sub-Specialists: Non-Compliance with AAP Clinical Guidelines  
Jaeh Chung, Suzanne Sunday, David Meryash, Alyson Gutman, Andrew Adesman. Developmental and Behavioral Pediatrics, Cohen Children’s Medical Center of New York, New Hyde Park, NY; Biostatistics, Feinstein Institute for Medical Research, Manhasset, NY.

Background: Current clinical guidelines for pediatricians (AAP) and child psychiatrists (AACAP) recommend that preschoolers with ADHD (P-ADHD) generally receive treatment with behavioral modification (BM) before pharmacotherapy, and that methylphenidate (MPH) be used for BM non-compliant patients. We compared preschool ADHD patients’ medication management with these guidelines.

Objective: To examine to what extent pediatric subspecialists (PSs) adhere to AAP guidelines regarding pharmacotherapy for P-ADHD 2. To identify differences in treatment approach among subspecialties.

Design/Methods: The Preschool ADHD Treatment Questionnaire (PATQ) was developed and mailed to a randomized sample of 3,000 PSs nationwide. The PATQ asked how often PSs recommend parent training in BM and how often they recommend medication as a first- or second-line treatment. PSs were also asked which type of medication they typically choose first.
RESULTS: 714 (23.8%) surveys were received, and analyses were limited to 560 board-certified pediatric subspecialists who diagnose P-ADHD: 322 developmental-behavioral pediatricians (DBP), 170 child psychiatrists (CP), and 68 child neurologists (CN). 21% of PSs reported using medication as a first-line treatment often or very often, 69.5% use medication as a second-line treatment often or very often. Availability of BM (or lack thereof) was not associated with decision to use medication as a first-line treatment. Among PSs who prescribe medication for P-ADHD (first- or second-line), more than one-third (38.3%) said they prescribe a medication other than MPH initially (19.4% amphetamines; 18.9% non-stimulants). 90.7% of PSs often or very often recommend BM – even in communities with limited availability. No differences were noted across subspecialties regarding medication initiation criteria or selection. Likewise, no differences were noted between PSs who primarily treat patients with Medicaid versus private insurance. When adherence to AAP guidelines was defined as initial treatment with BM (not medication) and pharmacotherapy specifically with MPH as second-line treatment, only 12% CP, 8% DBP, and 9% CN conformed with clinical guidelines. 15% of PSs stated that they expected the number of children for whom they will prescribe medication in the future will increase (vs 76% no change and 3% decrease).

CONCLUSIONS: The overwhelming majority of pediatric subspecialists deviate from current AAP guidelines for treatment of preschool ADHD regarding medication initiation and selection.

77
9:00am
Fellow in Training
Implications of MRI in Children with Autism Spectrum Disorder
Alison S. Gurtman, Eron Friedlaender, Susan E. Levy, Cynthia Molten, Karuna V. Shedekar, Andrea L. Bennett.
Pediatric Emergency Department, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: With the reported increased prevalence of autism spectrum disorders (ASD) and the impetus to better understand the diagnosis, MRI of the brain has been performed with increasing frequency. However, there are little data describing the indication for and results of MRI in these patients.

OBJECTIVE: To determine the reasons for brain MRI referral and prevalence of clinically significant findings in children with ASDs.

DESIGN/METHODS: Retrospective, descriptive chart review of patients with ASDs who underwent brain MRI from January 1st, 2010 - January 1st, 2012 at an urban tertiary care children’s hospital. Inclusion criteria: diagnosis of an ASD and age 2-18 years (inclusive). Exclusion criteria: no available images. Data collected: demographics, reason for referral, and results of MRI. Results were assessed for clinical significance (Ab MRI), defined as a finding that would likely prompt follow-up, excluding sinusitus. Children were categorized based on referral reasons as: ASD alone and ASD with 1 or more of the following: an abnormal neurological exam (Ab neuro), seizure (Se), headache (H/A), non-neurological condition (non-neuro), macro/microcephaly/regression/tics, or referred for a study protocol.

RESULTS: Of 185 children included, the mean age was 8.4 years, and the majority (82%) were male. The rates of Ab MRI ranged from 0%(0/17), 95% CI(0-19.5%) in the 9.2% referred for an ASD study protocol to 43%(16/37), 95% CI(27.1%-60.5%) in the 21.6% referred for an ASD and Ab neuro. Of the 33.5% referred for an ASD and Se, 37% (24/62), 95% CI(25.2%-50.3%) had an Ab MRI, whereas of the 10.3% referred for ASD and micro/macroscephaly/regression/tics, or tics, referred for a study protocol.

CONCLUSIONS: Preterm infants evaluated at 34-36 weeks PMA performed differently on the NNNS administration before term equivalent or underlying developmental abnormalities affected the cohort’s performance. Future comparison to childhood neurodevelopmental assessments is needed.

79
8:00am
House Officer
Obesity Is a Risk Factor for Symptomatic Cholelithiasis in Childhood
Kelly N.F. Fradin, Andrew D. Racine, Peter F. Belamarich.
Department of Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Obesity is a well-known risk factor for symptomatic cholelithiasis in adults, but in children, evidence is limited. Only one recent cross-sectional study has estimated the association between obesity and cholelithiasis in the outpatient setting, and further understanding of the epidemiology of pediatric cholelithiasis requiring inpatient stay is needed.

OBJECTIVE: To estimate the strength of the association between obesity and the diagnosis of symptomatic cholelithiasis in children and adolescents without known risk factors for cholelithiasis.

DESIGN/METHODS: We conducted a retrospective, matched, case-control study. Using the discharge diagnosis, we identified children age 4-20 years with symptomatic cholelithiasis admitted between 1/2001 and 9/2011 as cases. Our control group was comprised of children admitted with appendicitis during the same time period. We excluded individuals with pregnancy, hemolytic disease, and parenteral nutrition. Each case was individually matched to a control based on age, gender, ethnicity and race. Obesity was defined as a BMI z score of 1.645 or the 95th percentile. Review of imaging records was performed to validate the discharge diagnosis.

RESULTS: There were 259 cases with an average age of 16.7 years, 76% female, 69% Hispanic, 39% Multiracial, and 19% African American. There were 259 controls with an average age of 15.8 years and similar demographics. Cases were nearly six times more likely than controls to be obese (OR 5.78; p<0.0001, 95% CI 3.50-9.53).

The relationship between obesity and cholelithiasis persisted in sensitivity analysis limited to subjects with confirmatory imaging. Despite the finding that cases were slightly older than controls, post hoc analysis showed that this age difference did not influence our primary finding. We found a significant dose-response effect placing heavier individuals at higher risk of cholelithiasis.

CONCLUSIONS: Our data show that obesity is a significant risk factor for hospital admission due to cholelithiasis in our population.
Measuring Fatness and Fitness: The 6 Minute Walk Test in a Pediatric Setting


BACKGROUND: The 6 Minute Walk Test (6MWT) calculates fitness, or functional capacity, by measuring the distance walked in 6 minutes along with cardiac measures. Fitness is equally as important as measures of “fitness,” or Body Mass Index (BMI). Since BMI adjusts poorly to the variation in body types found in children, as compared to adults, the 6MWT may be a better method to identify children at risk of being unhealthy.

OBJECTIVE: By observing pre- & post-test heart rate (HR) and heart rate one minute post-exercise (heart rate recovery (HRR)), the 6MWT may allow practitioners to quickly determine the fitness level of children during a visit. We hypothesize that healthier children’s heart rates will have a smaller increase between pre- & post-test measurements and will recover more quickly one minute post-test, as compared to unhealthy children.

DESIGN/METHODS: Healthy children from ages 6 to 17 were recruited from visits at Nemours Pediatrics, Philadelphia between Jun 07 and Aug 12. The 6MWT is an IRB-approved, investigator-designed protocol. Pulse and blood pressure were measured pre- & post-6MWT, and one minute post-6MWT. Other data was extracted from medical records. Children were classified according to BMI percentile range. Healthy children were compared as a group to an unhealthy group, both overweight and obese children. Other analyses examined children by age; pre-pubescent children were < 11 while post-pubescent children were > 12. Analysis of Variance was used to analyze data.

RESULTS: When analyzed by sex, post-6MWT heart rate (HR) and HRR were significantly elevated in unhealthy females compared to healthy females, p=0.017 and p=0.008, respectively. When analyzed by age, unhealthy pre-pubescent children displayed significantly elevated HR, p=0.047 and HRR, p=0.017, when compared to healthy pre-pubescent children. No significant differences were observed in males or post-pubescent children.

CONCLUSIONS: As expected, HRR and HR were significantly elevated for unhealthy children. However, results demonstrate that these children experience more exertion than their healthy counterparts. Although the 6MWT may not be an effective tool for measuring fitness in the entire pediatric population, it may prove useful as a measure of fitness in the office for children in the pre-pubescent years, when intervention is most important.

Effect of a School Based Intervention on Parents’ Nutrition and Exercise Attitudes and Behaviors

John C. Rausch, Evelyn Berger-Jenkins, Andres Nieto, Mary McCord, Dodi Meyer, Pediatrics, Columbia University Medical Center, New York; Ambulatory Care Network, NewYork-Presbyterian Hospital, New York; Pediatrics, Medical College of Wisconsin, Milwaukee.

BACKGROUND: Obesity disproportionately affects young children in underserved and minority communities. Further, parents exert a significant effect on children’s eating behaviors and physical activity levels. It is imperative, therefore, to find successful obesity prevention programs that target whole families in underserved communities in order to exert lasting changes on children’s behaviors.

OBJECTIVE: To assess the impact of a school based intervention in an underserved community on parents’ nutrition and exercise knowledge, attitudes and behaviors.

DESIGN/METHODS: Healthy School’s Healthy Family is a Coordinated School Health Program that includes family and community involvement in health promotion in an underserved New York City community. As part of this program parents receive interactive workshops that promote healthy nutrition and physical activity. Parents completed bilingual self-administered surveys prior to the program and then yearly for 2 years. Questions were multiple choice and included demographic data and information on dietary choices and physical activity. Questions were combined to form scales regarding healthy diet and physical activity, including knowledge, self-efficacy, and reported dietary actions and levels of physical activity. Pre-survey scores were compared with post-survey scores after year 1 and year 2 using paired t-tests.

RESULTS: There were 277 parents completing the initial survey with 149 (54%) of the same parents completing the survey after year 1 and 126 (45%) completing the survey after year 2. There was an increase in parent self-efficacy for physically active lifestyles that was statistically significant (t-value 2.62, p=0.01) and a healthy diet that was almost statistically significant (t-value 1.76, p=0.08) at the end of year 1, but these were not statistically significant at the end of the year 2. While healthy nutrition behaviors did not change, unhealthy behaviors were significantly lower at the end of both year 1 (t-value 2.00, p=0.05) and year 2 (t-value 2.07, p=0.04). Physical activity behavior improved and almost reached statistical significance after both year 1 (t-value 1.85, p=0.07) and year 2 (t-value 1.79, p=0.08).

CONCLUSIONS: Coordinated school based obesity prevention programs may have an effect on parental nutrition and physical activity attitudes and behaviors. This will be essential if healthy changes in behavior are to be adopted and sustained by the entire family.

Association between Neighborhood Physical Activity Resources and Time Outdoors in Inner-City Minority Children

Leigh Goldstein, Maida P. Galvez, Kathleen McGovern, Susan Teitelbaum, Barbara Brenner, Mary Wolff, Department of Preventive Medicine, Mount Sinai School of Medicine, New York, NY; Department of Internal Medicine, Eastern Virginia Medical School, Norfolk, VA; Department of Pediatrics, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Neighborhood physical activity resources may play a role in promoting healthy behaviors. Geographic Information Systems (GIS) provides a unique opportunity to examine the resources children frequently encounter.

OBJECTIVE: Describe the number of physical activity resources passed by children on the shortest path between home and school and examine the association with time outdoors.

DESIGN/METHODS: School/home location and outdoor activity time were collected for 178 children. Physical activity resources data were collected by walking survey. Shortest paths between home and school and number of resources passed on route were determined with GIS. Two-sided t-tests with a Type I error of 0.05 were used to identify statistically significant differences in outdoor time between children passing 2 or fewer physical activity resources and those passing 3 or more.

RESULTS: Shortest paths between home and school were calculated, mean 447m. 279 physical activity resources were identified in East Harlem. (See Figure 1.)

CONCLUSIONS: As expected, HRR and HR were significantly elevated for unhealthy children. Further, parents exert a significant effect on children’s eating behaviors and physical activity levels. It is imperative, therefore, to find successful obesity prevention programs that target whole families in underserved communities in order to exert lasting changes on children’s behaviors.

Effect of a School Based Intervention on Parents’ Nutrition and Exercise Attitudes and Behaviors

John C. Rausch, Evelyn Berger-Jenkins, Andres Nieto, Mary McCord, Dodi Meyer, Pediatrics, Columbia University Medical Center, New York; Ambulatory Care Network, NewYork-Presbyterian Hospital, New York; Pediatrics, Medical College of Wisconsin, Milwaukee.

BACKGROUND: Obesity disproportionately affects young children in underserved and minority communities. Further, parents exert a significant effect on children’s eating behaviors and physical activity levels. It is imperative, therefore, to find successful obesity prevention programs that target whole families in underserved communities in order to exert lasting changes on children’s behaviors.

OBJECTIVE: To assess the impact of a school based intervention in an underserved community on parents’ nutrition and exercise knowledge, attitudes and behaviors.

DESIGN/METHODS: Healthy School’s Healthy Family is a Coordinated School Health Program that includes family and community involvement in health promotion in an underserved New York City community. As part of this program parents receive interactive workshops that promote healthy nutrition and physical activity. Parents completed bilingual self-administered surveys prior to the program and then yearly for 2 years. Questions were multiple choice and included demographic data and information on dietary choices and physical activity. Questions were combined to form scales regarding healthy diet and physical activity, including knowledge, self-efficacy, and reported dietary actions and levels of physical activity. Pre-survey scores were compared with post-survey scores after year 1 and year 2 using paired t-tests.

RESULTS: There were 277 parents completing the initial survey with 149 (54%) of the same parents completing the survey after year 1 and 126 (45%) completing the survey after year 2. There was an increase in parent self-efficacy for physically active lifestyles that was statistically significant (t-value 2.62, p=0.01) and a healthy diet that was almost statistically significant (t-value 1.76, p=0.08) at the end of year 1, but these were not statistically significant at the end of the year 2. While healthy nutrition behaviors did not change, unhealthy behaviors were significantly lower at the end of both year 1 (t-value 2.00, p=0.05) and year 2 (t-value 2.07, p=0.04). Physical activity behavior improved and almost reached statistical significance after both year 1 (t-value 1.85, p=0.07) and year 2 (t-value 1.79, p=0.08).

CONCLUSIONS: Coordinated school based obesity prevention programs may have an effect on parental nutrition and physical activity attitudes and behaviors. This will be essential if healthy changes in behavior are to be adopted and sustained by the entire family.

Modifiers of Cardiovascular Risk Factors in Middle and High School Students in Quito-Ecuador

Ramiro W. Lizano Santamaria, Marco Fornasini, Ivan Sisa, Pediatrics and Adolescent Medicine, Einstein Medical Center, Philadelphia, PA; School of Medicine, Universidad de las Americas, Quito, Pichincha, Ecuador.

BACKGROUND: Mortality in developing countries is transitioning from infectious diseases to other conditions, including chronic cardiovascular (CV) disease. Modifiable risk factors for CV disease may become detectable during childhood and adolescence.

OBJECTIVE: To assess the prevalence of modifiable risk factors for CV disease in middle and high school students in Quito, Ecuador.

DESIGN/METHODS: We conducted a cross-sectional study of a city-wide representative sample of middle and high school students attending 8th to 10th grades in Quito, Ecuador. We used a school-based stratified sample proportional to the size of the geographic sector within the Metropolitan Area of Quito. Students completed the WHO Global School Health Survey modules on diet, physical activity and tobacco use. We measured participants’ weight, height, and blood pressure (BP) and estimated body mass index (BMI).

RESULTS: 469 students were surveyed; 47% males; mean age 12.5 ±1 (SD) years (range 11-16 years); 16% in public school, 84% in private school. Based on BMI percentiles, one third of students were overweight or obese (overweight 15%, obese 18%), 7% had high systolic BP and 4% had diastolic BP. Identified modifiable risk factors included: dietary factors (less than 5 fruits/vegetables a day, 92%; one or more fatty meals a day, 69%; one or more sugary soft drinks a day, 67%); behavioral factors (physical activity less than 30 minutes 3 times per week, 53%; ever smoked, 37%; smoking in the last month, 12%). The prevalence of risk factors was similar for students in public and private schools, with the exception of ever smoked, which was higher among students in private school, 47%, compared to those in public school, 33% (p < 0.001).

CONCLUSIONS: Middle and high school students in Quito, Ecuador had a high prevalence of modifiable cardiovascular risk factors, with rates comparable to those of U.S. students. These findings indicate that it is important to implement interventions aimed at modifying these risk factors early in life in both developed and developing countries.
The Effect of Regular Exercise on Exposure to Violence in Inner City Youth
Noe D. Romo, Melissa Dupont-Reyes, Deborah Fry, Leslie Davidson.
Division of Child & Adolescent Health, Columbia University, New York, NY; Pediatrics, New York-Presbyterian Hospital, NY, NY; Epidemiology, Columbia University, New York, NY.

BACKGROUND: Community violence causes huge costs in death and disability to youth. Research suggests regular exercise provides psychological benefits to self-esteem and reduces depression, but little data exists on whether it decreases exposure to violence. Studies analyzing whether team sports prevent violence in urban youth have shown mixed results.

OBJECTIVE: To determine if regular exercise in inner city adolescents is associated with decreased exposure to violence.

METHODS: This is a secondary analysis of the cross-sectional Partners and Peers Study conducted in 2007-8. 1,312/1454 (90.2%) students completed in 4 NYC high schools using questions from Youth Risk Behavior Survey and the Child Health Illness Profile-Adolescent Edition. A total of 152 subjects were included in this study. There were 76 cases (55 females) and 76 controls (47 females). There were no significant differences between cases and controls for age or gender. Of the cases with UTI, 21 (28%) were overweight and 8 (11%) were obese; among controls, 15 (20%) were overweight and 9 (12%) were obese. There was no statistically significant difference between body habitus and the presence of UTI (p=0.52).

RESULTS: A total of 152 subjects were included in this study. There were 76 cases (55 females) and 76 controls (47 females). There were no significant differences between cases and controls for age or gender. Of the cases with UTI, 21 (28%) were overweight and 8 (11%) were obese; among controls, 15 (20%) were overweight and 9 (12%) were obese. There was no statistically significant difference between body habitus and the presence of UTI (p=0.52).

CONCLUSIONS: These results suggest that, despite an association between obesity and increased risk of UTI in the case population, no such association has been shown.

OBJECTIVE: To study the incidence of readmission within 1 month of discharge from the Pediatric Division of Child & Adolescent Health, Columbia University, New York, NY; and UTI in the pediatric population.

OBJECTIVE: To investigate any association between obesity and increased likelihood of UTI in the pediatric population.

METHODS: This was a retrospective, case-control study. A chronological list of urine cultures performed at Flushing Hospital Medical Center in calendar year 2011 for patients 0-18 years of age was reviewed. Patients were deemed to have a true positive urine culture if there was > 50,000 colony-forming units of a single organism; those patients were considered cases. Medical records were reviewed on prospective cases for underlying conditions that would predispose to them UTI, including structural renal abnormalities, immunodeficiency and pregnancy. Prospective cases with those conditions were excluded. Once a case patient was included, the control patient was selected from the said list as the next chronological negative urine culture, with an expectation that controls would match cases for age and gender at the end of the selection process. Patients were then classified as having body mass index (BMI) <85% (normal), BMI > 85% to 94% (overweight) or BMI > 95% (obese). SPSS software was used for statistical analyses. Descriptive statistics were analyzed with the BMI percentages, and the relationship between overweight/obesity and UTI was analyzed with Pearson chi-square. A p-value of <0.05 was considered significant.

RESULTS: A total of 152 subjects were included in this study. There were 76 cases (55 females) and 76 controls (47 females). There were no significant differences between cases and controls for age or gender. Of the cases with UTI, 21 (28%) were overweight and 8 (11%) were obese; among controls, 15 (20%) were overweight and 9 (12%) were obese. There was no statistically significant difference between body habitus and the presence of UTI (p=0.52).

CONCLUSIONS: These results suggest that, despite an association between obesity and increased risk of UTI in the case population, no such association has been shown.

OBJECTIVE: To study the incidence of readmission within 1 month of discharge from the Pediatric Division of Child & Adolescent Health, Columbia University, New York, NY; and UTI in the pediatric population.

OBJECTIVE: To investigate any association between obesity and increased likelihood of UTI in the pediatric population.

METHODS: This was a retrospective, case-control study. A chronological list of urine cultures performed at Flushing Hospital Medical Center in calendar year 2011 for patients 0-18 years of age was reviewed. Patients were deemed to have a true positive urine culture if there was > 50,000 colony-forming units of a single organism; those patients were considered cases. Medical records were reviewed on prospective cases for underlying conditions that would predispose to them UTI, including structural renal abnormalities, immunodeficiency and pregnancy. Prospective cases with those conditions were excluded. Once a case patient was included, the control patient was selected from the said list as the next chronological negative urine culture, with an expectation that controls would match cases for age and gender at the end of the selection process. Patients were then classified as having body mass index (BMI) <85% (normal), BMI > 85% to 94% (overweight) or BMI > 95% (obese). SPSS software was used for statistical analyses. Descriptive statistics were analyzed with the BMI percentages, and the relationship between overweight/obesity and UTI was analyzed with Pearson chi-square. A p-value of <0.05 was considered significant.

RESULTS: A total of 152 subjects were included in this study. There were 76 cases (55 females) and 76 controls (47 females). There were no significant differences between cases and controls for age or gender. Of the cases with UTI, 21 (28%) were overweight and 8 (11%) were obese; among controls, 15 (20%) were overweight and 9 (12%) were obese. There was no statistically significant difference between body habitus and the presence of UTI (p=0.52).

CONCLUSIONS: These results suggest that, despite an association between obesity and increased risk of UTI in the case population, no such association has been shown.

OBJECTIVE: To study the incidence of readmission within 1 month of discharge from the Pediatric Division of Child & Adolescent Health, Columbia University, New York, NY; and UTI in the pediatric population.

OBJECTIVE: To investigate any association between obesity and increased likelihood of UTI in the pediatric population.

METHODS: This was a retrospective, case-control study. A chronological list of urine cultures performed at Flushing Hospital Medical Center in calendar year 2011 for patients 0-18 years of age was reviewed. Patients were deemed to have a true positive urine culture if there was > 50,000 colony-forming units of a single organism; those patients were considered cases. Medical records were reviewed on prospective cases for underlying conditions that would predispose to them UTI, including structural renal abnormalities, immunodeficiency and pregnancy. Prospective cases with those conditions were excluded. Once a case patient was included, the control patient was selected from the said list as the next chronological negative urine culture, with an expectation that controls would match cases for age and gender at the end of the selection process. Patients were then classified as having body mass index (BMI) <85% (normal), BMI > 85% to 94% (overweight) or BMI > 95% (obese). SPSS software was used for statistical analyses. Descriptive statistics were analyzed with the BMI percentages, and the relationship between overweight/obesity and UTI was analyzed with Pearson chi-square. A p-value of <0.05 was considered significant.

RESULTS: A total of 152 subjects were included in this study. There were 76 cases (55 females) and 76 controls (47 females). There were no significant differences between cases and controls for age or gender. Of the cases with UTI, 21 (28%) were overweight and 8 (11%) were obese; among controls, 15 (20%) were overweight and 9 (12%) were obese. There was no statistically significant difference between body habitus and the presence of UTI (p=0.52).

CONCLUSIONS: These results suggest that, despite an association between obesity and increased risk of UTI in the case population, no such association has been shown.
RESULTS: The total number of admissions during the study period was 3964. The total number of readmissions was 104 (2.6%). Readmissions with the same diagnosis comprised 66% (69/104). Readmissions within one week of discharge comprised 44% (46/104) of total readmissions. The most common diagnoses with readmissions were acute asthma exacerbations (26%), bronchitis (13%), sickle cell disease with crisis (13%) and fever (7%). There was a peak in readmission during July, August and September. One to two year old children were most likely to get admitted (28%). The average length of stay during first admission was 3 days but averaged 4.1 days when readmitted. 49 out of 104 (30%) of readmitted patients missed follow up visits after their initial discharge, and 32 (30.7%) did not fill their prescriptions after discharge. Compliance to medications was an issue in 67/104(63%) patients. Of all the readmitted patients, 97% had active insurance at the time of first discharge whereas only 3% had no insurance. Amongst the insured patients, 25.7% had Medicaid, 66.3% had Managed care and 1% had private insurances.

CONCLUSIONS: This study gives an insight into the demographic data with factors related to possible readmissions and subsequent increase overall healthcare cost. It emphasizes the impact and need of patient education at the time of discharge which will lead to better compliance and lesser readmission rates. Our study shows insurance is not a factor for failure to keep appointments or to fill up prescriptions.

88 8:45am House Officer

Disparities in Functional Outcomes by Race, Ethnicity, and Insurance Status Following Injury-Related Inpatient Rehabilitation
Jennifer N. Fishe, Margaret G. Stineman, Mark R. Zonfrillo, Department of Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA; Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA; Center for Injury Research and Prevention, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Recent studies have highlighted racial/ethnic and insurance status disparities in pediatric acute injury outcomes. It is unknown whether similar disparities exist in functional outcomes after inpatient injury rehabilitation.

OBJECTIVE: To determine if racial/ethnic or insurance status disparities exist in pediatric physical functional outcomes after inpatient injury rehabilitation.

DESIGN/METHODS: This study was a retrospective analysis of patients 7-18 years old identified from the Uniform Data System for Medical Rehabilitation (UDSMR) who completed inpatient injury rehabilitation from 2002-2011. Functional outcomes were measured by the validated, categorical grading of the Functional Independence Measure (FIM) motor scale, which categorizes disability into clinically relevant stages. Patients were grouped by race/ethnicity (White/non-Hispanic, African-American/non-Hispanic, Latino/Hispanic) and insurance status (commercial, public, uninsured).

RESULTS: A total of 13,789 patients were included in the analysis. There were significant differences in the proportion of patients with discharge physical FIM grades signifying full functionality to mild disability versus severe disability amongst racial/ethnic (p<0.0001) and insurance (p<0.001) groups. White/non-Hispanics and those with private insurance had the highest percentage of patients attaining FIM grades of full functionality to mild disability.

<table>
<thead>
<tr>
<th></th>
<th>Discharge Physical Grade 1-3</th>
<th>Discharge Physical Grade 4-7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean % (SD)</td>
<td>Mean % (SD)</td>
</tr>
<tr>
<td>White/non-Hispanic</td>
<td>42 (41-43)</td>
<td>55 (57-59)</td>
</tr>
<tr>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American/non-Hispanic</td>
<td>52 (50-55)</td>
<td>48 (45-50)</td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td>44 (42-47)</td>
<td>56 (53-58)</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>42 (41-43)</td>
<td>55 (57-59)</td>
</tr>
<tr>
<td>Public Insurance</td>
<td>46 (45-48)</td>
<td>54 (52-55)</td>
</tr>
<tr>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninsured</td>
<td>44 (42-47)</td>
<td>56 (53-58)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: There are racial/ethnic and insurance status disparities in attainment of higher grades of physical functionality following inpatient rehabilitation for injuries in children. The etiology of such disparities is unknown, and it is unclear whether race/ethnicity or insurance status has the greater association with functional outcomes. Future work should explore other potential factors related to poor outcomes such as injury severity and the quality and quantity of rehabilitation services.

89 9:00am Infant Sleeping Practices at Nap and Night Time in an Inner City Population
Barbara A. Kelly, Matilde Irioven, Monique M. Mondesir, Natalia Isaza Brando, Pediatric & Adolescent Medicine, Einstein Medical Center Philadelphia, Philadelphia, PA.

BACKGROUND: Sudden unexplained infant death (SUID), including sudden infant death syndrome (SIDS), is more prevalent in African American populations and is associated with unsafe sleeping practices. Infants are at risk for SUID/SIDS at any time of day or night. However, it is not known whether parents use different sleeping practices for their infants during day time naps and night time.

OBJECTIVE: To assess infant sleeping practices at nap and night time.

DESIGN/METHODS: We conducted a secondary analysis of a longitudinal cohort study of sleeping practices in infancy. A convenience sample of postpartum mothers of healthy term newborns was recruited in the nursery of an inner city hospital. Mothers were given routine educational materials on safe sleeping practices and followed for six months. Mothers were asked in what position they placed their infants to sleep and where they placed the infants to sleep, for both nap and night time.

RESULTS: 70 mothers were enrolled: mean age 24 yrs; 84% African American; 21% high school; 90% Medicaid; 59% primipara; 60% initially breastfed; 21% lost to follow up. Use of safe sleeping practices was decreasing and decreased over time. Mothers reported placing infants on their backs to sleep at night more often than at nap time, although the difference was not statistically significant. The use of the crib or bassinet was also higher at night vs nap time (P<0.001 at 1 week and 2 months). 10% of babies at 1-week of age and 13% of babies at 2-months of age were placed in a carseat or bouncy seat at nap time but not at night time.

<table>
<thead>
<tr>
<th></th>
<th>1 week (N=59)</th>
<th>2 months (N=40)</th>
<th>4 months (N=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep position nap</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>88</td>
<td>74</td>
<td>72</td>
</tr>
<tr>
<td>Side</td>
<td>11</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Belly</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sleep position night</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>88</td>
<td>74</td>
<td>72</td>
</tr>
<tr>
<td>Side</td>
<td>11</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Belly</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sleeps location night</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s bed</td>
<td>45</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Car seat/bouncy seat</td>
<td>43</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Sleeps location naptime</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s bed</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Car seat/bouncy seat</td>
<td>70</td>
<td>67</td>
<td>67</td>
</tr>
</tbody>
</table>

CONCLUSIONS: In a minority, low income patient population, the use of safe sleeping practices was more common at night than nap time and decreased over the first 4 months of life. Some babies were placed to sleep in a car seat or bouncy seat and the safety of this practice is unknown. Ongoing educational strategies need to be implemented to ensure safe sleeping practices for both nap and night time sleeping throughout the first year of life.

90 9:15am Can You Fill This out? Caregiver, Clinician and Staff Perspectives on Pre-Visit Questionnaires Prior to Well-Child Care
Sara R. Slovin, Tashi L. Rowe, Kristin Mmari, Ashish Joshi, Cynthia S. Minkovitz, Pediatrics, Al duPont Hospital for Children/Nemours, Wilmington, DE; Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD; Population, Family & Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD; Health Services Research and Administration, University of Nebraska Medical Center, Omaha, NE.

BACKGROUND: Child health experts suggest using pre-visit questionnaires (PVQ) to identify caregiver priorities and concerns for well-child care (WCC). Little is known regarding their feasibility in low-income populations and preferences for electronic or paper format are unknown.

OBJECTIVE: 1) To identify caregiver, clinician and staff perspectives regarding processes, facilitators and barriers for implementing PVQs in WCC for low-income families; and 2) examine stakeholder preferences for paper or touch-screen PVQ formats.

DESIGN/METHODOLOGY: We conducted 15 in-depth interviews with caregivers and 5 focus groups of clinicians, residents and staff, each with 6-10 participants, at 2 urban clinics serving low-income families. After stakeholders reviewed both paper and touch-screen PVQ formats, an interviewee elicited their perspectives using a structured interview guide. Interviews and focus groups were audiorecorded, transcribed and independently double-coded with Atlas.ti software. We identified common themes using framework analysis, with discrepancies discussed until consensus was reached.

RESULTS: Caregivers (n=15), clinicians (n=16), staff (n=13) and residents (n=10) were aged 21-72 years. Five recurrent themes common to stakeholder groups emerged: 1) PVQ’s utility for identifying caregiver needs and priorities, facilitating communication, and preparing all stakeholders for WCC visit; 2) Logistical considerations (e.g., linking PVQ to medical records, timing/location of PVQ completion and review, and touch-screen maintenance); 3) Acceptance, with PVQ’s ease of use, non-invasive questions and child-focus 4) Unintended effects of PVQ, with medical-legal implications and possible overreliance on PVQ; 5) Potential barriers to accurate completion, including literacy level, time, distractions and perceived burden. All participant groups preferred the touch-screen format; for clinicians, staff, and residents, this preference was tied to logistical considerations for implementation.
8:15am National Trends and Resource Utilization in the Management of Infants with Urinary Tract Infections
Katherine O’Connor, Alyssa H. Silver, Lindsey C. Douglas, Joanne Nazif, Nora Esteban-Cruciani, Sage R. Myers, Pediatrics, Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY; Pediatrics, Children’s Hospital of Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, PA.

BACKGROUND: The increasing availability of national data sets allows for examination of trends in resource utilization. Urinary tract infection (UTI) accounted for 2% of pediatric hospitalizations and $520 million in aggregate costs during the years 2000-2006. To date, national trends and resource utilization for the management of infants less than 60 days admitted with UTI has not been assessed in a large data set including all-payers across multiple inpatient settings.

OBJECTIVE: To analyze national trends in length of stay (LOS) and total charges in the management of UTI in infants <60 days of age from 2000-2009 in a nationally represented cohort.

DESIGN/METHODS: We utilized the Healthcare Cost and Utilization Project Kids Inpatient Database (KID), weighted to allow for production of national estimates. We included all inpatient admissions for infants less than 60 days old with a primary or secondary diagnosis of UTI defined by ICD-9 codes for UTI and acute pyelonephritis. Exclusions: patients with codes for elective admission, transfer, in age<2 months, and hospital birth. Data were analyzed to assess the primary outcome of trends in LOS and total charges. Secondary outcome predictors of increased LOS were analyzed using weighted logistic regression to evaluate OR for LOS by hospital location, gender, teaching status and age < 30 days.

RESULTS: See Tables. Trends in LOS and Total Charges by year

Odds Ratios for LOS (95% CI)

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospital Location</th>
<th>Gender</th>
<th>Teaching status</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>urban v. rural</td>
<td>F v. M</td>
<td>teaching v. non-teaching</td>
<td>&gt;30 days v. &lt;30 days</td>
</tr>
<tr>
<td>2000</td>
<td>0.7 (0.1-5.4)</td>
<td>0.8 (*)</td>
<td>0.8 (0-3.2 9)</td>
<td>0.8 (0-2.4 0)</td>
</tr>
<tr>
<td>2003</td>
<td>8.8 (2.2-24.7)</td>
<td>0.7 (1-19.8)</td>
<td>5.8 (1.9-18.0)</td>
<td>0.7 (*)</td>
</tr>
<tr>
<td>2006</td>
<td>1.8 (0.5-6.2)</td>
<td>0.6 (0.2-1.3)</td>
<td>5.7 (2.4-13.7)</td>
<td>0.8 (0-3.2 1)</td>
</tr>
<tr>
<td>2009</td>
<td>2.9 (0.7-8.5)</td>
<td>1.4 (0-5.3-7)</td>
<td>6.8 (1-23.6)</td>
<td>0.5 (*)</td>
</tr>
</tbody>
</table>

*Missing CI: includes stratum with single sampling unit

CONCLUSIONS: There is a trend toward decreased LOS and increased total charges for infants <60 days hospitalized with UTI from 2000-2009. Hospital location, gender and age < 30 days did not predict longer length of stay, but hospitalization in a teaching hospital was significantly associated with longer length of stay after 2000. Further research evaluating factors influencing LOS and charges is warranted.

92 8:30am The Incidence and Clinical Characteristics of Acute Bronchiolitis with Urinary Tract Co-Infection among Children under 2 Years of Age Admitted to Urban Inner City Community Hospital
Saied N., Madhu Kankipati, Chukwuma Mmnuo, Nikiraka Fqenwa, Stefan Hagmann, Ayode Adeniyi, Richard Neugebauer, Savita Manwani, Pediatrics, Bronx Lebanon Hospital Center, Bronx, NY.

BACKGROUND: Studies have shown that febrile children with acute bronchiolitis do not have a higher risk of serious bacterial infection (SBI) but a slightly higher incidence of urinary tract infection about 1.5%. It is not clear whether the risk of SBI is altered in a meaningful way with clinical evidence of viral infection.

OBJECTIVE: a. To determine the incidence of UTI co-infection in patients with acute bronchiolitis; b. To identify the clinical characteristics of patients with acute bronchiolitis and UTI co-infection.

DESIGN/METHODS: A retrospective chart review of children 0-2 years hospitalized for acute bronchiolitis in a Pediatric inpatient at Bronx-Lebanon Hospital Center between January, 2006 - January, 2012. Fisher exact and chi-square tests were used for evaluating the association of two categorical variables; ANOVA for associations between categorical and continuous variables.

RESULTS: During this study period 1458 patients were admitted with acute bronchiolitis. We collected data for every 10th patient, 146 patient charts were analyzed. Out of 146 patients, 44 (30%) had urine culture done, of which 11 (7.5%) had a positive culture. We looked at various potential correlates of UTI co-infection status in this sample of patients with urine cultures done including sex, race and circumcision status. Urine culture was sent for 24 males and 20 females, 3 (12.5%) of males were positive as compared to 8 (40%) of females were positive (p<0.08). Urine culture was sent for 12 Hispanics and 18 African Americans, 5 (41.7%) of Hispanics were positive as compared to none positive for African Americans (p<0.005). Amongst 8 circumcised males 0 had a positive urine culture as compared with 3 (42.9%) amongst 7 uncircumcised males (p<0.08). Children with positive and negative urine cultures did not differ on age, birth weight, gestational age, temperature, respiratory rate, O2 saturations and activity levels at the time of admission, RSV and influenza status, WBC or, ANC.
94 8:45am
Frequency of APOL1 Risk Alleles among a US Cohort of Children with Perinatal HIV-1 Infection and Associations with Renal Phenotypes
Murali U. Purswani, Kunjal Patel, Jeffrey B. Kopp, Cheryl Winkler, Stephen A. Spector, Rohan Hazra, George R. Seage III, George K. Siberry, Lynne M. Moffenson, Gwendolyn B. Scott, Russell B. Van Dyke, Bronx-Lebanon Hospital Center, Albert Einstein College of Medicine, Bronx, NY; Harvard School of Public Health, Boston, MA; NIDDK, NIH, Bethesda, MD; CCR, NCI, Frederick, MD; University of California, San Diego, San Diego, CA; Eunice Kennedy Shriver NICHD, NIH, Bethesda, MD; Miller School of Medicine, University of Miami, Miami, FL; Tulane University Health Science Center, New Orleans, LA.
BACKGROUND: African Americans (AA) have a four-fold increased risk for chronic kidney disease (CKD), attributed to at least one independent sequence variants G1 and G2 in the APOL1 gene on chromosome 22. These alleles are common in certain African populations, particularly those of West African origin. In adult studies, 2 APOL1 risk alleles are highly associated with focal segmental glomerulosclerosis, hypertension-attributed end stage kidney disease and HIV-associated nephropathy.
OBJECTIVE: To estimate the frequency of APOL1 risk alleles in AA in a US cohort of children with perinatal HIV-1 infection (PHIV); and to examine associations of these alleles with proteinuria and CKD.
METHODS: Participants with PHIV had history obtained and urine and blood collected annually in the Pediatric HIV/AIDS Cohort Study. Proteinuria was defined as at least one urine protein/creatinine ratio (uPCR) ≥ 0.2. CKD was ≥ 2 sequential uPCR ≥ 0.2, eGFR < 60 mL/min/1.73 m² with no resolution or clinical diagnosis not contradicted by a normal uPCR. In children ≥ 18 yrs, eGFR was calculated with the updated Schwartz equation and for those ≥ 18, with the CKD EPI equation. Salivary DNA was amplified, genotyped for APOL1 risk alleles, and categorized as having 0-1 or 2 risk alleles. Associations between risk alleles and CKD and proteinuria were estimated using Fisher’s exact test. Renal outcomes were extended to include uPCR ≥ 0.5 and eGFR < 60 and <80/mL/min/1.73 m².
RESULTS: 406 of 448 subjects had APOL1 genotyping performed; 295 (73%) self-identified as AA. Their mean age was 11.5±2.5 yrs. The frequency of 1 and 2 risk alleles was 45% (127/295) and 13% (38/295) respectively in AA, and 34% and 9% respectively in the whole cohort. All 38 participants with 2 risk alleles self-identified as AA; only 11 with 1 did not. In AA children, CKD was present in 17 (5.8%), proteinuria ≥ 0.2 in 58 (20.3%), proteinuria ≥ 0.5 in 16 (6.3%), eGFR < 60 in 11 (3.7%) and eGFR < 30 in 54 (18.3%). Two APOL1 risk alleles compared to 0-1 was not associated with these renal phenotypes in AA children and the whole cohort.
CONCLUSIONS: APOL1 risk alleles are common in AA in this US cohort of children with PHIV, with a frequency of 13% for two risk alleles. However, no association with CKD, proteinuria or reduced eGFR was observed.

95 9:00am
Zanaia Coudhary, Russell J. McCulloh, Crystal-Rose Cuellar, Michael Koster, Brian K. Alverson, Warren Alpert Medical School, Brown University, Providence, RI; Pediatrics, Rhode Island Hospital/Brown University, Providence, RI.
BACKGROUND: There remains considerable variability in how pediatricians diagnose and manage community-acquired pneumonia (CAP). In order to address this variability and improve outcomes for children hospitalized with CAP, national guidelines were released in August 2011. These guidelines recommend routine blood cultures for children admitted to intensive care units (ICUs), narrow-spectrum antibiotics for fully-immunized children with uncomplicated pneumonia, and third-generation cephalosporins for children underimmunized for Haemophilus influenzae and pneumococcus.
OBJECTIVE: To assess physician practice patterns for children hospitalized for CAP in the setting of an academic pediatric hospital without a local CAP clinical practice guideline, and compare these practices to national guidelines recommendations.
METHODS: RETROSPECTIVE chart review of patients aged 3 months to 18 years with admit or discharge diagnosis of CAP January 2011-April 2012 at Hasbro Children’s Hospital. Researchers obtained data regarding length of stay (LOS), demographics, past medical history, vital signs, physical exam findings, and diagnostic and therapeutic interventions. Data were analyzed using chi-squared analysis for categorical variables, Mann-Whitney testing for continuous variables.
RESULTS: A total of 314 charts were reviewed. When evaluating diagnostic testing rates for procedures recommended as routine studies for hospitalized children, blood cultures were performed in 51.0% of children hospitalized with CAP overall and in 70.0% of children admitted to the ICU. Sputum cultures, urine pneumococcal antigen testing, and virologic testing were rarely performed. A complete blood count was done in 68.5% of children hospitalized with CAP overall and 77.5% of children admitted to the ICU. Chest radiography (CXR) was done in 304/314 (96.8%) of patients, with 8% of CXR results being read by the radiologist as normal. Use of narrow-spectrum antibiotic therapy in fully immunized children occurred in 63.1% of children, and third generation cephalosporin use occurred in 25.0% of under-immunized children.
CONCLUSIONS: Physican practice at a single children’s hospital varied significantly from national guidelines recommendations. This demonstrates a significant potential to improve practice through development of local clinical practice guidelines for diagnosis and management of CAP at our institution.

96 9:15am
Does Viral Coinfection Impact Bronchiolitis Severity?
Kelly N.F. Fradin, Gabriella Azzarone, Nora Esteban-Cruciani, Joanne Nazif, Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Pediatrics, Albert Einstein College of Medicine, Bronx, NY.
BACKGROUND: Acute viral bronchiolitis is responsible for over 150,000 admissions per year in the United States. With increased accessibility of viral polymerase chain reaction (PCR) testing, we are increasingly aware of specific causative virus(es). However, the implications of viral coinfection on severity of illness have been inconsistently reported in the literature.
OBJECTIVE: To assess whether children with more than one detected agent experience a more severe course of bronchiolitis as measured by length of stay (LOS), oxygen use, or admission to the intensive care unit (ICU), when compared with children without detected coinfection.
METHODS: We conducted a retrospective cohort study using electronic chart review of patients 0-24 months of age hospitalized between January 2007 and December 2010 for bronchiolitis, as determined by ICD-9 codes, in an inner city tertiary children’s hospital. We excluded children with neuromuscular conditions, congenital heart disease, immunodeficiencies, chronic lung disease due to prematurity, tracheostomy, sickle cell, cystic fibrosis, and without laboratory testing of the virus by viral culture or PCR. Our viral PCR detects respiratory syncytial virus, influenza, metapneumovirus, rhinovirus, parainfluenza virus, and adenovirus. At our institution, viral testing is done routinely for cohorting purposes. Chi square and t-tests were used to compare patients who tested positive for zero or one virus with those who tested positive for more than 1 virus, to assess various markers of illness severity. Data was analyzed using Stata.
RESULTS: 424 children met inclusion criteria. Of those, 46 (10.8%) had more than 1 virus detected on PCR or culture. Although there was a trend towards increased rates of ICU stay amongst these children, there were no statistically significant differences between children with and without coinfection.

Detected viruses
0 or 1 2 or more
% with ICU stay Y (%) 9.8% 17.4% *p=0.11
% with supplemental O2 Y (%) 45.8% 50% *p=0.59
Mean length of stay in days (median) 3.5 (2.8) 4.6 (3.1) *p=0.07

CONCLUSIONS: We found no differences in severity between children with and without coinfection in terms of LOS, oxygen use, or ICU admission. If confirmed, this study may be relevant to cohorting practices during hospitalization. Yet, our population exhibited a lower rate of viral coinfection than that reported in the literature, which may have precluded us from detecting potential differences.

Saturday, March 23, 2013
8:00am–9:30am
Plastic Platform
Neonatology I
97 8:00am
Trials of Persistent Pulmonary Hypertension of the Newborn Are Heterogeneous and Often Stopped Early
BACKGROUND: Persistent pulmonary hypertension of the newborn (PPHN) continues to have high mortality and morbidity. PPHN is challenging to study due to the severity and volatility of the clinical condition.
OBJECTIVE: (1) To assess the variability of inclusion criteria for clinical trials of PPHN; (2) To examine early stopping of trials in PPHN.
METHODS: All PPHN prospective intervention trials published or registered (clinicaltrials.gov) from 1997-2011 were reviewed for inclusion. Key trial characteristics, eligibility criteria, and enrollment data were abstracted and summarized.
RESULTS: 31 studies (24 published and 7 unpublished) were eligible (inter-rater agreement κ=0.86). (1) Variable Inclusion Criteria: Criteria varied but oxygenation index and echo parameters were the most common. The eligibility value for a given criteria was also highly variable (Table 1). (2) Early Stopping: Only 14/24 (58%) published studies reported a target sample size. Of these, 79% were stopped early after enrolling only 69% of the target population (Figure 1). Of unpublished studies, 29% reported being stopped early. The most common reasons for stopping early were low enrollment (36%) and benefit (26%).

Table 1
<table>
<thead>
<tr>
<th>Criterion (used by ≥1 study)</th>
<th>Number of studies (%)</th>
<th>Eligibility value, median (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygenation index</td>
<td>18 (52)</td>
<td>100 (40-100)</td>
</tr>
<tr>
<td>Echocardiographic parameters</td>
<td>18 (52)</td>
<td></td>
</tr>
<tr>
<td>Percent inspired oxygen (%)</td>
<td>13 (42)</td>
<td>100 (40-100)</td>
</tr>
<tr>
<td>Partial pressure of oxygen (mm Hg)</td>
<td>10 (32)</td>
<td>100 (50-150)</td>
</tr>
</tbody>
</table>

43
CONCLUSIONS: There are two serious methodologic problems in studies of PHIN. Stopping early is common and highly variable inclusion criteria make study populations heterogeneous and unable to be pooled. These methodologic issues increase the potential for bias. Consensus needs to be obtained on inclusion criteria to aid in designing future clinical trials.

98
8:15am
Fellow in Training
Natural History of Pulmonary Artery Pressure (PAP) Changes in Preterm Infants
Pediatrics, Women & Infants Hospital/Brown University, Providence, RI; Pediatric Cardiology, Hasbro Children’s Hospital/Brown University, Providence, RI.

BACKGROUND: PAP normalizes by 2 wks of life in preterm infants. Severe respiratory disease can be associated with pulmonary hypertension (PH). Changes in pulmonary artery pressure are understudied in preterm infants.

OBJECTIVE: To define the temporal profile of PAP in preterm infants with and without early pulmonary hypertension (early PH) between 10-14 days of age.

METHODS: Subjects were a subset of infants <28 wks admitted to the Women & Infants Hospital NICU and enrolled in a prospective study to find associations between early PH and BPD. Exclusion criteria were major congenital heart disease, pulmonary anomaly, or genetic syndromes. First study echocardiogram (echo) was between 10-14d of life. Infants with early PH were matched by gestational age (GA) with 2 infants with no early PH. Serial echoes were done every 7-10 days until 36 wks post-menstrual age (PMA) and were reviewed by pediatric cardiologists. Systolic PAP was estimated by measuring TR jet or PDA gradient, or from end systolic ventricular septal configuration (normal-No/Mild PH, flat/ Moderate PH, reverse bowing- Severe PH) in the absence of TR/PSA. Findings were grouped as no or mild PH (<50% of systolic blood pressure [sBP]), moderate PH (50% < sBP < 100% of sBP), and suprasystolic PH (sBP > 150% of systolic blood pressure).

RESULTS: From 3/11 to 10/12, 98 infants were eligible, 4 died before initial echo, and 94 were included. Eight had early PH. Matched infants (n=14) were similar to early PH group for % male (42% vs 42%), GA (25.6±0.3 vs 25.1±1.4wks) and birth weight (806±178 Vs 834± 204g) and SGA (13 vs 12%) were similar among PH and no PH infants.

CONCLUSIONS: Eight had early PH. Matched infants (n=14) were similar to early PH group for % male (42% vs 42%), GA (25.6±0.3 vs 25.1±1.4wks) and birth weight (806±178 Vs 834± 204g) and SGA (13 vs 12%) were similar among PH and no PH infants.

99
8:30am
Fellow in Training
Pulmonary Hypertension in Preterm Infants: Prevalence and Associations with BPD
Pediatrics, Women & Infants Hospital of Rhode Island, Providence, RI; Pediatric Heart Center, Rhode Island Hospital, Providence, RI.

BACKGROUND: Alveolar growth arrest and pulmonary vascular hypoplasia characterize new Bronchopulmonary Dysplasia (BPD). Vascular injury secondary to Pulmonary Hypertension (PH) could be an etiology for new BPD. The prevalence and associations of PH with BPD have been understudied.

OBJECTIVE: Early PH (10-14 d) is associated with moderate/severe BPD and/or PH at 36 wks post-menstrual age (PMA) in Extremely Low Gestational Age Newborns (ELGAN).

METHODS: This was a prospective observational cohort study of infants < 28wks gestation. Exclusion criteria were major congenital heart disease, pulmonary anomaly, genetic syndrome or death prior to the first study echocardiogram (echo). Echos were performed between 10-14 d of life and at 36 wks PMA to determine PH. Echos were read by either of two pediatric cardiologists for the presence and severity of PH. BPD and its severity was determined by the NIH consensus definitions using an O2 room air challenge reduction. Maternal, perinatal and neonatal variables were compared among infants with moderate/severe PH and with mild or no PH (no PH). Associations between PH and BPD were expressed as a relative risk (RR) and 95% confidence interval (CI). Calculated sample size is 125 infants and enrollment is ongoing.

RESULTS: From March 2011 to Sept 2012, 98 infants were eligible, 4 died before initial echo, 4 denied consent and 90 were enrolled. On initial echo, 8 infants had early PH (<10%) and 82 had no PH. Male gender (50% vs 61%), gestational age (25.1±1.4 Vs 25.6±3.6 wks), birth weight (806±178 Vs 834±204g) and SGA (13 vs. 12%) were similar among PH and non PH infants.

CONCLUSIONS: Early PH occurs in <10% of ELGANs and is associated with moderate/severe BPD. PH does occur with BPD at 36 wks PMA, but early PH does not predict PH at 36 wks PMA.

100
8:45am
Near-Infrared Spectroscopy (NIRS) Evaluation of Sodium Bicarbonate (NaHCO₃) Corrections in Very Low Birth Weight (VLBW) Neonates
Jonathan P. Mintzer, Boriana Parvey, Michael Chechela, Suresh Alpan, Edmund F. La Gamma.
Department of Pediatrics, Division of Neonatal-Perinatal Medicine, Stony Brook Long Island Children’s Hospital, Stony Brook, NY; Department of Pediatrics, Division of Newborn Medicine, Maria Fareri Children’s Hospital at Westchester Medical Center, Valhalla, NY.

BACKGROUND: In VLBW neonates during the first postnatal week, urine bicarbonate losses from immature renal tubules can result in significant metabolic acidosis. To ensure the optimal homeostatic benefits of a normal blood pH, NaHCO₃ correction is occasionally undertaken to replace lost renal bicarbonate. It is unknown whether NaHCO₃ corrections confer a measurable benefit on oxygen delivery and consumption parameters in this population.

OBJECTIVE: To determine the effects of NaHCO₃ replacement of renal bicarbonate losses on cardiopulmonary, laboratory, and tissue oxygenation parameters in VLBW neonates.

METHODS: Data were collected in an observational NIRS survey of 500-1250 g VLBW infants during the first postnatal week. A before-after analysis of NaHCO₃ corrections (0.3 x weight [kg] x base deficit [mEq/L]; infused over 30 minutes) of suspected renal bicarbonate wasting was conducted upon cardiopulmonary, laboratory, and cerebral, renal & splanchnic NIRS data.

RESULTS: Twelve subjects received a total of 17 NaHCO₃ corrections. Gestational age was 27±1 wk (mean ± SEM) and birth weight was 912±45 g. All subjects were in stable clinical condition with normal blood pressure and heart rate. NaHCO₃ corrections delivered a mean fluid bolus of 4.5 mL/kg and shifted the base excess from -7.6 ± 0.4 to -3.4 ± 0.5 (p < 0.05) with an increase in median pH to 7.33 (p < 0.05). No significant changes were observed in systolic or diastolic blood pressure, pulse oximetry, PCO₂, lactate, sodium, BUN, creatinine, or hematocrit. Cerebral, renal, and splanchnic rSO₂ were 74, 66, and 44% respectively at baseline and were unchanged in response to NaHCO₃ correction. Cerebral, renal, and splanchnic tissue oxygen extractions were 0.21, 0.29, and 0.52 respectively at baseline and were also unchanged following NaHCO₃ infusion.

CONCLUSIONS: Correcting metabolic acidosis attributed to renal bicarbonate wasting in this cohort of VLBW neonates produced no discernible effects on cardiopulmonary parameters including rSO₂ and FTOE. A definitive benefit of NaHCO₃ correction cannot be supported by this analysis. We speculate that real-time changes in rSO₂ and/or FTOE may aid in distinguishing renal bicarbonate wasting from metabolic acidosis caused by oxygen delivery/consumption imbalance, thus potentially enabling greater precision in promptly directing appropriate therapies to specific mechanisms.

101
9:00am
Medical Student
Toluene Disruption of L1-Mediated Neurite Outgrowth
Kimberly M.R. White, Penny Bamford, Min He, Ningfang Tang, Cynthia F. Bearer.
Pediatrics, University of Maryland School of Medicine, Baltimore, MD.

BACKGROUND: Toluene is a neurotoxic used as an organic solvent in industry, found in many household cleaning products, and is the main component in spray paint, glues, and other inhalants used by solvent abusers. Toluene exposure during pregnancy can lead to fetal solvent syndrome, which is phenotypically similar to fetal alcohol syndrome. The mechanism by which toluene affects fetal neurodevelopment is still unknown, but recent work has shown that other solvents, such as ethanol, disrupt protein-lipid raft interactions. This disruption leads to reduced neurite outgrowth (NOG) on a lipid raft dependent substrate, such as L1 cell adhesion molecule (L1), but not on a lipid raft independent substrate such as laminin.

OBJECTIVE: Our hypothesis is that toluene, like ethanol, disrupts protein-lipid raft interactions.

METHODS: Pharmacologically relevant concentrations of toluene (0.063 to 2 mM toluene) are used, similar to blood concentrations routinely found in solvent abusers and in
individuals in environments with high concentrations of toluene. Cerebellar granule neurons (CGN) are plated on tissue culture plates prepared with poly L-lysine (PLL) or with either laminin or L1. CGN are cultured overnight in a toluene containing serum free defined media, then fixed and neurite length measured by a blinded investigator.

RESULTS: L1 and laminin significantly increased mean neurite length over PLL. Toluene significantly reduced mean neurite length of CGNs grown on L1 but not laminin. Toluene concentrations down to 0.125 mM significantly reduced mean neurite lengths of neurons grown on L1.

CONCLUSIONS: Toluene significantly reduced L1-mediated NOG but not laminin. These results suggest that toluene acts on lipid raft-protein interactions at environmentally relevant concentrations.

102 9:15am Alteration of Nitric Oxide Pathway in Preterm Ovine Fetal Mesenteric Arteries with Antenatal Betamethasone, Enteral Feeds and Packed Red Cell Transfusions Javasree Nair, Sylvia F. Gujino, Lori Nielsen, Bobby Mathew, Satyan Lakshmimurisima, Neonatology, University at Buffalo, Buffalo, NY.

BACKGROUND: Antenatal betamethasone (beta) is associated with decreased incidence of NEC. We have previously shown that beta and enteral feeds decrease constriction to norepinephrine (NE) and enhance relaxation to nitric oxide (NO) donor in 134d ovine mesenteric arteries (MA) (Nair et al PAS 2011). Packed red cell (PRBC) transfusions increase mesenteric vasoconstriction in fed preterm ovine MA (Nair et al PAS 2012). NO is an important regulator of vasmotor tone in MA.

OBJECTIVE: To determine the effects of beta, feeds and PRBC transfusions on the NO pathway in preterm ovine fetal MA.

DESIGN/METHODS: Time dated pregnant ewes were injected with beta (n=6) or placebo (n=6) at 132 & 133d GA (term-145d), delivered by C-section at 134d and sacrificed at birth. Eight additional 134d lambs were ventilated for 24h and fed expressed breast milk (5 ml/kg q3h) from 6h of age.

RESULTS: Antenatal beta increased expression of eNOS, sGC and PDE5 mRNA and protein increased contractile activity following pretreatment of MA rings with L-nitro-arginine (LNA, 10^{-5} M). Feeds and transfusions increased basal NO activity and/or decreased beta mediated NO activity. Functional assessment of basal NO activity was done by measuring responses that were tabulated for attitudes towards weight and dietary practices. Weight and height of participants were measured to determine body mass index (BMI). Exclusion criteria were chronic disease, being on medications, or having a BMI < 5%ile. According to their BMI, participant groups were divided as G1 (BMI 5-85 %ile) or G2 (BMI > 85 %ile). Descriptive statistics included means, frequencies and SD. Comparisons between independent variables and BMI groups were evaluated with chi-squares and t-tests, using SPSS software.

RESULTS: Data from 60 participants (30 participants in G1 and 30 participants in G2) were analyzed. In G2, 63% considered themselves overweight or obese, while only 20% of G1 participants considered themselves as such (p < 0.05). G2 participants thought more often about losing weight than G1 (p < 0.05), and had better dinner portion size control (p < 0.01). There were no differences in the amount of soda/sweet drink consumption, snacks consumed daily, frequency of fast food consumption, fruit or vegetable portions, the reading of nutrition labels on food packages, or habitual eating behaviors. Nutritional knowledge was poor in both groups with no significant differences between groups.

CONCLUSIONS: The majority of overweight and obese adolescents had correct body weight perceptions and were motivated to lose weight. However, nutritional knowledge was poor among most adolescents in our study irrespective of BMI; education about nutrition would be an important step towards healthy dietary practices in this population. While overweight and obese adolescents had better control of dinner portion size, that alone is not sufficient for weight control, and other important measures might need to be implemented for better outcomes.
Patterns for White and Hispanic males were similar throughout, with about 3-4% self-reporting pre-SD. There was a small but significant decrease for White males from 1991 to 2011 (4% to 2.5%). Black males had higher levels of pre-SD in 1991 than all other ethnic groups at both time points.

**CONCLUSIONS:** Pre-SD has declined for some groups of US teens since 1991; however, the prevalence is still alarmingly high for females, especially Black females. Future efforts to delay sexual activity in youth needs to focus especially on minority females.
BACKGROUND: Despite improved outcomes for infants with hypoplastic left heart syndrome (HLHS), approximately half of infants in the US still receive comfort care. Factors that influence the decision to withhold comfort care from infants with HLHS and how attitudes have changed over time are not well understood.

OBJECTIVE: We hypothesized that enthusiasm for surgery for infants with HLHS increased at Columbia University Medical Center (CUMC) between 1995 and 2012 and that more providers now recommend surgery. We sought to identify factors that influence those changes.

DESIGN/METHODS: Confidential surveys were distributed to nurses, cardiologists and intensivists in the neonatal and pediatric ICUs at CUMC in 1995 and 2012 and results were compared. Factors influencing enthusiasm for surgery for HLHS were examined. Surgical preference scores (range 0-70) are presented as mean±SD or %±95%CI.

RESULTS: Surveys were completed by 99/176 providers (56% response rate) in 1995 and 134/244 (55%) in 2012. The average surgical preference score increased from 34±14 in 1995 to 42±13 in 2012 (p<0.001). Surgical preference scores increased for MDs (36±14 to 44±21, p<0.02), RNs (33±13 to 39±14, p<0.02), NICU RNs (28±13 to 38±13, p<0.02) cardiologists (38±13 to 45±12, p<0.05) and neonatologists (31±16 to 43±10, p<0.05). 63±8% of respondents recommended surgical intervention for a ward of the court in 2012 compared to 43±10% in 1995 (p<0.02). In 2012, 64±11% of respondents reported being more likely to recommend surgery than 10 years prior. 54±6% of respondents in 2012 had seen a patient with a good outcome following three-stage repair compared to 49±11% in 1995 (p<0.001). The majority believed that parents should have the option of comfort care, 91±6% in 1995 and 95±2% in 2012, p=0.2. In both eras, providers were more likely to recommend surgery for a newborn of older parents who have no other children and used IVF for the pregnancy while prematurity and other surgical problems dissuaded providers from recommending surgical intervention.

CONCLUSIONS: As outcomes have improved over the past 17 years, there has been a significant shift in provider attitudes at CUMC toward surgical intervention for newborns with HLHS. In addition, more providers have now seen good-three-stage surgical outcomes. Despite these findings, the majority of providers still believe that the option of comfort care should be provided to families.
Primary outcome and variables for the 1 gm/kg/day and 3 gm/kg/d group.

CONCLUSIONS: Lower amount of IFE was not associated with a reduction in the incidence of PNALD and did not adversely affect growth.

Supported in part by T32HD-07094 and UL1TR000124.

112 10:00am

**Graduate Student**

## Early Parenteral to Enteral Nutritional Transition Does Not Affect Weight Growth Velocity or Length of Hospitalization in Very Low Birth Weight Infants


**Pediatrics, Columbia University College of Physicians & Surgeons, New York, NY.**

**BACKGROUND:** Nutritional management of very low birth weight (VLBW) infants (Birth weight <1500 g) remains of paramount significance despite improved neonatal survival. In many NICU’s, despite concerns for infection the transition from parenteral-to-enteral nutrition is often delayed for the fear of suboptimal growth, longer duration of hospitalization and increased incidence of gastrointestinal morbidity in the form of necrotizing enterocolitis (NEC) leading to prolonged use of percutaneous central venous catheter (PCVC). The practice of timely discontinuation of total parenteral nutrition (TPN) and PCVC once adequate enteral nutrition is established is highly variable and inconsistent.

**OBJECTIVE:** In an ongoing quality improvement initiative addressing catheter linked blood stream infection reduction in VLBW infants, we addressed the issue of timely discontinuation of TPN and removal of PCVC with enteral nutrition and evaluated its effect on the weight growth velocity, length of hospitalization and NEC.

**DESIGN/METHODS:** The electronic medical records of 153 VLBW infants born between Jan 2011 and Dec 2011 were evaluated. During this period parenteral-to-enteral nutrition transition guidelines were developed and initiated. 110 infants who utilized PCVC and qualified for the study were divided into two groups based on enteral intake volume (100 ml/kg/d was divided by 25) and ≥ 100mg/kg/d (n=85) when the PCVC was removed. Data for weight growth velocity, length of hospitalization and incidence of NEC were compared between the two groups.

**RESULTS:** Earlier transition from parenteral-to-enteral nutrition and PCVC discontinuation at <100 ml/kg/d enteral intake had no effect on weight growth velocity from birth to discharge (12.5±2.0 vs. 12.1±2.9 g/kg/d, p=NS), weight growth velocity from full enteral intake to discharge (14.4±3.1 vs. 14.1±4.1 g/kg/d, p=NS), total length of hospitalization (71.4±33.9 vs. 75.9±32.4 d, p=NS) or incidence of NEC (0 vs. 1.3%, p=NS) compared to when the transition and PCVC discontinuation was delayed beyond 100ml/kg/d enteral intake.

**CONCLUSIONS:** Our data demonstrates that early parenteral-to-enteral nutritional transition does not affect weight growth velocity or length of hospitalization in VLBW infants. Further research into evaluating barriers towards adherence to standardized nutritional protocols is needed to improve outcome.

113 10:15am

**Graduate Student**

## Quality of Diet and Central Nervous System Activity in Low Birth Weight Infants

Jacquelyn Piraguppe, Philip Grieve, Kashyap Sudha, Michael Myers, Raymond Stark, Rakesh Sahni.

**Pediatrics, Columbia University College of Physicians & Surgeons, New York, NY.**

**BACKGROUND:** Our data in diet are known to influence brain function. It remains unknown whether qualitative and quantitative differences in diet, particularly fat and carbohydrate (CHO) intake, during periods of rapid growth and development can alter central nervous system (CNS) activity.

**OBJECTIVE:** To evaluate the effects on the brain of variations in non-protein energy substrate, we measured electrocortical (EEG) activity in low birth weight (LBW) infants with different fat and CHO intakes.

**DESIGN/METHODS:** 62 healthy LBW infants (Bwt<750-1600g) were randomized to receive 1 of 5 formulas differing in quality and quantity of non-protein energy. These formulas provided fixed intakes of protein (4 g/kg/d), but different intakes of fat (4.3-9.5 g/kg/d) and CHO (9.1-20.4 g/kg/d). 6-h studies were performed at 2-wk intervals from the time of full enteral intake until discharge. Infants were randomly assigned to prone or supine sleeping position for the first 3-h postprandial period; the position was reversed during second 3-h, 2-channels of EEG and EKG were recorded continuously and sleep state was coded every minute. Power spectral analysis was performed on EEG data; and total EEG power was segregated into 5 frequency bands: 0-1 Hz, 1-4 Hz, 4-8 Hz, 8-12 Hz and 12-24 Hz. Total EEG power, absolute (AP) and relative power in each band, spectral edge frequency (SEF), heart rate (HR) and heart rate variability (HRV) were calculated and averaged for each minute by state and posture. Maturational, sleep state, posture changes in EEG and cardiac activity were evaluated in relation to dietary intake.

**RESULTS:** Increasing fat intake (FI) was associated with increased SEF (F(4,56)=1.57,p=0.03). Higher AP in the 1-4Hz band was observed at FI ≥6 g/kg/d vs. ≤6 g/kg/d (r=0.3,p=0.03). The higher FI group also exhibited increased HRV (F(4,57)=3.7, p=0.02 (quiet sleep); F(4,57)=2.97, p=0.03 (active sleep)) and trends for slower HR relative to the low FI group. No significant effect of CHO intake on EEG activity was observed.

**CONCLUSIONS:** Results aligned with previous reports of maturational changes and sleep state changes by posture in LBW infants. The data demonstrate increased EEG Power in 1-4Hz band and increased HRV (increased parasympathetic activity) at higher FI. This suggests that the effects of nutrition on CNS activity are complex and involve the interplay of a variety of systems and may be manipulated to optimize short and long-term outcomes.

114 10:30am

**Resting Energy Expenditure in Survivors of Congenital Diaphragmatic Hernia**

Heather B. Howell, Christiana Farkouh-Karoleski, Rakesh Sahni.

**Pediatrics, New York University, New York, NY; Pediatrics, Columbia University, New York, NY.**

**BACKGROUND:** Infant survivors of Congenital Diaphragmatic Hernia (CDH) are at risk for growth failure from inadequate caloric intake and high catabolic stress. Currently there is no available data on energy expenditure in this population.

**OBJECTIVE:** To assess caloric intake and Resting Energy Expenditure (REE) in neonates with CDH and compare the values to historical normative data in healthy term neonates.

**DESIGN/METHODS:** A prospective cohort study of patients with CDH, medically and surgically managed in the neonatal period at the Children’s Hospital of New York Presbyterian, was performed. Patient demographics, clinical course and daily caloric intake from parenteral and enteral nutrition during hospitalization were recorded. Fifteen 2-hour bedside REE studies were performed via indirect calorimetry (ParvoMedics, Inc) prior to discharge when infants were on full enteral feeds and without any respiratory support. Minute-by-minute measurements of oxygen consumption, carbon dioxide production and REE were obtained. Data were compared to postnatal REE values obtained in healthy term infants (1) using t-test and the effect of post-natal age (PNA) on REE was evaluated using linear correlation analysis. 1, Bauer J et al. Metabolic rate analysis of healthy preterm and full-term infants during the first weeks of life. Am J Clin Nutr 2009;90:1517-24.

**RESULTS:** Of the 15 patients who underwent REE studies 53% were male, 73% had left sided defects and the average gestational age was 38.6 weeks with average birth weight of 3.2kg. At the time of the REE the average PNA was 4.1 weeks (1-12) and the average caloric intake, based upon three-day count, was 95.7kcal/kg/d (58.2-127.4). The average REE in infants with CDH was compared to the REE obtained in healthy term infants at various PNA and was not significantly different (df=3, p=0.29). Caloric intake by week were similar to the healthy term infants (df 3, p=0.4). The REE in our group increased with increasing PNA (r=0.51, p<0.05).

**CONCLUSIONS:** Our data demonstrates that during early infancy, REE in infants with CDH increases with increasing PNA and is comparable to that of healthy term infants at various PNA. Further longitudinal studies are needed to evaluate growth failure in these infants.

**Medical Education Platform Session**

Saturday, March 23, 2013

9:45am–10:45am

115 9:45am

**Helping Medical Students Use Their HEADDSS: Improving Encounters with Adolescent Patients Using OSCEs**

Hai Jung H. Rhim, Ilir Agalliu, Miriam Schechter.

**Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, NY.**

**BACKGROUND:** Interviewing an adolescent patient is one of the APA/COMSEP General Pediatric Clerkship Curriculum’s skills competencies. Clerkships must teach students the unique aspects of the adolescent interview and, more importantly, provide a means for students to practice.

**OBJECTIVE:** To design a curriculum for a standardized encounter with an adolescent patient using Objective Structured Clinical Examinations (OSCEs).

**DESIGN/METHODS:** We developed and implemented a resident-led OSCE curriculum to help medical students use their HEADDSS: Improving Encounters with Adolescent Patients Using OSCEs. In year one, we provided a formative OSCE during which students were given multiple clinical encounters with standardized patients (SP). They generally perform poorly on social history items.

**CONCLUSIONS:** Our data demonstrates that during early infancy, REE in infants with CDH increases with increasing PNA and is comparable to that of healthy term infants at various PNA. Further longitudinal studies are needed to evaluate growth failure in these infants.
RESULTS: We collected CSA results on 513 students over 3 years. All numbers represent % of students who addressed each HEADDSS item.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-interventions</th>
<th>WS only</th>
<th>WS &amp; OSCE</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=173</td>
<td>N=174</td>
<td>N=166</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>72</td>
<td>85</td>
<td>91</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Education</td>
<td>53</td>
<td>71</td>
<td>71</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Activities</td>
<td>30</td>
<td>45</td>
<td>66</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cigarettes</td>
<td>78</td>
<td>75</td>
<td>60</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Alcohol</td>
<td>84</td>
<td>86</td>
<td>81</td>
<td>0.47</td>
</tr>
<tr>
<td>Marijuana</td>
<td>76</td>
<td>79</td>
<td>78</td>
<td>0.73</td>
</tr>
<tr>
<td>Depression</td>
<td>39</td>
<td>57</td>
<td>60</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sexuality</td>
<td>60</td>
<td>58</td>
<td>74</td>
<td>0.0005</td>
</tr>
<tr>
<td>Safety</td>
<td>42</td>
<td>54</td>
<td>61</td>
<td>0.0002</td>
</tr>
<tr>
<td>Confidentiality</td>
<td>75</td>
<td>75</td>
<td>95</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The addition of an OSCE improved the establishment of confidentiality and all aspects of the HEADDSS exam, except education and drugs. This is on top of improvements due to the implementation of the WS. This highlights the importance of practicing concepts learned in the classroom. An OSCE is the ideal setting for this and can help ensure learners acquire competency in interviewing teenagers.

116
10:00am
House Officer
An Educational Intervention on Patient Handoffs
Hamnah Sasin, Catherine Sake
PEDIATRICS, THE CHILDREN’S HOSPITAL AT MONTEFIORI, BRONX

BACKGROUND: ACME regulations limiting resident work hours have increased the number of patient hand-offs. Numerous studies have demonstrated that sign-out related issues directly contribute to adverse patient effects. Despite this, sign-out remains unregulated with little to no formal resident training. At our institution, the content of patient handoff information has always been left to the discretion of the house officer providing sign-out.

OBJECTIVE: To determine if the resident sign-out process could be improved by providing residents with formal education on the topic and a standardized tool to guide the sign-out process.

DESIGN/METHODS: We conducted an IRB-approved study in which we recorded nighttime sign-outs on our pediatric inpatient units. Post-call residents completed a survey modeled after an instrument designed by O’Toole (Cincinnati Children’s) to measure unanticipated patient occurrences that overnight residents felt could have been prevented by more thorough sign-outs.

Mid-way through the residents’ rotation, we conducted a workshop on proper sign-out techniques with the introduction of a new sign-out sheet and mnemonic, CHAMPS, to serve as a framework: (Condition, HPI, Alarming events, Mandatory to do list, Person in charge and Scenarios). We continued to record and collect post-call surveys for the remainder of the rotation. A total of 105 surveys were analyzed.

RESULTS: The incidence of unanticipated patient occurrences went from 9% pre-intervention to 6% post-intervention (p < 0.06, Pearson’s Chi Square). Residents were more likely to appropriately report abnormal vital signs or physical exam findings 8.3% unreported pre vs. 0% unreported post (p < .03). The time residents spent during an overnight shift searching for information that they felt they should have received during sign-out decreased from 26.8 minutes pre-intervention to 11.4 minutes post-intervention.

CONCLUSIONS: We feel that this pilot study represents a better resident awareness of essential components of a complete sign-out resulting in decreased unanticipated patient occurrences overnight.

117
10:15am
Fellow in Training
Communication Skills Utilized by Pediatric Residents When Conducting a Difficult Conversation
Gail S. Cameron, Alexander Agthe, Brenda Hussey-Gardner, Pamela Donohue, Alison J. Falck
PEDIATRICS, UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE, BALTIMORE; PEDIATRICS, JOHNS HOPKINS SCHOOL OF MEDICINE, BALTIMORE

BACKGROUND: Conducting difficult conversations is an important skill for pediatrics; parents value knowledgeable and empathetic exchange when receiving difficult news. The ACME has identified interpersonal and communication skills as a core competency for residents. Clinical training is varied; pediatric residents express lack of confidence in advanced communication skills such as giving bad news.

OBJECTIVE: To determine communication patterns used by pediatric residents when conducting difficult conversations with a simulated parent, and describe the relationship between confidence and communication patterns.

DESIGN/METHODS: During 2011-12, pediatric residents at University of Maryland Medical Center were enrolled. Residents completed a 5-point likert survey validated by Rider et al., assessing confidence with communication skills. Residents then participated in a video and audio taped encounter with a simulated parent during which the diagnosis of Trisomy 21 in a newborn was disclosed. After debriefing, a post-encounter survey was completed. Roter Interaction Analysis System (RIAS) was utilized to analyze communication patterns by documenting the frequency of verbal exchanges and assigning resident talk to predefined and validated categories. ANOVA was used to compare confidence level with communication patterns.

RESULTS: 35/42 residents participated (PGY1=14, PGY2=11, PGY3=10). 46% were highly confident with responding to emotion, 65% with building rapport, and 80% with showing empathy. However, RIAS data demonstrated that only 22% of resident talk was social-emotional such as building rapport or empathy, and 78% was task-focused, such as providing information or data gathering. There was no relationship between confidence and communication patterns or differences based on PGY. On post-encounter survey, 3 major self-reported strengths were information exchange, social-emotional support, and building rapport. 91% reported a positive experience that highlighted strengths and weaknesses, reinforced skills, and provided a safe practice environment.

CONCLUSIONS: Residents express confidence with social-emotional communication skills, but utilized task-focused communication during the simulated scenario. Curricula should focus on all aspects of effective communication. Simulation may be used as an adjunct to clinical experience when teaching and evaluating this important competency. Funded by Mead Johnson Nutr. training grant.
Long Term Effect of Src Kinase Inhibition on Caspase-1 Activity in the Newborn Piglet Brain
Dimitrios Angelis, Tania D. Fontanez-Nieves, Qazi M. Ashraf, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: It is known that caspase-1 activation leads to pyroptosis and the formation of the inflammasome with end products the induction of IL-1β, IL-18 and TNFα. In previous studies we showed that caspase-1 activity and expression is increased during hypoxia. However the long term effect of hypoxia on caspase-1 activation and the inflammatory pathway is not known.

OBJECTIVE: The present study tests the hypothesis that hypoxia induced increased activity and expression of caspase-1 in the cytosol of the cerebral cortex of newborn piglets persists for 14 days.

DESIGN/METHODS: Piglets were divided into 4 groups: Normoxia (Nx, n=5), acute hypoxia (Hx, n=5), hypoxia followed by 1 day (Hx-D1, n=5) and 14 days (Hx-14D, n=5) in FiO₂ 0.21. Hypoxia piglets were exposed to FiO₂ 0.05 for 1 hour then returned to FiO₂ 0.21. Tissue hypoxia was documented by ATP and phosphocreatine (PCr) levels. Cytoisol was isolated and caspase-1 activity was determined by spectrophotometry, using a specific substrate (Ac-Tet-Glu-His-Asp-AMC) for caspase-1. Caspase-1 expression was determined by western blot using p-10 light chain rabbit polyclonal antibody. Results were expressed as autoradiographic values (OD/mm²) as percent of the control (Nx) at the band with molecular weight of 45kD, which corresponds to the precursor caspase-1 molecule.

RESULTS: ATP (µmol/g brain) was 5.05±0.72 in Nx and 1.94±0.5 in Hx (P<0.05 vs Nx), and PCr (µmol/g brain) was 3.4±0.51 in Nx, 1.23±0.38 in Hx (P<0.05 vs Nx). Caspase-1 activity (µmol/mg protein/hr) was 1.83±0.73 in Nx, 3.38±0.47 in Hx (P<0.05 vs Nx), 2.05±0.45 in Hx+PP2 (P<0.05 vs Hx, P<0.05 vs Nx), 3.13±0.95 in Hx-1D (P<0.05 vs Nx, P<0.05 vs Hx), 1.43±0.05 in Hx-14D (P<0.05 vs Nx, P<0.05 vs Hx, P<0.05 vs Hx-1D) and 4.14±0.54 in Hx+PP2-1D (P<0.05 vs Nx, P<0.05 vs Hx). The data show that caspase-1 activity and expression are increased in the hypoxic group and this increase is maintained up to 14 days post the hypoxic insult.

CONCLUSIONS: We concluded that the mechanism of increased activation of caspase-1 persists for 14 days following hypoxia, indicating that hypoxia-induced neuroinflammation may be sustained by the synthesis of proinflammatory cytokines such as IL-1β for a long period after a short hypoxic insult. We propose that the hypoxia-induced activation of caspase-1 is due to both the transcription-dependent as well as transcription-independent mechanisms.

Long Term Effect of Src Kinase Inhibition on Phosphorylation of CaM Kinase IV Following Hypoxia in the Cerebral Cortex of Newborn Piglets
Matthew Furst, Olha Lynch, Anli Zhu, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: It is known that caspase-1 activation leads to pyroptosis and the formation of the inflammasome with end products the induction of IL-1β, IL-18 and TNFα. In previous studies we showed that caspase-1 activity and expression is increased during hypoxia. However the long term effect of hypoxia on caspase-1 activation and the inflammatory pathway is not known.

OBJECTIVE: The present study tests the hypothesis that hypoxia induced increased activity and expression of caspase-1 in the cytosol of the cerebral cortex of newborn piglets persists for 14 days.

DESIGN/METHODS: Piglets were divided into 4 groups: Normoxia (Nx, n=5), acute hypoxia (Hx, n=5), hypoxia followed by 1 day (Hx-D1, n=5) and 14 days (Hx-14D, n=5) in FiO₂ 0.21. Hypoxia piglets were exposed to FiO₂ 0.07 for 1 hr then returned to FiO₂ 0.21. Tissue hypoxia was documented by ATP and phosphocreatine (PCr) levels. Cytoisol was isolated and caspase-1 activity was determined by spectrophotometry, using a specific substrate (Ac-Tet-Glu-His-Asp-AMC) for caspase-1. Caspase-1 expression was determined by western blot using p-10 light chain rabbit polyclonal antibody. Results were expressed as autoradiographic values (OD/mm²) as percent of the control (Nx) at the band with molecular weight of 45kD, which corresponds to the precursor caspase-1 molecule.

RESULTS: ATP (µmol/g brain) was 5.05±0.72 in Nx and 1.94±0.5 in Hx (P<0.05 vs Nx), and PCr (µmol/g brain) was 3.4±0.51 in Nx, 1.23±0.38 in Hx (P<0.05 vs Nx). Caspase-1 activity (µmol/mg protein/hr) was 1.83±0.73 in Nx, 3.38±0.47 in Hx (P<0.05 vs Nx), 2.05±0.45 in Hx+PP2 (P<0.05 vs Hx, P<0.05 vs Nx), 3.13±0.95 in Hx-1D (P<0.05 vs Nx, P<0.05 vs Hx), 1.43±0.05 in Hx-14D (P<0.05 vs Nx, P<0.05 vs Hx, P<0.05 vs Hx-1D) and 4.14±0.54 in Hx+PP2-1D (P<0.05 vs Nx, P<0.05 vs Hx). The data show that caspase-1 activity and expression are increased in the hypoxic group and this increase is maintained up to 14 days post the hypoxic insult.

CONCLUSIONS: We concluded that the mechanism of increased activation of caspase-1 persists for 14 days following hypoxia, indicating that hypoxia-induced neuroinflammation may be sustained by the synthesis of proinflammatory cytokines such as IL-1β for a long period after a short hypoxic insult. We propose that the hypoxia-induced activation of caspase-1 is due to both the transcription-dependent as well as transcription-independent mechanisms.

Mechanism of Caspase-2 Expression during Hypoxia in Cerebral Cortex of Newborn Piglets
Bhavi Patel, Dimitrios Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: Caspase-2, a cysteine protease, is required for cell death receptor-mediated programmed cell death. Caspase-2 is a developmentally regulated initiator caspase, which poorly cleaves other caspases but can initiate mitochondrial outer membrane permeabilization. We have previously shown that hypoxia results in increased expression of caspase-2 and increased activation of caspase-2 in the newborn pig brain. This study determined whether Src kinase will reduce the activation of caspase-8 up to 2 weeks after the hypoxia.

RESULTS: The average band density in Nx was 228.7, 364 in Hx (p<0.05), 489.8 in Hx-1D (p<0.05 vs Nx, p<0.05 vs Hx), 3.10±0.95 in Hx-14D (p<0.05 vs Nx, p<0.05 vs Hx), 1.43±0.05 in Hx+PP2-1D (p<0.05 vs Hx, p<0.05 vs Hx-1D) and 4.14±0.54 in Hx+PP2-14D (P<0.05 vs Hx, p<0.05 vs Nx, p<0.05 vs Hx). The data shows that caspase-8 activity increased by 38% 1 day after Hx and by 69% 14 days after hypoxia compared to Nx. Caspase-2 activity remained comparable to normoxic level until 1 day and 14 days after hypoxia when Src kinase inhibitor was administered prior to hypoxia.

CONCLUSIONS: We conclude that Src kinase inhibition prior to hypoxia abolishes hypoxia-induced activation of caspase-2 in the acute phase of hypoxia and that this effect is sustained up to 2 weeks. We propose that Src kinase inhibition following hypoxia will block both the extrinsic as well as intrinsic mitochondrial mechanisms of cell death and therefore it is a potential strategy for neuroprotection. (NIH 20373).

120 10:00am

House Officer

Mechanism of Caspase-2 Expression during Hypoxia in Cerebral Cortex of Newborn Piglets
Bhavi Patel, Dimitrios Angelis, Qazi M. Ashraf, Maria Delivoria-Papadopoulos. Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: Caspase-2, a cysteine protease, is required for cell death receptor-mediated programmed cell death. Caspase-2 is a developmentally regulated initiator caspase, which poorly cleaves other caspases but can initiate mitochondrial outer membrane permeabilization. We have previously shown that hypoxia results in increased expression of caspase-2 and increased activation of caspase-2 in the newborn pig brain. This study determined whether Src kinase will reduce the activation of caspase-8 up to 2 weeks after the hypoxia.

RESULTS: The average band density in Nx was 228.7, 364 in Hx (p<0.05), 489.8 in Hx-1D (p<0.05), 3.10±0.95 in Hx-14D (p<0.05 vs Nx, p<0.05 vs Hx), 1.43±0.05 in Hx+PP2-1D (p<0.05 vs Hx, p<0.05 vs Hx-1D) and 4.14±0.54 in Hx+PP2-14D (P<0.05 vs Hx, p<0.05 vs Nx, p<0.05 vs Hx). The data shows that caspase-8 activity increased by 38% 1 day after Hx and by 69% 14 days after hypoxia compared to Nx. Caspase-8 activity remained comparable to normoxic level until 1 day and 14 days after hypoxia when Src kinase inhibitor was administered prior to hypoxia.

CONCLUSIONS: We conclude that Src kinase inhibition prior to hypoxia abolishes hypoxia-induced activation of caspase-2 in the acute phase of hypoxia and that this effect is sustained up to 2 weeks. We propose that Src kinase inhibition following hypoxia will block both the extrinsic as well as intrinsic mitochondrial mechanisms of cell death and therefore it is a potential strategy for neuroprotection. (NIH 20373).
CONCLUSIONS: Simple morphometric measurements (UN and USP) are more accurate than formulas for UAC and UVC placement, regardless of birth weight.
CONCLUSIONS: We have demonstrated significantly improved in-hospital outcomes for very preterm infants at our institution after implementation of a delivery-room based QI initiative. We continue to monitor adherence to the guidelines and seek to continually improve the process of delivery room resuscitation. In next steps, we will expand the intervention to standardize delivery room management of larger infants.


Pediatrics, Section of Neonatology, University of Chicago Medicine, Chicago, IL.

BACKGROUND: Delivery room management of extremely premature infants is historically not regulated by professional organizations or regulations. In the United States legal definitions of human viability and statutes regarding elective abortions vary by state and are at times intentionally vague, placing providers in an often dubious position of whether to attempt resuscitation when faced with the delivery of an infant of 22-25 weeks gestation.

OBJECTIVE: To delineate any variations in delivery room resuscitation practices of perivable infants.

DESIGN/METHODS: Electronic survey sent to members of AAP Section of Perinatal Medicine. Multivariate logistic regression performed.

RESULTS: 637 completed surveys were returned. The majority (68%) of providers consider 23 weeks to be the youngest age that should be resuscitated at the parents' request, while 25 weeks is considered by 51% to be the youngest age of obligatory resuscitation even if the parents refuse. This did not vary based on age, years of practice, practice setting, religion, political views, or viability laws of providers’ State of employment. Significant differences in responses were found when providers were separated into geographical regions based on the US Census Bureau. When provided with delivery room scenarios, what the parents wanted significantly affected resuscitation attempts of 22-25 week, but not 26 week infants. When parental wishes were unknown, birth weight and "how the baby looked" were important factors (Figure 1A). In scenarios of perivable elective terminations, providers’ personal belief systems influenced management of aborted fetuses (Figure 1B).

CONCLUSIONS: Significant regional practice variation exists throughout the United States independent of specific state laws. Parental request is the most important factor to providers when faced with resuscitation of 22-25 week infants. Providers personal belief systems, including religion and political views, influence infant management in some situations.
**Neutralizing IL-4 Rescues Inflammation in Neonatal Islets and Prevents β-Cell Failure in Adult IUGR Rats**

Lane J. Jackle Santos, Rebecca A. Simmons.

**Background:** Intrauterine growth retardation (IUGR) is linked to the later development of type 2 diabetes (T2D). We have developed an animal model of IUGR, which leads to the development of T2D in adulthood. Inflammation is associated with T2D in both human and experimental models, but it is unknown whether inflammation is causal or secondary to the abnormal metabolic state.

**Objective:** To test the hypothesis that IUGR induces fetal inflammation in the islet which in turn leads to decreased islet vascularity and impaired insulin secretion.

**Design/Methods:** Gene expression was measured using microarrays in control and IUGR animals at 19 and post-natal day (PD) 14. Pancreas histology and analysis of cytokine and hormone levels were also performed at PD19 and PD14. Insulin secretion was measured at 11 weeks of age using perfusion ramp studies.

**Results:** Microarray analysis of fetal and PD 14 IUGR islets showed marked changes in expression of genes regulating immune mediated inflammation, macrophage activation and angiogenesis. Histological examination of fetal and PD 14 IUGR islets show decreased capillary density, and invasion by T-lymphocytes and macrophages. Levels of IL-2, IL-4 and IL-10 were significantly elevated in fetal islet lysates, consistent with Thelper 2 immune response. MCP1 and RANTES levels were also significantly increased in serum from PD 14 IUGR rats, consistent with increased monocyte and macrophage recruitment. To determine whether inflammation is responsible for the abnormal β-cell phenotype, animals received neutralizing IL-4 antibody treatment or vehicle at PD day 1-5. Neonatal neutralizing IL-4 treatment rescued inflammation, restored islet capillary density by PD14, and normalized insulin secretion at 11 weeks.

**Conclusions:** Our results demonstrate that adult-onset diabetes secondary to IUGR is both preceded by and caused by fetal islet inflammation, resulting in immune cell invasion, inflammatory cytokine release, decreased islet vascularity and beta cell mass, and increased insulin resistance. Administration of neutralizing IL-4 antibodies at the neonatal stage suppresses inflammatory cytokine levels, normalizes islet vascularity, and permanently restores insulin sensitivity, demonstrating a novel role for Th2 immune responses in the induction and progression of T2D. At the neonatal stage, inflammation and vascular changes are reversible, and may define an important developmental window for therapeutic intervention to prevent adult onset diabetes.

---

**Optimal Heart Rate Cut-Off for Initiation of Chest Compressions during Neonatal Resuscitation**

Bobby Mathew, Jayasree Nair, Daniel D. Szwartz, Chunxiang Ma, Vinay Shama, Sylvia F. Gugino, Carmon Koenigsknecht, Satyan Lakshminrusimha.

**Background:** Children in the emergency department (ED) frequently receive procedural sedation. However, there is a risk of respiratory depression during sedation. Capnography, a continuous noninvasive monitor of ventilation, has been shown to detect hypventilation and apnea earlier than standard monitoring and thus could improve patient safety.

**Objective:** To determine if adding capnography to standard monitoring for procedural sedation will increase staff interventions in response to apnea and hypventilation, as such verbal or physical stimulation and airway repositioning. 2) To determine if this will in turn decrease the frequency of oxygen desaturations <95%.
Do Thawing and Warming Affect the Integrity of Human Milk?

Deepali Handa, Ali Faraghi Abrahi, Champa N. Codipilly, S. A. Shah, Samantha Ruff, Debra Potak, Richard J. Schanler, Neonatal-Perinatal Medicine, Cohen Children’s Medical Center of New York, New Hyde Park, NY; Lilling Family Neonatal Research Lab, Feinstein Institute for Medical Research, Manhasset, NY; Pediatrics, Hofstra North Shore-LIJ School of Medicine, Hempstead, NY.

BACKGROUND: As most neonates in the NICU are fed human milk, efforts to ensure quality control of the milk are receiving renewed interest. Since most of this milk is frozen, it is common to thaw and warm human milk prior to feeding. There are 2 methods available to thaw and warm human milk but no comparison data are available.

OBJECTIVE: To evaluate the integrity of human milk subjected to 2 methods of thawing and warming and to evaluate the integrity of the milk after freezer storage, thawing, thawing, and warming, and waiting to be fed.

DESIGN/METHODS: Mothers in the NICU donated 100 mL of milk. One sample was stored immediately at 80°C (baseline), and the remainder was frozen at -20°C for 7 days. Subsequently, the frozen milk was subjected to 2 methods of thawing and warming (tropical and waterless methods). After each process, aliquot was stored at -80°C. Thawed milk also was maintained at refrigerator temperature of 4°C x 24 h prior to warming. Lastly, warmed milk was maintained in room temperature (RT) x4 h to simulate the length of a feeding session. Milk integrity was described as the overall effect of processing on milk pH, the contents of protein, sIgA, lactoferrin, fat, free fatty acids, oxidant activity, and bacterial colony counts (total, TBCC; Gram positive, GPCC; Gram negative, GNCC). Data were analyzed by repeated measures ANOVA and paired t test.

RESULTS: There were no differences in milk integrity between tepid water and waterless thawing and warming methods (p=1). There were no changes in total protein, sIgA, and lactoferrin with thawing and warming; there was a significant change in pH between baseline (mean pH 7.12), thawing (7.00), and warming (7.00), p < 0.001. TBCC did not change significantly between baseline (9.4±10), thawing (7.9), and warming (8.4). GPCC and GNCC did not change significantly from baseline to thawing and warming. When thawed milk was stored in the refrigerator x24 h and then warmed, the only change was a further decline in pH (6.75). When warmed milk was maintained at RT x4 h there was an increase in TBCC (12.5), GPCC (6.2), and GNCC (6.7), p < 0.001.

CONCLUSIONS: Thawing and warming do not affect the integrity of previously frozen human milk adversely. The integrity of the milk is affected similarly by the two methods of thawing and warming. Concerns about maintaining warmed milk at RT need to be explored.

House Officer

Prevalence and Duration of Breastfeeding in ADHD vs. Non-ADHD Children Ages 3-5: Analysis of 2007 National Health Survey Data

Rachel M. Goldberg, Suzanne Sunday, Andrew Adesman, Developmental Pediatrics, Cohen Children’s Medical Center of New York, New Hyde Park, NY; Biostatistics, Feinstein Institute for Medical Research, Manhasset, NY.

BACKGROUND: Previous studies have found a direct relationship between breastfeeding and improved cognition. Since breast milk (BM) is richer in needed essential fatty acids (EFA) for the developing brain than formula and since children with ADHD benefit from EFA supplementation, it raises the question whether children with ADHD differ from controls regarding breastfeeding history.

OBJECTIVE: To compares the prevalence and duration of breastfeeding in ADHD and non-ADHD children using a national sample of preschool aged children.

DESIGN/METHODS: This study is a cross-sectional analysis of children ages 3-5 years old from the 2007 National Survey of Children’s Health (NSCH). The NSCH includes 91,642 children and is weighted to represent the population of non-institutionalized children ages 0-17 in the United States. Following exclusion for confounding conditions missing data, analyses were done on 54 children with ADHD and 54 controls carefully matched for sex, age, race, poverty, health insurance status, respondent, # of children and # of adults in the home, and birth order. Dependent variables were whether the child was ever breastfed and at what age breastfeeding stopped.

RESULTS: Significantly fewer preschool aged children with ADHD did not breastfeed; 46% of ADHD children did not breastfeed; 22% of the non-ADHD controls did not breastfeed (χ²=7.12, p=0.0076). Among infants that were nursed, significant differences were noted regarding duration of breastfeeding. 57% of ADHD children were breastfed for <1 month, 20% for 1–5 months, and 22% for >6 months. For the cohort of matched controls, 26% breastfed for <1 month, 28% for 1–5 months, and 46% for >6 months (χ²=11.58, p=0.0003).

CONCLUSIONS: Mothers of ADHD children were less likely to have breastfed their child than matched controls. In addition, mothers of preschool children with ADHD who did breastfeed were more likely to discontinue breast feeding at an earlier time. Since breast milk has more of the key essential fatty acids for brain development than does formula, and since children with ADHD have lower levels of long-chain polysaturated fatty acids and benefit clinically from essential fatty acid supplementation, formula feeding may be an additional risk factor for ADHD. The lower incidence of breastfeeding in our matched preschool ADHD cohort is consistent with this hypothesis.
BACKGROUND: Information on infant formula sales in the US was last published in 2000. Since then there has been a proliferation of infant formula products many of which vary from standard cow’s milk formula in composition and cost. What formula-fed infants are consuming in the US is unknown. OBJECTIVE: A descriptive study of a nationally representative sample of one year’s worth of infant formula sales. We sought to describe the proportion of infant formula that is milk-based vs. soy based and among the milk-based formulas describe the proportion that is lactose modified, contains a protein hydrolysate, or is modified in both ways. We describe cost variation in relation to these modifications.

DESIGN/METHODS: Data on 52 week’s worth of sales of the top selling infant formula products were purchased from a company that tracks and aggregates point-of-sale scanner data from supermarkets, chain stores, and pharmacies nationally. The data we report was obtained in the 52 weeks preceding 9/5/2010. We obtained sales and cost information on the top 50 selling products and supplemented this with information from the manufacturer’s websites. Generic formulas were not individually identifiable and were treated as one brand. RESULTS: The data base includes information on 2.1 billion dollars worth of sales and 14.6 billion ounces of ready to feed equivalents (RTF) of formula. As a single formula can be sold in multiple different forms we found 20 unique infant formulas in the top 50 selling products. Our analyses are presented as the % of the total RTF equivalent ounces sold. Milk and soy - based formulas accounted for 90% and 10% of RTF ounce equivalents sold respectively. Generic formula accounted for 4.1%. Premature formula comprised 1.4% of sales. For the 13.1 billion RTF equivalent ounces of milk-based formulas sold, 22 % were lactose-free or reduced and 25% contained either casein or whey hydrolysate. The proportion with either a lactose or a protein modification was 36%. Ten percent were modified in both ways. The mean/SD cost (per RTF ounce) was $0.16±0.053, range $0.04–29. generic formula was $0.07±0.01. Mean cost for unmodified brand milk-based formula was $0.14±0.051 vs. lactose modified or hydrolysate containing brand milk-based formula 0.18±0.061, p<0.03.

CONCLUSIONS: A large number of formula products are now available and a substantial proportion of the milk-based formula now sold in the U.S. has either a reduced lactose content and or contains a protein hydrolysate. These modifications are associated with increased formula cost.
Sick or Not Sick: Using I-PASS To Identify Patients at Risk for Clinical Deterioration

Genevieve London, Mutia T Onigbano, Kathleen Brennan, Steve Paik.
Pediatrics, New York-Presbyterian Morgan Stanley Children’s Hospital, New York, NY; Columbia University, New York, NY.

BACKGROUND: Medical resident work hour restrictions have increased the frequency of patient handoffs. I-PASS is a standardized handoff format designed to augment patient care and safety; early identification of patients with high illness severity and therefore at risk for clinical deterioration has been shown to improve clinical outcomes. Little data exists analyzing the accuracy of I-PASS illness severity designations at identifying at risk patients.

OBJECTIVE: To assess the accuracy of resident physicians at determining illness severity and identifying patients at risk for clinical deterioration.

DESIGN/METHODS: In 2012, we implemented the I-PASS handoff system and adapted our electronic medical record (EMR) to include a complementary written handoff tool with a designation of patient illness severity using the I-PASS common vocabulary: stable, watcher, unstable. We are performing a retrospective case series of patients with clinical events (rapid response or code) at our institution between August 2012-present. We are collecting patient illness severity designations for these cases, determined by resident physicians caring for the patient, from the EMR handoff tab on the day of the event and the two preceding days. Additionally, we are tracking the distribution of illness severity classifications on our inpatient teams daily in order to analyze the sensitivity and specificity of the designations.

RESULTS: We collected data from 40 clinical events and found that 80% of these patients were designated watcher or unstable on the day of the event. Of this subset 29% were admitted on the day of or prior to the event. In contrast, of the 20% of patients who had events but were designated stable, 66% were admitted on the day of or prior to the event. On the day of events, 25-69% of the total patients on the teams were designated watcher or unstable.

CONCLUSIONS: Residents are proficient at identifying patients at risk for clinical deterioration. Resident assessments are less accurate on day 0-1 of hospitalization. Assessments are dynamic reflecting patient familiarity and patient clinical course. The severity designation is accessible via EMR to providers assuming care of the patient. Comparison of I-PASS designations with more objective measures such as a modified Pediatric Early Warning Score (PEWS) is warranted and underway.

Measles Vaccination Rates in Pediatric Emergency Department Patients


BACKGROUND: Maintaining high vaccination rates for measles is critical to sustain measles eradication. Measles, mumps and rubella (MMR) vaccination rates of patients presenting to the Pediatric Emergency Department (PED) has not been described. We hypothesized that the MMR vaccination rate in the PED population would be lower than that of other pediatric populations, potentially due to different demographic and clinical characteristics.

OBJECTIVE: To determine MMR vaccination rates of patients in an urban PED and compare them to national, state and local estimates.

DESIGN/METHODS: We conducted the study in 2 phases. [1] We prospectively enrolled a convenience sample of PED patients aged 12 months to 18 years (Non-critically ill triage categories 3,4,5) seen for 4 consecutive days in November 2011 and assessed their immunization records in the New York Citywide Immunization Registry (CIR) to determine feasibility of CIR use. Reporting to CIR is mandated under public health law. [2] We then used CIR to assess MMR vaccination rates of all consecutive PED patients 18 years and younger seen for 2 weeks in January 2012. Patients who resided outside NYC were excluded. We compared immunization rates of patients in Phase 2 to national, NY State, and NYC estimates in the 2011 National Immunization Survey.

RESULTS: In Phase 1, 94% (142/151) of patients had records in CIR. In Phase 2, 95.3 (1584/1645) of patients lived in NYC. Among 734 patients 16 months to 6 years old, 644 (88%) had at least one MMR dose reported to CIR. Among 696 patients 6-18 years old, 538 (77.3%), 44 (6.3%), and 114 (16.4%) had 1, 1 and 0 MMR doses reported to CIR, respectively. Among 19 to 35 month-olds, 224/264 (84.8%), 95% CI 80.5, 89.1) received 1 MMR dose compared with 91.6% (95% CI 91.2, 92.8) nationally, 91.0% (95% CI 88.2, 93.8) in NY State, and 91.5% (95% CI 87.9, 95.1) in NYC. Complete MMR vaccination (2 doses) for 5 to 6 year olds in the PED cohort was lower (81.8%) than rates for children entering kindergarten in 2011 nationally (94.8%) and in NY State (96.9%).

CONCLUSIONS: Among the learners, 6 used JumpSTART triage, 39 used Smart, and 22 used CDM. There was no significant difference in participant years of experience between the Smart and CDM sites; the JumpSTART participants were all paramedic students. Patients with expected triage levels of Red (p=0.37), Yellow (p=0.42), Green (p=0.055), and Black (p=0.60) had no difference in accuracy of triage outcome regardless of triage strategy used. There were no differences in accuracy for individual patients.

CONCLUSIONS: Our simulation-based PDT strategy comparison suggests that a CDM approach to PDT is equally efficacious to algorithm-based JumpSTART or Smart triage for accurate sorting of simulated child disaster victims. There was no difference in accuracy by triage level, or for any individual patients. This finding could impact selection of PDT strategies and EMT and paramedic education.
Abdominal Cts Do Not Improve Outcomes for Children with Suspected Acute Appendicitis

Danielle I. Miano, Renee M. Silvis, Jill Popp, Marvin C., Culbertson, Brendan Campbell, Sharon R. Smith.
Emergy, Connecticut Children’s Medical Center, Hartford, CT; Research, Connecticut Children’s Medical Center, Hartford, CT; Surgery, Connecticut Children’s Medical Center, Hartford, CT.

BACKGROUND: Acute appendicitis in children is a clinical diagnosis often aided by imaging such as Computed Tomography (CT) scans. CT scans expose children to high amounts of radiation, which may increase the lifetime risk of developing a fatal malignancy. Ultrasound (US) may be equally effective without the risk of radiation.

OBJECTIVE: To compare the rate of rupture and negative appendectomies between children with and without abdominal Cts; and to evaluate the same outcomes for children with and without US.

DESIGN/METHODS: A retrospective chart review was conducted from 1/1/2009 – 12/31/2010 and included patients with suspected acute appendicitis. Emergency department and inpatient medical records were reviewed for type/result of diagnostic imaging, admission, demographics, appendectomy, appendicitis and ruptured appendages. Appendicitis and rupture were determined by review of the pathology report. Negative appendectomies were defined as appendices with non-inflammatory pathology.

RESULTS: 1493 children were identified with suspected appendicitis, with mean age of 11 years, 54% Caucasian, 25% Hispanic, 10% African-American, and 50% girls. 754 were admitted, 20% (150) received a CT, 53% US, and 8.4% both. Of these 754, 435 (58%) had appendicitis. The frequency of pathology proven appendicitis was similar for children who had a CT (91/150, 61%) compared to those without (344/604, 57%), p=0.460. Children with ruptured appendages (N=107) who had a CT (29.7%) were compared to those who had only an US (13.7%) and there was no significant difference (p=0.219). The proportion of children who went to the operating room and had a negative appendectomy was similar for those with CT (1.1%), those with US (4.8%), and those with neither (2.8%, p=0.306). The majority (61%) of Cts were done at referring hospitals whereas 10.8% of US were done elsewhere.

CONCLUSIONS: The rate of complications did not vary significantly for children with suspected acute appendicitis who underwent a CT scan versus those who did not, or compared to children who had an US. The proportion of children with pathology proven appendicitis, ruptured appendages, and negative appendectomy was similar for children regardless of type of imaging used. Because the rate of complications is similar and CT carries the added risk of radiation exposure, the use of CT should be reserved for children who pose diagnostic challenges or risks of other pathologies.
Usefulness of Universal Pre-Discharge Serum Bilirubin Risk Stratification as a Predictor of Admission for Phototherapy
Denise Chisrelle C. Amado, Paulo R. Pina, David H. Rubin, Bianca A. Noronha, Maria L. Bautista, Ronald P. Arevalo, Pediatrics, St. Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: The Bhutani Normogram (BN) classifies a newborn’s risk for hyperbilirubinemia. To our knowledge, there are limited studies establishing a direct relationship between BN risk zones and neonatal intensive care unit (NICU) phototherapy admissions in Hispanic and African-American (AA) populations.

OBJECTIVE: To determine the risk of NICU admissions for phototherapy based on BN risk zones in an underserved population.

DESIGN/METHODS: We performed a retrospective chart review of 724 (66.9% Hispanic, 23.6% AA) healthy, breast and bottle-fed newborns discharged between 8/2011 and 3/2012 at a large, university-affiliated community hospital. Newborns were stratified based on demographic variables, birth weight, ABO blood group and Rh-incompatibilities. Post-discharge total serum bilirubin levels and their corresponding risk zones on the BN were recorded and compared with patient outcomes, i.e. routine discharge or admission within the first week of life for phototherapy. Chi square and t-tests were used to assess differences in neonatal outcomes between risk groups.

RESULTS: 697 patients (96.27%) were routinely discharged and 27 (3.73%) were admitted for phototherapy. There was no significant association between race, sex, age of gestation, mode of delivery, APGAR scores, birth weight, ABO incompatibility, Coombs status, or feeding type and patient outcome. 62 (40.2%) were in the low-risk group, 139 (19.2%) in the intermediate group, and 62 (8.56%) & 43 (5.95%) in the high-intermediate and high-risk zones, respectively. There were no admissions in the low-risk group, 1 (0.72%) in the intermediate, 6 (9.68%) in the high-intermediate group, and 20 (46.51%) in the high-risk group.

Chi-square analysis shows a significant relationship between risk stratification and admission for phototherapy (p < 0.05). A regression model shows a 9% increased odds of admission for every unit increase in risk (OR 1.09, 95% CI:1.08-1.11).

CONCLUSIONS: Risk stratification in the BN based on pre-discharge bilirubin is helpful in predicting phototherapy admissions. Data suggest that serum bilirubin risk stratification be done as a very useful guideline in all neonates being discharged.

Psychopharmacology in Pediatric Primary Care: An ePROS Study of Electronic Health Records

BACKGROUND: Increased use of psychotropic medications (PMs) in children has raised concerns regarding safety and efficacy, but patterns of use among those cared for by primary care pediatricians are incompletely understood.

OBJECTIVE: To describe the frequency of different patterns of PM use among children cared for by practicing primary care pediatricians.

DESIGN/METHODS: Electronic health record (EHR) data from children ages 4-20 years seen for ≥1 face-to-face visit were pooled from 14 independent pediatric primary care sites (11 states) in ePROS, the EHR-based network of the AAP. 5 different vendor systems were queried. After excluding those with seizures due to possible confusion between antiepileptics and mood stabilizers, we identified children 4-18 years of age prescribed any of the following groups of medication between 1/1/09 and 12/31/11: ADHD (stimulants, atomoxetine, alpha agonists), antidepressants (SSRIs, SNRIs, tricyclics), 2nd generation antipsychotics (SGAs), anxiolytics (benzodiazepines, others), and mood stabilizers. We then examined variability in PM use across practices. Group differences were calculated by chi-square tests.

RESULTS: Of a population of 20,652, 5,780 (27.9%) children were prescribed PM. A higher proportion of adolescents compared to those ≤11 years of age were prescribed PM (14% vs. 5%, p<0.001). Among children receiving PM, ADHD medications were the most common (4,236, 77%), followed by antidepressants (1,688, 30%), SGAs (620, 11%), mood stabilizers (322, 6%), and anxiolytics (221, 4%). 1,176 (21%) children were prescribed 2 or more PM groups during the study period. Of the 1,176, the most frequent combinations were ADHD medication and antidepressants (448, 38%) and ADHD medication and SGAs (173, 15%). We found substantial variability across practices in the proportion of patients receiving any PM (range 3-14%, median 8%, p<0.001), as well as 20-fold variation in the proportion receiving >1 PM group (range 0.2-3.9%, median 1.2%, p<0.001).

CONCLUSIONS: PM use and polypharmacy are common in pediatric primary care, but highly variable. Although some variability might be accounted for by the practice population or documentation, such differences are unlikely to fully explain variability of this magnitude. Determinants and outcomes of these distinct practice patterns warrant investigation.

Electronic Health Record Visit Summaries
Shareen F. Kelly, Bruce A. Berstein, Lorri L. Collins, Lee M. Pachter.

Electronic Health Record Visit Summaries
Shareen F. Kelly, Bruce A. Berstein, Lorri L. Collins, Lee M. Pachter.

OBJECTIVE: To calculate the readability of the EHR summary documents created in our outpatient clinic.

DESIGN/METHODS: We calculated the readability of a convenience sample of 245 EHR summaries generated by providers in our pediatrics outpatient clinic (“Patient Plan” in NextGen platform). Readability was calculated using the Flesh-Kincaid formula (FK), the Statistical Measurement of Gobbledygook (SMOG), and the Flesh Reading Ease (FRE) formula. Mean scores were calculated for the entire Patient Plan, then for the narrative portion. Documents were stratified by visit type (acute care AC--n=62, follow-up FUV--n=49, health maintenance HMV--n=143, and anxiolytics (212, 4%). 1,176 (21%) received drugs in two or more PM groups during the study period.

RESULTS: Of a population of 20,652, 5,780 (27.9%) children were prescribed PM. A higher proportion of adolescents compared to those ≤11 years of age were prescribed PM (14% vs. 5%, p<0.001). Among children receiving PM, ADHD medications were the most common (4,236, 77%), followed by antidepressants (1,688, 30%), SGAs (620, 11%), mood stabilizers (322, 6%), and anxiolytics (221, 4%). 1,176 (21%) children were prescribed 2 or more PM groups during the study period. Of the 1,176, the most frequent combinations were ADHD medication and antidepressants (448, 38%) and ADHD medication and SGAs (173, 15%). We found substantial variability across practices in the proportion of patients receiving any PM (range 3-14%, median 8%, p<0.001), as well as 20-fold variation in the proportion receiving >1 PM group (range 0.2-3.9%, median 1.2%, p<0.001).

CONCLUSIONS: PM use and polypharmacy are common in pediatric primary care, but highly variable. Although some variability might be accounted for by the practice population or documentation, such differences are unlikely to fully explain variability of this magnitude. Determinants and outcomes of these distinct practice patterns warrant investigation.

Determinants and outcomes of these distinct practice patterns warrant investigation.

Obinutuzumab (GA101) Significantly Enhances Cell Death and ADCC Compared to Rituximab Against CD20+ B-Cell Non-Hodgkin Lymphoma (NHL) and Lymphoblastic Leukemia (BLL)
Anthony Sabulski, Aradhana Awasthi, Janet Ayello, Carmella van de Ven, Matthew J. Barth, Mitchell S. Cairo.

OBJECTIVE: To evaluate the in-vitro efficacy of GA101 compared to RTX against RTX sensitive and -resistant B-Cell Non-Hodgkin Lymphoma (NHL) and Lymphoblastic Leukemia (BLL).

RESULTS: Of a population of 20,652, 5,780 (27.9%) children were prescribed PM. A higher proportion of adolescents compared to those ≤11 years of age were prescribed PM (14% vs. 5%, p<0.001). Among children receiving PM, ADHD medications were the most common (4,236, 77%), followed by antidepressants (1,688, 30%), SGAs (620, 11%), mood stabilizers (322, 6%), and anxiolytics (221, 4%). 1,176 (21%) children were prescribed 2 or more PM groups during the study period. Of the 1,176, the most frequent combinations were ADHD medication and antidepressants (448, 38%) and ADHD medication and SGAs (173, 15%). We found substantial variability across practices in the proportion of patients receiving any PM (range 3-14%, median 8%, p<0.001), as well as 20-fold variation in the proportion receiving >1 PM group (range 0.2-3.9%, median 1.2%, p<0.001).

CONCLUSIONS: PM use and polypharmacy are common in pediatric primary care, but highly variable. Although some variability might be accounted for by the practice population or documentation, such differences are unlikely to fully explain variability of this magnitude. Determinants and outcomes of these distinct practice patterns warrant investigation.

Determinants and outcomes of these distinct practice patterns warrant investigation.
GA101 vs RTX also elicited a significant increase a ADCC with K562-IL-15-41BBL expanded NK cells, in Raji 73.8±1.1% vs 56.8±2.0% vs 21.6±2.5%, Raji-4R 40.0±1.6% vs 0.5±1.1% and U968-M 70.0±1.6% vs 45.5±0.1%, compared to Loucy 21.6±0.48% vs 15.92±0.52%, respectively (p<0.001) at day 7.

CONCLUSIONS: GA101 compared to RTX significantly enhanced cell death and MK mediated ADCC in sensitive and RTX resistant B-NHL and B-LL. Further studies will investigate the combination of activated NK cells that may enhance or synergize with the efficacy of GA101 both in vitro and in vivo in xenografted NOD/SCID mice.

152 4:30pm  
Medicinal Student  
Transcription Activator-Like Effector Nucleases Mediated DLEU1 Gene Knockdown Suppresses Apoptosis in Burkitt’s Lymphoma  
Brandon Madris, Changchong Yin, Janet Avello, Carmella van de Ven, Sanghoon Lee, Mitchell S. Cairo.  
Pediatrics, New York Medical College, Valhalla, NY; Cell Biology & Anatomy, New York Medical College, Valhalla, NY; Medicine, Pathology, Microbiology & Immunology, New York Medical College, Valhalla, NY; 
BACKGROUND: Pediatric Burkitt Lymphoma (BL) is the most common histological subtype of Non Hodgkin Lymphoma in children and adolescents (Cairo et al, Blood, 2007; Miles Cairo, BJHaem, 2012). We previously identified in a subset analysis that children with BL and a 13q deletion, particularly 13q14.3, had significantly poorer outcome and inferior overall survival despite aggressive short, intensive multiagent chemotherapy (Poirier/Cairo et al, Leukemia, 2009; Nelson/Cairo/Sanger et al, BJHaem, 2009). Deleted in Lymphocytic Leukemia 1 (DLEU1) is BL tumor suppressor, and 2) deletion of DLEU1 in childhood BL may result in chemotherapy resistance according to loss of a tumor suppress gene.

OBJECTIVE: To generate large-scale, efficiently modified NK cells with low cost, clinical applicable and a non-viral method, we investigated the functional activities and cytotoxic effects of chimeric anti-CD20 antigen receptor (CAR) expression PBNK cells following mRNA nuclease against CD20- B-L/L.

DESIGN/METHODS: After expansion with inactivated K562-miL-15-41BBL cells, CD56+/CD3-PBKNK cells were isolated. Anti-CD20-4-1BB-CDS, mRNA (CAR mRNA) was produced in vitro and nucleofected into expanded PBKNK. PBKNK cytotoxicity was assessed by europium release assay. CD56, CD3, CAR expression, CD107a degranulation and intracellular IFNg production were measured by flow cytometry.

RESULTS: After CAR mRNA nucleofection, 50 to 95% PBKNK cells were detected to express CAR after 16hrs. PBKNK in vitr cytotoxicity was enhanced by CAR: PBKNK compared to CAR- PBKNK against CD20- B-L/L at 10:1 (n=3) Ramos (p<0.05), Daupl (p<0.05), Raji (p<0.05), and U-968-M (p<0.001). However, there was no significant difference against CD20- Ramos (p=0.003) and Daupl (p=0.001) stimulation. There was no significant difference in response to RPM13-1 or medium. Intracellular IFNg production was also enhanced in CAR: PBKNK compared to CAR-PBKNK in response to CD20- Ramos and Daupl specific stimulation.

CONCLUSIONS: Anti-CD20 CAR expression in PBKNK cells was associated with a significant increase in CD107a degranulation, IFNg production and significant specific PBKNK in vitro cytotoxicity against CD20- B-L/L. Future directions include examining CAR NK cytotoxicity against CD20- primary B-L/L tumor cells isolated from patients and testing the anti-tumor activity of CAR NK against B-L/L and survival in xenografted mice.

154 5:00pm  
Medical Student  
Low Day 100 Transplant-Related Mortality (TRM) and Relapse Rate Following Clofarabine (CLO) in Combination with Cytarabine, Total Body Irradiation (tbi) and Allogenic Stem Cell Transplantation (ALLSCT) in Children, Adolescents and Young Adults (CAYA) with Poor-Risk Acute Leukemia  
Department of Pediatrics, New York Medical College, Valhalla, NY; Department of Pediatrics, Hackensack University Medical Center, Hackensack, NJ; Department of Medicine, Harvard Medical School, Boston, MA; Department of Pediatrics, Columbia University, New York, NY; Department of Pediatrics, University of Louisville, Louisville, KY; Department of Pediatrics, Medical College of Wisconsin, Milwaukee, WI; Department of Pediatrics, University of California at Los Angeles, Los Angeles, CA; Department of Surgery, University of California at San Francisco, San Francisco, CA; Department of Medicine, New York Medical College, Valhalla, NY; Department of Pathology, New York Medical College, Valhalla, NY; Department of Pediatrics, New York Medical College, Valhalla, NY; Department of Microbiology and Immunology, New York Medical College, Valhalla, NY; Department of Cell Biology and Anatomy, New York Medical College, Valhalla, NY; Department of Microbiology and Immunology, New York Medical College, Valhalla, NY; 
BACKGROUND: Patients with acute leukemia in third complete remission (CR3), induction failure (IF) or refractory relapse (RR) have a poor prognosis(Caynon, BHI, 2005; Wells, JCO, 2003). CLO, a purine anti-metabolite, has been shown to induce lasting remissions with Busulfan in poor-risk AML. (Magenau et al., Blood, 2011).

OBJECTIVE: This study seeks to determine the safety, day-100 TRM, and overall survival (OS) associated with a conditioning regimen of CLO, cytarabine, and TBI followed by AllolSCT in CAYA with poor-risk ALL or AML.

DESIGN/METHODS: This is a multi-center Phase I/II trial of a novel conditioning regimen consisting of CLO (maximal dose of 52mg/m2 achieved without dose limiting toxicity) x5d, sequential cytarabine 1000 mg/m2 x 4 hours post CLO and TBI, (1200cGy) followed by AllolSCT from matched related or unrelated donors in CAYA with ALL or AML in CR3, RR or RR or IF. GVHD prophylaxis consisted of tacrolimus and MMF. Kaplan-Meier method was used to determine the probabilities of engraftment, GVHD, TRM, and OS.

RESULTS: 30 patients, median age: 11.9 yrs (1.5 – 21.8); M:F=21:9, ALL:AML:27:3 (10 CR3, 3RR, 17 IF), 11 related donors, 19 unrelated donors (11 BM/BPCS, 8 UCB). Median TNC and CD34 dose was 4.9x10^6/kg and 4.2x10^5/kg for BMP/BPCS and 4.8x10^5/kg and 3.4x10^5/kg for
OBJECTIVE: To investigate the role of innate laterality on outcome following HI, with and without hypothermia, in female and term equivalent ages.

METHODS: We characterized seizure and nonseizure behaviors in hypoxic (H) and hypoxic-ischemic (HI) neonatal rats. All HI pups exhibited both electrographic (EEG) seizures (Sz) with no tonic posturing or repetitive movements at birth. The behavioral repertoire included more subtle behaviors: wet-dog shakes, repetitive head shaking along with 2 more subtle behaviors: motor, and neurocognitive deficits. Rodents, like humans, have behavioral and neurochemical brain asymmetries that correlate with lateraled motor behavior. In adult stroke studies, a lesion to the dominant hemisphere results in worse outcome, however this has not been studied in neonates as most neonatal HI/stroke rodent models induce a unilateral cerebral lesion by matter infarction.

CONCLUSIONS: Innate hemispheric dominance, demonstrated by laterality, may play a role in functional recovery after HI possibly accentuated by therapeutic hypothermia, at least in females. These preliminary findings may have implications for behavioral/functional outcome studies in experimental models of unilateral cerebral lesions, as well as potential clinical manifestations related to impact of sex on recovery.

Saturday, March 23, 2013
4:15pm–5:45pm

157 4:15pm

Fellow in Training

Effects of Post Hypoxic-Ischemic Hypoesthesia on Hemispheric Preference in the Immature Rat

Leslie M. Pierce, Jeffrey Perlman, Holly Moore, Susan Vannucci.
Neonatal/Perinatal Medicine, New York Presbyterian Weill Cornell Medical Center, New York, NY; New York State Psychiatric Institute, Columbia University Medical Center, New York, NY.

BACKGROUND: Neonatal hypoxia-ischemia (HI) is a major cause of mortality and morbidity in survivors. Therapeutic hypothermia has shown promising results in protecting against mortality, motor, and neurocognitive deficits. Rodents, like humans, have behavioral and neurochemical brain asymmetries that correlate with lateraled motor behavior. In adult stroke studies, a lesion to the dominant hemisphere results in worse outcome, however this has not been studied in neonates as most neonatal HI/stroke rodent models induce a unilateral cerebral lesion by matter infarction.

CONCLUSION: Innate hemispheric dominance, demonstrated by laterality, may play a role in functional recovery after HI possibly accentuated by therapeutic hypothermia, at least in females. These preliminary findings may have implications for behavioral/functional outcome studies in experimental models of unilateral cerebral lesions, as well as potential clinical manifestations related to impact of sex on recovery.

155 5:15pm

Fellow in Training

Elevated Cotinine Levels Are Associated with More Frequent Hospitalizations in Children with Sickle Cell Disease

Sarah C. Sadreameli, Kevin T. Robinson, John J. Strouse.
Pediatrics, Johns Hopkins University, Baltimore.

BACKGROUND: Tobacco smoke exposure has been associated with more frequent hospitalizations in children with sickle cell disease (SCD), but previous studies have not quantified the exposure by direct methods.

OBJECTIVE: We hypothesized that elevated cotinine levels would be associated with increased rates of hospitalization for pain and acute chest syndrome in children with sickle cell disease.

DESIGN/METHODS: We enrolled 50 children and young adults with SCD in a retrospective cohort study. Tobacco exposure was quantified by indirect (questionnaire) and direct (salivary cotinine) measures. We used a multivariable negative binomial regression model to evaluate the association between salivary cotinine and hospital admissions and adjusted for known confounders.

RESULTS: We found that 45% (22/49) of participants had significant elevation of salivary cotinine (>0.5 ng/ml). The incidence risk ratio for admission for ACS was 4.5 (95% CI 1.2, 2.5, P=0.02) and for pain was 5.4 (95% CI 3.1, 10, P<0.001) for those with cotinine >0.5 ng/ml. The incidence risk ratio for all admissions was 4.5 (95% CI 3.7, 7.1, P<0.0001) for salivary cotinine >0.5 ng/ml. The incidence risk ratio for all admissions was 4.1 (1.3, 14, P=0.02) in those with elevated cotinine and adjustment for age, household income per person, and genotype of SCD.

CONCLUSIONS: In our study, acute hyperuricemia with the TLS is a risk factor for acute HTN in children with leukemia and lymphoma. Pediatric leukemia survivors are at known risk for HTN. Our results show that hyperuricemia at cancer diagnosis is a risk factor for acute HTN. Long-term follow up by nephrologist is warranted. Study of adult survivors of childhood malignancy might offer insight into long-term consequences of acute hyperuricemia.

156 5:30pm

House Officer

Hyperuricemia: An Unappreciated Risk Factor for Acute Hypertension in Pediatric Tumor Lysis Syndrome

Lydia Pecker, Shulamit Kulak, Mimi Kim, Adam Levy, Beatrice Goilav.
Pediatric Nephrology, Children’s Hospital at Montefiore, Bronx, NY; General Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Pediatric Hematology-Oncology, Children’s Hospital at Montefiore, Bronx, NY; Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Chronic hyperuricemia has been linked to endothelial dysfunction and is associated with primary hypertension (HTN) in adolescents. The role of acute hyperuricemia associated with primary hypertension (HTN) in adolescents. The role of acute hyperuricemia on the development of HTN has not been evaluated.

OBJECTIVE: This study investigated the relationship between acutely increased uric acid levels, induced by the tumor lysis syndrome (TLS), and short-term and long-term blood pressure (BP) in patients with leukemia and lymphoma.

METHODS: We evaluated the records of fifty-three children with leukemia or lymphoma, ages 1-21 years, admitted to our hospital between 1998 and 2007. We compared BP in hyperuricemic (uric acid ≥5.0 mg/dL, n=19) and normouricemic patients (n=34). We collected BP values, uric acid levels, biochemical data including renal function, and medications at regular intervals. We defined hypertension as BP ≥95th percentile for height, gender, and age at enrollment, and at 3 consecutive measurements on follow-up, or any patient requiring anti-hypertensive therapy. In patients >18 years, blood pressure was interpreted using adult guidelines.

RESULTS: Hyperuricemic patients were significantly more likely than normouricemic patients to have HTN at enrollment (11/19 vs 10/34, p=0.05), even after adjusting for BMI (p=0.71), gender (p=0.28), race (p=0.53), or days of treatment with rasburicase (p=0.55) or allopurinol (p=0.17) between the two groups. Patients diagnosed with HTN were significantly younger (6.38 ± 5.29 vs 11.81 ± 5.32, p<0.005) than normotensive subjects. At follow-up there was no difference in the prevalence of HTN between groups (p=0.98). Sub-group analysis showed children with leukemia (n=39) were significantly more likely than those with lymphoma (n=14) to be hypertensive at enrollment (20/39 vs 11/14, p=0.005) and to have sustained HTN at follow-up (22/39 vs 13/14, p=0.05).

CONCLUSIONS: In our study, acute hyperuricemia with the TLS is a risk factor for acute HTN in children with leukemia and lymphoma. Pediatric leukemia survivors are at known risk for HTN. Our results show that hyperuricemia at cancer diagnosis is a risk factor for acute HTN. Long-term follow up by nephrologist is warranted. Study of adult survivors of childhood malignancy might offer insight into long-term consequences of acute hyperuricemia.

158 4:30pm

Fellow in Training

Seizure vs Non-Seizure Behaviors in Hypoxic and Hypoxic-Ischemic Neonatal Rat Pups

Aimee M. Parow, Murray Engel, Jeffrey Perlman, Susan J. Vannucci.

BACKGROUND: Diagnosis of seizures in neonates and animal models has depended primarily on behavioral observations. With increased clinical use of electroencephalograms, it has become clear that many behaviors observed in neonates attributed to seizures (Sz) are not associated with electrophysiologic (EEG) Sz. This discrepancy may be even more pronounced in preterm, relative to term equivalent ages.

OBJECTIVE: To characterize seizure and nonseizure behaviors in hypoxic (H) and hypoxic-ischemic (HI) neonatal rat pups.

DESIGN/METHODS: We used P8 and P11 Wistar rats (brain development ~32-36 wk and 40 wk gestation, respectively) were used. EEG headmounts were placed the day before H or HI (n= 10/age/group). All pups underwent MRI at 1-2 weeks of recovery for damage scoring (DS). Side preference was determined by spontaneous behavior in a T-maze at P28.

RESULTS: Prior to HI 23(77%) demonstrated right-sidedness, 4(13%) left, and 3(10%) no preference with no effect of sex. NL recovery resulted in significant damage in all pups with males more damaged than females (DS 2.5 ± 7 vs 1.4 ± 3, p<0.05). At P28, ~25% of damaged NL animals switched from initial right to left sidedness, regardless of sex. In the H groups, 2/8 females and 1/6 males had no damage on MRI; the range of damage in the remaining animals was sufficient to preclude a significant effect of cooling. On determination of sidedness in the T-maze 5/6 H damaged females switched from initial right preference to left; the 2 with no damage maintained their original right preference. None of the 6 H males exhibited this transition from right to left preference (p<0.05 vs H females).

CONCLUSIONS: Innate hemispheric dominance, demonstrated by laterality, may play a role in functional recovery after HI possibly accentuated by therapeutic hypothermia, at least in females. These preliminary findings may have implications for behavioral/functional outcome studies in experimental models of unilateral cerebral lesions, as well as potential clinical manifestations related to impact of sex on recovery.
161 5:15pm

Fellow in Training

Indomethacin Prophylaxis (IP) for Intraventricular Hemorrhage (IVH) in Extremely Low Birth Weight (ELBW) Infants: Effects of Time of Administration

Hussain Mirza, Abbo R. Laptook, Sarah Kandefer, William Oh, Betty R. Vohr, Barbara Stoll, Barbara S. Stonestreet, Generic Database Subcommittee, Pediatrics, Brown University, Providence, RI; Statistics and Epidemiology Unit, RTI International, Research Triangle Park, NC; Pediatrics, Emory-Children’s Center, Atlanta, GA; Genetic Database Subcommittee, NICHD Neonatal Research Network, Bethesda, MD.

BACKGROUND: IP reduces the risk of IVH in preterm infants. Current references (Neofox) recommend administration of IP at 6-12h of life. Since IVH may occur soon after birth, earlier IP may be more effective.

OBJECTIVE: IP before 6 h of life (Early IP) reduces the incidence of IVH or death compared to initiation after 6 but before 24 hr (Later IP).

DESIGN/METHODS: This is a retrospective analysis of prospectively collected data from the Neonatal Research Network database for 2003-2010. Inclusion criteria were birth weight <1000 grams and IP before 24h of life. Exclusion criteria were death ≤ 12 h after birth, congenital syndromes, unknown time of IP and missing cranial ultrasound (CUS). The database contains the data from 2340 neonates who met the research criteria with the CUS report available in the first 28 days. Grade 3 and 4 IVH were defined as severe IVH. Infants were dichotomized based on age of IP (≤ 6 or > 6hrs). Groups were compared for maternal and neonatal variables, CUS findings and mortality > 12h. Logistic regressions adjusted for group differences.

RESULTS: IP was given to 4852 infants < 24h, 334 met exclusion criteria. 2340 infants received Early IP (age 3.8±1.3hr) and 1915 infants received Later IP (age 10.2±1.3h). Early IP mothers had more hypertension (29% vs 26%*), and antenatal steroids (64% vs 60%†), Gestational age (25.5±1.7 vs 25.4±1.7wk), birth weight (747±148 vs 741±145g) and percent male (49 vs 48) were similar. Early IP had less out-born births (3% vs 14%†), chest compressions at birth (6.4 vs 11.4%*), medically treated PDA (22 vs 30%) and lower mortality (20.3 vs 24.9%). Any IVH or death was lower in Early IP (41.7% vs 45.5%•); severe IVH or death was also lower in Early IP (30.4 vs 33.8%*). Any IVH (32.5 vs 33.7%) or severe IVH (17.9 vs 18.6%) did not differ for Early vs Later IP. After adjustment for maternal hypertension and antibiotics, cesarean section, antenatal steroids, race, gender, SGA, out-born, admission temperature, medically treated PDA and center, Early and Later IP did not differ for any IVH, severe IVH, any IVH or death, or severe IVH or death. There was no gender by time of IP interaction. (*p<.05, †p<.0001, •p=.01).

CONCLUSIONS: Time of Indomethacin prophylaxis does not affect the incidence of IVH alone or death among ELBW infants.

162 5:30pm

Fellow in Training

Choline Prevents Bilirubin Induced Neuronal Injury through a Lipid Raft Dependent Mechanism

Gail S. Cameron, Ningfeng Tang, He Min, Cynthia F. Bearer, Pediatrics, University of Maryland, School of Medicine, Baltimore.

BACKGROUND: Hyperbilirubinemia is an important cause of neurologic morbidity. However, the mechanism of its neurotoxicity is not known. We have previously shown that bilirubin may cause neurotoxicity through inhibition of lipid raft dependent neurite outgrowth. Lipid rafts are sphingomyelin rich microdomains of the plasma membrane important in cell signaling. L1 cell adhesion molecule (L1), critical for the proper development of the central nervous system, requires lipid rafts to promote neurite outgrowth. Therefore L1 serves as a reporter protein for lipid raft function. Choline, a constituent of sphingomyelin, has been shown to ameliorate the neurotoxicity of ethanol. We hypothesize that choline will protect the function of lipid rafts and therefore prevent bilirubin induced inhibition of L1 mediated neurite outgrowth.

OBJECTIVE: To determine if choline prevents the inhibition by bilirubin of L1 mediated neurite outgrowth.

DESIGN/METHODS: Cerebellar granule neurons were prepared from postnatal day 6 rats and plated on poly L-lysine coated plates (PLL) alone, or prepared with L1 cell adhesion molecule (PLL+L1). Choline supplementation was added to the serum free defined media. Bilirubin prepared in albumin (1:14 ratio) was added for a final concentration of 0.3mg/dL. Cells were grown overnight, fixed and neurite length measured.

RESULTS: Neurite length was significantly increased of CGN plated on L1 compared to PLL. Adding bilirubin to CGN plated on L1 reduced neurite length. Addition of choline 80 µg/dL prevented the inhibition of bilirubin on L1 mediated neurite outgrowth. Choline had no effect on L1 mediated neurite outgrowth itself, nor did bilirubin inhibit neurite outgrowth of CGN plated on PLL alone.
CONCLUSIONS: We conclude that choline prevents bilirubin inhibition of L1 mediated neurite outgrowth. This suggests that choline may be a novel intervention for the prevention of bilirubin induced neurotoxicity.

Neonatology II
Platform Session

Saturday, March 23, 2013
4:15pm–5:45pm

163
4:15pm

Fellow in Training

Impact of Postnatal Antibiotics on Diversity of the Preterm Intestinal Microbiota
Majd Dardas, Steven Gill, Gloria Pryhuber, Yi-Horng Lee, Ann Gill, Ronnie Gilliet. Pediatrics, Division of Neonatology, University of Rochester Medical Center, Rochester, NY; Surgery, Division of Pediatric Surgery, University of Rochester Medical Center, Rochester, NY; Microbiology and Immunology, University of Rochester Medical Center, Rochester, NY.

BACKGROUND: Prolonged antibiotics exposure has been associated with increased incidence of NEC. We studied the effect of postnatal antibiotic (abs) exposure on early establishment of the preterm intestinal microbiome as a potential etiologic link.

OBJECTIVE: To determine if duration of abs within the first 10d after birth affects the intestinal microbiome diversity at 10 and 30d.

DESIGN/METHODS: This study was performed at the University of Rochester Medical Center, 1/2012-1/2013. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth. Subjects were 24 GA 22 weeks at birth GA 27 weeks at birth.

RESULTS: We enrolled 28 infants to date, 16 who received 2d and 12 who received 7-10d of abs. Rectal swabs were collected at 10 and 30d. Bacterial DNA was extracted and analyzed by 454 pyrosequencing of bacterial 16S rRNA. Sequences were assigned to Operational Taxonomic Units based on degree of genetic relatedness. Diversity was determined using the Exponential Shannon Diversity Index (DI).

CONCLUSIONS: Post-transfusion infant lead levels correlate significantly with the transfused pRBCs lead level. Infant discharge lead levels were not significantly elevated indicating possible deposition of lead in tissues. Subjects from this study are being studied to follow neuro-developmental outcomes between 18-24 months.

165
4:45pm

Buccal Swabs: A Non-Invasive Method for Genetic Analysis in Premature Neonates
Mariam Said, Clint Cappiello, Zohreh Tatari-Calderone, Joseph M. Devaney, Stanislav Vukmanovic, Khalilwar Rais-Bahrami, Naomi Luban, Anthony Sandler, Children’s National Medical Center, Washington, DC; The George Washington University School of Medicine and Health Sciences, Washington, DC.

BACKGROUND: Phlebotomy is the current method of obtaining DNA for genetic evaluation in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants. Buccal cells have previously been discredited as a source of reliable DNA in premature infants.

CONCLUSIONS: Our preliminary data suggest that there is no difference in diversity of the intestinal microbiome in preterm infants exposed to different durations of early abs. We speculate that the preponderance of maternal breast milk feeds in both groups may contribute to this discrepancy.

166
4:30pm

House Officer

Risk of Lead Exposure in Preterm Infants Receiving Red Blood Cell Transfusions
Hijab Zubairi, Paul Visintainer, Jennie Fleming, Matthew Richardson, Rachana Singh. Baystate Children’s Hospital, Springfield, MA.

BACKGROUND: Lead is a potent neuro-toxin. The developing brain of preterm infants is particularly susceptible to the effects of lead exposure. Red blood cells (RBCs) transfused from adult donors may represent a significant lead exposure for preterm infants who are at risk for multiple transfusions; however, little information is available on the effect of transfusions on lead levels in this group.

OBJECTIVE: To quantify the impact of RBC transfusions on lead levels in preterm infants <30 weeks gestation.

DESIGN/METHODS: This was a prospective cohort study of infants admitted to Baystate Children’s Hospital NICU during the study period. Infants who were <30 weeks gestational age were eligible, while those ≥ 23 weeks gestational age and known chromosomal disease were excluded. Lead levels were obtained from the infant at birth (via cord blood), before and after each transfusion, and at discharge. Lead levels were obtained from the aliquot of donor RBCs that was transfused. A logistic regression was done to correlate pRBC lead load with post-transfusion lead levels while controlling for pre-transfusion lead levels.

RESULTS: In our cohort of 75 infants, 33 infants received a total of 95 pRBC transfusions. Each infant had an average of 2.9 transfusions (range 1-8). 92% of lead levels in the transfused aliquot were ≤ 5 mcg/dL. 6.8% had a level between 6-8, and 1 had a level of 56. The average total lead load was 1.3 mcg/dL with a range of 0.8-6.8 mcg/dL. For each 1 mcg/dL increase in transfused pRBC lead level, infant’s post transfusion lead level increased by 0.21 mcg/dL (p=0.001). There was no significant increase in discharge lead levels and the mean discharge lead level was 0.4 mcg/dL.
RESULTS: A total of 106 VLBW infants were included. The 2 groups were matched for gestation and birthweight. DNA was extracted and yields measured using NanoDrop spectroscopy at wavelengths of 260 and 280nm. When compared to whole blood, buccal cells yield significantly more DNA per sample (p<0.0001). 260/280nm ratios were not significantly different. Six SNPs were identified across 12 matched samples with 100% concordance. WES analysis of 36 samples identified approximately 19,000 SNPs, both known and novel.

CONCLUSIONS: Genomic DNA extraction from buccal cells obtained by swabs in premature neonates is feasible, simple, and non-invasive. This method can potentially be used as an alternative to drawing blood for genetic analysis. Further studies will aim to validate this method for clinical application.

---

167 5:05pm
House Officer

Laser Therapy for Retinopathy of Prematurity in Extremely Premature Infants: Frequency after the Revised Guidelines
Elizabeth O'Donnell, Sharon Kirkby, Ursula Nawab, Kevin C. Dysart, Linda Genen, Jay S. Greenspan, Zubair H. Aghai.

BACKGROUND: The guidelines for screening and treatment of retinopathy of prematurity (ROP) were revised by the American Academy of Pediatrics (AAP) in 2006. The first screening for ROP is performed at 31 weeks postmenstrual age (PMA) in premature infants born at ≤ 27 weeks of gestation. The revised guidelines for monitoring ROP and therapy were recommended for less severe ROP.

OBJECTIVE: To compare the frequency and PMA of laser surgery for ROP in extremely premature infants (< 27 weeks) before and after the revised AAP guidelines.

DESIGN/METHODS: This study is a retrospective data analysis from a large neonatal database for preterm infants (< 27 weeks) born between January 2004 and August 2012. The frequency and the PMA of laser surgery was compared before (2004-2006) and after (2007-2012) the revised AAP guidelines.

RESULTS: A total of 3,382 infants were included, 1,227 infants (BW 754±171 g, GA 25.2±1.0 w) born before and 2,155 infants (BW 754±171 g, GA 25.2±1.0 w) born after the revised guidelines. The frequency of therapy for ROP significantly increased and the mean PMA at surgery was reduced after the revised guidelines. None of the infants required laser surgery before 32 weeks PMA prior to new guidelines. However, 5 infants required intervention before 32 weeks PMA after the guidelines were revised.

---

168 5:30pm
Fellow in Training

Do the Signs and Symptoms of Gastroesophageal Reflux (GER) Correlate with the Reflux Episodes as Detected by Multiple Intraluminal Impedance (MII) Study?
Aryl Y. Funderburk, Ursula Nawab, Zubair H. Aghai.
Pediatrics/Neonatology, Thomas Jefferson University, Philadelphia.

BACKGROUND: Multiple-channel Intraluminal Impedance studies (MII) have become the gold standard for the diagnosis of gastroesophageal reflux (GER). Several clinical signs and symptoms which are attributed to GER during infancy may not be related to true reflux.

OBJECTIVE: Our objective was to correlate the observed reflux-like behaviors to true reflux events on MII studies.

DESIGN/METHODS: We conducted a retrospective review of data on infants being evaluated for GER by using MII between 01/09 and 10/12. These infants were referred for reflux evaluation based on a high index of clinical suspicion. During the MII study the infants were observed for clinical behaviors. The type and frequency of these behaviors were recorded during the MII study.

The behavioral symptoms were then reviewed to assess if there was any correlation to actual events detected by the MII.

RESULTS: 54 infants were evaluated during the study period. The mean age at study was 86 days. Irritability (30 infants), bradycardia (19), emesis (17) and desaturation (15) were the common signs and symptoms. A total of 2,142 (755 acidic and 1,386 non acidic) reflux episodes and 906 clinical reflux behaviors were recorded in 54 infants. Irritability, bradycardia and coughing occurred more frequently, however the majority of these events did not correlate with true reflux episodes correlating 37.2%, 24%, 16.6% of the time, respectively. Only 8.6% of arching episodes were related to acid reflux.

CONCLUSIONS: VLBW babies spend 36.9% of time with O2 sat ≥ 93%. Pareto analysis showed that time spent in the high range was equally distributed among all babies. Although %HiSat was (statistically) significantly lower when on HFV than other ventilation modes, the difference has little clinical implications.
Fellow in Training

Obesity, Unsuspected Early Puberty, and Hypothyroidism: A Variant of VanWyk-Grumbach Syndrome?

Evran Graber, Dennis Chia, Robert Rapaport, Pediatric Endocrinology & Diabetes, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: VanWyk and Grumbach described a syndrome of early sexual development and hypothyroidism. The presentation of VanWyk-Grumbach syndrome (VGS) includes early breast development, vaginal bleeding, no signs of adrenarche, high TSH, delayed bone age, and nonpubertal response to gonadotropin-releasing hormone (GnRH) stimulation testing.

OBJECTIVE: Demonstrate an atypical case of VGS.

DESIGN/METHODS: Patient Presentation.

RESULTS: The patient was a 9-year-old female with obesity (BMI 26.5 kg/m², Z-score = 2.34) and hypothyroidism (TSH = 83.29 uIU/mL (normal range 0.3-5.6)). Thyroglobulin (TGA) and thyroid peroxidase antibodies (TPO) were positive (TGA = 146.6 U/mL (normal < 4.1), TPO = 485.8 IU/mL (normal < 5.6)). She reported breast development since 8 years of age and one episode of vaginal bleeding at 8 years of age. On physical exam, she had Tanner III breasts, no pubic hair, and vaginal discharge. Random luteinizing hormone (LH) and estradiol (E2) were prepubertal. GnRH agonist (GnRHa) stimulation testing revealed a prepubertal response.

CONCLUSIONS: Our patient has features typical of VGS, including obesity, early pubertal pubic hair, prepubertal gynecomastia, and hypothyroidism.

Typical Features of VGS

Features of Patient

Elevated TSH
Early menarche
No adrenarche
Enlarged cystic ovaries
Delayed bone age
High E2
Prepubertal GnRHa stimulation response

Parents often report recent onset of obesity with resolution after treatment with levothyroxine. Our patient was obese for years prior to treatment and remains obese despite having adequately controlled thyroid disease for 6 months. The E2 level is elevated in girls and the bone age is delayed, which was not the case in our patient. In the setting of the prepubertal E2 level, the advancement of the bone age was most likely due to her longstanding obesity and non-sustained early puberty. Due to rising obesity rates, cases of VGS with advanced bone age and non-sustained early puberty may become more common. Thyroid functions should be obtained in girls who present with obesity and early puberty.

Fellow in Training

Arginine and Levo-Dopa Stimulation in Children: Association of Peak Growth Hormone Response with Body Fat Percentage

Elizabeth Chickco, Molly Regelmann, Rachel Annunziato, Evran Graber, Amy Buono, Elizabeth Wallach, Michelle Klein, Dennis Chia, Robert Rapaport, Pediatric Endocrinology and Diabetes, Mount Sinai Hospital, New York, NY; Fordham University, Bronx, NY.

BACKGROUND: Growth hormone (GH) stimulation testing (ST) is part of the evaluation of growth failure (GF) in children. An inverse relationship has been shown between Body Mass Index (BMI) and stimulated peak GH (PGH) levels in children. We are not aware of studies exploring the relationship between stimulated PGH levels and body fat percentage (BFP) in children with GF.

OBJECTIVE: Evaluate relationship between BFP and PGH levels in response to arginine and levo-dopa (ALD) ST.

DESIGN/METHODS: Prospective analysis of BFP in children with GF who underwent ALD ST (arginine 0.5 g/kg IV, levo-dopa 250-500 mg PO; 6 serum samples obtained from 0-180 min). BFP was measured using fat loss monitor model HBF-306C. BFP calculated by standard formula, BFP (%) = (body fat mass in pounds/body weight in pounds) x 100. GH and IGF-1 levels were measured by Esoterix Lab (Calabasas Hills, CA). Data collection included age, sex, height (Ht), weight, pubertal status, BMI, BFP, GH, and IGF-1. Statistical analyses included Pearson correlations and t-tests.

RESULTS: Data of 32 (26) consecutively tested children were reviewed. Females (n=6) were excluded from further analysis due to limited sample size. PGH levels negatively correlated with BFP and BMI-Z-score in all males (M) and pubertal M (PM). BFP was significantly higher in M with PGH <10 ng/mL (p=0.007). Simlar results were obtained for BMI-Z-score (p=0.005). PGH did not correlate with either Ht standard deviation score (SDS) or IGF-1 SDS.

CONCLUSIONS: A significant negative correlation was demonstrated between BFP and PGH response to ST in PM, but not in prepuberital M (PPM). For M with PGH <10 ng/mL, BFP and BMI were significantly higher. Therefore both BFP and BMI may need to be considered in the evaluation of the pituitary-GH axis in men evaluated for GF. Additional data from a larger population are needed to confirm these preliminary findings.

Fellow in Training

Endocrine Dysfunction in Diamond Blackfan Anemia

Amit Lahoti, Adrianna Vilacho, Jeffrey M. Lipton, Yael T. Harris, Phyllis W. Speiser, Pediatric Endocrinology, Cohen Children’s Medical Center, North Shore, LIJ Health System, New Hyde Park, NY; Hematology/Oncology and, Stem Cell Transplantation, Cohen Children’s Medical Center, North Shore LIJ Health System, New Hyde Park, NY.

BACKGROUND: Diamond Blackfan anemia (DBA) is a rare inherited syndrome characterized by bone marrow failure and congenital anomalies usually diagnosed in childhood. About 40% of patients receive chronic transfusions and are at risk of developing significant iron overload. There has been no formal study of endocrine complications stemming from iron deposition in this population. Cohen Children’s Medical Center of New York hosts the National DBA Registry (DBAR), providing a unique opportunity to assess endocrine complications.

OBJECTIVE: To evaluate potential endocrine dysfunction among DBA patients with respect to glucose tolerance, pituitary, adrenal, thyroid, parathyroid and gonadal function in anticipation of a broader prospective study.

DESIGN/METHODS: A retrospective chart review was done from a subset of DBAR patients evaluated between 1/1/2004 and 10/1/2012 who had undergone endocrine testing.

RESULTS: A total of 12 patient charts were reviewed. Most (83%, n=10) were males. One patient was deceased. Median age at DBA diagnosis was 6 months (range 2 weeks – 8 years) and median age at endocrine testing was 26y (range 11 - 43y). Ten of 12 patients had been receiving chronic blood transfusions. Of the other two, one was treated with glucocorticoids and another was in remission (off treatment for >6 months). Table 1 summarizes various endocrine disorders found.

<table>
<thead>
<tr>
<th>Endocrine Disorder</th>
<th>Number of Patients (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoglycemia</td>
<td>3</td>
</tr>
<tr>
<td>Primary hypothyroidism</td>
<td>2</td>
</tr>
<tr>
<td>Vitamin D insufficiency (25 OH Vit D level: 20-30 ng/ml)</td>
<td>4</td>
</tr>
<tr>
<td>Vitamin D deficiency (25 OH Vit D level: &lt;20 ng/ml)</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Secondary adrenal insufficiency</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes insipidus</td>
<td>1</td>
</tr>
<tr>
<td>Growth hormone deficiency</td>
<td>1</td>
</tr>
</tbody>
</table>

CONCLUSIONS: We have identified a wide spectrum of endocrine disorders in a group of patients with Diamond Blackfan anemia. We hypothesize that these complications are due to iron deposition following chronic transfusions that began in childhood. A broader prospective study is underway to understand the natural history of endocrinopathies and the respective contributions of transfusion, the underlying disease process and/or glucocorticoid therapy. Two of the patients in this analysis developed multiple endocrine deficiencies at <18 years age, indicating that endocrinopathy may start in pediatric age group. The significance of these investigations will be to develop appropriate surveillance and intervention strategies for the endocrinopathy at-risk DBA population.

Fellow in Training

Mechanisms of Ilet Dysregulation in Beckwith-Wiedemann Syndrome Resulting in Hyperinsulinism

Jennifer Kelley, Puja Patel, Changhong Li, Diva De Leon, Division of Endocrinology, Children’s Hospital of Philadelphia, Philadelphia, PA; Pediatrics, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA.

BACKGROUND: Beckwith-Wiedemann Syndrome (BWS) is a heterogenous disorder caused by genetic and epigenetic anomalies in the highly imprinted region of chromosome 11p15.5. Hypoglycemia due to hyperinsulinism (HI) is present in up to 50% of cases, but the mechanism responsible for dysregulated insulin secretion is not well understood.

OBJECTIVE: To describe the clinical phenotype of hypoglycemia in a child with BWS and to examine the mechanisms of insulin secretion in pancreatic islets isolated from the surgical specimen.

DESIGN/METHODS: Medical records were reviewed. Pancreatic islets were isolated from the surgical specimen by collagenase digestion. Cultured islets were incubated with Fura-2AM and calcein-AM and subsequent cytofluorometric studies of insulin secretion were performed using a perifusion system. Cytosolic calcium flux was measured by dual wavelength fluorescence microscopy.

RESULTS: Clinical case: Patient was born at 30 wks gestation with right hemihyptrophy.
Hypoglycemia was noted at birth and required IV dextrose to maintain euglycemia. Critical sample at time of hypoglycemia (blood glucose = 39 mg/dL) showed an insulin level of 161 uU/mL, betahydroxybutyrate level of 0.04 mmol/L and free fatty acids levels of 0.04 mmol/L. There was also a positive response to glucagon, all consistent with HI. Diazoxide was trialed for 4 months with no response to the glaucoma at baseline as compared to normal controls islets. When stimulated with amino acids, cytosolic calcium increased, in contrast to normal islets which don’t respond to stimulation with amino acids. In contrast to the brisk response to amino acids, the BWS islets did not respond to stimulation with glucose.

CONCLUSIONS: The islet phenotype in this case of BWS due to UPD resembles the phenotype of islets with activating mutations of K<sub>a</sub> channel and may explain the mechanism of HI. We postulate that the overexpression of paternally inherited genes results in dysregulated insulin secretion mediated by changes in K<sub>a</sub> channel function.

<table>
<thead>
<tr>
<th>Glucose Tolerance Category According to OGTT Plasma Glucose</th>
<th>Subject’s Screening OGTT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal (NGT)</strong></td>
<td></td>
</tr>
<tr>
<td>F1&lt;200 mg/dL</td>
<td>PG1&lt;194 mg/dL</td>
</tr>
<tr>
<td>F1&lt;140 mg/dL</td>
<td>PG1&lt;194 mg/dL</td>
</tr>
<tr>
<td><strong>Indeterminate</strong></td>
<td></td>
</tr>
<tr>
<td>F1&lt;200 mg/dL</td>
<td>PG1&lt;194 mg/dL</td>
</tr>
<tr>
<td>F1&lt;140 mg/dL</td>
<td>PG1&lt;194 mg/dL</td>
</tr>
<tr>
<td><strong>Impaired (IGT)</strong></td>
<td></td>
</tr>
<tr>
<td>F1&gt;140-199 mg/dL</td>
<td>PG2&gt;139 mg/dL</td>
</tr>
<tr>
<td>F2&gt;1 mg/dL</td>
<td>PG2&gt;139 mg/dL</td>
</tr>
<tr>
<td><strong>CFRD</strong></td>
<td></td>
</tr>
<tr>
<td>F1&gt;200 mg/dL</td>
<td>PG2&gt;139 mg/dL</td>
</tr>
</tbody>
</table>

During admission for new onset diabetes, his blood glucose range was 91-303 mg/dL, and averaged 23mg/dL during overnight continuous feedings. Insulin therapy (combinations of NPH and regular prior to lunch and to continuous feeds) was initiated. Four months later, his BMI<sup>2</sup>/m<sup>2</sup> was 25% and his FEV1% predicted was 108%. He had anemia, and his hemoglobin A1C was 7.5% consistent with CFRD. His BMI<sup>2</sup>/m<sup>2</sup> had decreased from 24% at age 10y to 23% at age 15y despite overnight enteral feedings and increasing pancreate enzyme doses. His FEV1% predicted also declined by 10% over the preceding year to 95%. OGTTs at ages 9y and 12y were normal according to current CF Foundation definitions.

**RESULTS:** For the 113 subjects surveyed, there was a negative correlation between HbA1c and meter BG average, r = -0.44, p < 0.001. There were no significant differences between the 14 subjects (12%) who admitted to manipulating the meter and those who did not in HbA1c (mean(SD)) (9.1(1.8) vs 8.6(1.4) p = 0.23, mean glomeruc BG 215 (46) vs 209 (23) p > 0.7). The mean glomeruc BG (105/26) vs 101(30) p = 0.66 or mean number of BG checks per day 3.9(1.9) vs 3.4(2.2) p = 0.42. Although only 12% of subjects admitted having actively tried to trick their meter, 26% acknowledged they sometimes will not test their blood glucose when they are afraid of getting a “bad” number. 7% of subjects acknowledged they knew of other individuals who trick their meters while 36% acknowledged that tricking a glucometer is possible. When asked about potential reasons why patients may stop to trick their meter, 61% of all subjects selected high readings upset patients; 56 selected high reasons make one feel bad about themselves; and 54% high readings upset the doctor. Strategies described included use of control solution, trying different codes, using friend’s blood, diluting the sample, wiping off the strip, slamming the meter, changing the time after a “good score”, bolusing insulin right before testing, and other creative tricks.

**CONCLUSIONS:** A minority of our population surveyed acknowledged trying to manipulate their glucometers although a larger proportion admit they will forgo glucometer testing if they anticipate an unsatisfactory result.
development, it is an integral part of cell membranes and also plays a role in neurogenesis. It can ameliorate these deficits. DHA is important for normal brain development, it is an integral part of cell membranes and also plays a role in neurogenesis. It can ameliorate these deficits. DHA is important for normal brain function.

OBJECTIVE: Using a rat model in which the somatosensory system is damaged, we will determine the effects of prenatal exposure to ethanol on energy metabolism and neurotransmitter synthesis in somatosensory cortex.

CONCLUSIONS: Severe metabolic acidosis at birth can be a predictive value to identify patients with moderate to severe encephalopathy and need for hypothermia therapy. Persistent acidosis at birth that does not correct rapidly most likely signifies the severity and duration of hypoxic ischemic perinatal event and is also associated with adverse outcome in our cohort. Larger study cohort may show statistical significance in the severity of cerebral background activity on post-injury outcome and need for vasopressors during cooling which may also be predictive of adverse outcome.

177 Fellow in Training
Comparison of Clonidine Versus Phenobarbital as an Adjunct Therapy for Neonatal Abstinence Syndrome. A Prospective Randomized Clinical Trial
Brooke Surran, Paul Visintainer, Susan Chamberlain, Kathleen Kopeza, Bhavesh Shah, Rachana Singh, Baystate Children’s Hospital, Springfield, MA; Boston Medical Center, Boston, MA.

BACKGROUND: Phenobarbital is a commonly used as an adjunct to neonatal morphine sulfate (NMS) for neonatal abstinence syndrome (NAS) therapy but may cause neurocognitive delays. Clonidine as an adjunct has been shown to be safe and effective.

OBJECTIVE: To compare phenobarbital versus clonidine as an adjunct for NMS therapy.

DESIGN/METHODS: A prospective, non-blinded, RCT was conducted at BCH NICU. Infants meeting eligibility criterion were block randomized and stratified for polydrug exposure. Both groups were dosed based on initial Finnegan scores for initiation and weaning of the NMS. Data collected included maternal and infant characteristics, maternal drug history, length of therapy with NMS, mean total dose of NMS, therapy failures and adverse events.

RESULTS: Both the study groups had a shorter length of NMS therapy days when compared to 25 days average prior to the clinical trial. After adjusting for clinical variables infants treated with phenobarbital had shorter inpatient therapy days with NMS (4.6, 95%CI: 0.3, 8.9; p = 0.03). The average total dose of NMS was similar between the two groups (1.1 mg/kg, 95%CI: -0.1, 2.4; p = 0.8). Cox regression showed that the phenobarbital group had a 2.2-fold increase in the rate of treatment completion (HR = 2.2, 95%CI: 1.2, 4.1).

2 infants in the clonidine group failed therapy requiring change to phenobarbital and there was a trend towards greater sedation in phenobarbital group but none of these reached statistical significance. No adverse events were noted in the clonidine group.

CONCLUSIONS: Therapy with phenobarbital as adjunct had a shorter inpatient therapy time with NMS, mean total dose of NMS, therapy failures and adverse events.

179 Fellow in Training
Neurotherapeutic Potential of Placenta-Derived Adherent Cells (PDAC) in a Neonatal Rat Model of Focal Cerebral Ischemia (FCI)
Ben H. Lee, Shuang Xu, Ajimee Herdt, Gregory Gedman, Javier Puhecco, Quinto, Kristen Labazzo, Julio Guerra, Elizabeth Eckman, Neanotology, MidAtlantic Neonatology Associates, Morrisstown, NJ; Celgene, Cellular Therapeutics, Warren, NJ; College Plaza Pediatrics, Randolph, NJ.

BACKGROUND: FCI induced in neonatal rats has been used to investigate various aspects of neonatal neuropathophysiology. PDAC have emerged as a potential neurotherapeutic agent but have not yet been evaluated in neonatal studies.

OBJECTIVE: To evaluate the neurotherapeutic effects of PDAC on adverse outcomes in a neonatal FCI rat model.

DESIGN/METHODS: Left middle cerebral artery FCI was induced in P7 Sprague-Dawley rats; sham-operation involved pertinent vessels dissection only. Left intracerebroventricular (ICV) injection of PDAC (4 or 20 x 10^6 cells/microL, low (lPDAC) or high (hPDAC) dose) or DMEM vehicle was performed 1hr post-FCI. Infarct size analyses were performed at 24 hours post-FCI. Gait analyses were performed at 3 and 6 weeks post-FCI or post-sham, with subsequent euthanasia for immunohistochemistry (IHC) analyses.

RESULTS: At 24 hours post-FCI, no differences in infarct sizes were detected among pups receiving IPDAC, hPDAC, or DMEM control (n=8 each), suggesting a similar degree of acute insult for all groups. For longer term outcomes (FCI+IPDAC=15, FCI+hPDAC=15, FCI+DMEM=18, Sham+DMEM=8, Sham+hPDAC=9), at 14 days post-FCI, survival among DMEM pups was 30% compared to 33% among PDAC pups. Post-insult, PDAC pups were less likely to have a widened stabilizing stance width, with values similar to sham controls, compared to FCI+DMEM pups.

IHC with GFAP and MAP2 staining showed qualitatively increased peri-infarct cellular density with PDAC versus DMEM. There were no differences in outcomes between IPDAC and hPDAC groups for mortality, infarct sizes, or gait analyses.

CONCLUSIONS: In a neonatal rat model, a single ICV dose of PDAC ipsilateral to induced FCI is associated with lasting neuroprotection and may reduce the burden of injury in the developing brain.

180 Fellow in Training
Can Administration of DHA Ameliorate Alterations in Brain Chemistry Caused by Prenatal Exposure to Ethanol?
Fares Boureit, Nathan Nguyen, Mary C. McKenna, Sandra M. Mooney, Pediatrics/Neanotology, University of Maryland, Baltimore, MD.

BACKGROUND: Prenatal exposure to ethanol is associated with profound effects on the nervous system including mental retardation and behavioral alterations. To date, early behavioral interventions are the most effective method of ameliorating deficits in social behavior; however, this is time-consuming and costly.

OBJECTIVE: Using a rat model in which the somatosensory system is damaged, we will determine the effects of prenatal exposure to ethanol on energy metabolism and neurotransmitter synthesis in somatosensory cortex. We propose that supplementation of an omega-3 fatty acid, docosahexaenoic acid (DHA), will ameliorate these deficits. DHA is important for normal brain development, it is an integral part of cell membranes and also plays a role in neurogenesis. It can also be metabolized to docosanoids which can be neuroprotective.
Long Term Effect of Src Kinase Inhibition on Eya1 Protein Expression during Hypoxia in the Cerebral Cortex of Newborn Piglets

Jennifer P. Alexander, Lynn Zeitz, Qazi M. Ashraf, Maria Delivoria-Papadopoulou.
Dept. of Pediatrics, Drexel University and St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: The EYA1 (eyes absent homolog 1) gene provides instructions for making a protein that plays a role in regulating the activity of other genes. EYA1 protein is involved in transcription factor or transcription coactivator. The EYA1 protein interacts with several other proteins to activate genes that are important for normal development. Before birth, these protein interactions appear to be essential for the normal formation of many tissues. The EYA1 gene belongs to a family of genes called PTIP (proteins tyrosine phosphatases). Previously we have shown that hypoxia results in increased activation of Src kinase in the cerebral cortex of newborn piglets.

OBJECTIVE: The present study aims to investigate the longitudinal effect of inhibiting the hypoxia-induced increased expression of EYA1 protein by administration of selective inhibitor of Src kinase, and test the hypothesis that inhibiting Src kinase prior to hypoxia will attenuate the hypoxia-induced expression of EYA1.

DESIGN/METHODS: Piglets were divided into 6 groups: Normoxia (Nx, n=3), acute hypoxia (Hx, n=3), hypoxia followed by 1 day (Hx-1D, n=4) and 14 days (Hx-14D, n=2), hypoxia-pretreated with a Src kinase inhibitor (PP2 1mg/kg i.v.) followed by 1 day (Hx+PP2-1D, n=3), and 14 days (Hx+PP2-14D, n=3) in FiO2 0.21. Hypoxic piglets were exposed to FiO2 0.07 for 1 hour then returned to FiO2 0.21. Nuclear proteins were isolated and the expression of EYA1 was determined by Western blot analysis using specific EYA1 antibodies. Band density was expressed as absorbance (OD/mm²).

RESULTS: The expression of EYA1 was 228.76 ±4.13 in normoxia and 497.43 ±15.31 (p<0.05) in hypoxia. Expression of EYA1 was 516.43 ±19.53 in Hx-1D (p<0.05) and 355.70 ±18.82 in Hx+PP2-1D. Following 14 days, expression of EYA1 was 348.40 ±42.90 in Hx-14D and 240.10 ±10.23 in Hx+PP2-14D. The data show that the expression of EYA1 decreased in the Hx group on day 14 as compared to day 1. Src kinase inhibitor also prevented the hypoxia-induced increase in expression at day 1 and day 14.

CONCLUSIONS: We conclude that the dephosphorylating mechanism for histone H2AX is activated for long term following hypoxia and the expression of EYA1 during recovery is Src kinase-mediated. Increased expression of EYA1, by dephosphorylating Tyr450 on H2AX, will facilitate binding of DNA repair factors and increase the potential for DNA repair in the hypoxic brain that may result in increased cell survival.

Parental Preference of Educational Handouts in an Urban Academic Pediatric Clinic

Aarti Patel, Jennifer P. Alexander, Kristel Tapfvo, Danielle Mercurio, Alan Salas, Thomas J. Kullen, Bruce A. Bernstein, Daniel Taylor.
Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: Prior studies have suggested that health literacy strongly predicts an individual’s health status. In our population, 20% of parents read at or below the fifth grade level; however, most public health care materials are at the tenth grade level. Inadequate health literacy has proven difficult to access health care and follow physician instructions.

OBJECTIVE: Assess the readability of revised well-visit handouts provided by our Center for Child and Adolescent Health.

DESIGN/METHODS: In the waiting room of our outpatient pediatric clinic, parents were chosen at random and given a survey as well as two handouts, in English or Spanish. Handout A was our revised handout with lower reading level, less wording, more white space, and more pictures; Handout B was the current well-child handout. On each survey, parents were asked to answer five questions to convey which handout they preferred.

RESULTS: Preliminary data includes responses for eight age groups (newborn to 9 years old) for a total of 160 surveys. Overall, 64.63% of parents preferred Handout A. There was preference for Handout A with reading, understanding, and interest, but no preference when asked which survey had more useful information.

Deep Gray Matter Involvement on MRI in Children with Acute Demyelinating Disease

Sreenath Thati Ganganna, Soji Varghese, Riddhiben Patel, Jagdish Desai.
Pediatric, Brookdale University Hospital & Medical Center, Brooklyn, NY.

BACKGROUND: Acute disseminated encephalomyelitis and multiple sclerosis are uncommon inflammatory or post-infectious, autoimmune demyelinating disorders in pediatric patients and there is little systematic documentation of the clinical and neuro-radiological profile of pediatric patients with acute demyelinating disease. Studies have shown that involvement of deep grey matter with T2 hypointensity is associated with early physical disability, ambulatory impairment, severe cognitive impairment, brain atrophy and poor response to treatment in adult patients, but such studies are lacking in the pediatric population.

OBJECTIVE: To study the clinical as well as radiological profile of children with deep grey matter involvement among acute demyelinating lesions in MRI over the last 15 years (1997 to 2011) at BHMC.

DESIGN/METHODS: It was a retrospective descriptive study. Children aged 0-19 years who underwent MRI brain imaging in BHMC between 1997-2011 were included in the study.

RESULTS: Total 2849 MRIs were done in this age group out of that 714 (25%) were positive based on indications. Mean age of the sample was 7.63 years (SD=5.6). Most common indications for MRI study were seizure (31%) followed by headache (19%), developmental delay (8%) and space occupying lesions (6%). Seizure was most common indication among all age groups except adolescents where headache was most common indication. Total number of positive MRI for demyelinating lesions were 15 (0.5%). Mean age was 14.5 years. Male to Female ratio was 1:4. Incidence of deep grey matter involvement in MRI was 20% (3 out of 15). Commonest sites of demyelinating lesions were periventricular region(67% pt), frontal lobe(26%) and internal capsule(20%). Clinically 43% of children had history of antecedent illness, 57% presented with motor deficit, 43% presented with blurring of vision and 43% had higher motor function deficit. None of them had cerebellar sign or symptoms. There were 43% children who had complete or near complete recovery with steroid therapy.

CONCLUSIONS: Acute demyelinating lesions of the brain are rare MRI findings in the pediatric population. The most common site of acute demyelination in the pediatric patients is the periventricular region and the involvement of deep grey matter is a significant finding in pediatric patients. There is a need for further studies to correlate the deep grey matter involvement with clinical prognosis of these patients.

Effect of Chronic Constipation on Children’s Quality of Life

Keshawadhamana Balakrishnan, Hanh Vo, Uprenda Mahat, Peter Kant, Sandipagu, Richard Neugebauer, Laura Debrot, Bolanle Akinosolu, Ronald Bainbridge, Stefan Hagmann, Ayoade Adeniyi.
Pediatrics, Bronx Lebanon Hospital Center, Bronx, NY; Epidemiology, Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND: Chronic constipation can contribute to abdominal pain and fecal soiling which may cause psychosocial difficulties and familial stress. Quality of life in such children has previously been insufficiently assessed, and never in comparison to asthma, the most prevalent chronic condition in children in urban inner-city areas.

OBJECTIVE: To assess quality of life (QoL) in children with chronic constipation aged 5-18 years by self-report and by report of their parents and compare this with both disease and healthy control children.

DESIGN/METHODS: A convenience sample of children with chronic constipation attending the pediatric gastroenterology clinic at the Bronx-Lebanon Hospital Center from 01/2010 to 05/2012 and their caregivers were asked to complete the validated PedsQL™ (Pediatric Quality of Life Inventory) version 4.0 generic core scale. The PedsQL examines physical, emotional, social and school functioning. The score, summed across these four areas, ranges from 0 to 100. Healthy children and children with asthma with their respective caregivers were recruited as controls from the center’s ambulatory clinic network and asthma clinic, respectively. Groups were compared on mean QoL using the independent samples t-test.
RESULTS: A total of 54 children completed the assessment (28 [52%] male, mean age [SD] 10.9 years [4.62]) including 20 children with chronic constipation, 19 children with asthma and 15 healthy children. Based on child self-report, the mean Qol score differed significantly among the three study groups (<0.00<0.Qol was significantly lower in the chronic constipation group compared with healthy children (70 vs 94, p<0.05) and did not differ from that of children with asthma (70 vs 73, p=0.26). Both asthma and constipation groups were both significantly worse off as regards quality of life from the healthy children. Findings based on parental reports paralleled those derived from child reports.

CONCLUSIONS: Quality of life by self-report and by parental report in children with both chronic constipation and asthma had significantly poorer quality of life when compared with healthy children. It is prudent that physicians planning comprehensive management for children with chronic constipation be cognizant of the effects on quality of life.

184

House Officer

Practical Parenting: A Reproducible Curricular Module for Pediatric Residents on Infant Consumer Products

Kristel Tafova, ShrutI Roy, Ada Davidoff, Mario Cruz, Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA.

BACKGROUND: Many pediatric residents are not parents and have limited experience with infant consumer products. This makes it challenging to gain credibility and provide guidance about consumer products during well child visits. To date, few residency programs have published their formal curricula to address this barrier. After performing a needs assessment of our graduating residents and reviewing the AAP policy statements, we designed a scavenger hunt-themed curricular module to educate pediatric residents on infant consumer products.

OBJECTIVE: Assess the practicality of a voluntary scavenger hunt-themed curricular module on infant consumer products related to diapering, sleeping, child-proofing, nutrition, breastfeeding, and automobile safety and evaluate its impact on the knowledge of pediatric residents of these products.

DESIGN/METHODS: From September through November of 2012, all 78 pediatric residents at St. Christopher’s Hospital for pediatric care were recruited to participate in a voluntary shopping curriculum to learn about the costs and features of a variety of infant consumer products. The residents self-identified as one of four groups: those who completed the curriculum in-store, online, both in-store and online, and those who did not complete the curriculum (control group). Changes in knowledge were measured by comparing a pre and post curriculum questionnaire.

RESULTS: Pre and post curriculum data were analyzed taking into account year of residency, previous experience with children, and completion of curriculum. At baseline, there was a significant difference between those who had previous exposure to children and those who did not (p=0.01) but no difference between year of residency training (p=0.81). Preliminary post curriculum data shows that residents who participated in the curriculum answered 47% of questions correctly versus 22% in residents in the control group (p=0.18). Post curriculum data approaches significance, however, more data is needed. First year residents were more likely to participate in the curriculum.

CONCLUSIONS: A formal curriculum with a scavenger hunt theme about infant consumer products was well received and demonstrates improved knowledge in pediatric residents in all years of training. Residency programs wishing to initiate similar shopping experiences should consider protecting resident time so that participation can be maximized or incorporate into resident curricula.

185

House Officer

Evaluation of the Utility of a Sleep Screener in the Primary Care Setting

Michelle S. King, Stefan A. Mandakovic, Hilda K. Kabali, Casandra M. Arevalo, Matilde M. Iriogen, Pediatrics, Einstein Medical Center, Philadelphia, PA.

BACKGROUND: Despite general knowledge about the prevalence and consequences of pediatric sleep disorders, sleep problems mostly go undetected during routine clinical care. More information is needed regarding the usefulness of sleep screeners to detect sleep problems in different pediatric patient populations.

OBJECTIVE: To evaluate the utility of a sleep screener to assess the severity and frequency of sleep problems among inner city children in a primary care setting.

DESIGN/METHODS: We conducted a chart review of children ages 2-12 years old who made a well child visit to a hospital-based pediatric primary care continuity clinic in an inner city community. In September 2012, we introduced a sleep screener adapted from the BEARS screen. The screener has 2 age-specific versions for children 2-5 years and 6-12 years old. The original BEARS was designed with a yes or no answer. We modified the BEARS by adding a time frame before a well child visit to a hospital-based pediatric primary care continuity clinic in an inner city sleep problems among inner city children in a primary care setting.

Snoring/Difficulty Breathing

<table>
<thead>
<tr>
<th>Snoring/Difficulty Breathing</th>
<th>Age 2-5 (n=102)</th>
<th>Age 6-12 (n=89)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>55%</td>
<td>60%</td>
<td>0.3241</td>
</tr>
<tr>
<td>Mild</td>
<td>8%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Moderate to Severe</td>
<td>7%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Excessive Daytime Sleepiness</td>
<td>18%</td>
<td>18%</td>
<td>0.9652</td>
</tr>
<tr>
<td>Mild</td>
<td>3%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Moderate to Severe</td>
<td>15%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Awakenings at Night</td>
<td>27%</td>
<td>6%</td>
<td>0.0002</td>
</tr>
<tr>
<td>Mild</td>
<td>13%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Moderate to Severe</td>
<td>18%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Snoring/Difficulty Breathing</td>
<td>15%</td>
<td>21%</td>
<td>0.3903</td>
</tr>
<tr>
<td>Mild</td>
<td>7%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Moderate to Severe</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS: Overall there was a high prevalence of sleep problems among inner city children. A modified version of the BEARS sleep screener was useful in assessing the severity and frequency of sleep problems among inner city children in a primary care setting.

186

Provider’s Experience with a Self-Administered Written Screening Tool for Intimate Partner Violence

Cynthia DeLago, Matilde Iriogen, Pediatric & Adolescent Medicine, Einstein Medical Center Philadelphia, Philadelphia, PA.

BACKGROUND: The American Academy of Pediatrics recommends screening for Intimate Partner Violence (IPV) in pediatric offices. No specific screening method is recommended. Little has been published about providers’ experience using a self-administered written tool to screen for IPV.

OBJECTIVE: To describe pediatric providers’ experience with and perceptions about a written tool to screen for IPV in a pediatric office.

DESIGN/METHODS: An IPV screening program was implemented in a resident continuity clinic serving an urban, minority, low-income population. The program included staff training by an on-site IPV counselor and use of a validated (English and Spanish) written screening tool, HITS. The HITS tool consists of 4 questions, such as “How often does your partner physically hurt you?” and 5 Likert-scale choices ranging from rarely to frequently. A score of 8 was considered a positive screen. Caregivers were asked to complete the tool and providers reviewed it and responded to positive screens. Nine months after program implementation, all providers were asked to complete a written survey that contained an anonymous survey about their experience, perceptions and level of comfort with the HITS tool.

RESULTS: 100% of faculty (6/6) and 70% (14/20) of residents responded to the survey. All residents and 80% of faculty had used the HITS tool; 57% of residents and 80% of faculty had had one or more caregivers who screened positive for IPV. All providers felt comfortable discussing IPV with caregivers, 95% knew what to do with a positive screen and were comfortable making referrals for IPV services. Most providers (75%) felt that caregivers responded honestly to the questions. 100% of providers felt the written tool was a good way to screen for IPV. All faculty and 57% of residents preferred to screen for IPV with the written tool, 14% of residents preferred to screen verbally and 21% had no preference. One tenth of all providers felt they needed more training to screen and respond to IPV and level of comfort was linked to the desire for more training.

CONCLUSIONS: Over a 9 month period, almost all residents and faculty in a resident continuity clinic screened caregivers for IPV with the written HITS tool and most identified IPV victims. Almost all felt the tool was an effective method to screen for IPV and preferred this method over verbal screening. Self-administered written tools appear to be a promising method to screen for IPV in pediatric office settings.

187

Care Transitions: Communication Challenges between a Hospitalist Service and a Primary Care Pediatric Network

Inshminde Kaur, Anna Marie Carr, Cynthia W. DeLago, Matilde Iriogen, Pediatric and Adolescent Medicine, Einstein Medical Center Philadelphia, Philadelphia, PA.

BACKGROUND: Transitions of care are actions designed to ensure coordination and continuity of care as patients transfer between different locations. Effective transition of care for the hospitalized child to the primary care setting is crucial to ensure quality patient care and safety. OBJECTIVE: To conduct a needs assessment of transitions of care between a pediatric hospitalist service and a primary care network.

DESIGN/METHODS: We conducted an anonymous survey of pediatric providers in an urban primary care practice network whose patients are admitted to its own hospitalist service at a children’s hospital. The network and hospital do not share electronic medical records. Providers were asked about their experience with communication from the hospitalist service; follow up of pending test results and their expectations regarding such communications.

RESULTS: The pediatric care practice network includes 10 practices: 5 solo, 3 medium size (2-5 providers), 2 large (10+ providers). Provider response rate was 76% (25/33). On average 20-29 patients per provider were hospitalized in the previous 2 years. Providers received communication regarding hospitalization in 50-75% of cases (fax, phone call or discharge summary brought by patient). A frequent complaint was poor legibility of discharge summaries. For pending test results at discharge, most providers called the hospital lab directly. Most providers would prefer communication both during the hospitalization and upon discharge, via email for complicated/urgent developments and fax for routine. However, communication expectations of providers varied by provider type. In the small practices, providers felt that incomplete communication was crucial to maintaining their relationship with the family. However, in large practices, where patients were cared for by multiple providers and information communicated to one provider was not always shared with fellow providers or documented systematically, providers felt that communication needs varied with complexity of hospitalization.
Not Prescribed ICS (n=103)

p-value
3%
93
33
7
0.082
0.142
29
8

OBJECTIVE: To determine the rate and predictors of New Inhaled Corticosteroid prescription to children hospitalized for Status Asthmaticus

BACKGROUND: Guidelines published by the National Heart, Lung and Blood Institute (NHLBI) suggest prescribing inhaled corticosteroids (ICS) for asthmatics of all ages with disease severity classified as persistent and consider initiating ICS therapy for any child requiring hospitalization for asthma symptoms.

Prior studies have reported low rates of prescribing ICS. Studies investigating NHLBI classification criteria may especially benefit from this type of intervention on surgical outcomes.

CONCLUSIONS: Medically complex children undergoing spinal fusion surgery for NS may benefit from a preoperative outpatient visit by a pediatric hospitalist. Patients with certain clinical characteristics may especially benefit from this type of visit. Future studies will evaluate the impact of this type of intervention on surgical outcomes.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

188 House Officer
Integration of Domestic Violence Screening in a Resident Continuity Clinic
Malgorzata Skarzynska, Cynthia Delgado, India Azzinaro.
Pediatrics, Children’s Hospital at Montefiore, Bronx, NY.

OBJECTIVE: To characterize the interventions suggested by pediatric hospitalists during preoperative visits for patients with NS in anticipation of spinal fusion surgery.

RESULTS: We analyzed data for 214 patients. Of these, 155 patients (72%) were positive for DV pre- and post-implementation.

CONCLUSIONS: A multifaceted DV screening program in a resident continuity clinic effectively increased screening rates and documentation of DV screening results in medical records. As medical educators, we aspire to help residents establish lifelong professional practices that can benefit patient care. These results show a promising start.

189 House Officer
Predictors of New Inhaled Corticosteroid Prescription to Children Hospitalized for Status Asthmaticus
Meera S. Meerkov, Jessica M. Gold, Gabriella Azzaroni, Alyssa H. Silver, Katherine O’Connor.
Pediatrics, Children’s Hospital at Montefiore, Bronx, NY.

BACKGROUND: Guidelines published by the National Heart, Lung and Blood Institute (NHLBI) suggest prescribing inhaled corticosteroids (ICS) for asthmatics of all ages with disease severity classified as persistent and consider initiating ICS therapy for any child requiring hospitalization for asthma symptoms.

RESULTS: We reviewed 565 records of unique patients hospitalized during the six-month period (October 2008 - April 2009). Exclusion criteria: reported current use of an ICS, asthma symptoms, prior studies have reported low rates of prescribing ICS. Studies investigating NHLBI classification criteria may especially benefit from this type of intervention on surgical outcomes.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

190 House Officer
Pediatric Hospitalist Preoperative Evaluation of Children with Neuromuscular Scoliosis
Samantha Cerra, David J. Rappaport, Imran Sharif, David M. Pressel.
Pediatric Residency Program, Jefferson Medical College/A.I. duPont Hospital for Children, Wilmington, DE; General Pediatrics, Jefferson Medical College/A.I. duPont Hospital for Children, Wilmington, DE.

BACKGROUND: Spinal fusion surgery is commonly performed at A.I. duPont Hospital for Children for patients with neuromuscular scoliosis (NS). Given these patients’ complexity, they benefit from a multidisciplinary approach to their management. One adult study has suggested improved clinical outcomes with hospitalist preoperative evaluation of medically complex patients. In 2009, we began a hospitalist preoperative evaluation program for patients with NS in anticipation of spinal fusion surgery.

CONCLUSIONS: Transitions of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.

CONCLUSIONS: Transition of care post discharge presents communication challenges at both the interface between the hospital and primary care setting as well as within the primary care setting. Improvements are needed to enhance information transfer and coordination of care, particularly in large practices.
CONCLUSIONS: Overall, this case study suggests that a specialist-hospitalist offers consistent and accessible after-care that facilitates enhanced quality, encourages inter-professional dynamics, and for specific complex diagnoses accomplishes both with shorter than expected stays for patients. The specialty-hospitalist model may be beneficial in other pediatric service lines as well as in adult medicine.

### House Officer

#### Parent and Caregiver Education on Management of Choking in Infants and Children

Yaron Ivan, John Snyder, Jane L. Garb.

**Pediatrics, Baystate Childrens Hospital, Springfield, MA.**

**BACKGROUND:** Choking is one of the major causes of morbidity and mortality among children. Between 2002-2009 over 900 children died of obstruction of the respiratory tract by food or nonfood items. Prompt, effective first aid provided by a bystander may and often does prevent morbidity or even death.

**OBJECTIVE:** To document the prevalence of a history of non-fatality choking episodes from a sample of patients in our clinic and to assess parental knowledge and confidence about choking management. We also wanted to increase parental knowledge and confidence by providing verbal demonstrations and American Red Cross Skill Cards on choking management.

**DESIGN/METHODS:** During visits to the clinic, parents of children 6 months to 5 years old (high risk population for choking based on AAP guidelines) completed a survey that assessed if they had ever witnessed a choking event in their child, whether they had intervened and how.

The survey also assessed parental knowledge of CPR and confidence in the ability to provide first aid. The parents were then shown appropriate intervention strategies and provided with American Red Cross Skill Cards that included diagrams and written instructions on choking management.

Finally, parents were asked to complete a feedback form assessing their post-intervention level of knowledge and comfort level in treating a choking child.

**RESULTS:** 140 parents filled out both the survey and the feedback form. 59 parents (42%) said they had witnessed their child choking at least once. Among those choking events, 9 (15%) were significant enough for the parents to call 911. Prior to our intervention only 18 of 140 patients (13%) demonstrated knowledge of basic choking management compared to 90 of 140 (64%) post-intervention. 107 parents (76.4%) indicated that they would like to get advice on choking prevention and management during their child’s health maintenance visit. Parents who reported having previously taken a CPR course were significantly more likely to answer the knowledge portion of the survey correctly (p=0.014).

**CONCLUSIONS:** A significant percentage of our parental respondents reported that they did not feel confident or have sufficient knowledge about choking management. Our data showed that a brief demonstration by a medical professional paired with handouts and written material can significantly increase knowledge and confidence levels, two factors that may result in more effective and timely treatment, and thereby reduce child morbidity and mortality due to choking.

### Use of Focus Groups To Inform a New Youth Diabetes Prevention Program

Nita Vangeepuram, Jane Carmona, Guedy Arniella, Deborah L. Burnet, Carol R. Horowitz.

Mount Sinai School of Medicine, NY, NY; Institute for Family Health, NY, NY.

**BACKGROUND:** While the prevalence of cardiovascular disease risk factors in adolescents has not changed, rates of diabetes and pre-diabetes have increased in the last decade and are disproportionately high in minority populations.

**OBJECTIVE:** To explore minority adolescents’ perceptions of their diabetes risk and barriers to adhering to lifestyle changes for diabetes prevention.

**DESIGN/METHODS:** We conducted four focus groups with adolescents (ages 14-18 with a family history of diabetes) recruited from collaborating community sites in East Harlem, NY. Trained moderators facilitated the groups, which were audio-taped and transcribed. Two researchers independently coded the transcripts, identified major themes, compared findings, and resolved differences through discussion and consensus. Interrater reliability was manually calculated as percent agreement in codes.

**RESULTS:** Participants (8 boys and 13 girls) were 60% Latino and 40% African-American. We identified 56 codes (with 92% code agreement) and 4 dominant themes: 1) Despite having a limited understanding of diabetes, adolescents do appreciate its impact on quality of life within their personal networks and community. 2) Although adolescents perceive that dietary modification is the only way they can prevent or control diabetes, regulation of diet is antithetical to their usual lifestyle. 3) Adolescents’ food choices and physical activity behaviors are largely determined by a combination of cost, mood, body image, social norms and environment, not health. 4) Social pressures reinforce sedentary behaviors and unhealthy diets, and there is minimal counteraction with positive lifestyle social support.

**CONCLUSIONS:** A community-based qualitative research approach yielded insight into youth perceptions of diabetes and perceived barriers and opportunities for diabetes prevention. Using findings, a Community Action Board is developing a peer-led diabetes prevention program for pre-diabetic adolescents. Based on themes identified, we recommend that youth diabetes prevention interventions include building self management skills, personal stories about diabetes, dispelling myths about common adolescent dietary practices, addressing non-health related factors impacting diet and physical activity, managing social pressure to engage in unhealthy behaviors, and building self efficacy through goal setting and addressing barriers to lifestyle changes.

### Clinical Versus Community-Based Recruitment for an Adolescent Diabetes Prevention Study

Nita Vangeepuram, Kenya Townsend, Guedy Arniella, Carol R. Horowitz.

Mount Sinai School of Medicine, NY, NY; Institute for Family Health, NY, NY.

**BACKGROUND:** Little is known about successful strategies for recruitment of adolescents for research, particularly in community settings.

**OBJECTIVE:** To compare recruitment from clinical and community sites for a new youth diabetes prevention program.

**DESIGN/METHODS:** We developed a diabetes prevention program for pre-diabetic youth (ages 13-19) in East Harlem, New York. We employed a two phase recruitment strategy. Diabetes risk was assessed by measuring body mass index (BMI). We then screened overweight/obese youth for pre-diabetes using oral glucose tolerance testing and completed adiposity and blood pressure measurements and a health and lifestyle survey. The two recruitment strategies included: 1) referral from health care providers and 2) screenings at community sites. We compared the number of adolescents completing both phases of recruitment, and the proportion eligible for phase two (a proxy for diabetes risk) and the proportion diagnosed with pre-diabetes between those recruited in clinical and community sites.

**RESULTS:** In 3 months, we screened 186 adolescents for diabetes risk (156 in community sites and 30 from clinical referrals). Overall, 47% were at risk for diabetes based on measured BMI, 64% returned for diabetes testing, 34% had pre-diabetes and 1.8% had diabetes. The table below compares recruitment in clinical and community sites.

<table>
<thead>
<tr>
<th>Recruitment Source</th>
<th>Screened Patients (n)</th>
<th>High Diabetes Risk (Based on BMI n%)</th>
<th>Returned for Testing n%</th>
<th>Pre-Diabetes Diagnosis n%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Community</td>
<td>156 (87%)</td>
<td>106 (67%)</td>
<td>81 (66%)</td>
<td>13 (12%)</td>
</tr>
<tr>
<td>Community</td>
<td>30 (14%)</td>
<td>16 (53%)</td>
<td>13 (81%)</td>
<td>1 (6%)</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** In a short time period, we screened 186 adolescents for diabetes risk, finding high rates of un-diagnosed pre-diabetes, even in clinical settings. Community based and clinical recruitment were both effective in diagnosing at-risk adolescents with pre-diabetes. Because providers referred adolescents to be at-risk, clinical sites yielded higher rates of diabetes risk based on BMI as well as higher rates of return for screening and diagnosed pre-diabetes. More adolescents screened in community sites were at lower risk for diabetes (not overweight), or did not have pre-diabetes once tested. However, this broad approach allowed access to more adolescents and opportunities for education about weight and diabetes in a community setting.
Fellow in Training

Does Dietician Diversity Impact Outcomes in Pediatric Weight Management?
Thao-Ly T. Phan, George A. Datto, Division of Weight Management, Nemours AI duPont Hospital for Children, Wilmington, DE.

BACKGROUND: Multidisciplinary care is important to pediatric weight management, but it is important to study how best to utilize different members of the care team and what characteristics of care team members are associated with successful outcomes.

OBJECTIVE: To determine whether seeing a dietician during an initial visit to a pediatric weight management clinic has an effect on retention rate and weight outcomes. Because our dieticians are all Caucasian females, we also studied the differential effect of seeing the dietician on outcomes by demographic subgroups.

DESIGN/METHODS: We conducted a retrospective cohort study of 1020 patients who presented for an initial visit to a pediatric weight management clinic between 2009 and 2011. We compared patients who saw a dietician for their initial visit and those who did not return for follow-up visit utilizing odds ratio analysis and change in weight and BMI percentile at the first follow-up visit utilizing t-tests. We also conducted subgroup analysis by age, gender, race, insurance, and baseline weight and BMI percentile.

RESULTS: The majority of patients were female (61%) and Caucasian (50%) with mean age 11 years and mean baseline weight 78.5 kg and BMI percentile 98.6%. Seventy-seven percent of patients returned for a follow-up visit (mean time to follow-up was 1.4 months). Between the initial and follow-up visit, the mean weight change per month was -0.3 kg (SD 2.1) and the mean BMI percentile change per month was 0.1% (SD 0.4). Twenty-one percent of patients saw a dietician at their initial visit. Seeing a dietician at the initial visit was not associated with an increase in the likelihood of a patient to return for a follow-up visit, except for patients who were male (OR 1.97, p=0.05) or Caucasian (OR 1.66, p=0.07). Seeing a dietician at the initial visit was not associated with mean weight change or BMI percentile change from the initial to the follow-up visit, even amongst different demographic subgroups.

CONCLUSIONS: Seeing a dietician during an initial pediatric weight management visit did not improve overall retention rates or weight outcomes. The finding that males and Caucasians were more likely to follow-up after a visit with a female Caucasian dietician suggests that some patients may benefit from seeing a dietician at the initial visit, but also that there is a need to recruit weight management providers who are diverse in background in order to provide the best and most culturally-compotent care for all weight management patients.

The Family Safe Zone: A Needs Assessment for a Multi-Level Parenting Intervention in the Pediatric Setting
Maria McColgan, Sally Kuykendall, Martha Davis, Stephen Sandelich, Stacy Ellen. Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA; Drexel University College of Medicine, Philadelphia, PA; St. Joseph’s University, Philadelphia, PA; Institute for Safe Families, Philadelphia, PA.

BACKGROUND: Physical punishment is a toxic stressor that disrupts normal brain development. Spanking is associated with increased aggressiveness, delinquency, criminality, and substance abuse, among children. Physical punishment is not an effective practice and impairs the parent-child relationship. Pediatric visits provide an opportunity to screen for harsh parenting, to educate parents and to refer families to local resources. While over 90% of pediatricians report discussing discipline with parents, 75% of parents report not discussing discipline.

OBJECTIVE: The Family Safe Zone sought to improve parenting practices through a multi-level intervention in one pediatric setting.

DESIGN/METHODS: Staff in a large, urban hospital completed surveys to identify attitudes and behaviors toward harsh parenting. The survey was intended to identify current practices in working with parents. Researchers also observed caregiver-child interactions in the clinic waiting areas and staff reactions to these interactions.

RESULTS: At baseline, healthcare providers (n=90) reported observing a variety of harsh parenting practices (90%), such as yelling (93%), cursing (83%), and hitting (71%). Many providers were not comfortable intervening with the abusive parent (61%), the distracted parent (28%), or the stressed parent (49.4%). While most providers reported discussing discipline techniques (78%) with parents, they were less likely to discuss spanking (67%) or toxic stress (40%). Clinic observations (40 hours, n=1460) revealed that 25% of caregiver-child interactions were negative with parents using name-calling, teasing, cursing, or saying “shut up” with children. Only two healthcare provider interventions were noted, one positive and one negative.

CONCLUSIONS: Needs assessment data suggested that providers knew the impact of harsh parenting on children’s development, yet needed support to intervene. Staff received training in two programs, OneKindWord and Partnering with Parents. These programs were designed to change the culture of the organization where providers would intervene when they witnessed harsh parenting. Once an intervention or positive screening occurred, staff could refer parents to an onsite parenting specialist. Data are currently being collected to determine changes in provider attitudes and behaviors. The Family Safe Zone offers a model for replication in other pediatric settings.

Needs Assessment of Parents in a Multi-Level Parenting Intervention in the Pediatric Setting
Maria D. McColgan, Sally Kuykendall, Martha Davis, Stephen Sandelich, Stacy Ellen. Pediatrics, St. Christopher’s Hospital for Children, Philadelphia, PA; Pediatrics, Drexel University College of Medicine, Philadelphia, PA; St. Joseph’s University, Philadelphia, PA; Institute for Safe Families, Philadelphia, PA.

BACKGROUND: Toxic stress, such as physical punishment, disrupts brain development. Spanking is associated with increased aggressive behavior, delinquency, physical abuse, violent/criminal behavior and substance abuse, and poor parent/child relationships. Pediatric visits provide opportunity to screen for family violence, intervene and potentially mitigate potential causes of toxic stress. While over 90% of pediatricians report providing anticipatory guidance about discipline, 75% of parents report not discussing discipline with their pediatrician.

OBJECTIVE: To identify areas of need among at-risk parents in a pediatric healthcare center parenting program.

DESIGN/METHODS: The Family Safe Zone project is a multi-level parenting program designed to increase screening for family violence by pediatric healthcare providers. At-risk families were referred to an on-site parenting specialist. The Parenting Specialist counseled parents on the effects of harsh parenting on children’s brain development and the use of positive discipline practices.

Parents/caregivers (n=54) completed the Parenting Stress Index and the Adult Adolescent Parenting Inventory (AAPI-2). The surveys were used to identify knowledge, attitudes, and behaviors of parenting.

RESULTS: Needs assessment data revealed that 21% of the parents seen by the specialist had critically high total stress levels (scored above the 85th percentile). On the AAPI-2, 43% of participants scored high risk on the power and independence scale. This scale identifies parents who restrict the child’s power while expecting strict obedience to parental demands. Approximately one-third of parents exhibited low levels of empathy, meaning that they did not understand or value normal childhood needs. Thirty percent of respondents reversed family roles, expecting the child to meet the parents’ needs rather than focusing on the child’s developmental needs. Seventeen percent scored high risk on inappropriate expectations. These parents expect more of their children than the child is capable of achieving.

CONCLUSIONS: Data suggest the need for anticipatory guidance by pediatricians in working with parents. Providers can help parents to identify normal childhood development behaviors and to support positive parenting. The impact of the program is currently being measured through post-program surveys with parents and healthcare providers.

Community Acquired MRSA: Does Anatomical Location Matter?
Catalina Ruiz Mesas, Jonathan Arciniegas, David Listman, Uri Belkind, David Perlstein. Pediatrics, St. Barnabas Hospital, Bronx, NY; Emergency Medicine, St. Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: The incidence of community acquired methicillin-resistant Staphylococcus aureus (CA-MRSA) skin infections is increasing worldwide. Although some risk factors, such as a personal or family history of abscesses or contact with healthcare workers, have been identified, often none of these are present. Given the delay in identifying antibiotic susceptibilities, factors that help predict infections with MRSA could help guide empiric antibiotic choice.

OBJECTIVE: To determine the association between the anatomical location of skin abscesses and infection with MRSA.

DESIGN/METHODS: We conducted a retrospective chart review of pediatric patients 0-21 years old (10.5±6.6 yrs) seen in the emergency department and ambulatory clinics of an inner-city, community-based hospital between 1/2007 and 12/2009. We identified 475 patients (55.1% females) with a diagnosis of cutaneous abscess where wound cultures were obtained; post-surgical infections and burns were excluded. We gathered data on classical risk factors of MRSA infection, location of the lesion, and demographic information. Associations were analyzed using Chi-square for categorical variables. A multiple logistic regression model was created to control for potential confounding.

RESULTS: 157 cases of MRSA (33.1%) were found during the study period. When analyzed by anatomical location, 72/185 (38.9%) of abscesses located in the upper extremities and head were MRSA compared to 16/51 (31.4%) and 65/227 (28.6%) of those located in the trunk and lower extremities respectively (p = 0.047). MRSA was identified more frequently in patients that presented with fever (p=0.007), had a family history of abscesses (p<0.001), and who received antibiotic treatment prior to obtaining culture (p = 0.004). When adjusting for these factors, along with age and gender, the association between location and MRSA persisted (p = 0.002).

CONCLUSIONS: Our data suggest that, in addition to fever, family history of abscesses, anatomical location of an abscess in the upper body (upper extremities and head/neck) is significantly associated with MRSA infection. This finding may help guide the choice of empiric antibiotic therapy for skin abscesses in pediatric patients.
Clinical Information Gleaned from Written Domestic Violence Screeners in a Primary Care Setting
Cynthia DeLago, India Azzinaro, Matilde铱geoisy, Pediatric & Adolescent Medicine, Einstein Medical, Center Philadelphia, Philadelphia, PA.

BACKGROUND: Childhood exposure to domestic violence (DV) can affect physical and psychological health. Universal DV screening in pediatric offices identifies victims of violence, acknowledges the presence of caregivers and children exposed to DV. Little is known about what clinical information can be gleaned from written DV screeners.

OBJECTIVE: To describe the type and amount of clinical information that can be obtained with a written DV screener in a pediatric primary care setting.

DESIGN/METHODS: Retrospective review of all self-completed DV screeners collected over 11 months at a hospital-based, primary care practice serving an inner city community. Unaccompanied female or male caregivers arriving with/their child for well-child visits were asked to complete anonymous, validated, written, 4-item questionnaires (HITS tool): How often does your partner 1) threat you with harm, 2) threaten you with harm, and 3) scream or curse at you? Answers were based on a 5-point Likert scale (never to frequently). We considered a score ≥ 8 as positive. Primary outcomes were: 1) number of screeners completed, number of positive screeners; 2) distribution of caregiver scores indicating degrees of DV in households and 3) caregiver comfort level with completing the screeners.

RESULTS: From October 2011 to August 2012, approximately 6,600 patients arrived for well-child visits and 2,329 written screeners were anonymity completed (35% screened). 56% were completed by females, 6% by males, and no sex was listed on the remaining 37%. Of all screeners completed, 80% (38% female, 3% male, 37% unlisted sex) had scores of 4, indicating no abusive behaviors; 16% had scores of 5-7 (58% females, 9% males, 32% unlisted sex), indicating some abusive behaviors; 3% (5% (101) had scores of 8 (68% female, 10% males, 22% unlisted sex), indicating more than one abusive behavior occurs sometimes to frequently. Almost all caregivers completing screeners were somewhat or very comfortable with the tool.

CONCLUSIONS: A written DV screener provides very useful clinical information about children’s home environments. Most caregivers felt comfortable completing the tool. Written screeners show promise as a way to screen for DV in pediatric primary care settings.

Medical Student

Pilot Methodological Study on Defining Adolescent Menstrual Regularity
Eliza W. Gardiner, Kathleen McGovern, Jessica Montana, Nancy Mervish, Barbara Brennan, Susan L. Tetelbaum, Mary S. Wolf, Maida P. Galvez, Mount Sinai School of Medicine, New York, NY; Preventive Medicine, Mount Sinai School of Medicine, New York, NY. mission.

BACKGROUND: Studies examining menstrual regularity, defined by the World Health Organization as one cycle every 20-40 days for three consecutive months, have used methods ranging from interviews to questionnaires to menstrual calendar diaries (electronic or paper). The best method to capture regularity has not been determined.

OBJECTIVE: We examined age, ethnicity, caregiver income/education, interview language, pubertal staging, and BMI and compared at least 3 consecutive monthly calendars as compared to those who were introduced to the calendars but completed less than three months. We compared reported menstrual regularity obtained from caregiver interview with information from monthly menstrual calendars completed by the girl.

DESIGN/METHODS: Latina (N=120) and African American (N=59) girls from the Growing Up Healthy study in New York City were introduced to the prospective menstrual calendar that recorded the month, day, and presence of cramps, bleeding, spotting, heavy bleeding, and bloating. The girls’ caregivers were asked annually in English or Spanish about girls’ menstrual regularity.

RESULTS: The 36 girls who completed at least 3 months of the calendar did not statistically differ in age (p=0.82), race (p=0.39), average age 13 years), BMI (p=0.42), interview language (p=0.60), or caregiver’s education level (p=0.15) compared to the 147 who completed 0-3 months. Caregivers’ classification of menstrual regularity as compared to calendar by reference, the demonstrated a sensitivity and specificity of 71% and 50% and a positive predictive value and negative predictive value of 77% and 42%, respectively.

CONCLUSIONS: Caregiver interview questions on menstrual regularity and monthly diaries gave comparable results, although a small percentage of girls may be incorrectly classified as irregular by the caregiver report in this low-income minority population. To our knowledge, this is among the first methodological studies comparing reported regularity versus menstrual calendars in adolescents and can inform future studies of reproductive health.

House Officer

Do Parents Read the Label? An Assessment of Parents’ Use and Understanding of Nutrition Labels
Chloe Turner, Kathryn Schainker, Sarah F. Braganza, Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Nutrition labeling on packaged food is a population-based approach that provides information for consumers. Research suggests that the mandated back-of-the box nutrition Facts label (NFL) is difficult to interpret and voluntary front-of-package labeling (FOP) is available on some food products. Few studies have investigated parents’ use and understanding of nutrition labels, especially among inner-city families where pediatric obesity rates are highest.

OBJECTIVE: To determine 1) reported use of nutrition labels among inner-city families and 2) comprehension of nutrition labels using the NFL, and 3) if FOP correlates with a better understanding of nutrition information.

DESIGN/METHODS: We created a 29-item questionnaire assessing use and understanding of nutrition labels among parents of pediatric patients in an inner-city academic practice located in the Bronx. Parents were assessed for food label comprehension of both the standard NFL and the FOP.

Data was analyzed using STATA. Two-sample z-tests were performed to compare proportions.

RESULTS: Seventy participants responded to the survey (86% were female, 36% with overweight/obese child). Overall, 63% reported reading the food label when purchasing a product for the first time. There were no significant demographic differences between the two groups. Of those who reported reading the label, 42% reported that their decision to purchase a food product was changed based on reading the label. Parents were more likely to understand the FOP vs the NFL.

CONCLUSIONS: Parents report reading nutrition labels when choosing food for their family and demonstrated improved comprehension of label information when using FOP. Development of a simple, standardized FOP system may help parents make more informed, healthier decisions when purchasing food for their families.

Medical Student

The Feasibility and Utility of Using a Brief Dietary Screener in the Pediatric ED
Meaghan Roy-O’Reilly, Daniella Miano, Renée Silva, Carly Heynes, Valerie B. Duffy, Sharon R. Smith, Molecular and Cell Biology, University of Connecticut, Storrs, CT; Department of Allied Health Sciences, University of Connecticut, Storrs, CT; Connecticut Children’s Medical Center, University of Connecticut, Hartford, CT.

BACKGROUND: Pediatric emergency departments (PED) provide a valuable setting to promote community health via screening, education and early intervention. Assessing dietary intake in the PED may represent what a child consumes when not sick, and indicate dietary risks associated with excessive adiposity. Previous research has shown that assessing food preferences correlates with biomarkers of dietary intake.

OBJECTIVE: To test the feasibility of assessing a child’s dietary intake during a PED visit using a food preference survey, assess the reliability of responses during the visit with those completed at home, and assess the diet-adiposity relationships.

DESIGN/METHODS: A convenience sample of children in the PED was asked to complete a preference survey for foods (3 non-foods, 4 foods). Those critically ill or with psychiatric illnesses was excluded. For test-retest reliability assessment, the preference survey was sent home to complete when usual health had resumed. Height and weight were measured for age- and sex-specific body mass index (BMI).

RESULTS: 150 children were approached, 2 were ineligible, and 8 failed to complete all items. The mean age was 11 years (range 5-17) and 43% were publically insured. The sample was gender balanced: 14% African American, 33% Hispanic, 45% Caucasian; and 3% underweight, 50% overweight, 47% were overweight/obese. The mean time to complete the survey was 3:52 minutes. Through comparing ranks of preferences, all children ranked vegetables as least liked and starches, sweets and fruits as most preferred. The relationship between reported preferences and actual consumption at the PED is strongest in girls. Overweight/obese females reported less preference for vegetables, yet greater preference for caloric beverages (juices, soda, whole milk) than did normal weight females. Through comparing absolute preference ratings via multiple regression analysis (p<0.05), liking for high-fat sweets increased as BMI percentile increased, independent of demographic variables. For reliability testing, the home survey showed good test-retest reliability with average intra-class coefficient of 0.7.

CONCLUSIONS: The food preference survey appears feasible to complete in the PED. The test-retest reliability was acceptable, suggesting that what was reported in the PED was reflective of dietary behaviors at home. The food preference responses could be used to initiate discussions and nutrition education.

Diagnostic Utility of Neuroimaging in Evaluation of Headache in Children Presenting to the Emergency Department
S. Shah, R. Basak, A. Swyampakula, D. Garipalli, S. Kankipati, R. Neugebauer, R. Vega, R. Kairam, Pediatrics, Bronx-Lebanon Hospital Center, Bronx, NY; Flushing Hospital, Medical Center, Flushing, NY; Mercy Hospital & Medical Center, Chicago, IL.

BACKGROUND: Headache is a common complaint in children. The frequency of visits to the pediatric emergency room (ED) with a chief complaint of headache is low (1.3%) and similar to that in adults (1.3% - 2.5%). Headache can be the initial symptom of life-threatening disorders, e.g., meningitis, intracranial hemorrhage, brain tumor. Neuroimaging is widely used for evaluation of headache, with a rise in CAT scan and MRI. However, the most common diagnoses in children presenting with headaches in the E.D are viral illness, sinusitis, migraine and post traumatic headache. Most of these conditions can be diagnosed based on history and physical examination without need for neuroimaging.

OBJECTIVE: To determine the role of MRI or CT in the pediatric emergency room evaluation of headaches.

DESIGN/METHODS: A 10 year retrospective chart review done at Bronx-Lebanon Hospital Center of all children presenting to the pediatrics E.D. with headache, its variants and associated symptoms as chief complaints. Headaches were classified into primary and secondary using the World Health Organizations classification of headache disorders. Primary/Secondary complaint of headache, and a discharge diagnosis with ICD codes: 784.0, 346.2, 307.81, 349.0, 346.9, 346.1, 668.8 were included in the study. The following data were collected: basic socio-demographic
206  
Fellow in Training  
Clinical Screening for HAART Induced Mitochondrial Toxicity in HIV-Infected Children in Ghana  
Allison Lane-Barlow, Lorna Renner, Karel Katz, Veronika Northrup, Paintsil Elijah, Yaw Akosah, Debrah Benjamin, New Haven, CT; Korle Bu Teaching Hospital, Accra, Ghana.

BACKGROUND: Highly active antiretroviral therapy (HAART) has decreased HIV morbidity and mortality; however, the prevalence of HAART toxicity is high. Mitochondrial dysfunction is implicated in most of these toxicities. Moreover, HIV infection also causes mitochondrial damage. Differentiating between mitochondrial dysfunction due to HAART or to HIV infection is crucial for treatment decisions, particularly in resource poor settings.

OBJECTIVE: Our primary objective was to test the utility of clinical tools (the Mitochondrial Disease Criteria (MDC) and the Enqué Préférante Française (EPF)) to screen for mitochondrial toxicity among HIV-infected children in a resource poor setting.

DESIGN/METHODS: We conducted a retrospective chart review of 403 HIV-infected children at Korle Bu Teaching Hospital, Accra, Ghana. Two clinical definitions of mitochondrial toxicity were used: the MDC and the EPF. Each is a checklist of clinical symptoms, a combination of which when present results in a (+) score. Data on demographics, WHO stage, age of diagnosis, start date of HAART, adherence, medications used, and length of treatment were collected. Fisher’s Exact Test determined significance regarding MDC or EPF (+) scores. Logistic regression models determined predictors of (+) score.

RESULTS: Of 403 HIV-infected children, 331 were on HAART. There was no significant difference in MDC score between those on HAART and treatment naive children whereas the differences in EPF score approached significance (p=0.1). Male sex, higher WHO stage, younger age at diagnosis, and younger age of HAART initiation were all significantly associated with EPF (+) score (p<0.01). Adherence to treatment trended toward a significant association with EPF (+) score (p=0.093). Nevirapine, Abacavir, and Didanosine appear to increase risk of an EPF (+) score (OR=3.5(95% CI=1.99-6.33), 4.76(2.59-9.43), 4.93(1.29-18.87), respectively). Efavirenz is protective (0.5(0.28-0.87)). None of the criteria of those with EPF (+) score seem to occur more frequently in children on HAART or treatment naive.

CONCLUSIONS: Neither EPF nor MDC were able to identify a significant difference between HIV-infected children with mitochondrial toxicity from HIV alone vs. HIV with HAART. However, indicators of longer exposure to HAART are associated with an EPF (+) score. A prospective study is needed to evaluate the utility of the EPF to detect mitochondrial toxicity in children in resource poor settings.

207  
House Officer  
Prescriber Perceptions of an Antimicrobial Stewardship Program (ASP)  
Dustin Flannery, Sanjeet Swami, Shannon Chan, Stephen Eppes. General Pediatrics, Alfred I duPont Hospital for Children, Wilmington, DE; Pediatric Infectious Diseases, Alfred I duPont Hospital for Children, Wilmington, DE; Pharmacy, Alfred I duPont Hospital for Children, Wilmington, DE.

BACKGROUND: The development of antimicrobial (AM) resistance has been shown to increase mortality, hospitalization, and healthcare costs. ASPs can help reduce AM use in hospitals and therefore reduce AM resistance. In 2004, our pediatric tertiary care hospital implemented an ASP which has helped decrease unnecessary AM use, as well as optimize AM selection and dosing. Aspects of our ASP include prospective audits with real-time feedback, required preauthorization and indication for certain AMs, online clinical guidelines, order sets, and a yearly antibiogram.

OBJECTIVE: We aimed to determine provider attitudes about the effectiveness of our ASP generally and its effects on their own AM prescribing behaviors specifically.

DESIGN/METHODS: We surveyed hospital-based providers, including residents, fellows, attending physicians, selected nurse practitioners and physician assistants. An online survey was designed utilizing questions with a Likert scale response format and was sent out by e-mail. The data were collected and analyzed using Stata.

RESULTS: Of 153 potential participants the survey was completed by 93 prescribers, 52% of whom were pediatric residents. Most participants found the features of our ASP to be helpful. Overall recommendations from the infectious disease (ID) pharmacist were found to be helpful by 82%, and 94% reported they had never experienced an adverse outcome related to ASP interventions. Individual aspects of our ASP were found to be more than somewhat helpful by more than 60% of participants.

208  
Fellow in Training  
Continuous Versus Intermittent Pulse Oximetry Monitoring of Children Hospitalized for Bronchiolitis  
Russell J. McCulloh, Brian K. Alverson, Kristin L. Koehn. Pediatrics, Long Island Children’s Hospital, Stony Brook, NY.

BACKGROUND: Influenza presents with increased morbidity & mortality in children <6-months of age. Vaccination of caregivers is indicated but immunization rates are estimated at 30%. The 2009 New York State Neonatal Influenza Protection Act (NIPA) aimed to reduce the burden of infant influenza by mandating offering of influenza vaccine to caregivers during the post-partum hospitalization in hospitals with neonatal intensive care units.

OBJECTIVE: To determine the impact of NIPA on infant influenza rates.

DESIGN/METHODS: Data on laboratory-confirmed influenza between 2006 & 2012 were extracted from the New York State Electronic Clinical Laboratory Reporting Service (ECLRS). Data on cases were categorized by age (0-5 months) & location (New York City, outside NYC) based on reporting laboratory site. Total number of influenza cases & percentage of total cases in the infant age group were normalized to number of reporting laboratory sites. Chi-Square Test of Independence was used in a bivariate analysis pre-and-post implementation. Year-to-year trends were assessed by linear regression. All tests of significance are two-sided and evaluated at the p<0.05 level.

RESULTS: During the 6-year study period, 3,154 cases of influenza were detected in infants 0-5 months of age. In bivariate analysis 1,707 (54.1%) cases occurred prior to NIPA implementation, 1,447 (45.9%) cases occurred after (p=0.001). Of 1,422 cases detected in NYC, percentages of influenza cases pre-post NIPA were 777 (54.6%) & 645 (45.4%) respectively (p=0.006). Outside NYC, the percentage of cases was reduced from 53.7%(930/1732) to 46.3% (802/1732, p<0.001). Prior to implementation there was a year-to-year increase in the number of infant influenza cases statewide (p=0.004 for trend). The ratio of infant influenza cases normalized per ECLRS site in NYC increased each year after NIPA passage (p=0.001 for trend). The ratio of infant cases outside NYC annually decreased (p=0.05 for trend). No year-to-year trends were seen in the percentage of total influenza cases in the infant age group compared to total cases across all age groups either within or outside NYC.

CONCLUSIONS: Comparison of influenza seasons before & after NIPA suggests a total statewide reduction in the burden of infant influenza. However the greatest driver of this reduction occurs from reduced disease in infants outside NYC. We speculate parenteral immunization as encouraged by NIPA may not create cocoon immunity in NYC.
208

Enteral Feeding Tube Design and Differential Bacterial Overgrowth: An In Vitro Comparison
Amy Presti, Ruth Snyder.
Neonatology, MidAtlantic Neonatology Associates, Morristown, NJ.

BACKGROUND: NICU patients often require nutritional gavage support via enteral feeding tubes (EFTs), with various designs existing for EFT caps, inlet hubs, and distal ends. It is possible that certain EFT designs may increase the risk for nosocomial infection by promoting bacterial overgrowth.

OBJECTIVE: To compare in vitro bacterial overgrowth of design components of commercially available 8 French EFTs, including the proximal hub (H), cap (C), and distal end (DE) outlet.

DESIGN/METHODS: EFT caps (plunger (PC), recessed (RC) and threaded (TC)); hubs (single or double port); and distal ends (open (OE) or pouch (POE)) were assessed. Four polyurethane (PE) and 1 silicone (S) EFT were selected. EFTs were inoculated with a 2:1 mixture of ready-feed 24 kcal/oz premature formula and human saliva, placed in a 75% humidified isolette at 34°C, and removed at 5, 24 or 72 hours. EFTs were sterilized sectioned, caps, hubs and distal ends were placed in PBS and cultured using standard microbiological procedures. Bacterial colony forming units (CFUs) were determined for each specimen and standardized for maximum growth by time and component, creating a ‘0-100’ scale for two-tailed t-test comparisons.

RESULTS: Maximal growth was detected for specimens at 3 hours. A significant difference existed between PC and RC caps at 3 and 24 hours; this difference disappeared by 72 hours.

209

Comparison of Multiple Combination Methods of Analgesia for Neonatal Circumcision
Sammir Perez, Fernanda Kupferman, Susana Rapaport, Kelly Cervellione, Lourdes Cohen.
Pediatrics, Flushing Hospital Medical Center, Flushing, NY.

OBJECTIVE: To determine whether 1. Maturity, as indicated by PMA, is the predominant factor essential to achieving this goal. This coordination is a variable developmental milestone usually achieved by 36 wks PMA.

RESULTS: Significant delays were seen across all 3 GA groups for PMA at first nipple feed, days between first nipple feed and at DC. Hypothesis: Majority of infants (> 75%) will attain FNF by 36 wks PMA independent of GA & then be discharged within a week.

CONCLUSIONS: When combined with non nutritive sucking and oral sucrose, EMLA cream produces significant increase in heart rate compare with dorsal penile or ring block suggesting a stronger pain response. Other physiologic and behavioral parameters were not different between the groups indicating that the heart rate might be more sensitive marker of pain response in neonates.

210

Withdrawn

211

Fellow in Training

Initiation and Attainment of Full Nipple Feeding (FNF) Is Influenced by Gestational Age (GA)
Abigail C. Wellington, Jeffrey M. Perlman.
Neonatal/Perinatal Medicine, New York Presbyterian-Weill Cornell Medical Center, New York, NY.

BACKGROUND: Attainment of independent nipple feeding is a primary criterion & often final barrier to discharge of a premature infant. The ability to coordinate suck-swallow-breathe is essential to achieving this goal. This coordination is a variable developmental milestone usually achieved by 36 wks PMA.

OBJECTIVE: To determine whether 1. Maturity, as indicated by PMA, is the predominant factor modulating initiation and attainment of FNF, 2. Attainment of FNF is temporally associated with hospital discharge (DC). Hypothesis: Majority of infants (> 75%) will attain FNF by 36 wks PMA independent of GA & then be discharged within a week.

RESULTS: Significant delays were seen across all 3 GA groups for FNF at DC. Days between first & full nipple feed & days from FNF to DC; these delays were inversely related to GA [Table 1]. By 36wks PMA, 50% had achieved FNF & 77% by 38 wks. [Table 2] Attainment of FNF was followed by DC within a wk only for infants > 28 wk but took twice as long (15 d) for infants < 28 wk.
CONCLUSIONS: These findings indicate that initiation and attainment of FNF is influenced by PMA as well as GA. It wasn’t until 38 weeks that >75% of infants in the cohort achieved FNF. There was an incremental 2 week delay in achieving FNF with ↓ GA. Additionally, infants born at an earlier GA exhibited a 2-fold delay to DC after achieving FNF. The mechanisms contributing to delay to FNF and time to DC require further investigation.

**212 House Officer**

**Management of Patient Ductus Arteriosus (PDA) with Two Different Protocols: A 10-Year Retrospective Study of Outcomes in Premature Babies with Birth Weight (BW) ≤ 1250 grams**

Arpit Agarwal, Satish Chikkabyrappa, Alok Bhutada, Prema Ramaswamy.
Marina Osolovsky, Mary Rojas, Hemalatha Murugan, Panayot Filipov.
Department of Pediatrics, Maimonides Infants and Children’s Hospital, Brooklyn, NY.

BACKGROUND: Management of PDA is controversial among neonatologists. Different protocols are used and opinions and outcomes vary.

OBJECTIVE: To analyze and compare outcomes of premature babies, treated with 2 different protocols between 2002 and 2011.

DESIGN/METHODS: A retrospective medical chart review of premature babies with BW ≤ 1250 grams, diagnosed with PDA, was conducted. Babies from 2002-2007 (group 1) were treated aggressively as per protocol based only on PDA size ≥ 1.7mm by echocardiogram (ECHO). Babies from 2008-2011 (group 2) were treated conservatively as per protocol based on clinical and ECHO signs of more severe PDA. Demographic data and neonatal outcomes were analyzed using chi square test.

RESULTS: Data for 380 babies (group 1=199, group 2=181) were analyzed. 72% of babies from group 1 were treated with Indomethacin or Ibuprofen (Indo/IBu) and 18% had ligation vs. 40% and 2.2% of babies from group 2, respectively (p<0.0001). There were no statistical differences in BW, GA, sex, maternal use of steroids, Apgar score, PDA size, days of ventilation or CPAP. Group 2 had statistically significant decrease in mortality and intraventricular hemorrhage (IVH). The main neonatal outcomes are summarized in Table 1.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Group 1 (N=199, %)</th>
<th>Group 2 (N=181, %)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD A Indo/IBu treated</td>
<td>52</td>
<td>60</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>PD A Ligation</td>
<td>18</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Oxygen at 28 days</td>
<td>82.3</td>
<td>90.3</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Oxygen at 36 weeks</td>
<td>50</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Pulmonary hemorrhage</td>
<td>6.5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>TVH</td>
<td>16.9</td>
<td>22.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>NICU</td>
<td>18.5</td>
<td>13.4</td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>5.7</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>ROP</td>
<td>22.3</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Length of stay</td>
<td>15.6</td>
<td>15.6</td>
<td>NS</td>
</tr>
<tr>
<td>Mortality</td>
<td>24.6</td>
<td>16.0</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Aggressive early treatment with Indomethacin or Ibuprofen and ligation of PDA in babies with BW ≤ 1250 grams did not result in any improvement of neonatal outcomes. Babies treated selectively had lower mortality and IVH. Careful clinical evaluation of the signs of PDA and ECHO assessment of cardiac function seem helpful to define the group of babies for treatment. This approach also significantly decreased the number of babies exposed to the risks, side effects and cost of medications and ligation.

**213 Wielding Technology To Transform NICU Model of Care: Large Scale Operations Testing Is Feasible with Little Prior Simulation Experience**

Jesse Bender, Robin Shields, James Maryman, James Padbury.
Pediatrics, Women & Infants’ Hospital, Providence, RI.
Pediatrics, Woman’s Hospital, Baton Rouge, LA.

BACKGROUND: Single Family Room (SFR) Neonatal Intensive Care Units (NICUs) enhance development of the tiniest infants. Care practices translate imperfectly from the bay model to SFR. Early care interventions, prophylaxis and opinion and outcomes vary.

OBJECTIVE: To encourage consideration of family concerns and preferences in daily plans for care.

CONCLUSIONS: Family concerns for their infant.

**214 Fellow in Training**

**Communication Intervention in the NICU: Can It Backfire?**

Pediatrics, Johns Hopkins University, Baltimore, MD; Johns Hopkins, Bloomberg School of Public Health, Baltimore, MD.

BACKGROUND: For parents of a critically ill child, good communication is vital and may help alleviate stress and anxiety. We adapted the Seattle Decision Making Tool (DMT) for NICU parents to learn more about their values, beliefs, contextual family issues, and quality of life concerns for their infant.

OBJECTIVE: To encourage consideration of family concerns and preferences in daily plans for patient care.

DESIGN/METHODS: Parents of critically ill neonates (SNAP score >20) admitted to the NICU were randomized, within 7 days of admission, to an intervention group, where parents were interviewed using the DMT, or standard of care. DMT information was shared with the clinical team through the medical record and communicated directly to the primary NICU clinician via email. Daily rounds on all infants were audio recorded after enrollment, with clinician consent. Parents completed the State-Trait Anxiety Inventory (STAI) at enrollment. Two weeks later, parents completed 3 surveys: the Family Inventory of Needs - Pediatrics (FIN-PED), satisfaction with NICU care, and the STAI. Recordings were analyzed with the Roter Interaction Analysis System.

RESULTS: Complete data were obtained for 10 control and 9 intervention families. 11 different clinical teams were recorded. The groups did not differ on demographic characteristics of infants or families. Mean infant SNAP scores were around 40 in each group. Anxiety and FIN-PED scores were similar for both groups; state anxiety did not decrease over time. There was minimal psychosocial content in rounds, < 5% of content; the groups did not differ in amount, or duration of rounds. Controls reported higher satisfaction with NICU care, specifically in questions regarding communication.

CONCLUSIONS: This study presents pilot data using the modified DMT with NICU families and clinicians. We found that additional information about family concerns and beliefs was not incorporated into rounds and that families in the intervention group were less satisfied with communication than controls. This suggests that intervention families may have been primed to expect better communication than they received. In addition, giving family data directly to busy providers may not be sufficient. When testing a communication intervention, researchers should consider whether they are raising family expectations, and determine how best to integrate family psychosocial information into the daily reality of busy NICU clinicians.

**215 Fellow in Training**

**Early Caffeine Therapy for Prevention of Bronchopulmonary Dysplasia in Preterm Infants**

Dalal Taha, Sharon Kirkby, Ursula Nawab, Kevin C. Dysart, Linda Genen, Jay S. Greenspan, Zubair H. Aghai.

BACKGROUND: Caffeine therapy started during the first 10 days of life reduces the risk of bronchopulmonary dysplasia (BPD) in preterm infants. Hyperoxia and ventilator induced lung inflammation during the first few days of life contributes to the pathogenesis of BPD. Caffeine has anti-inflammatory properties. If therapy is initiated within the first 2 days of life, this may confer an additional advantage in preterm infants.

OBJECTIVE: To determine if the neonatal outcomes are better with the early commencement of caffeine therapy.
Ears and thereby limit unnecessary interventions and exposure to broad spectrum antimicrobials. Protection of the ear from anti-adhesive solutions may reduce rates of non-infectious ear discharge of infectious etiology. Cultures of ear drainage do not appear to yield any useful information.

Cultures were positive for in 68%. Cultures of ear drainage were performed in 86% mostly yielded mixed flora. Two blood tubes were used on the face <48 hours prior to the onset of drainage. A sepsis evaluation was performed.

RESULTS: 50 total cases were documented from 1991-2012 with 62% occurring between 2008-2011, post-initiative rates of discharge were collected.

Ear Drainage and the Role of Sepsis Evaluations in the Neonatal Intensive Care Unit

A NICU photo album was developed to be utilized with inpatient prenatal radioactive exposure on PT infant’s cells is warranted. Mean cED by LOS= 0.22 mSv for 0-90 days, 0.81 mSv >90-180 days and 1.43 mSv >180days. 3.8% of subjects had at least 1 CT scan. Cumulative dose exceeded 0.5 mSv in 14% of cases.

CONCLUSIONS: PT infants are exposed to a higher cED than previously reported in the USA and Europe and this is most marked in extreme PT. Exposures are more than 6x higher in 22w compared to 32w infants. Efforts to minimize ionizing radiation exposure in NICU and increased use of non-ionizing radiation imaging studies are needed. Further investigation into the effects of radiation exposure on PT infant’s cells is warranted.

Ear Drainage and the Role of Sepsis Evaluations in the Neonatal Intensive Care Unit

Ocular Tissues - Postnatal Consultation to Potentially Alleviate Parental Stress and Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Ear Drainage and the Role of Sepsis Evaluations in the Neonatal Intensive Care Unit

Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Cumulative Diagnostic Imaging Radiation Exposure in Premature Neoneates

Early commencement of caffeine improved survival without BPD in preterm infants. The rate of NEC with early caffeine use requires further investigation.

Ear Drainage and the Role of Sepsis Evaluations in the Neonatal Intensive Care Unit

Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Cumulative Diagnostic Imaging Radiation Exposure in Premature Neoneates

CONCLUSIONS: Early commencement of caffeine improved survival without BPD in preterm infants. The risk of NEC with early caffeine use requires further investigation.

Premature Neonates

Utilization of Photographic Images during Prenatal Consultation to Potentially Alleviate Parental Stress and Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Utilization of Photographic Images during Prenatal Consultation to Potentially Alleviate Parental Stress and Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)

Anxiety Associated with Infants’ Admission to a Neonatal Intensive Care Unit (NICU)
**219**

**Fellow in Training**

**Factors and Outcomes Associated with the Speed of Rewarming Hypothermic VLBW Infants**


**BACKGROUND:** Amongst very low birth weight (VLBW ≤1500 grams) infants, hypothermia (<36.5°C) at birth is associated with an increased risk of adverse outcomes. The World Health Organisation (WHO) recommends that, “Newborns found to be hypothermic must be rewarmed as soon as possible.” To date, no optimal speed for re-warming the cold infant has been identified.

**OBJECTIVE:** We seek to determine if there is a correlation between the speed of re-warming hypothermic VLBW infants and morbidities or mortality in these infants.

**DESIGN/METHODS:** This is a retrospective nested cohort study of VLBW infants born and resuscitated in Westchester Medical Center between January 1, 2010 and October 31, 2011 who were hypothermic upon NICU admission. Exclusion criteria include: major congenital malformation or genetic syndrome diagnosed in the antenatal or postnatal period. Hypothermic infants are categorized as having undergone rapid rewarming (≤1 hour to euthermia: ≥36.5°C) or not. The relationships of maternal, antenatal and infant condition were correlated to clinical outcome variables (death, intraventricular hemorrhage, sepsis, Bronchopulmonary dysplasia, necrotizing enterocolitis, and periventricular leukomalacia). Categorical variables were compared utilizing chi square analysis. Student’s T-test was used to compare continuous variables. P<.05 is considered significant. Results are based upon the interim review of 166/249 charts.

**RESULTS:** During this time, 92/166 (55%) of VLBW infants were hypothermic upon admission to the NICU. 44 infants were rapidly rewarmed and 48 took greater than 1 hour. Rapidly rewarmed infants were found to have a decreased incidence of IVH (9 (20.5%) v 19 (40.4%)) Rates of all other clinical outcomes tested were similar. Of those variables which may affect the risk of warming and clinical outcomes, only (rapidly rewarmed vs rewarmed for greater than one hour) maternal age (27.68 ± 6.26 v 30.79 ± 7.32) and cesarean delivery (78.5% v 87.5%) were associated with re-warming rates. There was no difference in initial temperature, birth weight, gestational age, five minute Apgar score or delivery room resuscitation between those who were rewarmed rapidly or not.

**CONCLUSIONS:** Hypothermia is a significant problem in VLBW infants. Based on preliminary data, rapid rewarming is associated with decreased incidence of IVH. Further study of optimal rewarming speed is needed to ensure best outcomes for VLBW infants.

---

**220**

**Respiratory Morbidity in Infants with Myelomeningocele**

Maria Victoria Fraga, Annie Giaccone. Dept. of Pediatrics and Division of Neonatology, The Children’s Hospital of Philadelphia and the University of Pennsylvania, Philadelphia, PA.

**BACKGROUND:** The most common complications of myelomeningoceles (MMC) include urologic, neurologic, and orthopaedic issues. However, there is no published data on respiratory morbidity in infants with MMC.

**OBJECTIVE:** The purpose of this observational study was to characterize the incidence of respiratory morbidity in late preterm and term infants with MMC.

**DESIGN/METHODS:** All late preterm and term infants admitted to the Children’s Hospital of Philadelphia NICU between Aug 2008 and Sept 2012 with a diagnosis of MMC were included. Records of MMC patients (< 27 weeks) born between 06/2006 and 08/2012 and survived till first eye examination were reviewed for demographic data, repair type (fetal or postnatal) and respiratory support in the delivery room and in the first 24 hours in the NICU. The relationships between gestational age, type of repair, and need for respiratory support were modeled using logistic regression.

**RESULTS:** 165 infants were included (23 w = 23, 24 w = 44, 25 w = 51 and 26 w = 47). 58 infants were found to have a decreased incidence of IVH (9 (20.5%) v 19 (40.4%)). Rates of all other clinical outcomes tested were similar. Of those variables which may affect the risk of warming and clinical outcomes, only (rapidly rewarmed vs rewarmed for greater than one hour) maternal age (27.68 ± 6.26 v 30.79 ± 7.32) and cesarean delivery (78.5% v 87.5%) were associated with re-warming rates. There was no difference in initial temperature, birth weight, gestational age, five minute Apgar score or delivery room resuscitation between those who were rewarmed rapidly or not.

**CONCLUSIONS:** Hypothermia is a significant problem in VLBW infants. Based on preliminary data, rapid rewarming is associated with decreased incidence of IVH. Further study of optimal rewarming speed is needed to ensure best outcomes for VLBW infants.

---

**221**

**Defining Successful Extubation in Very Preterm Infants: What Is the Evidence?**

Annie Giaccone, Erik Jensen, Peter Davis, Barbara Schmidt. Department of Pediatrics and Division of Neonatology, The Children’s Hospital of Philadelphia and the University of Pennsylvania, Philadelphia, PA; Department of Paediatrics, The Royal Women’s Hospital and the University of Melbourne, Melbourne, Australia.

**BACKGROUND:** Studies of extubation strategies in very preterm infants often report the rate of reintubation within a pre-determined time window as their main outcome. However, the choice of the time window may not be evidence-based.

**OBJECTIVE:** To systematically review published studies for their definitions of extubation success and failure in very preterm infants.

**DESIGN/METHODS:** Eligible studies were published between 2002-2012 and reported reintubation as an outcome. Two independent observers abstracted trial characteristics, duration of observation, extubation observation window, reintubation criteria, and rates of reintubation. Relationships between trial characteristics and reintubation rates were modeled using linear regression.

**RESULTS:** Forty-four studies were eligible (n=0.93), but only 27 (61%) defined extubation success and reported the rate of this outcome. The duration of observation after extubation varied from 12-168 hours with all but 3 studies using a window of at least 48 hours. Reintubation criteria were defined in 25 studies. Most studies used apnea (92%), acidosis (88%), FiO2 (80%) or PaCO2 (76%) with a wide range of cutoff values. The mean±SD reintubation rate across all studies was 24±11%. In studies of infants with median birth weights ≤1000g, the reintubation rate increased with longer duration of observation (p=0.001), in contrast to studies of larger infants (p=0.37) (Figure).

---

**222**

**Does Extremely Preterm Infants Needs Screening for Retinopathy of Prematurity Earlier Than 31 Weeks Post Menstrual Age?**


**BACKGROUND:** The guidelines for screening and treatment of retinopathy of prematurity (ROP) was revised by the American Academy of Pediatrics (AAP) in 2006. The first screening for ROP is performed at 31 weeks postmenstrual age (PMA) in premature infants born at ≤27 weeks of gestation. The retinal findings that required ablative therapy was also modified and the treatment was recommended for less severe ROP. At our institution ROP screening is initiated earlier than 31 weeks PMA (at 4 weeks corrected age) for extremely premature infants.

**OBJECTIVE:** To determine the utility of screening all extremely preterm infants for ROP earlier than AAP suggested guidelines.

**DESIGN/METHODS:** This study is a retrospective data analysis from a single center for preterm infants (< 27 weeks) born between 06/2006 and 08/2012 and survived till first eye examination. The eye examination findings and PMA for laser therapy were extracted from the database. Results are based upon the interim review of 166/249 charts.

**RESULTS:** 165 infants were included (23 w = 23, 24 w = 44, 25 w = 51 and 26 w = 47). 58 infants were found to have a decreased incidence of IVH (9 (20.5%) v 19 (40.4%)). Rates of all other clinical outcomes tested were similar. Of those variables which may affect the risk of warming and clinical outcomes, only (rapidly rewarmed vs rewarmed for greater than one hour) maternal age (27.68 ± 6.26 v 30.79 ± 7.32) and cesarean delivery (78.5% v 87.5%) were associated with re-warming rates. There was no difference in initial temperature, birth weight, gestational age, five minute Apgar score or delivery room resuscitation between those who were rewarmed rapidly or not.

**CONCLUSIONS:** The definition of extubation success varies greatly in recently studies of very preterm infants. Investigators studying extremely low birth weight infants should consider post-extubation observation periods of at least one week in order to accurately measure extubation success or failure.

---

**223**

**House Officer**

**Does Extremely Preterm Infants Needs Screening for Retinopathy of Prematurity Earlier Than 31 Weeks Post Menstrual Age?**


**BACKGROUND:** The guidelines for screening and treatment of retinopathy of prematurity (ROP) was revised by the American Academy of Pediatrics (AAP) in 2006. The first screening for ROP is performed at 31 weeks postmenstrual age (PMA) in premature infants born at ≤27 weeks of gestation. The retinal findings that required ablative therapy was also modified and the treatment was recommended for less severe ROP. At our institution ROP screening is initiated earlier than 31 weeks PMA (at 4 weeks corrected age) for extremely premature infants.

**OBJECTIVE:** To determine the utility of screening all extremely preterm infants for ROP earlier than AAP suggested guidelines.

**DESIGN/METHODS:** This study is a retrospective data analysis from a single center for preterm infants (< 27 weeks) born between 06/2006 and 08/2012 and survived till first eye examination. The eye examination findings and PMA for laser therapy were extracted from the database. Results are based upon the interim review of 166/249 charts.

**RESULTS:** 165 infants were included (23 w = 23, 24 w = 44, 25 w = 51 and 26 w = 47). 58 infants were screened before 30 weeks PMA, 57 (98%) had immature eyes and only one infant had stage 1 ROP. However, at 30 weeks PMA 2 infants met the criteria for laser therapy and at 31 weeks 3 additional infants received laser therapy.

---

**CONCLUSIONS:** The definition of extubation success varies greatly in recently studies of very preterm infants. Investigators studying extremely low birth weight infants should consider post-extubation observation periods of at least one week in order to accurately measure extubation success or failure.
CONCLUSIONS: Extremely premature infants born before 27 weeks gestation may not need screening for ROP before 30 weeks PMA. As two infants developed ROP at 30 weeks PMA which required laser therapy, premature infants born before 27 weeks may benefit with earlier ROP screening at 30 weeks PMA.

223

Abstract Withdrawn

224

Fellow in Training

Acute Effects of Hyperoxia on Gene Expression in Lipopolysaccharide-Treated Newborn Rat Lung

Jagdish Flumalui, Esther Speet, Aynish Chandar.

Pediatrics, Stony Brook Long Island Children’s Hospital, Stony Brook, NY.

BACKGROUND: Perinatal infection and oxygen toxicity play a significant role in the pathogenesis of bronchopulmonary dysplasia. The net effect of the injurious insults is a persistent airway inflammation.

OBJECTIVE: To evaluate acute effects of short term hyperoxia on expression of genes associated with inflammation, antioxidant defense and lung development in newborn rat lung following intranasal lipopolysaccharide (LPS) administration.

DESIGN/METHODS: Sixteen Sprague-Dawley rat pups (2-day-old) were randomized to receive intranasal LPS (10µg/5µl) or normal saline (n=8 in each group). After 24hrs, four rat pups from each group were exposed for 6hrs to hyperoxia (100% O2) or room air. Immediately after this exposure, lung tissue was harvested and RNA extracted. Real-time PCR was performed with a custom-made TaqMan array plate containing 43 target genes (associated with inflammation, antioxidant defense and lung development). All values were normalized to the housekeeping gene, β-actin. One-way ANOVA test with bonferroni’s correction was used to compare the changes in mRNA expression, among different groups compared to saline-room air group. Results were considered significant at p< 0.05.

RESULTS: The mRNA for two inflammation associated genes Interferon-γ and Macrophage inflammatory protein-1α were higher by 94% and 32% respectively with combined but not with individual insults. Hyperoxia down-regulated immune response signaling genes like Myeloid differentiation primary response gene-88 by 47%, Toll-like receptor 2 (31%), Interleukin-1 receptor-associated kinase 4 (33%), Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor-α (28%) and this change was prevented by prior exposure to LPS. Pre-exposure to LPS also prevented hyperoxia down-regulation of endothelial cell matrix metalloproteinase converting enzyme-2 by 36%, type-2 alveolar epithelial cell matrix metalloproteinase A1 (32%), as well as, antioxidant genes like NADPH oxidase p91 subunit by 49% and Heme Oxygenase-1 (22%).

CONCLUSIONS: This animal model indicates that short term hyperoxia and airway LPS exposure have an additive effect on pro-inflammatory cytokine expression. Conversely LPS pretreatment followed by hyperoxia prevented the down-regulation of lung remodeling, antioxidant and Toll-like receptor signaling genes. Our study suggests that prior exposure of the newborn lung to LPS has potentially differential effects on gene expression upon exposure to short term hyperoxia.

225

Fellow in Training

Expression Profiling of microRNAs Related to Heme Oxygenase-1 in a Mouse Model of Hyperoxic Lung Injury

Hayato Go, Fumihiko Namba, Ping La, Guang Yang, Phyllis A. Denney.

Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA.

Pediatrics, University of Pennsylvania, Philadelphia, PA.

BACKGROUND: Lung heme oxygenase-1 (HO-1), the rate-limiting enzyme of heme degradation and an antioxidant defense protein, is induced in animals exposed to hyperoxia. We have previously demonstrated that despite increased HO-1 protein levels, neonates don’t induce HO-1 mRNA response to hyperoxia whereas adults do, suggesting that there may be posttranscriptional regulation of HO-1 expression in the newborn. MicroRNAs (miRNAs) are noncoding RNAs that play essential roles in cellular and developmental regulation. They bind to the 3’UTR of target genes and thereby repress translation. We hypothesize that developmental changes in miRNA expression in the lung may explain the discrepancy between HO-1 protein and mRNA expression after exposure to hyperoxia in newborns.

OBJECTIVE: To determine whether miRNAs and HO-1 related target genes are altered in the newborn lung exposed to hyperoxia.

DESIGN/METHODS: Neonatal mice were exposed to 21% or 95% O2 for 3 days. Lung HO-1 protein and mRNA levels were determined by Western blot and qPCR, respectively. Lung RNA was extracted from whole lung homogenates using mirVANA-RNA isolation kit (Applied Biosystems, Carlsbad, CA). A total of 35 miRNAs were analyzed using TaqMan Low Density Arrays(TLDA) and potential miRNA targets were identified using the TargetScan version 5.1. Potential miRNA gene expression was assessed using real-time PCR.

RESULTS: 10 miRNAs were significantly (≥2.0 fold) down-regulated in response to hyperoxia (miR-370, miR-335-3p, miR-29B, miR-409-3p, miR-543, miR-134, miR-376B, miR-296-3p, miR-503, and miR-351-3p), and 10 miRNAs were significantly up-regulated (miR-298, miR-334, miR-582-3p, miR-29c, miR-328, miR-296-5p, miR-582-5p, miR-551, miR-29a, and miR-155). Of these miR-298, miR-409-3p, and miR-503 were increased whereas miRNA, miR-582-3p, miR-551, miR-582-5p were decreased during embryonic and early postnatal development. MR-155, which binds to Bach1 mRNA, was identified as a potential miRNA related to HO-1 and was also significantly up-regulated in response to hyperoxia.

CONCLUSIONS: Hyperoxia alters lung miRNA profiles in the newborn. Since Bach1 inhibits HO-1 protein expression in vitro, we speculate that up-regulated miR-155 in neonatal lungs exposed to hyperoxia could reduce Bach1 protein levels and subsequently increase HO-1 protein levels in vivo.

226

House Officer

Correlates of Term and Preterm Infants Undergoing Unattended Sleep Studies

Marisa J. Pacella, Dona Tauber, Suzanne M. Touch.

Pediatrics, St Christopher’s Hospital for Children, Philadelphia, PA; Section of Pediatric Pulmonology and Sleep Medicine, St. Christopher’s Hospital for Children and Drexel University College of Medicine, Philadelphia, PA; Section of Neonatal-Perinatal Medicine, St. Christopher’s Hospital for Children and Drexel University College of Medicine, Philadelphia, PA.

BACKGROUND: Preterm and term infants are not routinely evaluated by unattended sleep studies before the age of 2 years. However, there is increasing concern that obstructive sleep apnea remains an underdiagnosed condition and linked to cognitive and physiological sequelae. Obstructive hypopnea is more common in this age range and has been hypothesized as a risk factor in the development of obstructive apnea.

OBJECTIVE: To characterize the frequency and nature of all respiratory events in infants and children under the age of 2 years during clinically indicated unattended sleep studies.

DESIGN/METHODS: Obstructive hypopneas, obstructive apneas, and central apneas were reviewed from unattended polysomnography studies performed between 10/2011 and 10/2012 at a pediatric hospital on children < 24 months. Studies were performed utilizing Somnstar somnographic equipment following standard protocol for pediatric studies. The apnea hypopnea index (AHI) was total number of obstructive apneas, hypopneas, central apneas and mixed apneas divided by total sleep time in hours. All values were compared by Student’s t test with p<0.05 as significant.

RESULTS: Studies and clinical records were retrospectively reviewed of 32 patients, mean age of 8.5 months ± 5 months, 34% preterm and 66% term gestation, p value for age NS. There were 21 males and 11 females who presented with indications for study: snoring (38%), apnea monitor alarms (18%), ALTE (9%), not otherwise specified (9%), stridor (3%), difficulty breathing (3%). The AHI was 0.5 ± 19.4 for preterm and 0.5 ±1.2 for term, p NS. These data are represented in graphic form demonstrating a peak in AHI approaching 12 months of age for both preterm and term infants.

CONCLUSIONS: These data represent a trend in increased AHI and snoring as a presenting symptom in infants younger than previously reported. This may suggest that these infants are at increased risk for obstructive events as they mature. This also brings into question whether infants should be considered for evaluation and intervention at a younger age.

227

LPS Induced Chorioamnionitis Decreases Sirtuin1 and HDAC2 in Fetal Membranes and Lungs of Neonatal Rats

Suhita Gaven nee Betal, Dalal Tahal, Ursula Nawab, Janet Larson, Zubair H. Aghai.

Pediatrics/Neonatology, Thomas Jefferson University/Nemours, Philadelphia, PA.

BACKGROUND: Histone deacetylases (HDACs) inhibit gene expression by blocking the binding of transcription factors to DNA promoter sequences. HDAC’s plays a role in regulating key inflammatory mediators. Sirtuin1 (SIRT-1) and HDAC-2 are histone deacetylators and are protective against inflammation.

OBJECTIVE: To study the effects of LPS induced chorioamnionitis on expression of SIRT-1 and HDAC2 in fetal membranes and neonates. LPS was administered to pregnant Sprague-Dawley Rats were anesthetized on gestational day 20 (E20) and either DMEM (control) or 1µg of LPS was injected in to the amniotic sac. In one group fetal membrane and fetal lungs were collected on gestational day 22 (E22). In another group, dams were allowed to give birth and pups were harvested for lung tissue collection on day of life 7 (DOL7). Nuclear proteins were extracted from both fetal membrane and lung tissues followed by analysis for SIRT-1 and HDAC2 by Western Blot.

RESULTS: LPS treated fetal membrane showed significant percent decrease in both SIRT-1 (87.3 ± 9.82) and HDAC2-2 (60.2 ± 8.12) as compared to control on E22 (figure 1). However, the lung showed a little decrease in SIRT-1 (76.1 ± 3.65) and HDAC2-2 (60 ± 0.21). The LPS effect further persisted in lung when tested for SIRT-1 (a decrease of 41.79 ± 23.83 %) or HDAC-2 (a decrease of 53.1 ± 29.8 %) on DOL7 as compared to control lung (figure 2).

RESULTS: Studies and clinical records were retrospectively reviewed of 32 patients, mean age of 8.5 months ± 5 months, 34% preterm and 66% term gestation, p value for age NS. There were 21 males and 11 females who presented with indications for study: snoring (38%), apnea monitor alarms (18%), ALTE (9%), not otherwise specified (9%), stridor (3%), difficulty breathing (3%). The AHI was 0.5 ± 19.4 for preterm and 0.5 ±1.2 for term, p NS. These data are represented in graphic form demonstrating a peak in AHI approaching 12 months of age for both preterm and term infants.

CONCLUSIONS: These data represent a trend in increased AHI and snoring as a presenting symptom in infants younger than previously reported. This may suggest that these infants are at increased risk for obstructive events as they mature. This also brings into question whether infants should be considered for evaluation and intervention at a younger age.
CONCLUSIONS: In a rat model, LPS induced chorioamnionitis reduced SIRT-1 and HDAC-2 expressions in fetal membranes and fetal/neonatal lungs.

228

Fellow in Training

Hyperoxia Regulates the Circadian Rhythm Gene Rev-ERBa in the Neonatal Lung

Shao Neng Gupta, Guang Yang, Namba Fumihiko, Phyllis A. Denney, Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Exposure to cigarette smoke (oxidative stress), nutrient content, meal timing, drug administration have been associated with changes in lung circadian gene expression and lung function. Previously we showed that hyperoxia regulated Rev-erba expression in vitro, however, the role of circadian genes, especially Rev-erba, in the developing lung in response to stressors such as hyperoxia is not clear. Given its roles in integrating various antioxidant and metabolic pathways as well as differentiation, we hypothesized that the expression of the key circadian genes, Rev-erba, Bmal and Per1, is regulated by hyperoxia in neonatal mice.

OBJECTIVE: Given its roles in integrating various antioxidant and metabolic pathways as well as differentiation, we hypothesized that the expression of the key circadian genes Rev-erba, Bmal and Per1 is regulated by hyperoxia in neonatal mice.

DESIGN/METHODS: Newborn (<12 hours old) C57Bl/6 mice pups were exposed to >95% O2/day-night cycle group (baseline). While the Rev-erba decreases did not reach statistical significance, the mRNA levels of Per1 and Bmal also decreased in the constant light and O2/day-night cycle group (p=0.038).

RESULTS: For per1, Bmal and Rev-erba, the highest mRNA levels were observed in the RA/day-night cycle group (baseline). While the Rev-erba mRNA levels decreased upon exposure to O2 as well as constant light, the decrease was statistically significant only for the hyperoxia group (p=0.038).

CONCLUSIONS: Lung Rev-erba mRNA levels are altered in the neonatal mouse lung after exposure to hyperoxia, but not to constant light alone. We speculate that, unlike other circadian genes, Rev-erba may be unique in its cytoprotective role in the neonatal lung undergoing oxidative stress.

229

Fellow in Training

Using Lung Ultrasound To Diagnose TTN and HMD in Neonates ≥ 28 Weeks Gestation

Claudia T. Cadet, James Tsung, Ian Holzman, Pediatrics, Mount Sinai School of Medicine, New York, NY.

BACKGROUND: Hyaline Membrane Disease (HMD) and Transient Tachypnea of the Newborn (TTN) are common neonatal respiratory disorders with overlapping clinical presentations, gestational ages, and radiographic pictures. Ultrasonographic findings may distinguish these disorders; however, data comparing diagnoses and disease severity by lung ultrasound with those by chest radiograph and clinical impression are lacking.

OBJECTIVE: This study aims to determine if ultrasound (1) can predict severity of clinical course and (2) is diagnostically consistent with chest radiograph and clinical impression.

DESIGN/METHODS: We conducted a prospective study of infants ≥28 weeks gestation admitted from 10/15/11 to 10/15/12 with respiratory distress. A group of similar but well patients were enrolled as controls. Demographic data, duration of respiratory support (DRS), surfactant administration, radiographic diagnosis, and clinical diagnosis were collected. An expert blinded to clinical data determined ultrasonic diagnoses and percentage B-line confluence (PBC), Primary outcome was to correlate ultrasound PBC with DRS. Secondary outcomes were comparisons of ultrasound diagnoses with those by radiograph and clinical impression.

RESULTS: 33 neonates (920–4430 gm; 28-40 weeks) were enrolled. 14 had clinical diagnosis of TTN; 12; HMD; and 7, normal. DRS ranged from 0-1495 hours. Linear regression gave significant correlation of DRS with PBC (R=0.496, p=0.003), improved by gestational age in a multivariable model (R=0.590, p=0.038) but not by birthweight, age at ultrasound, maternal steroids, surfactant and mode of delivery. Ultrasound had a sensitivity of 77% and specificity of 100% to diagnose HMD (using clinical diagnosis as gold standard) as compared to chest radiograph which had a sensitivity of 77% and specificity of 95%.

CONCLUSIONS: Although this limited data do not allow us to determine whether ultrasound can distinguish HMD from TTN, this pilot study suggests that PBC on lung ultrasound is predictive of duration of respiratory support. Ultrasound was as sensitive, and slightly more specific than chest radiograph to diagnose HMD.

230

Fellow in Training

Anti-Gastroesophageal Reflux Surgery in Infants with Severe Chronic Lung Disease

E.A. Jensen, D.A. Munson, H. Zhang, T.A. Bliimnan, H. Kirpalani, Department of Pediatrics and Division of Neonatology, Children’s Hospital of Philadelphia, Philadelphia, PA; Division of Pediatric Surgery, Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Gastroesophageal reflux (GER) may exacerbate respiratory disease in infants with chronic lung disease (CLD). Anti-GER surgery may therefore reduce the severity of this disease in some infants.

OBJECTIVE: Evaluate change in several clinical measures of CLD severity following Anti-GER surgery.

DESIGN/METHODS: Retrospective case series of infants with severe CLD (by NIH consensus definition) undergoing anti-GER surgery between Sept. 2010 and April 2012 at one tertiary center. Disease severity was measured by mode of support, inspired oxygen (FiO2), and maximum respiratory rate on 5 days spaced over 2 weeks directly pre-op and on the day 2 weeks post-op. For ventilated patients, a composite score of mean airway pressure x FiO2 was calculated. Values recorded 1 day pre-op and 2 weeks post-op were compared using paired t-tests or Wilcoxon rank tests. In the case of a significant difference (p<0.05), generalized estimating equations were used to compare all pre-op to post-op values.

RESULTS: We identified 22 infants. Three had shortened follow-up due to early transfer, in which case values from the last admitted day were used. Mean gestational age was 26.4 weeks (range 23-30) and birth weight 853g (range 510-1390). Mean conceptual age at surgery was 52.5 weeks (range 47.3-65.6). Nissen fundoplication was performed in all but one infant, who underwent a Toupet. All procedures were well tolerated. Nine also underwent tracheostomy during their admission and all but one received post-pyloric feeds for at least 2 weeks pre-op. Prior to surgery, 10 patients were managed with mechanical ventilation (6 via tracheostomy) and 12 with nasal positive pressure. By 2 weeks post-op all had returned to their pre-op mode of support except 2 who remained intubated after being on nCPAP. Of the recorded measures, only FiO2 changed significantly with a median of 35% (IQR: 28-40) 1 day pre-op compared to 30% (IQR: 26-40; p<0.001) 2 weeks post-op. In the longitudinal model comparing all pre-op to post-op values, the difference remained significant (p = 0.02).

CONCLUSIONS: Fundoplasty can be safely performed in infants with severe BPD. In this series, respiratory disease severity did not rapidly improve post-op, although a modest but significant reduction in FiO2 was observed. Efficacy and timing of anti-GER surgery in infants with CLD needs further evaluation. Outcomes such as simplification of care and ability to safely administer gastric feeds should be considered.
Monitoring Tidal Volume (Vt) on Neonatal Transport: Opportunity for Improvement in Ventilator Management


Pediatrics/Neonatology, Christiana Care Health System, Newark, DE.

BACKGROUND: Ventilator associated lung injury is an important risk factor in the development of bronchopulmonary dysplasia. While volume-targeted ventilation modes using appropriate tidal volume (4-6 mL/kg) may provide lung protection, mechanical ventilation during transport is usually limited to time cycled pressure limited ventilation (TCPCL). Transport often involves situations in which there is changing pulmonary compliance and delivery of Vt may be variable using the transport TCPCL ventilator.

OBJECTIVE: To determine if Vt during neonatal transport is maintained within the recommended 4–6 mL/kg range.

DESIGN/METHODS: This performance improvement project included intubated and ventilated infants transported to or from Christiana Care Health System NICU. Vt/breath was measured and transport personnel were blinded to the measurement. Goal Vt was defined as a 4-6 mL/kg. Transports were supervised by a transport nurse, a neonatal nurse practitioner, and respiratory therapist all experienced in the NICU setting. IRB approval was obtained prior to start of study.

RESULTS: In our initial study sample (n=10), gestational age ranged from 26 to 40 weeks and weight from 0.92 to 3.44 kg. One infant (10%) had Vt within the desired range (4.6 mL/kg) >95% of the transport time. The remaining infants were within the desired Vt range 11-13% of the transport time. With increasing time of transport, the Vt/kg was more likely to be out-of-range (p=0.024). Patients with higher weights were more likely to have Vt out-of-range (p=0.032).

CONCLUSIONS: Our study sample reveals a significant problem with excess or insufficient tidal volume using TCPCL ventilation mode during neonatal transport. Opportunities exist to engage in strategies that could reduce the risk of volutrauma during neonatal transport.

Isolation of Urinary Exosomes in Neonates: To Determine Presence and Development of Renal Na+ Transporters


Pediatrics, Mount Sinai Hospital, New York, NY.

BACKGROUND: Furosemide is routinely administered to premature newborns with pulmonary or cardiac disease. While this drug effectively promotes a diuresis in these infants, animal studies predict that the target of furosemide, the Na-K-2Cl cotransporter (NKCC2) in the renal thick ascending limb of Henle, is either not present or is minimally active in fetal life. These observations raise a question as to the mechanism of action of furosemide in this population of neonates. To the extent that urinary exosomes, 30-100 nm vesicles secreted into urinary fluid and representing invaginations of the apical cell membrane of the cell from which they are derived, contain integral membrane proteins, mRNAs, and other cytosolic components, their isolation and analysis provides a noninvasive tool to assess the developmental state of maturation of the kidney.

OBJECTIVE: To trace the developmental expression of total RNA encoding major Na transporting proteins expressed sequentially along the nephron: NKCC2, the Na-CI cotransporter (NCC) and epithelial Na channel (ENaC), in urinary exosomes collected from a cohort of premature newborns.

DESIGN/METHODS: A >6 ml sample of urine is collected at birth and then at regular intervals from newborns born at >28 wks gestation age (GA). Exosomes are isolated using a differential ultracentrifugation technique (Pisutikul et al, 2004) Exosome RNA is quantified using RT-PCR using the Taqman assay, with primers and probes specific for target genes.

RESULTS: Initial studies reveal that we are able to detect total RNA for actin and ENaC in >6 ml of urine collected from premature infants, a volume significantly lower than that needed in adults (~60 ml in parallel experiments ongoing in our lab), suggesting that developmental changes in membrane properties may modulate the efficiency of exosome release. In 3 initial subjects, steady state abundance of NKCC2 increases with GA when normalized to uromodulin as a housekeeping gene.

CONCLUSIONS: The ability to detect RNA in urinary exosomes from premature infants allows us to explore concordance between results of studies performed in animal models with the observed physiology of the developing human subject. Molecular data will be interpreted in the context of our ongoing longitudinal analysis of Na and water balance in the same infants to ultimately determine whether furosemide’s actions in the premature infant reflects inhibition of its presumed target (NKCC2).

Relationship of Urinary Excretion of Magnesium, Potassium, Sodium and Calcium with Arterial Blood Pressure

Ameya P. Patel, Susana Ranaport, Kelly Cervellione, Fernunda Kupferman, Robert P. Woronecki.

Pediatrics, Flushing Hospital Medical Center, Flushing, NY; Pediatric Nephrology, Columbia University Medical Center, New York, NY.

BACKGROUND: Hypertension is a modifiable risk factor for cardiovascular disease. Lower dietary intake of magnesium (Mg) and potassium (K), and higher intake of sodium (Na) and calcium (Ca) have been associated with elevated blood pressure (BP) in adults. Physiologic 24-hour urinary excretion (U24) of these ions can reflect their bodily levels in adults. The associations of U24 Mg, Na, Ca and K with BP have not been studied in children and adolescents.

OBJECTIVE: To determine the distribution of U24 Mg, K, Ca and Na with BP measurements in children and adolescents.

DESIGN/METHODS: We collected data retrospectively from 176 subjects referred to nephrology clinic for hematuria/crystaluria. Patient height, weight, BPs and U24 for Mg, K, Na and Ca were recorded and used to compute U24/body weight for each ion: Mg/kg (MgWT), K/kg (KWT), Ca/kg (CaWT) and Na/kg (NaWT). Indexed BPs (adjusted to 95th percentile for age, gender and height) were calculated for systolic (SBPi), diastolic (DBPi) and mean arterial (MAPi) BPs for each patient. Body-mass indices (BMI) were calculated, and BMI Z- and height Z-scores (HZ) noted. Subjects with glomerulonephritis, structural renal abnormalities, or on medications were excluded. Descriptive data were analyzed with percentages, means and standard deviations. Relationships between MgWT, KWT, CaWT, NaWT and BPs were analyzed using Pearson correlations, and between HZ and NaWT and CaWT by Spearman correlation. A p-value < 0.05 was considered significant.

RESULTS: Of the 176 subjects, 63 were female; mean age was 11.1±4.4 years, and mean BMI Z-score was 0.38±1.8. There were significant negative correlations between MgWT and both SBPi and MAPi, and between KWT and both SBPi and MAPi. NaWT and CaWT did not have significant correlations to BP indices (TABLE), nor were there significant correlations between NaWT and CaWT and HZ.

CONCLUSIONS: In children, lower U24 of Mg and K were associated with higher BPs, consistent with adult data. In contrast, BPs in children did not seem to correlate with U24 levels of Na and Ca. U24 of Na and Ca might be influenced by linear growth; however, we found no correlations between NaWT or CaWT and HZ.

Analgesia for Appendicitis in Children in Pediatric and General Emergency Departments

Kristen Delaney, Alexis Pankow, Jeffrey Avner, Joni Rabiner.

Pediatric Emergency Medicine, Children’s Hospital at Montefiore, Bronx, NY.

BACKGROUND: Appendicitis is a common pediatric emergency that requires prompt intervention. A Cochrane review of pediatric appendicitis found only 4 randomized controlled trials and no high quality evidence. This lack of evidence highlights the need to evaluate analgesia prescribing practices and timing in pediatric emergency medicine (PEM) compared with general emergency medicine (GEM).

OBJECTIVE: To compare analgesia prescribing practices and timing of analgesia administration vs. triage pain score, pediatric appendicitis score (PAS), and body mass index (BMI) between pediatric emergency medicine (PEM) and general emergency medicine (GEM) practitioners for children with appendicitis. Secondary objectives are to compare analgesia administration vs. triage pain score, pediatric appendicitis score (PAS), and body mass index (BMI).

DESIGN/METHODS: This was a retrospective chart review of patients < 21 years who presented to any emergency department in metropolitan New York City and were discharged with a diagnosis of appendicitis between January 2010 and December 2011. Patients were excluded if they had a triage pain score ≥ 8. Initial and follow-up pain scores were determined from the medical record. Analgesia was administered when the patient’s pain was ≥ 4 on a 0 to 10 scale. The timing of analgesia administration was evaluated by comparing analgesia administration time with the time of triage, PAS, and BMI.

RESULTS: Of 964 patients, 807 were included for analysis. The median pain score at triage was 7.5 (IQR 5.0-9.5). The median BMI was 17.3 (IQR 15.0-20.4). There were no differences in analgesia administration between NaWT or CaWT and HZ.
to an urban pediatric ED staffed by PEM physicians vs. 2 urban general EDs staffed by PEM physicians from July 2011 to June 2012 and were diagnosed with appendicitis. Charts were reviewed for patient demographics, clinical characteristics, and times to physician evaluation, analgesia administration, and imaging studies. PAS and BMI were calculated for each patient. RESULTS: 218 charts were reviewed, 153 (70%) from the pediatric ED and 65 (30%) from the general EDs. Patients seen by PEM physicians were younger than patients seen by PEM physicians (mean 12.8 vs. 15.4 years, p<0.002). There was no difference in sex, triage pain score, time to physician evaluation, duration of abdominal pain, vomiting, fever, rebound, leukocytosis, PAS score, or time to ultrasound study between patients seen by PEM and PEM physicians (p=NS). Patients seen by PEM physicians had a higher mean BMI than patients seen by PEM physicians (21.5 vs. 21.1). Patients evaluated by PEM physicians were more likely to receive analgesia in the ED (82% vs. 60%, p<0.003) and received analgesia sooner (mean 178 vs. 239 minutes, p=0.026) than patients evaluated by PEM physicians. Patients with triage pain scores >/= 6 were more likely to receive analgesia than patients with pain scores < 6 (71% vs. 51%, p<0.01). There was no association between PAS or BMI and analgesia administration or time to analgesia (p=NS). CONCLUSIONS: Patients with appendicitis evaluated by PEM physicians were more likely to receive analgesia and received analgesia more quickly than patients evaluated by PEM physicians. Patient with higher pain scores were more likely to receive analgesia, but PAS and BMI did not affect analgesia administration.

Observation after Racemic Epinephrine for Croup in the Pediatric Emergency Department
Julia R. Tokarski, Jeffrey R. Ayner, Ioni E. Babinger
Pediatric Emergency Medicine, Children’s Hospital at Montefiore, Bronx, NY.
BACKGROUND: Nebulized racemic epinephrine (RE) is used for the rapid treatment of stridor or respiratory distress in croup. Due to the short half-life of RE, it is standard practice to observe patients who receive RE prior to discharge home to ensure that stridor or respiratory distress does not return as the medication is being cleared. While there is literature suggesting that the effects of RE dissipate within 2 hours of administration, there is limited data regarding the recommended length of observation after administration of RE, with suggested periods of observation up to 4 hours. OBJECTIVE: To determine the length of observation necessary for children with croup treated with RE in the emergency department (ED) prior to discharge home. DESIGN/METHODS: This was a retrospective chart review of patients < 21 years who presented to the ED between July 2008 and June 2012, diagnosed with croup, and treated with RE. Chart review included patient demographic and clinical characteristics, timing of RE administration, other interventions performed, disposition from the ED, and time of ED discharge. RESULTS: 183 patients were enrolled with a mean age of 2.2 years (SD 2.1). Patients had respiratory symptoms for a mean of 32.1 hours (SD 28.3) prior to ED visit, and 50 (27%) patients had a history of croup. 157 (86%) patients had stridor, and 81 (44%) patients had reiterations. In addition to RE, 174 (95%) patients received dexamethasone. For the 48 (26%) patients requiring a second dose of RE in the ED, the median time between the first and second doses of RE was 135 minutes (33 to 75th IQR 79.5 to 192.5 minutes). For the 107 (58%) patients receiving only one dose of RE and discharged home, the median time of observation in the ED was 217 minutes (25th to 75th IQR 167 to 260 minutes). CONCLUSIONS: The majority of patients requiring a second dose of RE for the treatment of stridor or respiratory distress due to croup in the ED required the second dose of RE over 2 hours after the first dose. Patients receiving RE for croup should be observed for 3-4 hours in the ED prior to discharge home.

Rapid Trichomonas Testing for Adolescents with Suspected Sexually Transmitted Infections (STIs) in the Emergency Department (ED)
Heather M. Territo, Gale R. Burstein, Scott Bouton, Brian Wronialiak, Haiping Qiao, Pediatric Emergency Medicine, Women and Childrens Hospital, of Buffalo, Buffalo, NY; Pediatrics, SUNY at Buffalo School of Medicine and Biomedical Sciences, Amherst
BACKGROUND: Trichomonas vaginalis (TV) is a common STI. TV diagnosis is often based on microscopy exam of vaginal secretions which has 60-70% sensitivity. The OSOM Trichomonas Rapid Test (Sekisui Diagnostics) is a CLIA-waived, point of care test with a sensitivity >83% and results in 10 minutes. OBJECTIVE: The study purpose was to determine if making a systems change of adding TV testing to all routine STI laboratory evaluations increased TV diagnoses in the ED. DESIGN/METHODS: Setting: Western New York State (NYS) urban, academic children’s hospital ED population. End points: November, 2011 to October 2012. Methods: We performed a retrospective review of consecutive medical records of eligible patients during T1. We conducted a prospective study of enrolled females who presented to the ED with suspected STI during T2. An OSOM Trichomonas Rapid test and a TV nucleic acid amplification test (NAAT, Aptima, GenProbe) were ordered for enrolled patients. Chi-square tests and logistic regression were used to assess statistical significance. RESULTS: During T1, 234 ED patients met study inclusion criteria, of which 15% (35/234) were tested for TV with 8.5% (3/35) testing positive. During T2, 163 eligible females were enrolled. All TV NAAT and OSOM TV Rapid Detection Test (TV) (20% of TV) were negative. During T1, 20 (12.3%) of 163 rapid TV test were positive (p<0.001) and 25 (18.0%) of 139 TV NAATs were positive (p<0.001). In 129/139 (92.8%) patients rapid TV test results were concordant with TV NAAT results, with 15 testing positive and 114 testing negative with both tests. Ten (60%) of 16 TV NAAT positive patients had negative rapid TV test results. TV testing was given to 6.9% (16/233) of patients during T1 compared to 20.2% (33/163) during T2 (p<0.001).
**Comparison of Appendicitis Risk Scoring Protocols and the Need for Imaging in Diagnosing Appendicitis**  
Sanjeetha B. Rao, David Listman, Uri Belkind, Stasha O’Callaghan, Rosemary Thomas, Andrew Schneider, David H. Rubin.  
Pediatrics, St Barnabas Hospital, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY.  
**BACKGROUND:** Diagnosing appendicitis in the emergency department (ED) is challenging. The Alvarado Score (AS) and Pediatric Appendicitis Score (PAS) scoring systems were developed to aid clinicians in diagnosis. Despite having been validated in large trials, they are infrequently used by clinicians who mainly rely on imaging for diagnosis. Prior studies demonstrated a reduction in the use of CT scans by using the modified AS scoring. However, these studies were limited by small sample size and failure to compare different scoring systems.  
**OBJECTIVE:** To determine the usefulness of the AS & PAS scoring systems as compared to imaging in the diagnosis of appendicitis.  
**DESIGN/METHODS:** We analyzed a retrospective cohort of patients 2-18 years old from 2001-2010 in whom appendicitis was suspected, and had imaging done as part of their workup. PAS & AS scores were calculated for each subject based on the ED record. Performance of scoring systems was calculated using ROC curves and chi-square when scores were dichotomized into high vs low scores.  
**RESULTS:** Of 286 patients (51.1% male), 98 (34.3%) were diagnosed with appendicitis after imaging. Available pathology results (70/98) showed perfect correlation with CT diagnosis of appendicitis. 43.8% males compared with 24.3% females were diagnosed with appendicitis (OR 2.43, 95% CI: 1.47-4.04, p = 0.001). 20.8% vs 58.3% of patients with low (≤5) vs high (>5) AS score, respectively, had appendicitis (OR 5.32, 95% CI: 3.13-9.04, p < 0.001). Similarly, 14% with low (<6) vs 56.6% with high (≥6) AS score were diagnosed with appendicitis (OR 8.02, CI 4.52-14.21, p < 0.001). The ROC area for AS (0.77, 95% CI: 0.72-0.83) and PAS (0.75, 95% CI: 0.70-0.81) were not statistically different (p = 0.12).  
**CONCLUSIONS:** Our data suggest that both scoring systems are helpful predictors of appendicitis in our population and show comparable performance. However, the use of either scoring system alone would result in an unacceptable number of missed diagnosis and unnecessary interventions, therefore imaging remains a vital tool in diagnosing appendicitis.
CONCLUSIONS: BOUS can be successfully accomplished in children, and is a potentially useful, non-invasive modality in the assessment of ICP in the ED. Assessments for ONHE and ONSD may be useful in the detection of optic nerve swelling and therefore ICPC. These metrics should be considered to determine test characteristics of BOUS in children in future studies.

Endocrinology Platform Session

Sunday, March 24, 2013
9:45am–12:00pm

244
9:45am
Targeting Nicotinic Acetylcholine Receptors Ameliorates Defective Counterregulatory Hormonal Responses in Animals with Model of Hypoglycemia Associated Autonomic Failure (HAAF)
Neela Kirtok, Uduak Akpan, Bistra Nankova, Edmund F. LaGamma.
Division of Newborn Medicine Department of Pediatrics, Maria Fareri, Children’s Hospital Westchester Medical Center at NYMC, Valhalla, NY.

BACKGROUND: Intensive glycemic control achieved with insulin increases the incidence of hypoglycemia. Repeated hypoglycemia is further associated with HAAF; a syndrome of impaired counterregulation. Hypoglycemia triggers the autonomic nervous system to release acetylcholine (ACh) which initiates both release and biosynthesis of epinephrine (Epi) via nicotinic ACh receptors (nAChRs) at adrenal chromaffin cells. Hypoglycemia also alters neurally mediated glucagon secretion from pancreatic islet alpha cells. Cytisine is a nAChR partial agonist, its effects on autonomic neurotransmission have not been addressed.

OBJECTIVE: To determine whether the nAChR partial agonist cytisine can modulate excessive cholinergic stimulation during recurrent hypoglycemia and thus restore normal counterregulatory hormonal responses in HAAF.

DESIGN/METHODS: Non-diabetic male Sprague-Dawley rats with vascular catheterization were individually housed under controlled conditions. Hypoglycemia was induced by i.p. injection of 2 mg/kg regular human insulin twice daily for 3 consecutive days. Control animals received i.p. saline or cytisine (1mg/kg). In the combined treatment, cytisine was given 30 min before insulin. A hyperinsulinemic hypoglycemic glucose clamp was performed on day 4 following overnight fasting. Blood was collected during the clamp for plasma hormone analyses.

RESULTS: Recurrent 3-day antecedent hypoglycemia caused marked deterioration of day 4 hormonal responses to hypoglycemia consistent with HAAF -- i.e. decreased plasma epi and glucagon (3020 ± 162 pg/ml vs. 1060 ± 95 pg/ml, 492 ± 130 pg/ml vs. 314 ± 20 pg/ml, respectively; P<0.05). Pretreatment with cytisine during recurrent 3-day antecedent hypoglycemia ameliorated epi and glucagon responses on day 4. (1616 ± 230 pg/ml vs. 1060 ± 95 pg/ml, 490 ± 80 pg/ml vs. 314 ± 20 pg/ml, respectively; P<0.05). Corresponding increase in steady state TH mRNAs levels (a surrogate marker of epi biosynthesis) were also observed in cytisine pretreatment group.

CONCLUSIONS: Pre-treatment with cytisine, a nAChR partial agonists, during antecedent hypoglycemia improved cytisine glucagon responses to recurrent hypoglycemia. Modulation of receptor overstimulation restores epi biosynthesis and thus offers promise as a translational adjunctive therapy for insulin-dependent diabetes.

245
10:00am
House Officer
Association between the Degree of Control of Children and Adolescents with Diabetes Mellitus and QTc Prolongation on EKG
Pediatrics, Flushing Hospital Medical Center, Flushing, NY; Clinical Research, Jamaica Hospital Medical Center, Jamaica.

BACKGROUND: The QT interval represents ventricular depolarization and repolarization. Prolonged QTc has been associated with an increased risk of sudden cardiac death. Prevalence of prolonged QTc on the electrocardiogram (EKG) in the pediatric population is 2.5%. Data have shown an increased association of prolonged QTc in children and adolescents with diabetes mellitus. There has not been any data comparing the degree of glycemic control, as measured by hemoglobin A1c (A1c) with the severity of prolongation of QTc. The mean QTc in children is 0.404.

OBJECTIVE: To determine if there is an association between glycemic control, as measured by A1c and prolongation of the QTc on EKG. To determine whether type 1 (T1DM) or type 2 (T2DM) diabetes mellitus causes a greater prolongation of QTc on EKG.

DESIGN/METHODS: A prospective study of children and adolescents between 8 and 17 years visiting our pediatric clinic or admitted to Flushing Hospital Medical Center with a known history of (T1DM) or (T2DM) was done. Patients with a cardiac anomaly or who were taking any medications causing prolonged QTc were excluded. An EKG was done, comparing A1c to QTc values in patients with T1DM and T2DM.

RESULTS: Eighteen patients, 12 with T1DM (58% males) and 6 with T2DM (67% males) participated in study. The range of A1c was 6.1 to 14.6 % (mean = 9.97 % SD 2.5). The range of QTc was between 0.388 and 0.455 (mean = 0.410, SD 0.014). The linear correlation between A1c and QTc was 0.84 at the 0.01 level. There was a greater fluctuation in QTc values in patients with T1DM than T2DM.

246
10:15am
Fellow in Training
Hyperinsulinism Profile: Emerging Biomarkers for Diagnosing Disease
Christine T. Ferrara, Charles A. Stanley, Andrea Kelly.
Endocrinology Division, Children’s Hospital of Philadelphia, Pennsylvania, PA.

BACKGROUND: Congenital hyperinsulinism (HI) is the most common cause of recurrent hypoglycemia in the neonate, but treatment delay may arise from failed recognition of this disorder. For instance, the insulin level at the time of hypoglycemia may be undetectable but this finding does not exclude the diagnosis of HI.

OBJECTIVE: To investigate the sensitivity of C-peptide and IGF-BP1, the latter a protein regulated by insulin, in diagnosing congenital HI.

DESIGN/METHODS: A retrospective chart review was conducted examining diagnostic fasting tests of patients admitted to the Children’s Hospital of Philadelphia from 2002-2010 with genetically or pathologically confirmed congenital HI, treated with neither octreotide nor diazoxide at the time of testing(n=30); children with ketotic hypoglycemia served as controls(n=26). Data obtained at the time of hypoglycemia (plasma glucose <50mg/dL) included serum insulin, C-peptide, and IGF-BP1. Elevated C-peptide at the time of hypoglycemia was defined as <0.55 ng/mL and suppressed IGF-BP1 as <100uM.

RESULTS: Plasma insulin at the time of hypoglycemia was undetectable in 2 of 30 HI subjects and appropriately suppressed in all subjects with ketotic hypoglycemia, p<0.0001, 93% sensitivity; 100% specificity. C-peptide and IGF-BP1 data at time of hypoglycemia differed between groups.

Of 22 HI subjects with c-peptide measured, all had elevated levels versus none in the ketotic group (specificity and sensitivity 100%). IGF-BP1 was suppressed in 12 of 13 HI subjects tested while all control patients had levels above the 100uM threshold (92.3% sensitivity, 100% specificity).

CONCLUSIONS: The study confirms that while a detectable insulin level at the time of hypoglycemia is diagnostic of HI, an isolated undetectable insulin level at this time does not rule out this disease. We show that c-peptide >0.55ng/mL and suppressed IGF-BP1 <100uM may be equally or more sensitive in identifying HI, especially when used in combination with other biomarkers of insulin activity.

247
10:30am
House Officer
Growth Hormone Stimulation Testing: Area under Curve Correlates with Growth Hormone Peak but Not with IGF-1 or Pituitary Volume
Laurie R. Braun, Molly O. Regellmann, Bradley N. Delman, Andrew Tenore, Robert Rapaport.
Division of Pediatric Endocrinology & Diabetes, Kravis Children’s Hospital, Mount Sinai School of Medicine, New York, NY; Department of Radiology, Mount Sinai School of Medicine, New York, NY; Department of Pediatrics, University of Udine, Udine, Italy.

BACKGROUND: In the course of evaluation of children with growth failure, assessment of the growth hormone (GH)-insulin-like growth factor-1 (IGF-1) axis by GH stimulation testing (GH ST) and MRI of the pituitary gland may be indicated. We have previously suggested that GH ST AUC has not been evaluated with respect to PV.

OBJECTIVE: To hypothesize that GH ST AUC correlates with PV, as well as IGF-1.

DESIGN/METHODS: We performed a retrospective chart review of children followed for growth
CONCLUSIONS: GH AUC does not correlate with PV by MRI or with IGF-1 levels. These findings suggest that PV may be more reflective of circulating IGF-1 levels than acute GH response to stimulation. Further studies are needed to assess the potential utility of GH AUC as part of the evaluation of children with growth failure.

248 10:45am Fellow in Training

Hypoglycemia and Increased Insulin Secretion in a New Form of Glycogen Storage Disease Due to Phosphoglucomutase-1 Deficiency

Amanda A. Misfeldt, Hudson H. Freeze, Eva Morava, Can Ficicioglu, Charles A. Stanley.
Division of Endocrinology, The Children’s Hospital of Philadelphia, Philadelphia, PA; Sanford-Burnham Medical Research Institute, La Jolla, CA; Tulane University Medical School, New Orleans, LA; Division of Metabolism, The Children’s Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Phosphoglucomutase-1 (PGM1) catalyzes the interconversion of glucose-1-P and glucose-6-P, important for glycogen synthesis and degradation. PGM1 deficiency was recently reported in a child with cleft palate, hypotonia, hepatothaphy, abnormal protein glycosylation, and has been termed glycogen storage disorder type XIV.

OBJECTIVE: This report describes hypoglycemia in an infant with PGM1 deficiency, suggesting a role for PGM1 in B cell insulin regulation.

METHODS/RESULTS: To characterize hypoglycemia, the patient underwent fasting studies; acute insulin response tests with IV calcium, leucine, and glucose; oral glucose tolerance test. Multiple fasting evaluations revealed hypoketotic hypoglycemia, consistent with hyperinsulinism, without response to glucagon. Insulin was markedly increased in response to glucose: plasma insulin increased from <1.5 µU/mL to 82.9 µU/mL at 120 minutes after oral glucose and from <3 µU/mL to 115.5 µU/mL at 1 minute after IV glucose. There was no acute insulin response to calcium or leucine (plasma insulin <3 µU/mL during both tests). He had no hypoglycemia after an oral protein challenge. Diazoxide and octreotide failed to control hypoglycemia; he was maintained with continuous enteral dextrose at a low rate of 2 mg/kg/min. Transfer in isoelectric focusing studies revealed abnormal type 1 and type 2 glycoprotein patterns. Genetic analysis of PGM1 revealed a missense mutation (D263Y) and a nonsense mutation (Y517X); enzymatic activity in fibroblasts was 2.8% of normal. At age 9, re-evaluation of the hypoglycemia revealed good control on oral cornstarch and a fasting pattern of early-onset hyperketonemia typical of mild defects in glycogen synthesis and release.

CONCLUSIONS: PGM1 is expressed in pancreatic islets, where its function is unclear since 8 cells have little or no glycogen. Results from our patient indicate that PGM1 deficiency increases β-cell glucose stimulated insulin secretion, resulting in a phenotype of post-prandial hyperinsulinemic hypoglycemia not seen in other glycogenoses. PGM1 appears to play an important role in regulating β-cell glucose metabolism not previously recognized.
values were analyzed and multivariate logistic regression (MLR) analysis assessed the association of Surg with VitD categories, serum parathyroid hormone > 65 pg/mL (PTH65), breastfeeding > 6 months (BF6M), and regular dietary dairy intake (Dairy). RESULTS: 201 patients were studied (age 10y/4y; VitD 28±10 ng/ml, PTH 27±19 pg/ml); 30% were categorized as Surg; 58% were male; VitD categories, PTH65, and BF6M were statistically associated with and Dairy trended towards an association with Surg. Serum Ca, P04, alkaline phosphatase were not associated with Surg; sex, BMI, skin tone, multivitamin intake, time spent outdoors, and sunscreen use were not statistically associated with Surg. In MLR analyses, PTH65, VitD20, and VitD30 remained significantly associated with Surg.

<table>
<thead>
<tr>
<th>Endocrine Society Guidelines</th>
<th>Institute of Medicine Guidelines</th>
<th>OR (Surg)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient ➔ 20: 15%</td>
<td>≥ 12: 5%</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Insufficient 20-29: 45%</td>
<td>≥ 12-19: 15%</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>≥ 30-42%</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS: Among “healthy” pediatric patients with fracture injuries, poor bone health may underlie a significant proportion of medical disease, particularly VitD deficiency and PTH abnormalities. These findings suggest that surgical orthopedic patients should routinely have serum VitD levels and secondary hyperparathyroidism monitored and abnormalities addressed.

252
11:45am
Fellow in Training
Nicotinic Receptor Partial Agonists Attenuate Norepinephrine Release and Suppress Tyrosine Hydroxylase Protein Levels in PC 12 Cells: Implications for Sympathoadrenal Stress-Responsiveness
Uduak S. Akpan, Necla Kirtok, Bistra Nankova, Edmund F. LaGamma. Division of Newborn Medicine, Maria Fareri Children’s Hospital, NY MC, Valhalla, NY.
BACKGROUND: Nicotinic acetylcholine receptor (nAchR) partial agonists bind to nAchRs and may alter signaling pathways involved in the biosynthesis and release of catecholamines distinct from nicotine. OBJECTIVE: To determine the effects of nAchR stimulation using partial agonists compared to nicotine in PC 12 cells.
DESIGN/METHODS: PC 12 cells (rat pheochromocytoma, normally expressing A3B4 and A7 nAchRs similar to adrenal chromaffin cells) were grown in culture and treated with 3 compounds characterized previously by electrophysiologic testing as nAchR partial agonists (2F1, 8F1 and 9F1) and cytisine (major chemical component of Chantix®; an established nAchR partial agonist). These were compared to the full agonist nicotine (100µM); untreated cells were used as controls. Norepinephrine (NE) levels of media were determined by ELISA. Tyrosine hydroxylase (TH) (rate limiting enzyme in catecholamine biosynthesis) protein content and phosphorylation were measured by Western blot.
RESULTS: Nicotine is known to increase Ser40 TH phosphorylation with sustained effect up to 48h with an increase in TH protein. In these experiments, cytisine led to a 75% increase in phosphorylation at Ser40 evident by 15 min with a return to baseline by 24h in association with a 50% decrease in TH protein at 24h.

Cytisine (100µM)

- PTH/ β actin
- TH/ β actin

Of the 3 new compounds tested, 8F1 and 9F1 were confirmed as partial agonists in vitro based on the attenuated amount of NE released in comparison to nicotine.
CONCLUSIONS: Partial agonists release little norepinephrine but affect TH activity in a manner distinct from nicotine. The fall in TH protein with partial agonists suggests there are independent mechanisms governing catecholamine release and TH protein levels that may have physiologic impact as pharmacological therapies to alter stress responsiveness.

Secondhand Smoke Exposure in Multiunit Housing: What’s the Drift?
Lauren Zajac, Kathryn Scharbach, Sandra F. Braganza. Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY.
BACKGROUND: Children living in multiunit housing (MUH) have higher levels of secondhand smoke (SHS) exposure compared to children living in detached homes. Many children in inner-cities live in MUH, and may be at disproportionate risk from harmful effects of SHS. Limited data exist to compare the burden of SHS exposure in public vs. private MUH, and such data could support local smoke-free housing policy initiatives.
OBJECTIVE: The objectives of this study were to (1) examine factors associated with SHS exposure in the homes and common areas of MUH, and (2) assess the support for smoke-free building policies among parents in an inner-city pediatric practice.
DESIGN/METHODS: A convenience sample of parents in an inner-city pediatric practice located in Bronx, NY completed a verbally administered survey. Respondents were asked their gender, smoking status, if they lived in public or private housing, smelled SHS in common areas of MUH or through SHS drift into their home (“drift”), and their opinion on smoke-free policies. Chi-square analyses were done using STATA.
RESULTS: 60 parents completed the survey; 93% were female and 22% were smokers. All 60 respondents reported living in MUH (90% in apartments and 10% in multi-family houses), with 47% living in public housing, 48% living in private housing, and 5% unsure. Respondents reported that in the last 12 months, 72% smelled SHS in an indoor common area of their building; 77% smelled SHS in an outdoor common area. 40% reported SHS drifted into their home frequently (daily or a few times per week), and 22% reported occasional drift (a few times per month or year). Respondents living in public housing were more likely to report SHS drift compared to private housing residents (OR=5.2, p=0.004) and were also more likely to report smelling SHS in indoor common areas (OR=4.9, p=0.02) and outdoor common areas (OR=7.9, p=0.01). The majority of respondents (90%) stated that they would prefer to live in a completely smoke-free building, with no significant difference in preference between public and private housing residents.
CONCLUSIONS: The majority of respondents reported smelling SHS in common areas, SHS drift into the home, or both. SHS exposure was significantly more commonly reported among public than private MUH residents. These results suggest that indoor smoke-free policies may be accepted and preferred by inner-city parents. Future studies should address whether children who live in public housing benefit from living in smoke-free buildings.

254
10:00am
Cost Analysis of Staffing Options for Inpatient Care
Evan Fieldston, Joan Li, Bo Huang. University of Pennsylvania, Philadelphia, PA.
BACKGROUND: Data on the costs of staffing different types of frontline ordering clinicians (FLOCs) (e.g. resident-trainees, nurse practitioners, physician assistants, house physicians, hospitalists, etc.) in children’s hospitals are limited, particularly as related to changing duty hour regulations and proposals for graduate medical education (GME) funding.
OBJECTIVE: Develop a financial model to compare the costs of various unit-level staffing options and understand the role of GME funding on the costs of staffing with resident-trainees.
DESIGN/METHODS: Financial modeling of staffing cost for a hypothetical 20-bed pediatric unit under 4 coverage models: (1A:1B) intern/sector residents with attending supervision (1A:post-1B:pre-2003 ACGME duty-hour restriction); (2) hospitalist only; and (3) nurse practitioner (NP) & attending physician. Cost estimate based on effective annual compensation for inpatient time of clinicians only, accounting for number of employees, difference in resource utilization efficiency, and GME subsidy. Sensitivity analysis to obtain range of cost estimates with different mixes of full-time clinicians vs. rotating academic attendings.
RESULTS: The most expensive option is residents & attendings without GME subsidy ($1.42 million/year or $163/hour). The least expensive is NPs & hospitalists only, $196,750/year ($24/hour). The duty-hour regulations increase costs significantly. One example of clinical resource inefficiency (e.g. extra testing) estimated at the 10% level also illustrates the costs of an institution of having trainees as FLOCs. Including GME funding reduces cost to comparable levels with staffing either hospitalists or NP & attendings (Table 1).
Table 1: Cost Scenarios of Frontline Ordering Clinician (FLOC) Staffing Hypothetical 20-bed Inpatient Unit at Per Hour Cost

<table>
<thead>
<tr>
<th>Staffing Model</th>
<th>Per Hour</th>
<th>Per Hour</th>
<th>Per Hour</th>
<th>Per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Resident: Clinical Resource Use/efficiency (mean GME)</td>
<td>$125</td>
<td>$25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No Resident: Clinical Resource Use/efficiency (mean GME)</td>
<td>$73</td>
<td>$16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Resident: Clinical Resource Use/efficiency (mean GME)</td>
<td>$163</td>
<td>$34</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Resident: Clinical Resource Use/efficiency (mean GME)</td>
<td>$111</td>
<td>$16</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**RESULTS:**

- Child Life present: p = 0.016
- Numbing Medicine used: p = 0.002
- Skill of person who drew blood (1-5): p = 0.067
- Parent perception that CP was adequately controlled (1-5): p = 0.03
- PACES Score (0-5): p = 0.11

There were no significant differences in gender of child, proportion of infants, parental age, parental education, ethnicity or race between groups of parents surveyed.

**CONCLUSIONS:** The efforts of the “Making Needles Easier to Bear” interdisciplinary initiative have led to more consistent presence of child life specialists and the use of more topical anesthetic during routine venipuncture at CHAM. Parent’s assessment of their child’s comfort during venipuncture was significantly improved over time, suggesting the efforts of the interdisciplinary initiative have been successful at making venipuncture less painful.

257
10:45am

**House Officer**

**Prediction of Spinal Needle Depth for Successful Lumbar Puncture Using Weight, Height and Body Surface Area**

**Meurick K. Sarmiento.**

**Pediatrics, Einstein Medical Center Philadelphia, Philadelphia, PA.**

**BACKGROUND:** Estimating the spinal needle depth of insertion for lumbar puncture (LP) in children is challenging. A practical guide to estimate the correct depth of insertion based on anthropometric measurements might help reduce unsuccessful LP attempts and bloody taps.

**OBJECTIVE:** Correlate anthropometric measurements with the depth of spinal needle insertion in children and develop a predictive model for depth of spinal needle insertion.

**DESIGN/METHODS:** The author conducted a prospective study of children <19 years of age who required LP for treatment or diagnosis. Data collected included age and anthropometrics: weight, height and body surface area (BSA = Square root of (wt x ht)/3600). The outcome measure was the depth of insertion of the spinal needle in successful LPs. Correlation and regression analysis were used to develop a predictive model for spinal needle depth insertion.

**RESULTS:** 41/45 children underwent successful non-bloody LPs. 34 were oncology patients while 7 had LPs to rule out meningitis. The mean age of the population was 5.6 ± 4.0 years (Range 0.1-17.4), mean weight 19.39 ± 12.25 Kg (3 – 61), mean height 102.86 ± 26.98 cm (49 – 161), mean BSA 0.73 ± 0.32 m² (0.18 – 1.65), mean depth insertion of the spinal needle 26.56 ± 9.45 mm (8 – 52). In decreasing order, BSA, height, weight and age showed a strong correlation with the depth of spinal needle insertion.

**Variable** | Pearson Correlation with Depth | Regression analysis with Depth (R²)
---|---|---
BSA (m²) | 0.944 (p<0.001) | 0.891
Height (cm) | 0.930 (p<0.001) | 0.865
Weight (kg) | 0.921 (p<0.001) | 0.853
Age (yr) | 0.906 (p<0.001) | 0.803

BSA was the best predictor of the depth of spinal needle insertion in both correlation and regression models. Using regression equation, a practical guide to estimate the depth of spinal needle insertion (in mm) is (28 x BSA) + 6.

**CONCLUSIONS:** Among children, the depth of insertion of spinal needle for lumbar puncture can be approximated by using a simple equation based on BSA. This model needs to be validated in future studies.

258
11:00am

**Fellow in Training**

**Determinants of Late Acute Rejection in Pediatric & Adolescent Kidney Transplant Recipients**

Leoil A. Eid, Shamir Tuchman, Asha Moudgil.

**Pediatric Nephrology, Children’s National Medical Center, Washington, DC.**

**BACKGROUND:** Long-term graft function has not kept pace with short-term graft survival in children. Late Acute Rejection (LAR) episodes are in part responsible for the lack of long-term graft survival. The risk factors for LAR in pediatric & adolescent in kidney transplant (Tx) recipients are not well defined.

**OBJECTIVE:** To identify the determinants for LAR in pediatric & adolescent kidney Tx recipients.

**DESIGN/METHODS:** A retrospective analysis of pediatric & adolescent kidney Tx recipients ≥ 2 years of age at the time of Tx with at least 1 yr follow-up. Of 73 Tx recipients, 64 were included in the analysis. 9 recipients were excluded for either graft loss or early acute rejection (occurring ≤ 6 months post-Tx). The included patients were divided into 2 cohorts; control group 41 & LAR group 23 patients (≥6 months at time of rejection). Donor-Specific Antibodies (DSA) were obtained at the time of clinical suspicion of LAR.

**RESULTS:** LAR was diagnosed by clinical & pathological criteria in 23 (35.9%) Tx recipients. Mean age at Tx was not different in the groups (13.3 ± 5.2 yrs in controls vs. 12.6 ± 5.3 yrs in LAR). Mean age at the time of LAR was 14.7 ± 4.8 yrs with 60.8% ≥ 12 yrs of age. Mean follow-up period was 31.2 (3.9-79) months. Significant clinical & demographic factors that were associated with LAR by univariate analyses in the cohort are shown below.
CONCLUSIONS: Development of de-novo DSA, DGF, & increased variability of TAC levels are risk factors for LAR in pediatric & adolescent. The effect of non-adherence on LAR couldn't be demonstrated in multivariate analyses. These results need to be validated through a prospective multi-center study.

259
11:15am
Preferences, Goals, and Treatment Initiation in ADHD
Alexander Fiks, Stephanie Mayne, Elena DeBartolo, James Guervara, Thomas Power.
The Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Shared decision making involves the assessment of preferences and goals and is prioritized in national ADHD treatment guidelines, yet little work has examined the impact of preferences and goals on treatment receipt.

OBJECTIVE: To describe the association between parents’ ADHD treatment preferences and goals and treatment initiation.

DESIGN/METHODS: Parents/guardians of children aged 6-12 years diagnosed with ADHD in the past 18 months and not receiving medication (MED), or behavior therapy (BT), or either treatment were recruited from 8 primary care sites and an ADHD treatment center. Parents completed the ADHD Preference and Goal Instrument, a validated measure, and reported treatment receipt at the end of the 18-month period. Logistic regression measured the association of baseline preferences or goals with treatment initiation. Covariates included parent and child characteristics, time since diagnosis, ADHD subtype, impairment, and treatment history.

RESULTS: The study included 148 parents/guardians (47% African-American; 24% not receiving MED, 40% not receiving BT, and 84% neither at baseline). We found that parental treatment preferences, in particular greater acceptability and fewer concerns regarding medication side effects, were associated with treatment initiation for both BT and MED. In addition, having academic goals for treatment was associated with MED initiation, but behavioral and interpersonal relationship goals were related to BT initiation (Table).

CONCLUSIONS: Development of de-novo DSA, DGF, & increased variability of TAC levels are risk factors for LAR in pediatric & adolescent. The effect of non-adherence on LAR couldn’t be demonstrated in multivariate analyses. These results need to be validated through a prospective multi-center study.

260
11:30am
Impact of the Change in “Actionable” Lead Level from 10µg/dL to 5µg/dL in an Urban Community
Department of Pediatrics, Einstein Medical Center Philadelphia, Philadelphia, PA.

BACKGROUND: In May 2012 the CDC endorsed a change in the “actionable” lead level from 10 µg/dL to 5 µg/dL, as recommended by the Advisory Committee on Childhood Lead Poisoning Prevention. This new reference value of 5 µg/dL is based on the 97.5th percentile of the blood lead level distribution in US. children aged 1–5 years. The impact of this new reference level in urban communities with old housing stock is not known.

OBJECTIVE: To compare the prevalence of children with positive lead screening tests at the 10 µg/dL and 5 µg/dL cutoff reference values in a inner city community.

DESIGN/METHODS: We conducted a retrospective cross-sectional study of lead screening tests done 2010-2012 for children <5 years of age at a hospital-based pediatric ambulatory center. Children were screened around their first and second birthdays or at any time before their fifth birthday, if not previously screened. The center serves a low income, minority community with old housing stock in Philadelphia, PA. Outcome measures are the prevalence of children who screened positive using the 10 µg/dL and the 5 µg/dL cutoffs. We compared these outcomes overall and stratified by years of age.

RESULTS: The number of lead screening tests done from 2010-2012 was 2205. Lead levels tended to increase with age (Spearman correlation=-0.17, p<0.0001). Using the 10 µg/dL cutoff, the prevalence of positive screens was 1.2% (n=26); using the 5 µg/dL cutoff the prevalence increased to 9.1% (n=201), a 7.6 fold increase (p<0.0001). For example, in children between 24 and 35 months, the number of positive screens increased from 16 to 99.

CONCLUSIONS: Development of de-novo DSA, DGF, & increased variability of TAC levels are risk factors for LAR in pediatric & adolescent. The effect of non-adherence on LAR couldn’t be demonstrated in multivariate analyses. These results need to be validated through a prospective multi-center study.

261
11:45am
Impact of Parental Support on Health Indicators/Utilization of High-Risk NICU Babies after Discharge
Maheswari Ekambaram, Cynthia De Lago.
Pediatrics, Einstein Healthcare Network, Philadelphia, PA.

BACKGROUND: Since 2009, high risk graduates from our neonatal intensive care unit (NICU) seeking primary care at our clinic have received health navigation services and support from a patient liaison (PL). OBJECTIVE: To assess the impact of PL services on high-risk infants’ health indicators and health care utilization.

DESIGN/METHODS: Retrospective review of medical charts and health insurance data comparing health indicators and health care utilization of high-risk infants whose parents received PL services compared to those receiving standard care at a hospital-based clinic serving a low-income, urban community. The study group met the following inclusion criteria: medical risk factors (preterm, birth weight < 2.5 kg, or medical conditions requiring subspecialty care); social criteria (parents with psychological, physical or substance abuse issues, age < 18 yrs., < 12th grade education or lacking social support); and enrollment in our primary care clinic. The control group met medical and social criteria but did not receive PL services because their parents declined them or did not intend to enroll at our clinic. Health indicators included receipt of vaccines, growth, development, well-child visits, emergency visits, and hospitalizations during the first year of life. The PL enrolled parents in the NICU, visited them at home to assess needs, reminded parents of appointments, helped with transportation, obtaining social/medical services, referrals and supplies, and liaised with medical providers.

RESULTS: 69 babies met inclusion criteria: 33 study group, 36 controls. 48% were male, 86% Black. There were no significant differences in sex, race, prenatal care, or other maternal factors (substance use, age, postpartum depression) between the groups (p>0.35). Babies in the study group were more premature, weighed less, and had more medical conditions (apnea and retinopathy of prematurity) than controls (p<0.05). Despite this, the study group had better attendance at the 1 (p=0.04) and 2 month well-child visits (p=0.002), and trended toward better attendance at the 6 months visit (p=0.099), and had fewer non-emergency urgent hospital visits (p=0.077). No differences were observed between the groups’ growth, development, vaccine rates, emergency visits or hospitalizations.

CONCLUSIONS: Providing parents of high-risk infants with health navigation services and support demonstrates promise as a way to reduce unnecessary health care utilization.
262
9:45am
Clinical Decision Support and Premature Infants: A Means To Protect from Respiratory Syncytial Virus
Annieque Hogan, Dean Karavite, Alexander Flaks, Scott Lorch, Lihai Song, Mark Ramos, Russell Locatio, Robert Grundmeier.
Children's Hospital of Philadelphia, Philadelphia, PA.

BACKGROUND: Premature infants are at higher risk of serious infection with Respiratory Syncytial Virus (RSV) and timely vaccination with Palivizumab can protect this vulnerable population. However, there are multiple barriers to receiving this vaccine.

OBJECTIVE: 1. Compare the completion rate of the Palivizumab series before and after implementation of a clinical decision support (CDS) tool in the electronic health record (EHR) 2. Identify reasons for failure to complete the series and determine the impact of the CDS tool.

DESIGN/METHODS: We implemented a CDS tool embedded in the EHR that identified premature patients eligible to receive Palivizumab and provided nursing tools to track eligible patients in 22 primary care practices. We identified those eligible for the full series (5 doses) of Palivizumab during the 2010-2011 season (pre-intervention) and the 2011-2012 season (post-intervention). We compared the rates of completion of at least 4 doses before and after the implementation of the CDS tool. We completed a manual chart review to identify reasons for failure to complete the series both pre and post intervention.

RESULTS: In the pre-intervention season, 129 patients were eligible for 5 doses of Palivizumab compared to 157 patients in the post-intervention season. In the pre-intervention season, 72 (57%) of the eligible patients received at least 4 doses compared with 102 (65%) in the post-intervention season (p=0.05). Pre-intervention, the leading cause for missed doses was failure to recognize patients as eligible (N=27), followed by failure to schedule appointments (N=20), patients not arriving for appointments (N=20), and missed opportunities to vaccinate while in the office (N=10). Insurance denials (N=2) and family refusal (N=2) were much less frequent. Post-intervention, significantly fewer patients were not recognized as eligible (N=4, p=0.001), but there was an increase in the all the other reasons why children did not receive doses. Many patients in both seasons had multiple reasons why doses were missed.

CONCLUSIONS: The CDS intervention was most effective at improving the recognition of eligible subjects. Rates of completing the Palivizumab series improved. Difficulty scheduling appointments and capturing vaccination opportunities in the office remain significant problems that should be addressed in future efforts.

263
10:00am
Randomized Controlled Trial of the Efficacy of Nebulized 3% Saline without Bronchodilators for Infants Admitted with Bronchiolitis: Preliminary Data
Pediatrics, Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY; Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Though bronchiolitis causes over 150,000 hospitalizations/year in infants, there remains no effective treatment. Recent studies outside the US suggest nebulized 3% saline (hypertonic saline-HS) decreases length of stay (LOS) in infants hospitalized with bronchiolitis.

OBJECTIVE: 1. To assess the effect of HS on LOS in infants admitted with bronchiolitis. 2. To assess safety of HS without adjunctive bronchodilators, regardless of history of prior wheeze.

DESIGN/METHODS: This is an IRB approved, prospective, randomized, double-blind, controlled clinical trial. Infants 0-12 months of age admitted with bronchiolitis to an urban tertiary care children’s hospital were recruited within 12 hours of admission. Exclusion criteria: status asthmaticus, chronic cardiopulmonary disease, Trisomy 21, neuromuscular disease, or admit ICU, prior enrollment in the study within 72 hours. Randomized patients received 4mL of nebulized HS or normal saline (control) every 4 hours during discharge. Investigators remain blinded in this ongoing study. We compared demographics of the 2 groups using the t-test (continuous) and chi-square (categorical) test. For LOS outcomes distribution was log-normal, so the Wilcoxon rank-sum (Mann-Whitney) test was used to compare medians between the 2 groups. All tests were 2-sided with p<0.05 considered statistically significant.

RESULTS: 96 patients enrolled between 11/2011 and 11/2012. 9 patients withdrew in Group A,8 in Group B. Adverse events were similar in race, ethnicity, age, gender, insurance, viral status, prematurity and previous wheeze.

Subgroup analysis: Median LOS, days

<table>
<thead>
<tr>
<th>A (n=39)</th>
<th>B (n=40)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median LOS, days</td>
<td>2.60</td>
<td>2.44</td>
</tr>
<tr>
<td>Adverse events</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Preliminary data from the first US prospective, randomized, double-blind, controlled clinical trial of nebulized HS without adjunctive bronchodilators including infants with a history of prior wheeze shows no significant difference in LOS between study groups in this ongoing trial (expected completion 4/2013). Rates of adverse events are similar between groups, suggesting HS alone is safe for infants with previous wheeze.

264
10:15am
House Officer
Comparing the Clinical Severity of RSV + and RSV – Bronchiolitis
Kelly N.F. Fradin, Gabriella Azzarone, Nora Esteban-Cruciani, Joanne Nazif.
Pediatrics, Children’s Hospital at Montefiore, Bronx, NY; Pediatrics, Albert Einstein College of Medicine, Bronx, NY.

BACKGROUND: Acute viral bronchiolitis is responsible for over 150,000 admissions per year in the United States. Respiratory syncytial virus (RSV) testing is frequently performed in this population but the differences in clinical severity between RSV+ and RSV- bronchiolitis are not well described.

OBJECTIVE: To assess whether children who are RSV+ have more severe bronchiolitis than RSV- children, as determined by increased length of stay (LOS), use of supplemental oxygen, or rate of intensive care unit (ICU) admission.

DESIGN/METHODS: We conducted a retrospective cohort study involving electronic chart review of patients 0-24 months of age hospitalized between January 2007 and December 2010 for bronchiolitis, as determined by ICD-9 codes, in an inner city tertiary children’s hospital. We included infants without congenital heart disease, use of supplemental oxygen, chronic lung disease due to prematurity, tracheostomy, sickle cell, cystic fibrosis, and without laboratory testing of the virus by RSV rapid antigen testing by enzyme-linked immunosorbent assay. At our institution, viral testing is done routinely for cohorting purposes. Chi square and t-tests were used to compare patients tested positive for RSV with those who tested negative, to assess various markers of illness severity. Data was analyzed using Stata.

RESULTS: We identified 1246 children admitted with viral bronchiolitis. 1153 had testing for RSV, and of those, 55% tested positive. RSV+ children were on average significantly younger than RSV- children (mean age in days 204 vs. 245 p=0.0002). RSV+ children were more likely to require oxygen and had longer hospital stays, but did not differ significantly in rate of ICU admission. However, when stratifying this analysis by age, these trends persisted but were not statistically significant.

265
10:30am
House Officer
Does New Prescription of Inhaled Corticosteroids on Hospital Discharge Decrease Hospitalizations and ED Visits for Asthma? Preliminary Data from a Retrospective Chart Review
Jessica M. Gold, Meera S. Meerkov, Gabriella Azzarone, Alyssa H. Silver, Katherine O’Connor.
Pediatrics, Children’s Hospital at Montefiore, Bronx, NY.

BACKGROUND: Inhaled corticosteroids (ICS) have been shown to control asthma symptoms and reduce frequency of acute exacerbations, ED visits, and total hospital admissions. Recent studies to assess various rates of delivery of recommended preventive care, including prescription of ICS, to children hospitalized for asthma. However, whether prescription of ICS during hospitalization decreases rates of future hospitalization or ED visits for asthma remains unclear.

OBJECTIVE: To investigate whether new prescription of ICS to 2-20 year-olds hospitalized for status asthmaticus is associated with decreased readmission or ED visits for asthma-related symptoms, improving resource utilization.

DESIGN/METHODS: This is a retrospective study of children 2-20 years old admitted to an urban tertiary care children’s hospital with a primary or secondary diagnosis of status asthmaticus between 2008 and 2010. Exclusion criteria: comorbid conditions (eg, prematurity or congenital heart disease), and current use of ICS. The primary outcome was the rate of any readmission for asthma at 180 days, with secondary outcomes of rates of readmission or ED visits at 30, 60, and 365 days. Data were analyzed in STATA with two-sample tests of proportions.

RESULTS: During the study period, 1510 patients were admitted with a primary or secondary diagnosis of status asthmaticus. On partial review of data (October 2008-April 2009) 565 patients were admitted, 235 of which met criteria for this study.
CONCLUSIONS: Preliminary results for this cohort suggest no statistically significant difference in rates of readmission or ED visits between patients newly prescribed or not prescribed ICS when hospitalized for status asthmaticus. The preliminary results suggest a trend towards an increase in readmissions and ED visits in those newly prescribed ICS. This trend may suggest that ICS are only being prescribed for patients with more severe disease. If the completion of this study reveals increased incidence for patients newly prescribed ICS, the criteria used for choosing to prescribe ICS will need to be further examined.

266
10:45am
House Officer
Hospitalist and Non-Hospitalist Adherence to Evidence-Based Guidelines for the Management of Community-Acquired Pneumonia
Clota Snow, Russell McCulloh, Zunaria Choudhary, Crystal-Rose Cuellar, Michael Koster, Brian Alverson.
Department of Pediatrics, Hasbro Children’s Hospital, Providence, RI; The Warren Alpert Medical School, Brown University, Providence, RI.
BACKGROUND: Community-acquired pneumonia (CAP) is a common cause of hospitalization in the US. However, there is significant variability in how providers evaluate, diagnose and treat these patients. National guidelines were released in 2011 in an effort to provide an evidence-based guide for management of CAP.
OBJECTIVE: To assess trends in physician management, antimicrobial use, and clinical outcomes among children hospitalized for CAP who are treated by hospitalist or non-hospitalist pediatricians in light of recent national guidelines.
METHODS: A retrospective chart review was conducted of otherwise healthy patients hospitalized for CAP at a tertiary children’s referral hospital from January 2011 to April 2012. Reviewers collected demographic data, evaluation data (including microbiologic testing and diagnostic radiography), antimicrobial use, therapeutic interventions, and clinical outcomes. Data were analyzed using Chi-square analysis for categorical variables, Wilcoxon rank-sum testing for continuous variables.
RESULTS: There were 314 patients that met inclusion criteria. There was no significant difference in baseline characteristics between hospitalist and non-hospitalist patients. Among immunized children, hospitalists more often prescribed amoxicillin or amoxicillin-clavulanic acid at discharge (78.2% vs. 46.7%, p<0.0001) than non-hospitalists. Among unvaccinated or incompletely vaccinated children, third-generation cephalosporin use between hospitalists and non-hospitalists in these children did not differ (p=0.265). The two groups also did not differ in the use of azithromycin for patients with multifocal or intestinal CXR findings (p=0.400). Rates of diagnostic testing (including CBC, blood culture, and chest x-ray) between the two groups did not differ, although initial diagnostic evaluation occurs primarily in the ER. Length of stay (LOS) and rates of readmission were similar in hospitalists and non-hospitalists (1.97 vs. 1.75 days, p=0.192 for LOS; 2.2% vs. 3.0%, p=0.655 for readmission). There were no deaths in the cohort.
CONCLUSIONS: Our data show that in regards to antibiotic choice for the management of CAP, hospitalists adhere more closely to national guidelines than non-hospitalists. There was no significant difference between the groups in clinical outcomes measured in this study.

267
11:00am
House Officer
Relationship between Asthma Control and Depression among Adolescents in an Urban Community
Vanessa Camino, Fernanda Kupferman, Kelly Cervellione, Vinod Dhar, Susana Rapaport, Won Baik-Han, Partha Chatterjee, Pediatrics, Jamaica Hospital Medical Center, Jamaica, NY; Pediatrics, Flushing Hospital Medical Center, Flushing, NY; Psychiatry, Jamaica Hospital Medical Center, Jamaica, NY.
BACKGROUND: Previous studies have shown an increased prevalence of depression in patients with asthma. The prevalence of depression is highly associated with increased symptoms and burden for youth with asthma. Early diagnosis of depression can improve general health and quality of life.
OBJECTIVE: To investigate the relationship between depression and the level of asthma control in 12-18-year-old adolescents in an urban community.
METHODS: We conducted a case-control study with a sample of convenience of 12-18-year-old patients who attended the outpatient clinic or emergency department or were inpatients at Jamaica Hospital Medical Center. We obtained demographic data (age, gender, ethnicity) on all subjects and administered them the Patient Health Questionnaire-9 modified for teens (PHQ-9). It is a screening test (sensitivity 89.5%, specificity 77.5%), and is graded from 0-5 (0=no depression, 1=minor, 2=mild, 3=moderate, 4=moderately severe, 5=severe depression) to determine the grade of depression (GD). Adolescents with a GD≥2, or if they had a positive answer in the questions about suicide, were considered to have a positive screen for depression. Asthma control level was assessed with The Asthma Control Test (sensitivity and specificity of 71%) scored from questions about suicide, were considered to have a positive screen for depression. Asthma control was assessed by The Asthma Control Test (sensitivity and specificity of 71%).
CONCLUSIONS: Preliminary results for this cohort suggest no statistically significant difference in rates of readmission or ED visits between patients newly prescribed or not prescribed ICS when hospitalized for status asthmaticus. The preliminary results suggest a trend towards an increase in readmissions and ED visits in those newly prescribed ICS. This trend may suggest that ICS are only being prescribed for patients with more severe disease. If the completion of this study reveals increased incidence for patients newly prescribed ICS, the criteria used for choosing to prescribe ICS will need to be further examined.

268
11:15am
House Officer
Children with Asthma in the Emergency Department; What Did the Chest X-Ray Change?
Dept of Pediatrics, Drexel University & The Children’s Hospital at Monmouth Medical Center, Long Branch, NJ; Dept of Emergency Medicine, St. Christopher’s Hospital for Children, Philadelphia, PA.
BACKGROUND: The Expert Panel Report 3 “Guidelines for the Diagnosis and Management of Asthma” (EPR3) does not recommend that the use of a chest x-ray (CXR) in the evaluation of children with asthma exacerbations unless they are in severe respiratory distress or have not responded to treatment. However, many children who come to the emergency department (ED) with an asthma exacerbation receive a CXR. Along with unnecessary radiation exposure and increased medical costs, these children many times receive antibiotics since the CXR findings in asthma can be interpreted as pneumonia. We hypothesize that the CXR does not usually alter the management of their asthma exacerbation.
OBJECTIVE: To assess the use and utility of CXR in the evaluation of children with asthma in the ED.
METHODS: Retrospective chart review was performed including patients, already identified with asthma, aged 1-18 years with asthma exacerbations who were evaluated in the ED and received a CXR between 2010-2012. Patients with an indication for CXR other than respiratory symptoms were excluded. The subjects were grouped based on their CXR findings and were compared with regards to their disposition status, the use of antibiotics and their clinical course (vital signs, oxygenation, response to treatments) in the ED based on the EPR3 guidelines for CXR. The CXR readings by the ED physician and the radiologists were compared. Results were analyzed using frequencies and χ².
RESULTS: Data of 561 patients were analyzed and from those, 16% (n=91) were admitted. The children who were admitted and met the EPR3 criteria for CXR (31%, n=29), 51% had normal CXR and 49% had pneumonia. The admitted children who did not meet the EPR3 criteria for CXR (69%, n=62), 50% had normal CXR and 50% had pneumonia. Out of the 561 patients, 30.1% (n=169) received antibiotics and, from those patients, 50% had normal CXR and 50% pneumonia. There was no significant difference between the CXR findings, the antibiotic therapy, the disposition status and the fulfillment of the EPR-3 criteria for CXR (p<0.1). There was no significant difference between the radiologists and the PED physicians CXR reading, (p>0.1). Almost 68% (n=381) of the patients had received ≥3 previous CXR.
CONCLUSIONS: This data shows that the CXR did not alter the management and thus should not be a part of the routine evaluation of children with asthma exacerbation.

269
11:30am
House Officer
Cognitive and Emotional Morbidity Following Youth Concussions
Daniel J. Corwin, Christina L. Master, Kriby B. Arbegast, Mark R. Zmijewski.
BACKGROUND: Sports- and recreation-related concussions are common injuries sustained by youth and adolescent athletes. Little is known about the cognitive and emotional morbidity of pediatric concussion patients followed longitudinally by clinicians.
OBJECTIVE: To characterize the prevalence of specific co-morbidities, cognitive and emotional outcomes, and subspecialist referral in a sample of concussion patients cared for in a sports medicine clinic.
METHODS: Of a sample of 3740 unique patients seen in a tertiary pediatric hospital affiliated sports medicine clinic from 7/1/2010-12/31/2011 and diagnosed with concussion, a 5% random sample (187) of medical records was reviewed. Of the random sample of patients, all visits for concussion were examined.
RESULTS: 73% of concussions were sports-related. Patients missed a median of 37 days of school (mean 81), including school vacations. 13% missed greater than 6 months of school. 66% required some form of school accommodation, and 27% required home schooling. 61% of patients reported a decline in grades during recovery. Only 53% had been prescribed cognitive rest by the referring provider prior to their first subspecialty visit. 28% of patients seen had a co-morbid condition, including attention deficit hyperactivity disorder, anxiety, depression, and learning disabilities.
18% required the care of a psychiatrist, 17% of a neuropsychologist, and 14% of a neurologist.

Patients required a median of 66 days (mean 95) before they were symptom-free.

CONCLUSIONS: Patients with concussion experience cognitive and emotional burden that can last for several months following injury. Patients with concussion and pre-existing co-morbidities may have specific needs following injury that need to be addressed by specialists. Future work should determine the effect of pre-existing conditions and concussion treatments on outcomes.

270
11:45am
Undergraduate Student
Symptom Guided Emergency Department Discharge Instructions for Children with Mild Traumatic Brain Injury
Adam Bartholomew, Danielle Miano, Emily Ly, Sharon R. Smith.
Molecular and Cell Biology, University of Connecticut, Storrs, CT; Pediatrics, Connecticut Children’s Medical Center, Hartford, CT.

BACKGROUND: Mild traumatic brain injury (TBI) symptoms can persist and may over an indefinite period of time depending on the patient and extent of the brain injury.

OBJECTIVE: To evaluate symptom guided discharge instructions for children with TBI to better facilitate care of somatic, emotional and cognitive signs and symptoms.

DESIGN/METHODS: A randomized trial comparing the symptom guided discharge instructions and the standard discharge instructions was conducted. Patients ages 7-17 diagnosed with a TBI within 24 hours of the emergency department visit were enrolled into the study. The patient had to be presenting with at least 1 TBI symptom provided on a graded symptom checklist, and could not be admitted to the hospital. A graded symptom checklist was given to the patient and caregiver to complete over the course of a week after the ED visit and return. A phone interview was given to the caregiver at the conclusion of the week to assess satisfaction of discharge instructions. Data analyzed included location and cause of TBI, sign and symptom duration, and family demographic information.

RESULTS: To date, 98 patients have been enrolled. Demographic characteristics comprised of 71% white, 12% black, 12% hispanic and 5% other. Caregiver education was 70% at some college or greater level (college graduate, post-graduate, etc.). The significant differences between the intervention and control group were: the average period of time symptoms persisted to the day the patient returned to school (8.5 vs 10 days, p=0.005); average period of time symptoms persisted to the day the patient returned to watching television (4 vs 5 days, p<0.005); the average period of time symptoms persisted to helpful the respective instructions were when deciding when the patient returns to school (1.5 vs 1.0 days, p=0.034); and average period of time symptoms persisted to helpful the respective instructions were when deciding when the patient returns to physical activities (sports, walking, etc). (1.5 vs 1.0 days, p=0.005).

CONCLUSIONS: The symptom guided discharge instructions appear to be more useful when aiding caregivers’ decision allowing the patient to return to school, to return to physical activities, and to watch television.

271
9:45am
Tracheal Suctioning Does Not Alter Pulmonary Vascular Resistance (PVR) in Asphyxiated, Non-Vigorous Lambs with Meconium Aspiration
Satyan Lakshminrusimha, Bobby Mathew, Sylvia F. Gugino, Carmon Koenigskecht, Jayavese Nair, Devaraj Sambalingam, Melissa Carmen, Daniel D. Swartz.
Pediatrics, University of Buffalo, Buffalo, NY; Pediatrics, University at Rochester, Rochester, NY; Department of Physiology, University of Buffalo, Buffalo, NY.

BACKGROUND: Depressed infants born through meconium-stained amniotic fluid (MSAF) are at risk for meconium aspiration syndrome (MAS). Current guidelines recommend tracheal suctioning for non-vigorous neonates born through MSAF.

OBJECTIVE: To evaluate the effect of tracheal suctioning of MSAF at birth on gas exchange and PVR in depressed lambs asphyxiated by umbilical cord occlusion.

DESIGN/METHODS: Near-term gestation (141d, term 145d) lambs were instrumented to measure PVR. Meconium (5 ml/kg 20% in amniotic fluid) was labeled with fluorospheres and added to a funnel attached to the endotracheal tube (ETT). The umbilical cord was occluded for 5min to induce asphyxia and gasping leading to “spontaneous” aspiration of meconium. After 10min of recovery, cord occlusion was repeated. Lambs were randomized to no suction (n=5) or suction (n=12). Results are shown in the top graph.

RESULTS: Lambs were severely asphyxiated (cord pH 6.92±0.02) and aspirated meconium. Asphyxia and gasping leading to “spontaneous” aspiration of meconium. After 10min of recovery, cord occlusion was repeated. Lambs were randomized to no suction (n=5) or suction (n=12). Results are shown in the top graph.

CONCLUSIONS: In depressed lambs with asphyxia and meconium aspiration in the immediate antenatal period, effective tracheal suctioning at birth does not alter PVR but may reduce the severity of MAS.

272
10:00am
Fellow in Training
TRPV4 Regulates Fetal Lung Development and Injury
Suji Pritha Nayak, Yulian Wang, Xiaodi Chen, Barbara Stonestreet, Juan Sanchez-Estebaran.
Pediatrics, Women and Infants Hospital/ Alpert Medical School of Brown University, Providence, RI.

BACKGROUND: Mechanical forces play a key role in lung development and lung injury. Transient Receptor Potential-Vallinoid 4 (TRPV4) is a calcium channel known to respond to mechanical signals in several tissues and to contribute to inflammation and pulmonary edema in adult lungs. However, the role of this channel in fetal lung is unknown.

OBJECTIVE: To describe the fetal ontogeny of TRPV4 in murine lung development and to investigate the role of TRPV4 in lung differentiation and injury mediated by mechanical forces.

DESIGN/METHODS: Type II epithelial cells were isolated from mice on E17-19 of gestation and exposed to 5% or 20% cyclic strain to simulate normal fetal lung development or lung injury, respectively. TRPV4 mRNA was analyzed by real-time PCR; TRPV4 protein was evaluated by Western blot. Type II cell differentiation was assessed by SP-C mRNA expression. Lung injury was investigated by measuring release of the pro-inflammatory IL-6 into the supernatant by ELISA.

RESULTS: TRPV4 mRNA is present to similar levels on E17 and E18 type II cells but decreases by 50% on E19. Mechanical strain increases TRPV4 mRNA and protein abundance by 70% only on E17 of gestation. As expected, 5% stretch increased SP-C mRNA by 2-fold; incubation with the TRPV4 agonist GSK 1016790A further increased SP-C mRNA by 50% when compared to stretch samples without agonist. In contrast, incubation with the TRPV4 antagonist HC 067047 had the opposite effect. Lastly, mechanical strain for 48 h released IL-6 into the supernatant by 2-fold when compared to controls. Incubation with TRPV4 antagonist decreased IL-6 release to the control levels.

CONCLUSIONS: TRPV4 expression is developmentally regulated and responds to mechanical strain only during the canalicular stage of lung development. TRPV4 participates in strain-induced type II cell differentiation and release of pro-inflammatory cytokines. These studies unveil a potential novel role of this channel not only in fetal lung development but also in the injury of premature lungs.

273
10:15am
Fellow in Training
Is the Higher Expression of Matrix Metalloproteinase-9 Associated with Bronchopulmonary Dysplasia in ELBW Infants?

BACKGROUND: BPD is characterized by abnormal alveolar septation and microvascular maturational delay. Alveolarization requires extracellular matrix remodeling, a process in which matrix metalloproteinases (MMP) play an important role. MMP-9 has proteolytic activity against connective tissue and its functional polymorphism (C-1562T) is associated with COPD in adults.

We therefore considered the functional polymorphism of MMP-9 (C-1562T) as the candidate genes in the susceptibility to BPD.

OBJECTIVE: Hypothesis: MMP-9 (C-1562T) is associated with susceptibility to BPD in ELBW infants.

DESIGN/METHODS: This is an ongoing cohort study that enrolls infants <1 kg at birth, without...
BPD (n=68)

15 (36%)

≤

<0.001

23 (34%)

42

33 (48%)

16 (38%)

p

26.2 ±1.6

712 ±141

10 (24%)

16

CONCLUSIONS: Plasma BNP at 36 weeks PMA was significantly elevated in preterm infants with BPD compared with no/mild BPD group (26.5 (10.3-43.4) vs 9.3 (6.2-24.1) pg/ml, p<0.05). Mean alveolar width was increased in steroid-treated animals compared to controls (p<0.001 for both). No differences in the percentage of air space, parenchyma, vascularity, air space/parenchyma ratio, alveolar density, alveolar surface area, or media-to-arteriole diameter ratio were observed.

CONCLUSIONS: Exposure to antenatal betamethasone in the late-preterm period increases the size, but reduces the number of alveoli, resulting in the same percentage of air space and unchanged alveolar surface area.

CONCLUSIONS: In this pilot study, ELBW infants who progressed to BPD were more likely to have lower birthweight and gestational age (p<0.001). BW and GA were lower in BPD group. Genotype distributions for MMP 9 SNP was significantly high in BPD (p<0.04). MMP 9 expression in tracheal aspirate was higher among tt genotype (p<0.001).

CONCLUSIONS: Similar to term animals, steroid-treated sheep exhibited lower radial alveolar counts & decreased alveolus-per-linear field measurements compared to control (p<0.001, p<0.01). Mean alveolar width was increased in steroid-treated animals compared to controls (p<0.05) but reduced in comparison to term sheep (p<0.001). Total calculated alveolar surface area was increased in the term sheep compared to either the control or steroid-treated groups (p<0.001 for both). Mean arteriole lumen diameter was increased in steroid-treated animals with & without the use of mechanical ventilation compared to controls (p<0.01 for both). No differences in the percentage of air space, parenchyma, vascularity, air space/parenchyma ratio, alveolar density, alveolar surface area, or media-to-arteriole diameter ratio were observed.

CONCLUSIONS: In animal models, antenatal steroid use at late preterm gestation improves lung compliance, function, reducing mortality and severity of respiratory distress syndrome. Late preterm infants exhibit high rates of respiratory distress, but antenatal steroid use at these gestations has not been fully evaluated. In animal models, antenatal steroid use at late preterm gestation improves lung compliance, and We speculate pulmonary vascular resistance. Yet, the effect on lung histology has not been characterized.

OBJECTIVE: To determine the effect of antenatal betamethasone on lung histology in late preterm fetal lambs.

CONCLUSIONS: Truncated HO-1 inhibited apoptosis and improved survival in MEF cells. This enhancement of DNA repair and tolerance to hyperoxia.

DESIGN/METHODS: HO-1 null mutant mouse embryonic fibroblasts (MEF) cells were stably infected with retroviruses expressing full-length (FL) or C-terminal truncated (TR) HO-1 cDNA, or empty vector (VEC) as a control. To evaluate oxidative stress response, cells were exposed to 95% O₂/5%CO₂ (hyperoxia) or room air/5%CO₂ (normoxia) for 28 hours. Cells were counted at 0.4, 8, and 24hrs to assess cell viability using the Moxi Z automated cell counter (Ortho). DNA fragmentation as a marker of apoptosis was evaluated by DNA laddering and oxidative DNA damage was assessed by immunostaining for 8-hydroxy-2’-deoxyguanosine (8-oxo-dG). mRNA and protein levels of the DNA repair enzyme 8-oxoguanine DNA glycosylase (OGG-1), were assessed by quantitative polymerase chain reactions(qPCR), western analysis, and immunostaining.

RESULTS: After hyperoxia, TR cells survived better than both VEC and FL. Both DNA laddering and immunofluorescence staining for 8-oxo-dG were decreased in TR cells, demonstrating less oxidatively damaged DNA. Although qPCR revealed a three fold increase in OGG-1 mRNA in TR cells at 28 hrs hyperoxia cellular OGG-1 protein was not increased at this point. Interestingly, immunostaining for OGG-1 protein showed increased nuclear localization in TR cells.

CONCLUSIONS: Truncated HO-1 inhibited apoptosis and improved survival in MEF cells. This was associated with less oxidative DNA damage and apoptosis. The likely mechanism is enhanced nuclear translocation of OGG-1 rather than up-regulation of OGG-1 protein since this occurred later. We speculate that nuclear translocation of HO-1 mitigates hyperoxic injury in neonates by enhancing repair or obviating oxidative damage of DNA. Funded by NIHRO1HL058752(P.A.D).

CONCLUSIONS: In this pilot study, ELBW infants who progressed to BPD were more likely to have lower birthweight and gestational age (p<0.001). BW and GA were lower in BPD group. Genotype distributions for MMP 9 SNP was significantly high in BPD (p<0.04). MMP 9 expression in tracheal aspirate was higher among tt genotype (p<0.001).

CONCLUSIONS: In this pilot study, ELBW infants who progressed to BPD were more likely to have lower birthweight and gestational age (p<0.001). BW and GA were lower in BPD group. Genotype distributions for MMP 9 SNP was significantly high in BPD (p<0.04). MMP 9 expression in tracheal aspirate was higher among tt genotype (p<0.001).
Effect of Nitric Oxide with Vitamin A on Altered Lung Airway and Microvasculature Development during $O_2$-Induced Lung Injury

Sana Mujahid, Courtney Thomas, Heber Nielsen, MaryAnn Volpe, Newborn Medicine, Floating Hospital for Children at Tufts Medical Center, Boston, MA; The Sakler School of Biomedical Studies, Tufts University School of Medicine, Boston, MA.

BACKGROUND: Lung disease remains a major cause of morbidity and mortality for infants born at 23-24 wks gestation. We have previously shown that 0.4%O2 exposure to ex utero developing mouse lungs dramatically alters lung airway and microvascular development by adversely changing the expression patterns of the transcription factors, Hoxb5 and Hox5 and other developmentally important signaling molecules. Nitric oxide (NO) and Vitamin A (retinoic acid, RetA) are important regulators of lung morphogenesis and regulate blood vessel formation and function through independent and potentially interrelated mechanisms. These therapies evaluated in isolation have led to only minor reductions in preterm infant pulmonary morbidity. OBJECTIVE: We hypothesize that NO and RetA used in combination will ameliorate $O_2$-induced altered lung airway and vascular development.

DESIGN/METHODS: Whole fetal mouse lungs (E14 at 48 hrs culture) and fetal mouse lung endothelial (MFLM) cells were cultured in Room Air, 0.4%O2, + NO (2 or 10 ppm) + RetA 10 M/liter for 48 hrs. Airway structural development was microscopically evaluated daily and by E-cadherin whole mount immunofluorescence (EF) at end of culture. Hoxb5, Hox5, VEGF2, eNOS, and Akt-P protein levels were analyzed using western blot.

RESULTS: Real-time imaging and E-Cadherin IF showed that 0.4%O2 arrested airway branching and dilated distal airways. Addition of 10 ppm NO plus RetA to 0.4%O2 increased branch generations. Distal airway dilation was less than with $O_2$ or RetA and airway patterning was structurally more primitive. Compared to $O_2$, alone, O2 $O_2$ 3 cmH2O + NO (2 or 10 ppm) ± RetA treatment led to similar but less robust changes in these proteins; but NO 2 ppm + RetA showed minimal changes.

CONCLUSIONS: NO(10 ppm) + RetA treatment reversed the $O_2$-induced changes in proteins important for lung microvascular and airway development. Further experiments evaluating a dose-response for NO and RetA are underway. Given the varied response of fetal lung endothelial cells vs. whole lung, use of both models is necessary in evaluating effects of NO and RetA combined therapy.

Optimizing HFNC and Nasal CPAP Support in Preterm Infants Using Respiratory Inductive Plethysmography

Soraya Abbasi, Emidio M. Sivieri, Jeffrey S. Gerdes, Pediatrics, Division of Neonatology, The Children's Hospital of Philadelphia, Philadelphia, PA; Philadelphia, Pennsylvania, Hospital, Philadelphia, Pediatrics, Perelman School of Medicine, Univ of PA, Philadelphia, PA.

BACKGROUND:ynchrony between ribcage and abdominal motion (paradoxical breathing) has been used clinically as a measure of respiratory distress and the adequacy of respiratory support. Respiratory inductive plethysmography (RIP) is a non-invasive bedside technique for evaluation of chest wall movement. When properly calibrated, it can measure respiratory function in infants who are on non-invasive respiratory support which precludes use of a traditional airway flow sensor for obtaining respiratory mechanics measurements.

OBJECTIVE: To measure respiratory mechanics and thoracoabdominal asynchrony (TAA) indices in premature infants with RDS treated with humidified high flow nasal cannula (HFNC) and nasal continuous positive airway pressure (nCPAP).

DESIGN/METHODS: 17 infants (11 HFNC, 6 nCPAP) with GA 31.5±1.8 wks, BW 1720±460g were studied at ages 5.6 days (1-22). Measurements were made at baseline, 2, 3, 4 L/min HFNC and 3, 4, 5, 6 cmH2O nCPAP. RIP was calibrated at baseline by multiple linear regression of pneumotachometer derived tidal volume with RIP ribcage and abdomen signals. Esophageal pressure was measured using a water filled catheter. Lung compliance (CL), airway resistance (R) and work of breathing (WOB) were computed by a least mean square technique. Labeled breathing index (LBI), phase angle (phi) and phase relation total breath (PRTB) were obtained from analysis of ribcage and abdomen excursions.

RESULTS: In our patient population LBI, phi and CL were optimum at 4-5 cmH2O and 3-4 L/min HFNC.

CONCLUSIONS: Properly calibrated RIP appears to be a useful bedside technique to quantify the degree of chest wall asynchrony and overall respiratory function and to help optimize the level of non-invasive respiratory support in preterm infants.
**RESULTS:**

Clinical characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Preterm (n=15)</th>
<th>Term (n=28)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth-weight</td>
<td>1666 ± 770</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>Gestational age</td>
<td>37 ± 2</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>Males</td>
<td>13 (86%)</td>
<td>20 (71%)</td>
<td>0.26</td>
</tr>
<tr>
<td>African-Americans</td>
<td>15 (100%)</td>
<td>20 (71%)</td>
<td>0.26</td>
</tr>
<tr>
<td>Age at sampling (hours)</td>
<td>15 ± 3</td>
<td>12 ± 2</td>
<td>0.19</td>
</tr>
<tr>
<td>C-section</td>
<td>10 (67%)</td>
<td>17 (61%)</td>
<td>0.48</td>
</tr>
<tr>
<td>Histological chooroamnionitis</td>
<td>7 (47%)</td>
<td>15 (54%)</td>
<td>0.46</td>
</tr>
<tr>
<td>P/TH</td>
<td>8 (40%)</td>
<td>12 (43%)</td>
<td>0.56</td>
</tr>
<tr>
<td>UGR</td>
<td>3 (20%)</td>
<td>1 (4%)</td>
<td>0.19</td>
</tr>
</tbody>
</table>

*P-values calculated using t-test and chi-square test.

Comparison of different EPC subtypes:

<table>
<thead>
<tr>
<th>EPC Subtype (%)</th>
<th>Preterm (n=15)</th>
<th>Term (n=28)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD34+/CD133+/VEGFR2+</td>
<td>0.29 (0.004, 0.039)</td>
<td>0.067 (0.002, 0.026)</td>
<td>0.006</td>
</tr>
<tr>
<td>CD34+/CD133+</td>
<td>0.37 (0.05, 0.21)</td>
<td>0.25 (0.12, 0.34)</td>
<td>0.399</td>
</tr>
<tr>
<td>CD34+/VEGFR2+</td>
<td>0.37 (0.05, 0.21)</td>
<td>0.25 (0.12, 0.34)</td>
<td>0.399</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:**

Circulating VEGFR2 expressing EPC subtypes are significantly higher in preterm newborns as compared to term newborns. Further studies are warranted to explore the changes in EPC milieu across different gestational ages.

### 281 10:00am

**Fellow in Training**

**Coagulopathy in Newborns with Hypoxic Ischemic Encephalopathy (HIE) Treated With Therapeutic Hypothermia**


Neonatology, Children’s National Medical Center, Washington, DC; Hematology/Oncology, Children’s National Medical Center, Washington, DC; Laboratory Medicine, Children’s National Medical Center, Washington, DC; Pediatrics, The George Washington University School of Medicine, Washington, DC.

**BACKGROUND:** Newborns with HIE are at risk for coagulopathy due to systemic oxygen deprivation. Additionally, therapeutic hypothermia (TH) slows enzymatic activity of the coagulation cascade, leading to prolongation of coagulation studies in these patients. The level of laboratory abnormality that predicts bleeding is unclear, leading to varying practice in transfusion therapy.

**OBJECTIVE:** To determine the thresholds of INR, aPTT, fibrinogen (Fib) and platelet count (Plt) that are associated with bleeding in HIE infants undergoing TH.

**DESIGN/METHODS:** HIE infants meeting criteria for TH (Shankaran, NEJM 2005) between 2008-2012 were included. Initial, min and max values of INR, aPTT, Fib and Plt (measured twice daily during TH) were collected retrospectively. Bleeding that 1) decreased Hb by 2g/dL in 24 hrs, 2) required blood products for hemostasis, or 3) was in a critical organ system (Goldenberg, J Thromb Haemost, 2011) was noted. Laboratory data between the bleeding group (BG) and non-bleeding group (NBG) were compared and significant variables were evaluated with ROC analyses to determine cut-points to predict bleeding.

**RESULTS:** A total of 76 infants (mean BW 3.34±0.67 kg, GA 38.6±1.9 wks, median pH 6.98 (IQR 36x137), 5-min Apgar 3 (IQR 2) were enrolled. BG included 41 infants. Bleeding sites involved 1) intracranial (n=13), GI (n=19), pulmonary (n=18), hematuria (n=11) or other (n=2). There were no differences between BG and NBG in baseline characteristics.

**CONCLUSIONS:** Laboratory evidence of coagulopathy is universal in HIE babies undergoing TH. Appropriate thresholds to prevent clinical bleeding may include maintaining platelet count >130K/mcL, fibrinogen level >150 mg/dL, and INR <2 in this population.

### 282 10:15am

**Fellow in Training**

**Protection Against Neonatal Candidiasis by a Monoclonal Antibody Targeting the Candida albicans Adhesin, Als3p**

Aanoon S. Pulickal, Sonia S. Laforet-Neshati, Lois L. Hover, Joseph M. Bliss.

Pediatrics, Brown University, Women & Infants Hospital, Providence, RI; Pathobiology, University of Illinois, Urbana, IL.

**BACKGROUND:** Neonatal candidiasis, with Candida albicans as the primary etiological agent, is the third most common cause of late-onset neonatal sepsis. Despite treatment, death or severe impairment is observed in 73% of infected extremely low birth weight infants.

**OBJECTIVE:** We evaluated the capacity of a monoclonal antibody targeting the C. albicans adhesin, Als3p (anti-Als3p MAb), to protect against neonatal candidiasis when used as a prophylactic or therapeutic agent in a mouse model. Transplacental and postnatal transfer of anti-Als3p MAb was also determined following administration in pregnancy and its humoral longevity was tested.

**DESIGN/METHODS:** Anti-Als3p MAb was administered by i.p. injection in 2-day old Balb/c mice daily for three days either before or after an i.p. challenge with 5 x 10^6 cfu of C. albicans. Control mice received either saline or isotype control antibody. Survival was the primary outcome measure; fungal burden in the kidney, liver, lung and brain was also determined at death or at 72 hours following infection in surviving pups. In other experiments, pregnant dams at E19 were injected with anti-Als3p MAb intravenously. The persistence of MAb was evaluated by immuno-fluorescence microscopy in timed sera following injection and at terminal bleed of neonatal mice born to these dams.

**RESULTS:** Significant improvements in survival were observed in vaccinated vs. control mice (91% vs. 30%, p<0.001) and in treated vs. control mice (100% vs. 30%, p<0.002). The median fungal colony counts (cfu/g) were significantly lower in the liver (960 vs. 79000, p<0.001), kidney (60 vs. 4840, p<0.001), lung (30 vs. 900, p<0.001) and brain (0 vs. 70, p<0.001) of vaccinated vs. control pups compared to control pups. Similarly, significant differences were observed in the median fungal colony counts in the liver (340 vs. 1860, p<0.05), kidney (150 vs. 805, p<0.05) and brain (0 vs. 55, p<0.05) of treated pups compared to control pups. Anti-Als3p MAb was detected in the sera of adult mice up to 7 days post-injection and in pups, born to dams given MAb in pregnancy, at 5 days of life.

**CONCLUSIONS:** These data indicate that in a mouse model of neonatal candidiasis, anti-Als3p MAb protects against C. albicans, has a sustained presence in sera and is perinatally transferred to neonates. Anti-Als3p MAb may have utility as an antenatal/neonatal passive vaccine and neonatal therapeutic agent in the management of invasive neonatal candidiasis.

### 283 10:30am

**Fellow in Training**

**Aquaporins as Possible Autoimmune Effectors of Preeclampsia**

Nisreen S. Maari, Surendra Sharma.

Pediatrics, Women and Infants Hospital of RI, Providence, RI.

**BACKGROUND:** Preeclampsia (PE) is a late pregnancy complication, diagnosed by hypertension, proteinuria, and edema. Dysregulation in hormonal activity, angiogenesis, auto-antibodies and immunity are considered to contribute to the onset of PE. Our recent studies suggest that perturbed aquaporin water channels contribute to preterm birth, polyhydramnios and angiogenic defects associated with perinatal toxicant exposure in mouse models.

**OBJECTIVE:** We hypothesize that PE is an auto-immune disorder associated with auto-antibodies against aquaporin water channels.

**DESIGN/METHODS:** We injected pregnant dams at E19 with 5 x 10^6 cfu of C. albicans and administered various anti-alcohol MAb proteins. Anti-alcohol MAb was tested in pregnant dams at E19, and the offspring were injected with anti-alcohol MAb intravenously. The persistence of MAb was evaluated by immuno-fluorescence microscopy in timed sera following injection and at terminal bleed of neonatal mice born to these dams.

**RESULTS:** Significant improvements in survival were observed in vaccinated vs. control mice (91% vs. 30%, p<0.001) and in treated vs. control mice (100% vs. 30%, p<0.002). The median fungal colony counts (cfu/g) were significantly lower in the liver (960 vs. 79000, p<0.001), kidney (60 vs. 4840, p<0.001), lung (30 vs. 900, p<0.001) and brain (0 vs. 70, p<0.001) of vaccinated vs. control pups compared to control pups. Similarly, significant differences were observed in the median fungal colony counts in the liver (340 vs. 1860, p<0.05), kidney (150 vs. 805, p<0.05) and brain (0 vs. 55, p<0.05) of treated pups compared to control pups. Anti-Als3p MAb was detected in the sera of adult mice up to 7 days post-injection and in pups, born to dams given MAb in pregnancy, at 5 days of life.

**CONCLUSIONS:** These data indicate that in a mouse model of neonatal candidiasis, anti-Als3p MAb protects against C. albicans, has a sustained presence in sera and is perinatally transferred to neonates. Anti-Als3p MAb may have utility as an antenatal/neonatal passive vaccine and neonatal therapeutic agent in the management of invasive neonatal candidiasis.
RESULTS: AQP9 expression, but not AQP1 and AQP8, was decreased in PE compared to normal placental sections. 75% of sample IgG (9/12) isolated from PE serum demonstrated the presence of AQP9 auto-antibodies as shown by its strong binding to the cytoplasmic antigen on HTR8 cells, compared to only 25% IgG (3/12) isolated from normal pregnancy serum. The binding of circulating AQP9 auto-antibodies was reversed by AQP9 protein but not AQP 1, AQP 8 epitope binding peptide.

CONCLUSIONS: We believe that AQP9 autoantibody is a potential novel player in the etiology of preeclampsia.

284
10:45am
Fellow in Training
CXCR1 Inhibitor Can Delay Preterm Delivery Induced by Chorioamnionitis and Reduce Neonatal Mortality and Morbidity
Ranjith Kamity, Hardik Patel, Sharif Younis, Edmund Miller, Mohamed Ahmed.
Neonatal-Perinatal Medicine, Cohen Children’s Medical Center of New York, New Hyde Park, NY; Lilling Family Neonatal Research Lab, Feinstein Institute for Medical Research, Manhasset, NY.

BACKGROUND: Intrauterine infection is one of the main etiologies associated with preterm delivery. The associated inflammatory injury has been linked to bronchopulmonary dysplasia, perventricular leukomalacia, cerebral palsy, and poor neurodevelopmental outcome. Cytokines involved in the inflammatory process of chorioamnionitis include IL1, TNFα, IL6, IL8, MCP1, and IL10. Antileukinate (AL) is a potent selective IL8 inhibitor that binds to CXCRs on neutrophils thereby inhibiting IL8-induced neutrophil chemotaxis and cytokine release.

OBJECTIVE: To determine if Antileukinate delays preterm delivery in a mouse model of chorioamnionitis.

DESIGN/METHODS: Timed pregnant adult C57BL6 mice were studied. The LPS group (n=8) received intraperitoneal (IP) injections of LPS (50 mcg/mouse) on gestational day (GD) 15 to induce preterm delivery. The AL group (n=8) received LPS on GD15 followed by daily IP injections of AL (1mg/mouse) on GD15, 16 and 17. Control groups received either saline (n=5) or no injections (n=5). Time to delivery and number of pups delivered (stillborn/live) were recorded. Blood and uterine tissues from the dams and brain and lungs from surviving pups were collected. Histopathology was studied, and cytokines [IL1, TNF, IL6, KC (Mouse IL8 homologue), MCP1 and IL10] were measured using ELISA.

RESULTS: In the LPS group, 88% delivered within 24 hours after LPS compared to 25% in the AL group (P<0.005). The LPS group had 85% stillborn pups compared with 23% in the AL group (P<0.001). Uterine histopathology in the LPS group showed evidence of severe chorioamnionitis with inflammatory cell infiltration, abscess formation and necrosis while the AL group showed mild to no evidence of chorioamnionitis. Dams in the AL group had a significant reduction of KC, TNF and MCP1 in serum compared with LPS group (P<0.05). Cytokine levels in surviving pup brain and lungs in AL were not significantly different from those in the control groups (P>0.05).

CONCLUSIONS: Our data confirm that Antileukinate significantly delays preterm delivery in a mouse model of chorioamnionitis. This may also be applicable for bronchopulmonary dysplasia (BPD) which remains a common morbidity in preterm infants despite technological advances.

Are Bone Morphogenetic Proteins Involved in Bronchopulmonary Dysplasia?
Indira M. Araviran, Jhonna Calo, Lance Parton, Susan Olson.
Newborn Medicine, The Regional Neonatal Center, Maria Fareri Children’s Hospital at Westchester Medical Center New York Medical College, Valhalla, NY; Biochemistry & Molecular Biology, New York Medical College, Valhalla, NY.

BACKGROUND: Bone morphogenetic proteins (BMPs) influence proliferation, growth, differentiation, and apoptosis of a number of cell types. Expression of BMPs as well as their receptor BMPRII and downstream targets such as nitric oxide synthase have been found to have a role in several disease states. This may also be applicable for bronchopulmonary dysplasia (BPD).

OBJECTIVE: The aim of this study was to determine the effect of hyperoxia on BMP4, phosphorylated eNOS, total eNOS and BMPRII expression in human pulmonary arterial endothelial cells (HPAEC).

DESIGN/METHODS: HPAECs were cultured at 37°C with 5% CO2. Cells were passaged at 70-80% confluence with trypsin. Primary cultures of passages 5-6 were used in the experiments. HPAECs were plated in 6-well plates, placed into chambers, and exposed to 95% O2 and 5% CO2 for up to 72 hours. Cell lysates were collected at 24, 48 and 72 hours. Antibodies to BMP4, eNOS and phosphorylated eNOS were used in Western blot assays to determine protein expression.

RESULTS:

Preliminary results show that BMP4 expression is decreased in HPAECs exposed to hyperoxia for 24h (Fig 1). Published reports as well as work done in our lab show that BMP influences phosphorylation of eNOS. As such, the effect of hyperoxia on eNOS phosphorylation and eNOS protein expression was assessed. eNOS phosphorylation was decreased with exposure to high oxygen for 72h (Fig 2). Initial upregulation of eNOS expression was seen at 24h but returned to basal levels by 72h (Fig 2). In addition, BMPRII appears to be decreasing with increasing duration of oxygen exposure (Fig 3).

CONCLUSIONS: Preliminary results demonstrate that hyperoxia decreased BMP4 expression and eNOS phosphorylation at 72h. Our study in its entirety may provide an alternative pathogenesis and may ultimately lead to new pharmacological targets for the prevention and treatment of BPD.
Standardized Early Transition from Parenteral-to-Enteral Nutrition Will Decrease Central Line Utilization in Preterm Infants ≤1500 grams
Lakshmi Vaithilingam, Lisa Saiman, Inga Gukhman, Eleanor Estebanez, Rakesh Sahni.
Pediatrics, Columbia University College of Physicians and Surgeons, New York, NY.

BACKGROUND: Central line associated blood stream infections (CLABSI) are common, costly and significant cause of morbidity and mortality in hospitalized patients. Among the factors associated with CLABSI in neonates, the duration of percutaneous central venous catheter (PCVC) utilization and the use of total parenteral nutrition (TPN) have been shown to be the significant independent risk factors. Standardizing early transition from parenteral-to-enteral nutrition and timely removal of PCVC can potentially decrease PCVC utilization and reduce CLABSI rates without adverse outcomes.

OBJECTIVE: In an ongoing quality improvement initiative we evaluated whether standardized early transition from parenteral-to-enteral nutrition will decrease the central line utilization and reduce CLABSI rates without adverse outcomes in preterm infants with birth weight ≤1500g.

DESIGN/METHODS: To meet the objective of consistent timely removal of PCVC and limiting TPN exposure once adequate enteral feeding was established, we developed, agreed and instituted feeding guidelines for early parenteral-to-enteral nutritional transition in our NICU. This transition is initiated when infants reach enteral intake of 80cc/kg/day and completed over next 48 hours. Data from three periods, i.e., pre-standardization phase (May’09-to-Dec’10), transitional phase (Jan’11-to-Dec’11, during which early transition was gradually developed and adopted but not closely monitored for adherence), and standardization phase (Jan’12 onwards) are being compared.

RESULTS: Preliminary analysis demonstrates decreases in both PCVC utilization rate (0.4 to 0.29, p<0.05, 2010 to 2011) and CLABSI rate (3.4 to 1.3, p<0.05, 2010 to 2012) without any increase in adverse outcomes.

CONCLUSIONS: Structured intervention approach to quality improvement in the NICU setting, using standardized early parenteral-to-enteral nutritional transition, focused on limiting the use of invasive devices, is an effective means to reduce central line utilization and CLABSI rate in preterm infants with birth weight ≤1500g. These preventive strategies can be successfully incorporated into bundles of best practices within the NICU’s that are critical to continually decreasing CLABSI to a zero infection rate. Further, such approaches would not only improve short- and long-term neonatal outcomes but can also potentially decrease the overall healthcare burden and cost.
<table>
<thead>
<tr>
<th>Abstract Presenter Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbasi, Soraya</td>
</tr>
<tr>
<td>Agarwal, Arpit</td>
</tr>
<tr>
<td>Aijayi, Samuel</td>
</tr>
<tr>
<td>Akpan, Udha S.</td>
</tr>
<tr>
<td>Alexander, Jennifer P.</td>
</tr>
<tr>
<td>Amado, Dennise Chriselle C.</td>
</tr>
<tr>
<td>Angelis, Dimitrios</td>
</tr>
<tr>
<td>Apenteng, Tawia</td>
</tr>
<tr>
<td>Arawiran, Jenda M.</td>
</tr>
<tr>
<td>Arora, Prem</td>
</tr>
<tr>
<td>Arshad, Arslan</td>
</tr>
<tr>
<td>Arzuaga, Bonnie H.</td>
</tr>
<tr>
<td>Balakrishnan, Keshawahdiana</td>
</tr>
<tr>
<td>Balamuth, Subha</td>
</tr>
<tr>
<td>Basak, R.</td>
</tr>
<tr>
<td>Bass, Jonathan</td>
</tr>
<tr>
<td>Battu, Subba</td>
</tr>
<tr>
<td>Belamarich, Peter F.</td>
</tr>
<tr>
<td>Bender, Jesse</td>
</tr>
<tr>
<td>Bennett, Michelle</td>
</tr>
<tr>
<td>Bhopi, Rashmi S.</td>
</tr>
<tr>
<td>Blau, Jonathan</td>
</tr>
<tr>
<td>Brachio, Sandhya S.</td>
</tr>
<tr>
<td>Bragg, Jennifer J.</td>
</tr>
<tr>
<td>Brandsma, Erik</td>
</tr>
<tr>
<td>Braun, Laurie R.</td>
</tr>
<tr>
<td>Brouni, Fares</td>
</tr>
<tr>
<td>Bullock, Adam</td>
</tr>
<tr>
<td>Cadet, Claudra</td>
</tr>
<tr>
<td>Cameron, Gail S.</td>
</tr>
<tr>
<td>Camino, Vanessa</td>
</tr>
<tr>
<td>Carey, Alison J.</td>
</tr>
<tr>
<td>Cerra, Samantha</td>
</tr>
<tr>
<td>Chacko, Elizabeth</td>
</tr>
<tr>
<td>Chen, Nan</td>
</tr>
<tr>
<td>Choudhary, Zunaria</td>
</tr>
<tr>
<td>Chung, Jaeah</td>
</tr>
<tr>
<td>Cicero, Mark X.</td>
</tr>
<tr>
<td>Clark, Kevon</td>
</tr>
<tr>
<td>Clarke-Pounder, J.P.</td>
</tr>
<tr>
<td>Corwin, Daniel J.</td>
</tr>
<tr>
<td>Cruz, Hanaise</td>
</tr>
<tr>
<td>Dardas, Majid</td>
</tr>
<tr>
<td>DeLago, Cynthia</td>
</tr>
<tr>
<td>Delaney, Kristen</td>
</tr>
<tr>
<td>DeMauro, Sara B.</td>
</tr>
<tr>
<td>Desai, Jagdish</td>
</tr>
<tr>
<td>DeVries, Lindsay B.</td>
</tr>
<tr>
<td>Dickinson, Blair</td>
</tr>
<tr>
<td>Dipalma, Stacey</td>
</tr>
<tr>
<td>Dodt, Stacy E.</td>
</tr>
<tr>
<td>Donohue, Melissa</td>
</tr>
<tr>
<td>Drogalis, Diana E.</td>
</tr>
<tr>
<td>Durrwachter, Katherine A.</td>
</tr>
<tr>
<td>Edmonds, Sadiqa A.</td>
</tr>
<tr>
<td>Eid, Loai A.</td>
</tr>
<tr>
<td>Ekambaram, Maheshwari</td>
</tr>
<tr>
<td>Elumalai, Jagdish</td>
</tr>
<tr>
<td>Emerson, Beth L.</td>
</tr>
<tr>
<td>Estebanez, Eleanor</td>
</tr>
<tr>
<td>Faustino, E. Vincent S.</td>
</tr>
<tr>
<td>Feldman, Alexander M.</td>
</tr>
<tr>
<td>Ferrari, Christine M.</td>
</tr>
<tr>
<td>Faturi, Najla A.</td>
</tr>
<tr>
<td>Fieldston, E.</td>
</tr>
<tr>
<td>Fieldston, Evan</td>
</tr>
<tr>
<td>Fiks, Alexander</td>
</tr>
<tr>
<td>Fiks, Alexander G.</td>
</tr>
<tr>
<td>Fishe, Jennifer N.</td>
</tr>
<tr>
<td>Flannery, Dustin</td>
</tr>
<tr>
<td>Flannery, Dustin</td>
</tr>
<tr>
<td>Foggia, Elizabeth E.</td>
</tr>
<tr>
<td>Fontaniz-Nieves, Tania D.</td>
</tr>
<tr>
<td>Forman, Katie R.</td>
</tr>
<tr>
<td>Fox, Jenny R.</td>
</tr>
<tr>
<td>Fradin, Kelly N.F.</td>
</tr>
<tr>
<td>Fuchs, Maria</td>
</tr>
<tr>
<td>Fried, Lawrence E.</td>
</tr>
<tr>
<td>Galva, Payal K.</td>
</tr>
<tr>
<td>Galvez, Chiara</td>
</tr>
<tr>
<td>Ganesh, Hariram</td>
</tr>
<tr>
<td>Gardiner, Eliza W.</td>
</tr>
<tr>
<td>Gayen Nee Betal, Suhita</td>
</tr>
<tr>
<td>Gedman, Gregory L.</td>
</tr>
<tr>
<td>George, Annie</td>
</tr>
<tr>
<td>Ginsburg, Karen</td>
</tr>
<tr>
<td>Gogo, Seema</td>
</tr>
<tr>
<td>Gold, Jessica M.</td>
</tr>
<tr>
<td>Goldman, Leigh</td>
</tr>
<tr>
<td>Graber, Evan</td>
</tr>
<tr>
<td>Green, Nicole</td>
</tr>
<tr>
<td>Gupta, Ashish O.</td>
</tr>
<tr>
<td>Guzman, Alison S.</td>
</tr>
<tr>
<td>Handa, Deepali</td>
</tr>
<tr>
<td>Harley, Jennifer F.</td>
</tr>
<tr>
<td>Haong, Truc</td>
</tr>
<tr>
<td>Hogan, Amnieke</td>
</tr>
<tr>
<td>Howell, Heather B.</td>
</tr>
<tr>
<td>Hussain, Naveed</td>
</tr>
<tr>
<td>Ivahn, Yaron</td>
</tr>
<tr>
<td>Jack, Richard A.</td>
</tr>
<tr>
<td>Jaecle Santos, Lane J.</td>
</tr>
<tr>
<td>Jackson, E.A.</td>
</tr>
<tr>
<td>Jimenez, Manuel</td>
</tr>
<tr>
<td>Kaari, Vaneet K.</td>
</tr>
<tr>
<td>Kamimura-Nishimura, Kelly</td>
</tr>
<tr>
<td>Kanimity, Ranjith</td>
</tr>
<tr>
<td>Kankipati, Stanka Madhu</td>
</tr>
<tr>
<td>Karnati, Sreenivas</td>
</tr>
<tr>
<td>Kase, Jordan S.</td>
</tr>
<tr>
<td>Kaur, Ishminder</td>
</tr>
<tr>
<td>Kehler, Erica</td>
</tr>
<tr>
<td>Kelly, Jennifer</td>
</tr>
<tr>
<td>Kelly, Barbara A.</td>
</tr>
<tr>
<td>Kelly, Shareen F.</td>
</tr>
<tr>
<td>Khaira, Sharmeel</td>
</tr>
<tr>
<td>Khan, I.</td>
</tr>
<tr>
<td>Khattra, Mona</td>
</tr>
<tr>
<td>King, Michelle W.</td>
</tr>
<tr>
<td>Kirtok, Necla</td>
</tr>
<tr>
<td>Kovatch, Kevin J.</td>
</tr>
<tr>
<td>Krastimeno, Panagiotis</td>
</tr>
<tr>
<td>Krishna, Sushma</td>
</tr>
<tr>
<td>Kumar, Vasanth H.S.</td>
</tr>
<tr>
<td>Kusulas, Matthew P.</td>
</tr>
<tr>
<td>LaBarge, Lara R.</td>
</tr>
<tr>
<td>Lahoti, Amit</td>
</tr>
<tr>
<td>Lakshminirusinga, Satyan</td>
</tr>
<tr>
<td>Lang, Sean M.</td>
</tr>
<tr>
<td>Langhan, Melissa L.</td>
</tr>
<tr>
<td>Langsd-Barlow, Allison</td>
</tr>
<tr>
<td>Latuga, M. Susan</td>
</tr>
<tr>
<td>Lawhon, Gretchen</td>
</tr>
<tr>
<td>Leafe, Morgan</td>
</tr>
<tr>
<td>Lee, Ben H.</td>
</tr>
<tr>
<td>Leon-Hernandez, Angela</td>
</tr>
<tr>
<td>Levit, Orly L.</td>
</tr>
<tr>
<td>Lin, Elaine</td>
</tr>
<tr>
<td>Lizano Santamaria, Ramiro W.</td>
</tr>
<tr>
<td>London, Genevieve</td>
</tr>
<tr>
<td>Maar, Nisreen S.</td>
</tr>
<tr>
<td>Madera, Laura</td>
</tr>
<tr>
<td>Madris, Brandon</td>
</tr>
<tr>
<td>Maher, Jennifer L.</td>
</tr>
<tr>
<td>Malaeb, Shadi</td>
</tr>
<tr>
<td>Malhotra, Y.</td>
</tr>
<tr>
<td>Marchese, Ronald F.</td>
</tr>
<tr>
<td>Mathew, Bobby</td>
</tr>
<tr>
<td>Mccolgan, Maria A.</td>
</tr>
<tr>
<td>Mccolgan, Maria D.</td>
</tr>
<tr>
<td>McCulloh, Russell J.</td>
</tr>
<tr>
<td>McGovern, Jessica M.</td>
</tr>
<tr>
<td>McKinsey, Scarlett</td>
</tr>
<tr>
<td>Meerkov, Meera S.</td>
</tr>
<tr>
<td>Melendi, Misty</td>
</tr>
<tr>
<td>Memon, Naureen</td>
</tr>
<tr>
<td>Mekinit, Ogechukwu R.</td>
</tr>
<tr>
<td>Miano, Danielle I.</td>
</tr>
<tr>
<td>Minkowitz, Emma</td>
</tr>
<tr>
<td>Misfeld, Amanda A.</td>
</tr>
<tr>
<td>Moonthag, Tazuddina A.</td>
</tr>
<tr>
<td>Moore, Lakshmi A.</td>
</tr>
<tr>
<td>Mustaki, Ulises</td>
</tr>
<tr>
<td>Nair, Jayasree</td>
</tr>
<tr>
<td>Narayana, S.</td>
</tr>
<tr>
<td>Nawah, Ursula</td>
</tr>
<tr>
<td>Nayak, Sujir Prittha</td>
</tr>
<tr>
<td>Nguyen, Margaret</td>
</tr>
<tr>
<td>O’Connor, Katherine</td>
</tr>
<tr>
<td>O’Donnell, Elizabeth</td>
</tr>
<tr>
<td>Olsiri, Anthony</td>
</tr>
<tr>
<td>Pacella, Marisa J.</td>
</tr>
<tr>
<td>Parow, Aimee M.</td>
</tr>
<tr>
<td>Patel, Aarti</td>
</tr>
<tr>
<td>Patel, Bhavi</td>
</tr>
<tr>
<td>Patel, Riddibben</td>
</tr>
<tr>
<td>Patil, Ameya P.</td>
</tr>
<tr>
<td>Paul, Erin A.</td>
</tr>
<tr>
<td>Pecker, Lydia</td>
</tr>
<tr>
<td>Perez, Sammir</td>
</tr>
<tr>
<td>Phan, Thao-Ly T.</td>
</tr>
<tr>
<td>Pierce, Leslie M.</td>
</tr>
<tr>
<td>Pierro, Joanna</td>
</tr>
<tr>
<td>Piraique, Jacqueline</td>
</tr>
<tr>
<td>Piv, Y.</td>
</tr>
<tr>
<td>Pollock, Abigail C.</td>
</tr>
<tr>
<td>White, Kimberly M.R.</td>
</tr>
<tr>
<td>Wiegel, Dorothea</td>
</tr>
<tr>
<td>Williams, Monica L.</td>
</tr>
<tr>
<td>Winter, Michael A.</td>
</tr>
<tr>
<td>Yahr, Ashlin</td>
</tr>
<tr>
<td>Yamamoto, Yuka</td>
</tr>
<tr>
<td>Yamamoto, Yuka</td>
</tr>
<tr>
<td>Zubairi, Hijab</td>
</tr>
<tr>
<td>Zubairi, Hijab</td>
</tr>
<tr>
<td>Abstract Presenter Index</td>
</tr>
</tbody>
</table>

**Index numerals refer to the Abstract number, not the page number.**

**Only Presenting Abstract Authors are included in the Index.**
SAVE THE DATES!

26TH Annual ESPR Meeting
March 21 - 23, 2014
Philadelphia, PA

ESPR Program Office
3400 Research Forest Drive, Ste. B-7
The Woodlands, TX 77381
Email: espr-info@aps-spr.org
Phone: 281-419-0052
Web: www.aps-spr.org/ESPR

Photo Credits:
Roy Tennant 2012