AAP Section on Emergency Medicine
Scientific & Educational Program Schedule
Abstract & Poster Presentations

AAP National Conference & Exhibition
October 1-4, 2010
San Francisco, CA

Updated 8-23-10
AAP Section on Emergency Medicine Schedule

FRIDAY, OCTOBER 1, 2010
9:00 AM – 7:00 PM
(H0010) – MOSCONE CONVENTION CENTER, ROOM 104

Section on Emergency Medicine Scientific Abstract, Educational Program & Reception
The morning session will include presentation by two experts who will review recent literature, common uses and challenges for use of ultrasound in the pediatric ED while minimizing risk to patients. The afternoon session will include presentation of scientific research abstracts, posters, the 2010 Ken Graff Young Investigator Award, and results from the 2008 Ken Graff research project. The session will conclude with a one-hour reception for Section members to include abstract awards – Willis Wingert, Overall Best Paper, and Best Poster – as well as plenty of time to meet faculty and network with colleagues.

SUBCOMMITTEE ON FELLOWSHIP PROGRAM DIRECTORS WORK GROUP MEETING
(INVITATION ONLY) – ROOM 121-125
7:30 – 9:00 am Colette Mull, MD, FAAP/Michele Nypaver, MD, FAAP

COMMITTEE FOR OUR FUTURE PROGRAM
9:00 am – 12:00 pm All About Ultrasound in the Pediatric Emergency Department
Lei Chen, MD, FAAP
Stephanie Doniger, MD, FAAP
Jason Levy, MD

12:00 pm – 1:00 pm Lunch Break

SCIENTIFIC ABSTRACT PRESENTATIONS, POSTERS, AWARDS

1:00 – 1:05 pm Welcome
Steve Rogers, MD, FAAP

1:05 – 1:10 pm Introduction
Ron Paul, MD, FAAP

1:10 – 1:15 pm Presentation of Ken Graff Award 2010
Recipient: Kari Posner, MD
Presented by: Marc Gorelick, MD, MSCE, FAAP

1:15 – 1:30 pm 2008 Ken Graff Research Project Report: Randomized, Double Blind, Placebo Controlled Trial of Daily Montelukast for Treatment of Viral Bronchiolitis
Frank Petruzella, MD

1:30 – 3:30 pm Abstract Session I
Moderators: Donna Moro-Sutherland, MD, FAAP & In Kim, MD, FAAP

1. 1:30 pm #9281 Prashant Mahajan, MD, MPH, MBA, FAAP
Spinal Cord Injury without Radiologic Abnormality in Magnetic Resonance Imaging Era

2. 1:45 pm #9771 Melissa Langhan, MD, FAAP
Capnography Improves Time to Correction of Endotracheal Tube Dislodgement by Prehospital Providers

Note: Room locations are subject to change. Double-check on-site.
3. 2:00 pm  #11740  Jonathan E. Shoag, MD
Development of a Scoring System to Predict Ovarian Torsion in Pediatric Patients
Using a Logistic Regression Model

4. 2:15 pm  #10546  Nicole Adelaide Green, MD
Emergency Severity Index Version 4 Predicts Visit Outcome and Resource Utilization
in a Pediatric Emergency Department

5. 2:30 pm  #9920  Nadine Aprahamian, MD
First Time Focal Seizure and Emergent Neuroimaging-Stratifying the Risk

6. 2:45 pm  #11686  Esther M. Sampayo, MD, MPH, FAAP
Initiation of Inhaled Corticosteroids After a Pediatric Emergency Visit for Asthma:
A Randomized Clinical Trial

7. 3:00 pm  #10662  Matthew P. Gray, MD
A Systematic Review and Meta-Analysis of Recurrent Intussusception After Successful
Enema Reduction

8. 3:15 pm  #9960  Neil A. Evans, MD, FAAP
A Prospective Evaluation of the Accuracy of Weight Estimation Using the Broselow
Tape in Overweight and Obese Pediatric Patients in the Emergency Department

3:30 pm  

Coffee Break

3:30 – 4:15 pm  

Poster Presentations

#9930  Jeranil Nunez, MD
Survey of Dehydration Treatment Practices Among Pediatric-Trained and Non-
Pediatric Trained Emergency Physicians

#10075  Kathleen A. Lillis, MD, FAAP
Incident Reports From Six Pediatric Emergency Departments in a Research Network

#10084  David O. Kessler, MD
The Effect of A Simulation-based Mastery Learning Intervention On Pediatric Interns
Procedural Skills Performance: A Multicenter Randomized Trial

#10422  Atim Uya, MD, FAAP
Training Pediatric Emergency Medicine Fellows in Airway Ultrasonography Using An
Adult Cadaver Model

#11149  Lori E. Rutman, MD, MPH
Emergency Department-Based Health Insurance Enrollment for Kids: Does Site of
Enrollment Impact Retention and Utilization?

#11332  Brad Sobolewski, MD
Predictors of Mental Health Follow up Among Adolescents with Suicidal Ideation
After Emergency Department Discharge

#11420  Anita Roy, BS, MD, MPH
Predictors of Best Patient Satisfaction Scores in a Pediatric Emergency Department

#11632  Nazli Ghafouri, MD
Comparison of One-Dose and Two-Dose Regimes of Oral Dexamethasone in the
Management of Acute Asthma Exacerbations in the Pediatric Emergency Department

Note: Room locations are subject to change. Double-check on-site.
AAP Section on Emergency Medicine Program Schedule

#11663 Thomas J. Abramo, MD, FAAP
Accessory Muscle Use in Pediatric Patients with Acute Asthma Is Associated with Reduced Lung Function and Decision to Hospitalize

#11795 Jerri A. Rose, MD
Comparison of a Breath-Actuated Nebulizer Versus a Conventional Continuous-Output Nebulizer in Treating Acute Asthma in a Pediatric Emergency Department: An Ongoing Randomized Controlled Trial

4:15 – 6:00 pm Abstract Session II
Moderators: Marie Lozon, MD, FAAP & Manish Shah, MD, FAAP

9. 4:15 pm #9881 Philip Spandorfer, MD, FAAP
Recombinant Human Hyaluronidase-Facilitated Subcutaneous Vs Intravenous Fluid Administration for Rehydration Therapy in Children

10. 4:30 pm #9980 Ami P. Shah, MD, MPH
Occurrence of Inpatient Condition A or C Events After Admission From a Pediatric Emergency Department: Effect of An "ED Time-out Vital Sign Review" Process

11. 4:45 pm #11087 Maria Y. Kwok, MD, MPH
Improving Chronic Asthma Care During An Acute Visit: An Interactive Asthma Kiosk in the Emergency Department

12. 5:00 pm #10228 Mindy M. Jacques, MD
A Systematic Review: Low Risk Criteria in the Evaluation of the Febrile Neonate

13. 5:15 pm #10314 Aaron J. Reitman, DO
Procalcitonin Compared to C-Reactive Protein in Detecting Serious Bacterial Infections in Infants

14. 5:30 pm #11513 Halden F. Scott, MD
Early Physical Exam Findings Are Not Sufficient to Predict Illness Severity in Children with Sepsis in the Pediatric Emergency Department

15. 5:45 pm #11593 Melissa Guerra-Wallace, MD
"Just-in-Time" Lumbar Puncture Simulation Training for Residents in the Pediatric Emergency Department

SECTION ON EMERGENCY MEDICINE RECEPTION – ROOM 300

6:00 – 7:00 pm Presentation of Abstract Awards – Willis Wingert, Overall Best Paper, Best Poster Ron Paul, MD, FAAP

Note: Room locations are subject to change. Double-check on-site.
## AAP Section on Emergency Medicine Program Schedule

### SATURDAY, OCTOBER 2, 2010
8:00 AM – 5:30 PM
(H1019) – MOSCONE CONVENTION CENTER, ROOM 104

### Section on Emergency Medicine Business Meeting, Subcommittee Reports, EmergiQuiz, PEMpix Photo Competition, Distinguished Service Award, New Award & Educational Sessions

The morning session includes EmergiQuiz presentations and awards, the SOEM business meeting with reports from the Executive Committee and all subcommittee chairs, the PEMpix photo competition, and presentation of the Jim Seidel Distinguished Service Award. A new award in honor of Steve Miller for Excellence in Education & Mentorship will also be presented. In addition, two educational sessions are planned. The first will address the state of patient safety in the ED and issues and potential solutions related to lack of standardization for pediatric medications. The second features an expert panel will review current literature and common surgical emergencies presenting to the ED and will compare approaches to management, which often cause controversy, from both the medical and surgical perspectives.

### SECTION ON EMERGENCY MEDICINE BUSINESS MEETING, AWARDS, EDUCATION SESSIONS

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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| 8:00 – 9:00 am | EmergiQuiz Presentations  
Christine Cho, MD, MPH, FAAP                                                             |
| 9:00 – 9:30 am | Business Meeting & Subcommittee Reports  
Laura Fitzmaurice, MD, FAAP – SOEM Executive Committee Chair                           |
| 9:30 – 9:45 am | Presentation of Jim Seidel Distinguished Service Award 2010  
Recipient: Richard M Ruddy, MD, FAAP  
Presented by: Connie M. McAneney, MD, FAAP  
Sponsored by Cadmus Communications & Elsevier Inc |
| 9:45 – 10:00 am | Presentation of Steve Miller Award for Excellence in Education & Mentorship in  
Pediatric Emergency Medicine (NEW)  
In Honor of: Michael Shannon, MD, FAAP  
Introduced by: Steve Selbst, MD, FAAP  
Presented by: TBD  
Accepted by: TBD |
| 10:00 – 10:15 am | Coffee Break                                                                              |
| 10:15 – 10:30 am | PEMPix Photo Competition  
Cara Doughty, MD, FAAP                                                                    |
| 10:30 – 12:00 pm | First Do No Harm: Keeping Your Patients Safe in the Emergency Department  
Kathy Shaw, MD, MSCE, FAAP  
Karen Frush, MD, FAAP                                                                   |
| 12:00 – 1:30 pm | Lunch Break                                                                               |

### COMMITTEE FOR OUR FUTURE SUBCOMMITTEE MEETING – ROOM 250-262

<table>
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<tr>
<th>Time</th>
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| 12:00 – 1:30 pm | EmergiQuiz Presentation  
Christine Cho, MD, MPH, FAAP                                                             |

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AAP Section on Emergency Medicine Program Schedule

2:30 – 2:45 pm  Coffee Break

2:45 – 3:00 pm  EmergiQuiz Awards Presentation
Christine Cho, MD, MPH, FAAP
Best Discussion of an Unknown Case
Best Case Presentation
Sponsored by Elsevier Inc on behalf of Clinical Pediatric Emergency Medicine

3:00 – 5:30 pm  Controversies in Pediatric Surgery Presenting to the Emergency Department
David Tuggle, MD, FAAP
Brendan Campbell, MD, MPH

DISASTER PREPAREDNESS SUBOMMITTEE MEETING – ROOM 113
12:00 – 1:30 pm  Marie Lozon, MD, FAAP, Chair

SUBCOMMITTEE ON FELLOWSHIP DINNER MEETING (INVITATION ONLY)
6:00 – 9:00 pm  Colette Mull, MD, FAAP & Michele Nypaver, MD, FAAP, Co-Chairs
Deborah Hsu, MD, FAAP, Chair-Elect

SUNDAY, OCTOBER 3, 2010
8:30 AM – 11:00 AM
(H2021) – MOSCONE CONVENTION CENTER, ROOM 104

Section on Emergency Medicine Educational Program
In this SOEM educational session, experts in the field of pediatric emergency medicine and the American Board of Pediatrics will review current core competencies in the field and how those have changed from prior requirements. Recommendations to ensure future certification for each member of the specialty will be offered. In addition, there will be a review of the top 10 pediatric emergency medicine articles for the past year.

PEDIATRIC EMERGENCY MEDICINE IN NON-CHILDREN’S HOSPITALS
SUBOMMITTEE MEETING – ROOM 114
7:00 – 8:30 pm  Donna Moro-Sutherland, MD, FAAP, Chair

SECTION ON EMERGENCY MEDICINE EDUCATIONAL SESSION

8:30 – 10:00 am  Are you Good Enough? Assessing and Maintaining Competency in Pediatric Emergency Medicine
Joan Bothner, MD, FAAP
Naghma Khan, MD, FAAP

10:00 – 10:15 am  Coffee Break

10:15 – 11:00 am  A Review of the Top 10 PEM Articles of 2009/2010
James F. Wiley II, MD, MPH, FAAP

PEDIATRIC EMERGENCY MEDICINE COLLABORATIVE RESEARCH COMMITTEE MEETING (INVITATION ONLY) – ROOM 250-262
11:30 – 1:00 pm  Charles Mactus, MD, MPH, FAAP & David Schnadower, MD, MPH, FAAP

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AAP Section on Emergency Medicine Program Schedule

MONDAY, OCTOBER 4, 2010
8:30 AM – 12:00 PM
(H3024) – MARRIOTT MARQUIS, ROOM GOLDEN GATE A-B

Joint Section on Emergency Medicine, Cardiology and Cardiovascular Surgery, Critical Care, and Hospital Medicine Program: Resuscitation Controversies 2010
This is a multi-section joint program designed to update cardiologists, intensivists, hospitalists, pediatricians, and emergency medicine physicians on important new clinical recommendations from the American Heart Association (AHA) on cardiopulmonary resuscitation (CPR). Topics to be included are the physiology of CPR, use of hypothermia, controversies of vasopressin versus epinephrine, goal directed therapy in shock, and CPR in children with congenital heart disease. The rationale of changes in the AHA Pediatric Advance Life Support to these topics will be discussed including the evidence based grading used to evaluate the literature.

“Resuscitation Controversies 2010: American Heart Association Guideline Revisions for 2010”

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>8:30 - 8:35 am</td>
<td>Introduction</td>
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<td><em>John Straumanis, MD, FAAP</em></td>
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<td>8:35 - 9:05 am</td>
<td>The Physiology of CPR: How does it work?</td>
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<td><em>Marc D. Berg, MD, FAAP</em></td>
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<tr>
<td>9:05 - 9:40 am</td>
<td>Hypothermia: To chill out or not?</td>
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<td><em>Ericka Fink, MD, FAAP</em></td>
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<td>9:40 - 10:15 am</td>
<td>Ventilation and CPR: Do we go straight to “C”?</td>
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<td><em>Marc D. Berg, MD, FAAP</em></td>
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<tr>
<td>10:15 - 10:30 am</td>
<td>Coffee Break</td>
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<tr>
<td>10:30 - 11:05 am</td>
<td>Goal Directed Therapy for Resuscitation: Where’s the end zone?</td>
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<td><em>Todd J. Kilbaugh, MD, FAAP</em></td>
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<tr>
<td>11:05 - 11:40 am</td>
<td>Resuscitation in Congenital Heart Disease: Is it different if they are supposed to be blue?</td>
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<td><em>Brad Marino, MD, FAAP</em></td>
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<tr>
<td>11:40 - 12:00 pm</td>
<td>Panel Discussion</td>
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<td></td>
<td><em>All speakers</em></td>
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Registration for the AAP National Conference & Exhibition begins in June 2010 at [www.aap.org/nce](http://www.aap.org/nce)


*Note: Room locations are subject to change. Double-check on-site.*
Other AAP Section on Emergency Medicine Sponsored Sessions

SATURDAY, OCTOBER 2, 2010
8:30 AM – 9:15 AM (F1046)

Methamphetamine and Children in our Communities
Karen Farst, MD, FAAP

This session will discuss methamphetamine production and prevalence in our communities and the impact of meth exposure on children of all ages. The warning signs of metn use/abuse by parents will be discussed as well as how to evaluate and treat children who are found in homes where meth is produced or used.

SUNDAY, OCTOBER 3, 2010
8:30 AM – 10:00 AM (W2031) – Repeats as W3031

Office Emergency Procedures
Alan Johnson, MD, FAAP and Karim Mansour, MD

This session will review common pediatric emergency scenarios that may occur in the pediatrician’s office.

MONDAY, OCTOBER 4, 2010
8:30 AM – 10:00 AM (X3012)

Poisons That Kill – Antidotes That Save
Milton Tenenbein, MD, FAAP

This presentation will review the presentation and management of acetaminophen, methanol/ethylene glycol, sulfonylurea, and iron poisonings with a focus on indications, dosing, and duration of antidote administration. In some instances there are specialized issues regarding these antidotes in young children versus adolescents. Many of these considerations do not appear in routine reference sources.

TUESDAY, OCTOBER 5, 2010
2:00 PM – 3:30 PM (F4047)

Dermatologic Conditions: Is It Abuse or Not?
Kenneth Feldman, MD, FAAP and Jonathan Thackeray, MD, FAAP

Discussion of how accidental burns can be distinguished from inflicted burns as well as how best to determine when an “accident” is more likely the result of lack of adequate supervision (i.e., neglect) and when to report to authorities. Common mimics of burns will be addressed as well as how to approach a burn evaluation in a multidisciplinary fashion. Appropriate anticipatory guidance and prevention strategies will also be covered.

Note: Room locations are subject to change. Double-check on-site.
1. (9281) Spinal Cord Injury without Radiologic Abnormality (SCIWORA) in Magnetic Resonance Imaging (MRI) ERA

Prashant Mahajan, MD, MPH, MBA, FAAP,1 David M. Jaffe, MD, FAAP,2 Cody S. Olsen, MS,3 Jeffrey Leonard, MD,4 Lise E. Nigrovic, MD,5 Alexander J. Rogers, MD,6 Nathan Kuppermann, MD, MPH,7 Julie Leonard,7 for The Pecarn.8
1Pediatrics, Children's Hospital of Michigan, Detroit, MI; 2Department of Pediatrics, St. Louis Children's Hospital & Washington University School of Medicine, St. Louis, MO; 3Department of Pediatrics, University of Utah School of Medicine, Salt Lake City, UT; 4Department of Neurosurgery, St. Louis Children's Hospital and Washington University School of Medicine, St. Louis, MO; 5Division of Emergency Medicine, Children's Hospital Boston and Harvard Medical School, Boston, MA; 6Departments of Emergency Medicine and Pediatrics, University of Michigan Medical Center and University of Michigan School of Medicine, Ann Arbor, MI; 7University of California, Davis School of Medicine, Sacramento, CA; 8C-spine working group.

Purpose: The term SCIWORA was introduced prior to widespread use of MRI in the evaluation of spinal injuries. The objective of our study was to compare presenting characteristics and outcomes of children managed with MRI and diagnosed as SCIWORA to those with isolated spinal cord injuries on MRI.

Methods: We performed a retrospective cohort study of children <16 years of age with blunt cervical spine injury, who presented to participating PECARN hospitals from 1/00-12/04. Cases were identified by query of electronic databases and verified on structured chart review. For this substudy, we only included patients who had MRIs performed. We excluded patients with bony and/or ligamentous injuries on radiological imaging. Children were assigned to the SCIWORA group if diagnosed by a neuro-consultant and had a normal MRI. Isolated spinal cord injury on MRI was defined as any non-bony and/or non-ligamentous spinal cord abnormality diagnosed on MRI. We compared children in these two groups for differences in presenting characteristics, interventions and neurological outcomes.

Results: 540 children had cervical spine injuries, of whom 297 (55%) were imaged with MRI. Of these, 60 (20%) had SCIWORA and 15 (5%) had an isolated spinal cord injury. The table below compares their presenting characteristics:

<table>
<thead>
<tr>
<th></th>
<th>SCIWORA n=60</th>
<th>Isolated spinal cord injury n=15</th>
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<tbody>
<tr>
<td>Median age (IQR)</td>
<td>12.6 (11, 14)</td>
<td>8.7 (4, 14)</td>
</tr>
<tr>
<td>MECHANISM OF INJURY*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVC</td>
<td>0 (0%)</td>
<td>3 (20%)</td>
</tr>
<tr>
<td>Fall/Dive</td>
<td>15 (25%)</td>
<td>7 (47%)</td>
</tr>
<tr>
<td>Sports</td>
<td>31 (52%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Other</td>
<td>14 (23%)</td>
<td>5 (33%)</td>
</tr>
<tr>
<td>CLINICAL PRESENTATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altered mental status*</td>
<td>2 (3%)</td>
<td>7 (47%)</td>
</tr>
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Note: Room locations are subject to change. Double-check on-site.
Children with isolated spinal cord injury were more likely to have persistent neurological deficits at discharge (67% vs. 7%) and to require surgical stabilization of the spinal column (20% vs. 0%).

Conclusions: There were differences in the history, clinical presentation, and outcomes in patients with SCIWORA and isolated spinal cord injuries. Our data suggest that the diagnosis of SCIWORA should be restricted to those children with persistent neurological deficits referable to the cervical spinal cord and no imaging abnormalities on MRI.

2. (9771) Capnography Improves Time to Correction of Endotracheal Tube Dislodgement by Prehospital Providers

Melissa Langhan, MD, FAAP,1 Kevin Ching, MD,2 Michelle Alletag, MD,1 Payal Kadia, MD,3 Lei Chen, MD,1 1Pediatric Emergency Medicine, Yale University School of Medicine, New Haven, CT; 2Pediatric Emergency Medicine, New York University; 3Pediatrics, Yale University School of Medicine, New Haven, CT.

Purpose: Dislodgement of endotracheal tubes (ETT) during patient transport is not uncommon. Unrecognized ETT dislodgement puts patients at risk of hypoxemia and cardiac arrest. Paramedics work in difficult and noisy environments in which intubated patients are routinely being moved and at risk of dislodgement. Capnography continuously monitors patient ventilation and shows immediate changes with ETT dislodgement unlike pulse oximetry and cardiac monitors. However, this equipment is not routinely available to prehospital providers. The objective of this study was to determine the difference in time to correction of ETT dislodgement with or without the use of capnography in addition to standard monitoring devices.

Methods: A prospective randomized controlled study was performed. Paramedics participated in a simulated transport of a child during which the ETT became dislodged. Standard cardiac monitoring and pulse oximetry were available to all subjects. Subjects were randomized whether continuous capnography was available. A high-fidelity manikin was used for this study. All sessions were video-recorded. The patient scenario and environment were identical in both groups aside from capnography. At the time of simulated dislodgement, there was an immediate loss of breath sounds and chest rise in both groups, as well as loss of capnograph waveform for the cases. If correction did not occur, there was a slow decline in pulse oximetry and heart rate. Our primary outcome was time to correction of ETT dislodgement, defined as removal of the ETT, bag-valve mask ventilation around the ETT or repositioning of the ETT under direct visualization. If correction of the dislodgement did not occur within 10 minutes, at which point the simulated patient was severely hypoxic and bradycardic, the simulation was ended. Demographic information and perceived comfort with capnography was collected at the end of each scenario.

Results: Forty subjects were enrolled in this study; 3 were excluded due to video malfunction, removal of ETT prior to dislodgement, and subject withdrawal. Eighteen subjects were randomized to the capnography group (cases) and nineteen subjects were randomized to the standard monitor group (controls). One paramedic in each group did not achieve our outcome of interest by 10 minutes. The mean time to correction was 156 seconds for the cases vs. 234 seconds for the controls (p=.04). There were no significant differences between the 2 groups in terms of years of prior paramedic

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experience, perceived comfort or prior use with capnography. For all subjects, there were no differences in the time to correction of ETT dislodgement based on years of experience (188s vs. 198s), comfort with capnography (197s vs. 194s), or by training institution (195s vs. 197s).

Conclusions: The use of capnography significantly improves the time to correction of ETT dislodgement by prehospital providers. This monitoring device should be used routinely during patient transport.

3. (11740) Development of a Scoring System to Predict Ovarian Torsion in Pediatric Patients Using a Logistic Regression Model

Jonathan E. Shoag, MD, Brian J. Minnillo, MD, Rogerio H. Sayao, Jose A.S. Cruz, Hiep T. Nguyen, MD. Urology, Children's Hospital Boston, Boston, MA.

Purpose: Diagnosing ovarian torsion in the pediatric population remains challenging. There is a dearth of known history and physical exam findings associated with torsion. The substantial morbidity of delayed diagnosis has led to the widespread reliance on ultrasound and Doppler imaging modalities when torsion is suspected. We identified characteristics obtained from patient history that would predict torsion. Then, we sought to generate a clinically useful scoring system to aid in assessing the likelihood of a patient having torsion.

Methods: We have identified 276 pediatric patients (mean age 14.5 years, range 1-22) who presented to the emergency room and were suspected of having ovarian torsion. These patients were seen at our institution between 2007 and 2009. Of these, 273 (99%) underwent ultrasound evaluation, 68 (25%) underwent surgical evaluation for torsion, and ultimately 46 (16.7%) were confirmed to have ovarian torsion. A retrospective chart review yielded 13 patient characteristics that were analyzed using univariate and multivariate logistic regression. Finally, multiple multivariate models were generated to aid in a bedside diagnosis.

Results: On univariate analysis, torsion positively correlated with pelvic pain (OR 8.0;95% CI 1.8-34.4), previous torsion (OR 5.4;95% CI 1.05-27.7), and gastrointestinal symptoms (OR 5.3;95% CI 2.0-14.0). The patient's age (coefficient-0.131;95% CI -1.17 to -0.08) being post menarche (OR .11;95% CI .05-.23), and being sexually active (OR .13;95% CI .04-.43) significantly decreased the odds of intra-operatively confirmed torsion. Multivariate regression utilizing all 6 characteristics generated an AUC of .91 (95% CI; 0.86 O 0.96) on ROC analysis, with gastrointestinal symptoms being significantly independentely correlated with torsion. A model containing only gastrointestinal symptoms, reproductive age, and sexual activity had an AUC of .85 on ROC analysis (95% CI 0.78664 - 0.91061) with all 3 variables being statistically significant. A scoring system for this model was generated, such that a patient score was the sum of the following: +3 for GI symptoms, -2 for being of reproductive age, and -1 for being sexually active. Using this simple system (AUC .85; 95% CI .77 - .90), we found that in our population none of the patients receiving scores below 0 were found to have torsion on surgical evaluation. We were therefore able to determine that use of this scoring system (with a cutoff of 0 such that no torsions are missed) would have resulted in a 34% reduction (50/148) in the number of ultrasounds performed, and prevented 9% (2/22) of unnecessary surgical evaluations.

Conclusion: We have identified six risk factors for ovarian torsion. Using these risk factors, we generated models that are highly predictive of torsion as well as a clinically useful scoring system for predicting torsion at the bedside. Further prospective studies will be needed to confirm these findings and their clinical utility.

4. (10546) Emergency Severity Index Version 4 Predicts Visit Outcome and Resource Utilization in a Pediatric Emergency Department

Nicole Adelaide Green, MD, Yamini Durani, Deena Brecher, Magdy W. Attia. Emergency Medicine, A I duPont Hospital for Children, Wilmington, DE.

Purpose: The Emergency Severity Index version 4 (ESI v.4) is the most recently implemented 5-level triage system, yet its validity for use in the pediatric population has not been extensively established. Levels 1 and 2 represent highest acuity,

Note: Room locations are subject to change. Double-check on-site.
while the level 3 designation is intended to predict patients requiring many resources. ESI v 4 categorizes patients into 3 groups based on anticipated number of resources utilized in the ED: 0, 1 or > 1. The goal of this study is to determine if ESI v. 4 is a valid triage tool in pediatric emergency department triage. We are testing the hypothesis that the ESI v. 4 algorithm is valid in predicting hospital admission, emergency department (ED) lengths of stay (LOS) and number of resources utilized.

Methods: We conducted a retrospective chart review of 780 patients presenting to the ED at a pediatric tertiary care hospital. A sample size of 685 achieves 90% power to detect a minimum effect size of 0.15 using chi-square analysis for each outcome measurement with significance level of 0.05. Therefore every fifth patient presenting to the ED over a 1 month period (January 2010) was selected for data abstraction. Abstracted data included acuity level assigned by the triage nurse using ESI v.4 algorithm, disposition (admission vs. discharge), LOS, and number of resources utilized. To analyze the validity of ESI v.4, patients were divided into 2 groups for comparison; higher acuity patients (ESI scores 1, 2 and 3) and lower acuity patients (ESI scores 4 and 5). Pearson’s chi-square analysis was performed for nominal variables. For continuous variables we conducted a comparison of means based on parametric distribution of variables.

Results: The distribution of ESI scores among the 780 cases are as follows: ESI 1(2, 0.25%), ESI 2(73, 9.4%), ESI 3(289, 37%), ESI 4(251, 32%), and ESI 5(165, 21%). Hospital admission rates by ESI score are 1(100%), 2(42%), 3(14.9%), 4(1.2%), 5(0.6%). The admission rate of the higher acuity group (288/364, 79%) was significantly greater than the lower acuity group (415, 45%, p<0.001. The mean ED length of stay (minutes) for the higher acuity group was 364 (±SD 132) versus 143 (±SD 81) in the lower acuity group, p<0.001. The higher acuity group also had significantly greater use of resources than the lower acuity group, p<0.001. The percentage of low acuity patients receiving 0 resources was 54%, compared to only 26% in the higher acuity group. Conversely, a greater percent of higher acuity patients utilized many resources than the lower acuity cohorts, 43% versus 12%, p<0.001. This was true regardless of the number of resources utilized.

Conclusion: ESI v. 4 triage system is a valid predictor of hospital admission, ED length of stay and resource utilization in the pediatric population.

5. (9920) First Time Focal Seizure and Emergent Neuroimaging-Stratifying the Risk

Nadine Aprahamian, MD,1 Sanjay P. Prabh, MBBS, FRCP,2 Zujaja Sadiq, MD,1 Alcy Torres, MD,1 Marvin Harper, MD,1 Amir Kimia, MD,1 Emergency Medicine, Children's Hospital Boston, Boston, MA; 2Neuroradiology, Children's Hospital Boston, Boston, MA.

Purpose: Emergent neuro-imaging is often obtained in patients presenting with their first focal seizure. Current data suggests these patients are at high risk of having an intracranial lesion accounting for the focality of the seizure. Most patients get a definite imaging [MRI] despite the emergent imaging done in the emergency room. In this study we attempt to stratify the risk of an acute intra-cranial process requiring emergent intervention among patients with first time focal seizure.

Methods: A retrospective study of patients 1m-18y of age presenting with first time focal seizure to our emergency department [ED] from 1995-2010. Patient identification was performed using computer assisted screening tool followed by manual chart review. A pediatric neurologist read through 15% of the records to assure inter-reviewer agreement. We included all patients presenting with 1st time focal seizure who had head imaging within 24hrs of presentation. Exclusion criteria included known potentially progressive structural brain abnormality [preexisting tumor, AVM, head injury, tuberous sclerosis], a prior focal seizures, and patients in whom focality is hard to assess [hemiparesis, significant underlying neurologic disorder]. A concurrent febrile illness and prior non-focal seizures were not part of the exclusion criteria. Independent variables included age, gender, seizure characteristics, prior seizure history, predisposing factors, present illness, medications, physical exam laboratory and imaging findings, intervention/management and disposition. Dependent variable was any finding of imaging, further categorized as findings leading to an urgent neurosurgical or medical intervention, findings requiring further non-urgent intervention and normal studies. All available imaging studies were read by a pediatric neuro-radiologist. We also screened the records for delayed imaging results (>24h) as well as clinical follow up with the neurology team. A recursive partitioning model was used to stratify the risk for significant imaging findings.

Results: We have identified 516 patients who had either normal imaging or findings requiring urgent intervention, 240 (44%) were female and the median age was 3.9 years [1.5, 8.5]. Four hundred ninety six patients (92%) presented with their first time focal seizure. Attached is a recursive partitioning model.

Note: Room locations are subject to change. Double-check on-site.
Conclusion: Patients presenting with first time focal seizure, have a high incidence of serious intra-cranial pathology. A small subset of patients may be monitored pending their definite imaging and potentially avoid radiation exposure.

6. (11686) Initiation of Inhaled Corticosteroids After a Pediatric Emergency Visit for Asthma: A Randomized Clinical Trial

Esther M. Sampayo, MD, MPH, FAAP, Amber Chew, Joseph Mechak, F. Jonathan Skilton, Maryann Mazer, MD, PharmD, Richard Scarfone, MD, Joseph Zorc, MD, MSCE. Emergency Medicine, Children's Hospital of Philadelphia/ University of Pennsylvania School of Medicine, Philadelphia, PA.

Background: Recent national guidelines recommend emergency physicians consider initiating controller medications such as inhaled corticosteroids (ICS) for patients with persistent asthma. However, prescribing ICS at ED discharge occurs uncommonly and data are lacking to support this recommendation.

Purpose: To determine whether a prescription for ICS added to standard asthma ED discharge therapy for children with persistent asthma leads to ongoing ICS use and improved asthma outcomes as measured by patient report, pharmacy data, and PCP record review.

Methods: This randomized control trial enrolled children age 1-18 years who met criteria for persistent asthma but had not been prescribed controller medications prior to an acute asthma visit to an urban children’s hospital ED. Intervention subjects received a one month prescription for ICS in addition to standard asthma therapy, education, and discharge instructions. Follow-up phone interviews were conducted at 2 and 8 weeks after the ED visit. Pharmacy verification of a refill of a subsequent prescription for ICS was the primary outcome. Asthma symptoms, severity and quality of life were assessed as secondary outcomes. Outcomes were confirmed by PCP medical record and pharmacy record review.

Note: Room locations are subject to change. Double-check on-site.
Results: 151 subjects were enrolled and baseline measures of demographic, asthma history and severity were similar between study groups. Intervention group subjects were more likely to fill a prescription for an ICS during the 2 months after the ED visit compared to controls by both parental report (76% vs. 44%, p=0.001) and pharmacy confirmation (43% vs. 23%, p=0.01). For ICS prescriptions given by a PCP subsequent to the ED visit, there was no difference in the pharmacy fill rates between study groups (18% in both groups). Asthma-related quality of life was also similar between study groups.

Conclusion: For children with persistent asthma who had not been prescribed a controller medication prior to an ED visit, initiating ICS at ED discharge increased the rate of filling an ICS prescription. Subsequent ICS refills and short-term asthma-related quality of life did not appear to be increased by ED ICS prescription.

7. (10662) A Systematic Review and Meta-Analysis of Recurrent Intussusception After Successful Enema Reduction

Matthew P. Gray MD,1 Marc Gorelick,2 1Pediatrics, Medical College of Wisconsin Affiliated Hospitals, Milwaukee, WI; 2Department of Pediatric Emergency Medicine, Medical College of Wisconsin, Milwaukee, WI.

Background: It is common practice to hospitalize children for 24 to 48 hours after successful enema reduction of intussusception to observe for recurrence. The rate and timing of recurrences, however, are not well known.

Purpose: To determine the overall, 24-hour, and 48-hour rate of recurrence after enema reduction. We hypothesized that the 48-hour rate of recurrence after enema reduction is less than 5% and therefore small enough to allow outpatient management.

Methods: This was a systematic review and meta-analysis. We performed electronic searches of OVID Medline from 1950 to July, 2009. Search strategies were created using the search terms “intussusception,” “recurrence” and a pre-validated filter used to limit studies to children. Inclusion criteria included: 1.) Age 0-18 years 2.) Proven intussusception 3.) Enema reduction of intussusception 4.) Data to calculate rate of recurrence. Two reviewers independently evaluated titles and abstracts of articles retrieved from the initial search. All potentially relevant articles were retrieved in full and reviewed independently by both authors for final inclusion, with disagreement reconciled by consensus. Study quality was rated on a 10-point scale based on design, enrollment, definition of data source, data abstraction, and follow-up. Meta-analysis using a random effects model was used to calculate combined success and recurrence rates with 95% confidence intervals. Covariate meta-regression was used to identify sources of heterogeneity.

Results: A total of 261 studies were identified of which 61 met final inclusion criteria (55 retrospective, 49 consecutive enrollment). A total of 15,102 patients were reported with 836 excluded due to primary surgical treatment and 47 excluded for other reasons. Reduction methods were barium enema in 30%, non-barium/hydrostatic enema in 52%, and air enema in 18%.

Success Rates: The overall success rate for enema reduction was 72.8% (70.0%, 75.6%). Covariate meta-regression demonstrated significant heterogeneity based on enema modality: barium enema (p=0.003), hydrostatic enema (p=0.000), and air enema (p=0.129). Success rates by modality were: barium 63.6% (56.7%, 70.4%), hydrostatic 86.7% (79.4%, 94.0%), and 85.2% (80.6%, 89.8%)

Recurrence Rates: The overall recurrence rate of intussusception was 8.8% (7.7%, 9.9%). Meta-regression demonstrated significant heterogeneity based on developed versus developing country (p=0.004) and based on enema modality. Overall recurrence rates by location and modality were: developed 7.25 (5.8%, 8.6%), developing 10.5% (9.3%, 11.7%), barium 10.2% (8.7%, 11.7%), hydrostatic 7.1% (5.0%, 9.1%), and air 7.2% (4.8%, 9.6%). These associations were not present in the 24-hour and 48-hour recurrence rate analysis. The 24-hour recurrence rate was 2.4% (0.9%, 3.8%) and the 48-hour recurrence rate was 3.7% (2.2%, 5.3%)

Conclusions: Enema reduction of intussusception is highly successful and dependant on enema modality. Both the 24-hour and 48-hour recurrence rates are less than 5%. Based on rates of recurrence, outpatient management of successfully reduced intussusception should be considered.

Note: Room locations are subject to change. Double-check on-site.
8. (9960) A Prospective Evaluation of the Accuracy of Weight Estimation Using the Broselow Tape in Overweight and Obese Pediatric Patients in the Emergency Department

Neil A. Evans, MD, FAAP, Halim Hennes, MD, MS, FAAP. Pediatric Emergency Medicine, UT Southwestern/Children's Medical Center, Dallas, TX.

**Purpose:** Accurate weight estimation is an essential element in the critical care of acutely ill or injured children in the pediatric emergency department (ED). Weight is used to calculate medication dosage, fluid volume, and proper equipment size. Previous studies reported that visual estimations of a patient’s weight are often inaccurate. Hence, the Broselow tape (BT) was developed to assist in this challenging task when physically weighing the patient is not feasible. As the prevalence of overweight and obese children increases, weight estimation tools such as the BT should be evaluated for accuracy. Patients at the highest risk for error when using the BT are overweight or obese children. To date, no studies have evaluated the accuracy of the BT in estimating obese and overweight children’s weight in the ED. The purpose of this study was to determine the accuracy of weight estimation using the BT in overweight and obese children, as defined by their Body Mass Index (BMI), in the ED and develop an adjustment value for the BT.

**Methods:** During the study period all ambulatory patients presenting to the pediatric ED over 2 years old and with height < 146 cm (maximum length of the BT) were enrolled in the study. Caregivers completed demographic information and caregiver weight estimation. Patient’s height, weight, and abdominal circumference were obtained using calibrated devices. The patient’s weight was estimated using the BT while supine.

**Results:**

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Number of Patients n=108</th>
<th>Actual Weight Average (kg)</th>
<th>BT Estimated Average Weight (kg)</th>
<th>Range of BT Weight Underestimation (kg)</th>
<th>Mean Difference</th>
<th>95% CI</th>
<th>Two-Tailed p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>56</td>
<td>20.89</td>
<td>20.52</td>
<td>N/A</td>
<td>0.37</td>
<td>-0.30 - 1.05</td>
<td>0.27</td>
</tr>
<tr>
<td>Overweight</td>
<td>20</td>
<td>28.88</td>
<td>24.10</td>
<td>1.4 - 11</td>
<td>4.78</td>
<td>3.46 - 6.09</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Obese</td>
<td>32</td>
<td>38.38</td>
<td>26.66</td>
<td>2.8 - 31</td>
<td>11.73</td>
<td>9.5 - 13.95</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

**Conclusion:** The Broselow tape underestimates the weight of pediatric overweight and obese children by 16.6% and 30.5% respectively. This underestimation in weight can lead to dosage errors of medication used for resuscitation or sedation, in fluid administration, and in equipment size used. An adjustment factor for this patient population should be added to the Broselow estimated weight.

*Note: Room locations are subject to change. Double-check on-site.*
9. (9881) Recombinant Human Hyaluronidase-Facilitated Subcutaneous Vs Intravenous Fluid Administration for Rehydration Therapy in Children

Philip Spandorfer, MD, FAAP,1 George Maher, DO,2 Coburn H, Allen, MD,3 Keith Friend, MD,4 George Harb, MD, MPH,4
1Children's Healthcare of Atlanta at Scottish Rite, Atlanta, GA; 2Memorial Children's Hospital, South Bend, IN; 3Department of Pediatrics, Sections of Emergency Medicine and Infectious Diseases, Baylor College of Medicine, Texas Children's Hospital, Houston, TX; 4Baxter Healthcare Corporation, New Providence, NJ.

Purpose: Establishing intravenous (IV) access can be difficult, particularly in dehydrated children, who often have small, volume-depleted veins. Hyaluronidase-facilitated subcutaneous (HFSC) rehydration therapy with recombinant human hyaluronidase (rHuPH20) represents an alternative to IV in patients with mild to moderate dehydration. A pilot study provided safety, efficacy, and tolerability data on this technique of SC fluid administration in children. The objective of the INcreased Flow Utilizing Subcutaneously-Enabled Pediatric Rehydration II (INFUSE-Peds II) study was to evaluate whether, in a pediatric population with mild to moderate dehydration, HFSC fluid administration can be given safely and effectively in clinically-appropriate volumes, no less than that delivered via IV administration.

Methods: Children aged 1 month to 10 years presenting to emergency departments with mild to moderate dehydration were enrolled in a Phase IV, multicenter, randomized, open-label, noninferiority, company-sponsored clinical trial. Patients were stratified by baseline dehydration severity and body weight and randomized to receive 20 mL/kg isotonic fluid via HFSC or IV over 1 hour and additional fluid, as needed, until clinically rehydrated up to 72 hours. The primary outcome was total fluid volume administered at a single infusion site; secondary outcomes included dehydration symptoms, dehydration score, ease of use outcomes, and safety evaluations.

Results: Enrollment (November 2008 to December 2009, 24 sites, N=148) is now complete. Interim analysis is reported on 74 patients (37 HFSC, 37 IV), mean (SD) age 1.98 (1.56) years. Mean (SD) volume infused was 374 (292.1) mL HFSC vs 491 (645.3) mL IV. Mean (SD) duration of infusion at a single site was 2.8 (3.29) hours HFSC vs 6.0 (13.75) hours IV. When analysis of covariance was performed to adjust for duration of infusion, mean volume infused was 445 mL HFSC vs 419 mL IV. Mean improvement in dehydration score (95% CI) was −2.8 (−3.2, −2.4) HFSC and −2.4 (−3.0, −1.8) IV; mean weight change did not differ between groups. Initial catheter placement was successful in 97% HFSC vs 49% IV (OR=38.0; 4.7-306.9); median placement time (95% CI) was 0.6 minutes (0.25, 0.92) HFSC vs 5.0 minutes (1.0, 9.92) IV. Adverse events were mild to moderate in severity: pain (73% HFSC, 86% IV), erythema (73% HFSC, 6.9% IV), swelling (80% HFSC, 0% IV), and extravasation (0% HFSC, 3% IV).

Conclusion: Interim data suggest that treatment of dehydration was comparable for HFSC and IV, catheter placement took less time and was more successful on the first attempt with HFSC vs IV, and HFSC infusions with rHuPH20 were generally safe and well tolerated. Final analysis of the complete data that will be presented at the American Academy of Pediatrics’ 2010 National Conference will provide more definitive results from this trial.
10. (9980) Occurrence of Inpatient Condition A or C Events After Admission From a Pediatric Emergency Department (ED): Effect of An “ED Time-out Vital Sign Review” Process

Ami P. Shah, MD,1 Melinda Fiedor-Hamilton,2 Richard A. Saladino, MD,1 Noel S. Zuckerbraun, MD,1,1 Emergency Medicine, Children's Hospital of Pittsburgh, Pittsburgh, PA; 2Pediatric Critical Care Medicine and Pediatrics, Children's Hospital of Pittsburgh, Pittsburgh, PA.

Background: Children admitted from the emergency department (ED) often wait in the ED for a time period after initial stabilization. Their clinical condition may change and go unnoticed prior to evaluation by the inpatient doctors. We initiated a process, “ED Time-Out Vital Sign Review,” which requires all ED patients being admitted have a current full set of vital signs reviewed with the attending ED physician to ensure stability prior to departure. Unstable condition after admission may lead to a Condition A response initiated for cardiopulmonary/respiratory arrest or a Condition C response which is initiated for a critical decline in a patient’s condition.

Purpose: To assess the occurrence of inpatient Condition A and C responses (CR) after ED admission. Secondarily, to assess the occurrence of CR within 12 hours of ED admit before and after initiation of ED Time-Out Vital Signs.

Methods: We conducted a retrospective medical review of children's hospital records of ED patients admitted between June 2004 and June 2008 who had a CR. Data collected included patients' age, gender, ED depart date/time, ED Time-Out Vitals, admitting diagnosis and service, CR date/time, and reason for CR. Descriptive statistics were utilized. ED Time-Out Vital Signs were initiated in June 2006. Fisher exact tests were used to compare CR proportions before and after initiation of this process.

Results: During the study period, there were 31,150 patients admitted from the ED. 45 condition responses (CR) occurred in these patients (9 Condition A responses and 36 Condition C responses). Of those with a CR, the median age was 3 years old (25th and 75th quartiles were 0.42, 9) and 58% were male. 35 (78%) patients had a significant past medical history (PMH). 51% of patients were admitted to the general pediatric service. The most common reason for a CR was respiratory distress (60%) followed by seizures (31%). Of the 27 CR occurring within 12 hours of ED departure, 10 were before and 17 were after initiation of ED Time-Out Vital Signs (p=0.36). Of the CR types before and after, 4/10 (40%) were a Condition A after vs 1/17 (6%) after initiation of ED Time-Out Vital Signs (p=0.047).

Conclusion: Condition responses after admission from the ED in our institution are uncommon. These events predominantly occur in younger patients with significant PMH and are most often for respiratory distress and seizures. Given the small number of events in our population, it is difficult to determine the ability of our ED Time-Out Vital Sign Review process to decrease the frequency of CR after admission from the ED. We did find a decrease in the potentially more serious Condition A responses which may have been influenced by initiation of the Time-Out Vital Sign process.

11. (11087) Improving Chronic Asthma Care During An Acute Visit: An Interactive Asthma Kiosk in the Emergency Department

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Purpose: The Emergency Department (ED) is a unique setting for promoting dissemination of knowledge in diagnosing and managing chronic asthma. Our aim was to develop and pilot test a computerized kiosk to promote National Heart, Lung, and Blood Institute (NHLBI) guideline-based chronic asthma care in the ED, better patient self-management and enhance partnerships with the primary care physician (PCP). We hypothesized that kiosk use would increase long term controller medication (LTCM) use, PCP follow-up and prescription of LTCM and Asthma Action Plans (AcPl) in the ED.

Methods: With a panel of experts in asthma, emergency medicine, medical informatics, and behavioral science, we developed a computer-based asthma kiosk. The kiosk was revised using an iterative process with heuristic evaluation done by 3 experts in human-computer interface and usability testing done by 8 end users. The resultant 3-part kiosk computer program gathers data from caregivers on their children’s chronic asthma severity and control. It educates caregivers on LTCM use and PCP follow-up, and identifies barriers to them. Kiosk output includes a summary report on the patients’

Note: Room locations are subject to change. Double-check on-site.
chronic asthma severity and recommendations for LTCM and AcPls which ED clinicians can prescribe. Prior to the kiosk’s implementation, we collected baseline data on ED clinicians’ prescribing of LTCM and AcPl. In the ED, we recruited caregivers of children 2 to 18 years with known persistent asthma to use the kiosk during an acute care visit. We gathered baseline data on daily LTCM use and rate of PCP follow up prior to kiosk use. Investigators called families within 4 weeks after ED discharge to determine their LTCM use and PCP follow-up and confirmed data with pharmacies and PCPs.

Results: In the Usability Testing Lab, all 8 end users (4 ED clinicians and 4 caregivers of asthmatic children) thought it was useful and easy to use. During the pilot phase from 6/09 to 11/09, we approached 69 families, 28 did not meet inclusion criteria, 5 refused and 5 were admitted, leaving 31 for analysis. All patients had persistent uncontrolled asthma. The median kiosk completion time was 20 minutes (IQR: 13, 30). Confirmed rate of LTCM use was higher after using the kiosk 18/31(58%) compared to the reported baseline rate 0/31(0%), p<0.001. Confirmed rate of PCP follow-up was higher after kiosk use 13/31(42%) compared to the reported baseline rate 4/21(19%), p=0.084. More LTCM were prescribed in the ED with kiosk use 19/31(61%) than the reported baseline rate 2/20(10%), p=0.0002. More AcPls were prescribed in the ED with kiosk use 17/31(55%) than the reported baseline rate 0/20(0%), p<0.001.

Conclusion: A computerized version of the NHLBI chronic asthma care guideline used at the time of treatment for an acute asthma exacerbation can be effective in increasing guideline compliant care for children with persistent asthma.


Mindy M. Jacques, MD, Maureen Vaughan, Jennifer Woelker. Emergency Department, Akron Children's Hospital, Akron, OH.

Purpose: Many investigators have studied combinations of history, physical examination, and laboratory data to identify infants 0-90 days with fever above 38°C who are at low risk (LR) for having a serious bacterial infection (SBI), but no single set of criteria has been chosen as the ideal. Our objective is: to determine whether including cerebral spinal fluid (CSF) analysis in LR criteria for the evaluation of infants with fever without a source of infection is necessary to provide the best prediction of being LR for having a SBI.

Methods: We performed a systematic review of trials evaluating low risk status for SBI in infants less than 3 months. Articles were obtained from Medline, Embase, and Cochrane Database and cross-referenced in Science Citation Index. Medline was searched from years 1966 through July 2009 and Embase from 1980 through July 2009. The articles selected based on their abstract were closely reviewed for appropriateness for inclusion and for methodological quality. Of 1071 articles found, 19 were analyzed. Sensitivity and specificity were analyzed separately using random-effects models, with inclusion of CSF analysis as a covariate. The analysis was performed on the log-odds scale, with final results converted back to average probabilities.

Results: A total of 2434 patients were analyzed in the 6 studies that included CSF in the LR criteria for the prediction of SBI, of which 25 patients were found to be LR yet have SBI. A total of 4578 patients were analyzed in the 13 studies which did not include CSF in the LR criteria for the prediction of SBI, of which 39 were found to be LR yet have SBI. Those studies using spinal fluid analysis for the decision on LR status showed no difference from those not including CSF analysis in detecting SBI. Average sensitivity for studies with CSF analysis is 0.89 and those without CSF is 0.92 (p=0.450). Average specificity is 0.46 with CSF and 0.58 without CSF (p=0.131). Three infants were designated LR and found to have bacterial meningitis, all of whom were less than 30 days of age.

Conclusion: Among infants less than 3 months of age, there is no statistical difference regarding inclusion of CSF analysis as part of LR criteria in detection of SBI as compared to those studies that did not include CSF as part of LR criteria. Spinal fluid analysis may not be required in all infants less than 3 months of age in determination of low risk status for detection of serious bacterial infection. Special consideration should be taken in patients less than 1 month of age.

Note: Room locations are subject to change. Double-check on-site.
13. (10314) Procalcitonin Compared to C-Reactive Protein in Detecting Serious Bacterial Infections in Infants

Aaron J. Reitman, DO, Rhonda M. Pisk, Robert Kezirian, MD. Pediatrics, UCSF Fresno / Children's Hospital Central California, Madera, CA; Research, Children's Hospital Central California, Madera, CA.

Purpose: To validate serum procalcitonin (PCT) as a better biological marker than C-Reactive Protein (CRP) in detecting serious bacterial infections in infants.

Methods: An IRB-approved observational study performed at a tertiary care pediatric emergency department (ED). Infants under 1 year of age with fever and concern for sepsis had a complete blood count, CRP, PCT, blood culture, CSF analysis with culture, urine analysis with culture, and chest radiograph if clinically indicated. Blood cultures positive for Staphylococcus Epidermidis were considered contaminates unless present in two blood cultures. Infants were classified as having definite, possible, or no serious bacterial infection (SBI). The authors, AJR and RMP measured PCT by using an immunoassay with time resolved amplified cryptate emission technology (PCT Kryptor analyzer; BRAHMS). The cutoff values for PCT (0.5 ng/ml) and CRP (3.0 mg/dl) were used for analysis.

Results: A total of 214 infants (median 54 days) were studied. 38 patients (17%) had definite SBI, 10 patients (5%) had possible SBI and 166 patients (78%) had no SBI. The mean PCT was significantly higher for definite SBI and possible SBI (3.790±6.316 ng/ml) compared to no SBI, (0.214±0.391 ng/ml) (p < 0.001). As a biomarker for SBI, the sensitivity of PCT was higher (68%) versus CRP (64%) respectively. In ruling out SBI, PCT had a greater specificity and negative predictive value compared to CRP (94%, 80% and 87%, 76%, respectively). According to the area under the receiving operating characteristic curve, PCT was superior to CRP in predicting a definite and possible SBI with an AUC of 0.92 and 0.85 respectively (p< 0.03) There was one patient who presented with a seizure and classified as no SBI but had a CRP of 0.3 mg/ml and a PCT of 3.34 ng/ml.

Conclusion: PCT is confirmed as an excellent marker for detecting occult bacterial infections. PCT also showed to be a better determinant of SBI when compared to CRP in infants with concern for sepsis presenting to the ED.

Note: Room locations are subject to change. Double-check on-site.
14. (11513) Early Physical Exam Findings Are Not Sufficient to Predict Illness Severity in Children with Sepsis in the Pediatric Emergency Department

Halden F. Scott, MD,1 Ronald F. Marchese, MD,2 David F. Gaieski, MD,3 Aaron J. Donoghue, MD, MSCE,4 Rakesh D. Mistry, MD, MS,11 Emergency Medicine, Children's Hospital of Philadelphia, Philadelphia, PA; 1Pediatrics, Children's Hospital of Philadelphia, Philadelphia, PA; 2Emergency Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA; 3Emergency Medicine and Anesthesia & Critical Care Medicine, Children's Hospital of Philadelphia, Philadelphia, PA.

Background: Early recognition and treatment of sepsis improves survival, but recognition of pediatric sepsis prior to decompensation is difficult. Sepsis therapy is invasive and resource-intensive and thus tests to identify patients requiring treatment must be both specific and sensitive. Current guidelines for management of pediatric sepsis recommend the use of physical examination to identify patients requiring resuscitation. However, the specific physical findings suggested by these guidelines have not been validated as markers for development of severe illness in pediatric sepsis. Therefore, further evaluation of physical exam findings in early detection of sepsis in children is necessary.

Purpose: To assess whether recommended physical examination findings of shock are predictive of development of severe illness in pediatric ED patients with Systemic Inflammatory Response Syndrome (SIRS).

Methods: This analysis was conducted as part of an ongoing prospective cohort study of pediatric sepsis. Study subjects were children <19 years presenting to a tertiary-care pediatric ED. Subjects were eligible if they were febrile (T>38.5), met age-specific SIRS criteria for heart rate, and were undergoing phlebotomy. Outcome measures of severe illness included presence of organ dysfunction, serious bacterial infection (SBI) by definitive radiograph or positive culture, and hospitalization. At ED presentation, attending and fellow pediatric emergency physicians recorded initial exam findings suggestive of shock (alterations in mental status, capillary refill, peripheral pulse, oxygen requirement, cold/mottled extremities); assessments were made prior to knowledge of patient outcomes. The cumulative number of exam findings was compared with the presence of outcome measures.

Results: To date, 75 subjects have been enrolled. Mean age was 3.7±4.2 years. Of the study population, 60 (80%) of subjects were admitted, 7 (9.3%) had organ dysfunction; 1 (1.3%) had hypotension; 22 (29%) had SBI; no subjects died. 35 (46.7%) had at least 1 sign of shock; 8 (10.7%) had ≥2 signs of shock. Presence of at least one sign of shock was not predictive of ED organ dysfunction (p=0.24), SBI (p=0.52), or hospitalization (p>0.99). Presence of ≥2 signs of shock was not predictive of SBI (p>0.99) or admission (p>0.99). Presence of ≥2 signs of shock was associated with an increased risk of organ dysfunction (RR=6.3, 1.7-23.2), although it demonstrated poor sensitivity (43%; 6-80%) and positive predictive value (37.5%; 4-71%). When present, ≥2 signs of shock were specific (93%; 86-99%) for organ dysfunction.

Conclusion: Although the presence of ≥2 signs of shock is specific for the development of organ dysfunction in pediatric patients with SIRS, it is not sensitive. Physical exam findings alone are not an adequate screening test for severe pediatric sepsis. Further investigation is warranted to improve early identification of children at risk for severe sepsis.

15. (11593) “Just-in-Time” Lumbar Puncture Simulation Training for Residents in the Pediatric Emergency Department

Melissa Guerra-Wallace, MD,1 Noel S., Zuckerbraun, MD, MPH,2 Mioara D. Manole, MD,1,1 Pediatrics, Division of Pediatric Emergency Medicine, Children's Hospital of Pittsburgh, Pittsburgh, PA; 1Pediatrics, Children's Hospital of Pittsburgh, Pittsburgh, PA.

Background: Lumbar Puncture (LP) is a commonly performed procedure in the Emergency Department (ED). Multiple studies have shown resident’s confidence and success in performing LPs to be low. Although simulation has been widely used as a procedural training tool, data on simulation for LP are limited. A recent trial utilizing live didactic and simulation for LP found pediatric resident performance improved immediately after training; however, skills declined with time.

Purpose: We sought to perform a pilot study to assess the feasibility and effectiveness of a “just in time” self-taught procedural training intervention using simulation and an educational video for residents in the ED with the goal of improving LP success.

Note: Room locations are subject to change. Double-check on-site.
**Methods:** Residents rotating through a tertiary children’s hospital ED were randomized to undergo simulation training versus standard of care immediately prior to performing LPs on patients younger than two years old. Residents of all levels of training were eligible. The intervention consisted of an educational video on LP preparation and performance, as well as direct practice on an infant LP simulator immediately prior to performance on the patient. Data collected included number of attempts, cerebral spinal fluid cell count, presence of a traumatic LP (> 1000 RBCs /mm3), person who completed LP (resident vs. attending) and resident confidence in performing LP, assessed by resident and attending. Data for traumatic LPs were obtained by patient chart review. All other data were obtained by resident self-report through a standard questionnaire completed after the procedure. Data between groups were compared using Chi-Squared analysis.

**Results:** Fifty three residents participated in the study. Twenty four residents were randomized to the simulation arm and twenty nine to the standard of care arm. Table 1 shows data on the number of traumatic LPs, LPs requiring multiple attempts, and LPs completed by the resident vs. supervising physician in each arm. Although there were fewer numbers of traumatic LPs and more procedures successfully completed after one attempt in the “just in time” simulation arm, these differences did not achieve statistical significance.

**Conclusion:** A randomized control trial of “just-in-time” self-taught LP simulation for residents in the ED was feasible at our institution. A larger trial is needed to evaluate the effectiveness of “just in time” LP simulation resident training. Our data found approximately 70% of residents complete the LP on the first attempt. To detect a 10% difference in LP success between groups (alpha 0.05, power 80%), an enrollment of 157 residents per arm would be needed.

<table>
<thead>
<tr>
<th></th>
<th>Simulation (n=24)</th>
<th>Standard care (n=29)</th>
<th>p value</th>
<th>Simulation (n=24)</th>
<th>Standard of Care (n=29)</th>
<th>P value</th>
<th>Simulation (n=24)</th>
<th>Standard of Care (n=29)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traumatic LPs</td>
<td>17% (n=4)</td>
<td>21% (n=6)</td>
<td>0.7</td>
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<td></td>
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</tr>
<tr>
<td>Multiple LP attempts</td>
<td>29% (n=7)</td>
<td>31% (n=9)</td>
<td>0.5</td>
<td></td>
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</tr>
<tr>
<td>Resident completion of LP procedure</td>
<td>67% (n=16)</td>
<td>69% (n=20)</td>
<td>0.8</td>
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</table>

*Note: Room locations are subject to change. Double-check on-site.*
1. (9930) Survey of Dehydration Treatment Practices Among Pediatric-Trained and Non-Pediatric Trained Emergency Physicians

**Jeranil Nunez, MD, Deborah R. Liu, MD, Alan L. Nager, MD, MHA. Division of Emergency and Transport Medicine, Childrens Hospital Los Angeles, Los Angeles, CA.**

**Purpose:** The American Academy of Pediatrics (AAP) and the Centers for Disease Control and Prevention (CDC) have established guidelines for the management of pediatric dehydration due to acute gastroenteritis. We sought to survey emergency physicians in the United States regarding the identification and management of pediatric dehydration secondary to acute gastroenteritis. We hypothesized that responses from physicians with dedicated pediatric training (PT), i.e., board certification in Pediatrics or Pediatric Emergency Medicine, would differ from responses of physicians with no dedicated training in pediatrics (non-PT).

**Methods:** An anonymous survey was mailed to randomly selected members of the American College of Emergency Physicians. The survey was also sent electronically to all members of the Brown University pediatric emergency medicine listserv. Respondents provided demographic information, such as type of practice (community vs. academic), whether the physician had dedicated pediatric training (PT vs. non-PT), or if they practiced in a general vs. pediatric emergency department (GED vs. PED). The survey consisted of 17 multiple-choice questions based on a clinical scenario depicting a 2 year old with acute gastroenteritis and moderate dehydration. Respondents were asked to classify the patient's level of dehydration, route of fluid administration (oral, nasogastric [NG], or intravenous [IV]), preferred type and amount of IV fluids compared to 121 (58.2%) PT physicians. PT physicians were more likely to initially choose oral or NG hydration compared to non-PT physicians (p=0.0127). PT physicians were less likely to perform laboratory testing in this clinical scenario compared to the non-PT group (n=92, 44.7% vs. n=337, 65.6%; p <0.0001). Community physicians, those practicing in a GED, and non-PT physicians were more likely to perform laboratory tests (p < 0.0001). Most physicians (92.7%) chose to hydrate the patient with normal saline or lactated ringers solution after a failed oral challenge. A larger percentage of non-PT physicians (8.5%) chose dextrose-containing or hypotonic fluids compared to 3.9% of PT physicians (p=0.0118).

**Conclusions:** Contrary to established AAP and CDC recommendations for the management of moderately dehydrated children, the majority of physicians initially selected IV hydration over oral hydration, and chose to perform laboratory testing. Significantly more PT physicians, compared to non-PT physicians, followed established guidelines.
2. (10075) Incident Reports From Six Pediatric Emergency Departments in a Research Network

Kathleen A. Lillis, MD, FAAP,1 Richard M. Ruddy, MD, FAAP,2 Kathy N. Shaw, MD, MSCE, FAAP,3 Prashant V. Mahajan, MD, MPH, MBA, FAAP,4 Richard Lichenstein, MD, FAAP,5 Cody S. Olsen, MS,6 James M. Chamberlain, MD, FAAP,7
1Pediatrics, Division of Emergency Medicine, Women and Children's Hospital of Buffalo, Buffalo, NY; 2Pediatrics, Cincinnati Children Hospital Medical Center, Cincinnati, OH; 3Division of Emergency Medicine, Dept. of Pediatrics, The Children's Hospital of Philadelphia & University of Pennsylvania School of Medicine, Philadelphia, PA; 4Pediatrics, Children's Hospital of Michigan, Detroit, MI; 5Pediatrics, University of Maryland Children's Hospital, Baltimore, MD; 6Department of Pediatrics, University of Utah School of Medicine, Salt Lake City, UT; 7Pediatric Emergency Medicine, Children's National Medical Center, Washington, DC.

Purpose: Voluntarily reported hospital Incident Reports (IRs) are one method used to measure and address patient safety issues in hospitals and emergency departments (EDs). Analysis of IRs across institutions may provide more global solutions for reducing medical errors. There has, however, been reluctance to share IR data outside individual hospitals because of fear of legal ramifications. Our objective was to describe IRs from six Pediatric EDs in HHS/HRSA PECARN over a one-year period.

Methods: De-identified IRs submitted to the data center were randomly assigned to six investigators. Two investigators independently classified the IRs by major incident type, subtype, severity, staff involved, and contributing factors (CF). Discordant responses were resolved by consensus.

Results: In academic year 2007, 882 IRs were submitted. Eight percent were excluded because the incident did not occur in the ED, patient was >18 years of age, did not involve a patient/individual accompanying patient or inadequate details were provided. IR rates varied more than 10-fold among the 6 sites from 0.42-6.13 IRs/1000 visits. IRs were categorized as laboratory (33%), medications (17%), radiology (16%), process variance (e.g. delays in care) (14%), medical procedure (7%), falls (5%), behavior (3%), medical equipment/devices (3%), environmental safety (1%) and blood products (0.5%). Of the laboratory incidents, 23% involved wrong patients, 21% delayed results/lost specimen, 16% unlabeled specimens, and 11% specimens labeled incorrectly. The most common medication incidents were wrong dose (38%) and wrong medication (20%). Of the radiology incidents, 76% were misreads or changed readings. Severity was categorized as: event without harm (32%), temporary harm (20%), unsafe condition (17%), unknown impact on patients (17%), near miss (13%) or permanent harm including death and near death (<1%). Two-thirds of IRs involved human CF including failure to comply with established procedures (40%), incorrect clinical judgment (15%) and communication failures (13%). Other CF responsible included systems (18%), patient (8%), equipment (5%), Information Technology (2%), and environmental factors (1%). While CF were determined in 86% of IRs, factors were only clearly stated as such in 41%. When staff involvement was identified, physicians were reported 36%, nurses 26%, other personnel 15%, lab personnel 9%, radiology personnel 5%, clerk/registrar 4%, pharmacist 3% and patient care technicians 2%.

Conclusion: IRs are a reasonable source of information regarding patient safety, and it is possible to collect, categorize, and analyze safety events across different institutions. There is, however, great variability in reporting amongst sites. While CF are not well-described, human factors were the most common factors identified. Interventions that help to reduce errors related to human factors such as computer physician order entry and clinical decision support may lead to a decrease in incidents and unsafe conditions. Supplemental qualitative methods are needed to determine the effectiveness of such interventions.


David O. Kessler, MD,1 Grace Arteaga,2 Jessica Foltin,3 Laura Haubner,4 Gunjan Kamdar,5 Amanda Krantz,1 Julie Lindower,6 Michael Miller,1 Shannon O'Malley,1 Matei Petrescu,1 Martin V. Pasic,9 Joshua Rocker,7 Nikhil Shah,1 Christopher Strother, MD,10 Lindsey Tilt,1 Eric Weinberg,1 Marc Auerbach, MD, MSCI,11 Pediatrics / Emergency Medicine, New York University / Bellevue Hospital Center, New York, NY; 2Mayo Clinic Children's Hospital; 3Pediatric Emergency Medicine, Weil Cornell School of Medicine, New York, NY; 4University of South Florida College of Medicine; 5Children's Hospital of New York Presbyterian; 6University of Iowa Children's Hospital; 7Schneider Children's Hospital; 8Tulane University School of Medicine; 9Pediatrics, Columbia University Medical Center, New York, NY; 10Pediatrics, Mount Sinai School of Medicine.

Note: Room locations are subject to change. Double-check on-site.
Purpose: To demonstrate that mastery learning through hands-on deliberate practice using bench-top task trainers improves intern clinical performance in infant lumbar puncture (ILP) and child intravenous line placement (CIV).

Methods: Interns from 10 pediatric training programs were randomized to either (1) ILP or (2) CIV. All subjects completed a data collection instrument evaluating their knowledge, experience and attitudes related to ILP and CIV. Subjects completed an audiovisual training module describing both procedures and demonstrating expert modeling of ILP and CIV (40 minutes). Subjects participated in mastery learning on the bench-top partial task trainer to which they were randomized (1) ILP or (2) CIV. Mastery learning sessions involved deliberate practice on the simulator until the subject achieved a pre-defined level of skill mastery. All coaches were clinician educators who participated in a 30 minute train-the-trainer session prior to the study. Clinical performance indicators were captured via self-report by interns each time they attempted CIV or ILP during a real patient encounter over the next six months.

Results: 210 interns were approached for consent and 201 agreed to participate (107 in ILP group 103 in CIV group). Groups were similar with respect to ILP and CIV knowledge and confidence in the procedure. Infant Lumbar Puncture A total of 182 clinical ILP attempts were reported from 85 interns. Interns in the ILP group were successful for 66% of reported ILP attempts compared to 65% in the CIV group. There was no statistically significant difference for first attempt success rate between groups (56% LP vs 60% IV). Child Intravenous Line placement A total of 251 clinical CIV events were reported from 62 interns. Interns in the CIV group were successful for 65% of reported CIV attempts compared to 66% in the ILP group. There was also no statistically significant difference for first attempt success rate between the groups (66% LP 60% IV).

Conclusion: A single hands-on mastery learning session is not sufficient to impact an intern's clinical success. Further research is needed into best educational methods for improving procedural skills prior to patient contact. Future studies should focus on training that is more proximal to clinical events.

4. (10422) Training Pediatric Emergency Medicine Fellows in Airway Ultrasonography Using An Adult Cadaver Model

Atim Uya, MD, FAAP, Dave Spear, MD, Kalpesh Patel, MD, Pam Okada, MD, Halim Hennes, MD, Paul Sheeran, MD, Audra Mccreight, MD. Emergency Medicine, UT southwestern medical school/childrens medical center, Dallas, TX.

Purpose: Bedside ultrasound (US) can provide timely information regarding endotracheal tube (ET) tube position and depth. US verification of adequate ET tube position by emergency practitioners has been studied utilizing different US windows: subdiaphragmatic, cricothyroid membrane and suprasternal notch. Image acquisition depends on the approach utilized and the experience of the sonologist. Currently there is no standardized method for sonographic verification of ET tube position or training novice sonologists in the procedure. The purpose of this study was to evaluate the impact of training US novice Pediatric Emergency Medicine (PEM) fellows in identifying ET tube position and depth in an intubated adult cadaver using the suprasternal approach.

Methods: Eight PEM fellows (representing all training levels) with no prior training in airway US, participated in this prospective single blinded study. Baseline ultrasound knowledge was assessed using a pre-training questionnaire. All received a 20 minute didactic training session focused on airway ultrasound, followed by a 30 minute practice session. During the practice session each fellow used a linear US probe placed at the suprasternal notch to identify the saline filled cuff of an ET tube in both the trachea and the esophagus. Following training, the ET tube was placed in either the esophagus or trachea of the cadaver model by the Principal Investigator. ET depth (adequacy) was confirmed by chest radiograph. Each PEM fellow, blinded to of the ET tube, used US to determine ET tube location and position. If placement was determined to be tracheal, the fellow was asked to comment on adequacy of tube placement. Adequate placement was defined as complete visualization of the ET tube cuff within the trachea at the suprasternal notch. Findings were recorded using a standardized scoring tool. This study sequence was repeated 5 times for each trainee, each with varying placement of the ET tube in the trachea or esophagus.

Results: PEM fellows displayed limited baseline knowledge of ultrasound prior to receiving the training module (average accuracy of 50% on pretest questionnaire). Following training, PEM fellows correctly identified ET tube location in 39 of 40 exams (97.5%) and adequate placement in 22 of 24 exams (91.7%). For calculations of sensitivity, specificity, and negative predictive value (NPV), tracheal and esophageal intubations were evaluated separately.

Note: Room locations are subject to change. Double-check on-site.
AAP Section on Emergency Medicine Program Schedule

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal Placement</td>
<td>1.00 (95% CI: 0.79-1.00)</td>
<td>0.96 (95% CI: 0.79-1.00)</td>
<td>1.00 (95% CI: 0.85-1.00)</td>
</tr>
<tr>
<td>Tracheal Placement</td>
<td>0.96 (95% CI: 0.79-1.00)</td>
<td>1.00 (95% CI: 0.79 - 1.00)</td>
<td>0.94 (95% CI: 0.71-1.00)</td>
</tr>
<tr>
<td>Placement Adequacy</td>
<td>1.00 (95% CI: 0.63-1.00)</td>
<td>0.93 (95% CI: 0.68-1.00)</td>
<td>1.00 (95% CI: 0.77-1.00)</td>
</tr>
</tbody>
</table>

Conclusion: PEM fellows, lacking formal airway US training, can accurately identify ET tube placement and position at the suprasternal notch following a 50 minute teaching module.

5. (11149) Emergency Department-Based Health Insurance Enrollment for Kids: Does Site of Enrollment Impact Retention and Utilization?

Lori E. Rutman, MD, MPH,1 Mary Giammona, MD, MPH, FAAP,2 Olga Saynina, MA, MBA,3 Charles Dibble, PhD,4 Marmi C. Bermudez,5 Vicky Shih,2 Lisa Chamberlain, MD, MPH,5 N. Ewen Wang, MD,6 Lucile Packard Children's Hospital at Stanford, Palo Alto, CA; 2Health Plan of San Mateo, South San Francisco, CA; 3Stanford University, Stanford, CA; 4Patient Admitting Services, Stanford Hospital and Clinics, Stanford, CA; 5Pediatrics, Stanford University School of Medicine, Palo Alto, CA; 6Pediatric Emergency Medicine, Stanford University School of Medicine, Palo Alto, CA.

Purpose: Despite the expansion of public insurance programs, more than two thirds of eligible children remain uninsured. When children obtain coverage, disenrollment rates are as high as 28% nationally and negative health outcomes associated with poor retention are well documented. Novel outreach programs from emergency departments (EDs) where many uninsured children receive care have demonstrated cost effectiveness, however there have been no studies of retention or health care utilization after children are enrolled. The purpose of our study was to evaluate whether children enrolled in public insurance via the ED retain coverage for longer periods than those enrolled in non-emergent settings and to describe factors associated with longer retention time. Furthermore, we assessed utilization patterns of children enrolled in the ED compared to other sites.

Methods: A retrospective, case control study design was used. Data were extracted from a county-wide public insurance enrollment and claims database. Children 0-18 years old enrolled from 2004-2007 in public insurance programs via an emergency department based program were matched 1:1 by age, gender, year of enrollment, and insurance program to children enrolled in other settings. Survival analyses were performed to assess retention of insurance coverage. Cox regression models were used to determine the factors associated with longer retention. Descriptive statistics and t-tests were used to evaluate claims data.

Results: We examined 360 cases; the majority of children (n=282) were enrolled in Medicaid (87%). Children enrolled via the ED retained health insurance for an average of 686 days until the first break in coverage, compared to 560 days for children enrolled through other sites (p<0.005). Previous studies identified age, female gender, and increased contact with physicians as factors associated with longer insurance retention; in our study, the site of enrollment (i.e., the ED) was more strongly associated with longer insurance retention than any of these other variables. During their first year of insurance coverage, children linked via the ED had a mean of 23 claims compared to 7 in the group linked in non-emergent settings (p<0.005). These trends were significant for both prescription and non-prescription based claims. Claim payments per month of enrollment were also significantly higher with fewer denied claims for children enrolled through the emergency department (p<0.005).

Conclusion: Children linked to health insurance via the ED were enrolled longer and had elevated utilization of the health care system than those enrolled in non-emergent settings. Further expansion and evaluation of ED based insurance enrollment programs is warranted.

Note: Room locations are subject to change. Double-check on-site.
6. (11332) Predictors of Mental Health Follow up Among Adolescents with Suicidal Ideation After Emergency Department Discharge

Brad Sobolewski, MD, Jacqueline Grupp-Phelan, MD, MPH, Linda Richey, MSW, Robert Kowatch, MD, PhD.

Purpose: The emergency department (ED) serves as the portal of entry for mental health services for the majority of suicidal adolescents. Thirty percent of suicidal youth are sent home from the ED, yet little is known about the mental health follow up patterns of adolescents after the initial ED evaluation. The aim of this study is to examine mental health follow up patterns in a prospective series of adolescents with suicidal ideation or attempt after discharge home from a pediatric ED.

Methods: The parent or guardian of all suicidal youth ages 11 to 18 years who were discharged from the pediatric ED were interviewed by telephone one month following the ED visit. Parents were asked to report whether their child had suicidal ideation, if they succeeded in following up with a mental health professional, and if they returned to the ED for mental health concerns. Previous mental health service experiences and demographic characteristics were also obtained.

Results: Analysis of initial study data revealed that 46 patients with suicidal ideation were sent home from the ED after a mental health evaluation. Thirty five were successfully contacted for follow up. The mean age of the patients was 15.2 years (+/- 2.05 years), and 43.5% were male. The majority (84.8%) had a previous psychiatric diagnosis, while 28.3% had been previously admitted to an inpatient psychiatric facility. Most youth (94.1%) followed up with a mental health professional within a month of their ED visit. On follow up, parents reported that 11/35 were currently displaying suicidal behaviors, or at risk for committing suicide. Of the patients successfully contacted 6/35 (17.1%) returned to the ED for mental health concerns, and 5/6 (83.3%) of those visits resulted in inpatient admission. Most parents (31/35, 88.6%) characterized their prior mental health experience as positive. These results reflect partial data. Study completion is expected in summer 2010, with an anticipated 100 patients successfully contacted via telephone follow up.

Conclusion: A substantial proportion of suicidal youth who are discharged from the ED continue to have suicidal thoughts and behaviors. Many return within a month of their initial visit and require inpatient psychiatric admission. Children who are deemed safe for discharge after an evaluation for suicidality remain a high risk group.

7. (11420) Predictors of Best Patient Satisfaction Scores (PSS) in a Pediatric Emergency Department (ED)

Anita Roy, BS, MD, Kay Holbrook, MSN, RN, NE-BC, Mariane Stefano, BSN, MBA, FACHE, Alex Koster, MA, Jobayer Hossain, PhD, Jay Greenspan, MD, MBA, Magdy Attia.

Purpose: Patient satisfaction has become important as it could be considered a surrogate marker for quality of care from the parent's perspective. Mailed patient satisfaction surveys have become the norm after an ED visit. Our institution used a survey to measure PSS. Achieving the best score in one particular question (likelihood to recommend, LTR) was considered one of our institution's main outcome measures. The aim of the study is to identify predictors of best PSS in our ED based on LTR.

Methods: We performed an analysis of PSS from returned surveys by guardians who visited our ED from 11/07-3/09. Responses used a 5-point Likert scale 1 (lowest) - 5 (highest). All responses were dichotomized to best score (5) or less than best. After descriptive statistics, we performed univariate analysis comparing the main outcome measure to the rest of the responses using Pearson's chi-square test. We eliminated questions that had more than 20% missing data. Then we performed backward binary logistic regression to identify variables associated with LTR best score.

Results: 1514 surveys were analyzed. There was no difference in regard to patient gender or age between those who scored LTR as 5 or <5. However, insurance type, length of stay (LOS), and acuity did make a difference. Shorter LOS (<240

Note: Room locations are subject to change. Double-check on-site.
minutes) and higher acuity correlated with LTR score of 5. Univariate analysis showed all questions with best scores were significantly associated with achieving a best score in LTR. Logistic regression results are shown in table 1.

Table 1 – Backward Binary Logistic Regression of Significant Variables

<table>
<thead>
<tr>
<th>Variable Measured</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Nurses' Attention to Privacy</td>
<td>.001</td>
</tr>
<tr>
<td>Nurses' Attention to Needs</td>
<td>.003</td>
</tr>
<tr>
<td>Helpfulness of Front-End Staff</td>
<td>.015</td>
</tr>
<tr>
<td>Use of Universal Precautions (hand washing)</td>
<td>.023</td>
</tr>
<tr>
<td>Pain Control</td>
<td>.024</td>
</tr>
<tr>
<td>Overall Care by Physician</td>
<td>.028</td>
</tr>
<tr>
<td>Triage to Room Time</td>
<td>.037</td>
</tr>
</tbody>
</table>

Conclusion: In addition to LOS, parents seem to place higher emphasis on privacy, hygienic precautions by staff, and pain control when it comes to their satisfaction.

8. (11632) Comparison of One-Dose and Two-Dose Regimes of Oral Dexamethasone in the Management of Acute Asthma Exacerbations in the Pediatric Emergency Department

Nazli Ghafouri, MD, Ghazala Q. Sharieff, MD, Anthony Rajasingham, John Kanegaye, MD. Division of Pediatric Emergency Medicine, Rady Children's Hospital, San Diego, CA.

Purpose: To compare single-dose and 2-dose courses of oral dexamethasone in preventing relapse within 7 days for pediatric asthma patients managed in the Emergency Department (ED).

Methods: This was an open-label, randomized controlled trial of children ages 2-17 years old who presented to the ED with mild to moderate asthma exacerbations. Patients were randomized to receive a single oral dose of dexamethasone (0.6 mg/kg, maximum 16 mg) in the ED (Group 1) or an ED dose plus a prescribed second dose to be given in 2 days (Group 2). We compared the 2 groups with regard to time to resolution of symptoms and rate of relapse, defined as hospital admission after ED discharge, unscheduled follow up visits, or additional corticosteroid prescriptions within 7 days of discharge.

Results: The 62 Group 1 and 63 Group 2 patients had similar demographic and clinical characteristics. There were no statistically significant differences between the 1- and 2-dose groups with regard to admission rates after discharge (1.9% vs. 4.2%, p=0.61), unscheduled follow up (9.6% vs. 18.8%, p=0.19), new corticosteroid prescriptions (15.4% vs. 4.2%, p=0.09), and time to symptom resolution (median 3 days for both groups).

Conclusion: Our study found no significant differences between a single dose and 2 doses of dexamethasone in preventing relapse or improving symptoms in children with acute asthma exacerbations.

Table 1. Baseline demographics and severity at presentation

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (n=62)</th>
<th>Group 2 (n=63)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex, n (%)</td>
<td>47(76)</td>
<td>47(75)</td>
<td>0.88</td>
</tr>
<tr>
<td>Age, years, mean (SD)</td>
<td>6 (3.6)</td>
<td>5.9(4.3)</td>
<td>0.51</td>
</tr>
<tr>
<td>Race (%)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>White</td>
<td>18(29)</td>
<td>18(28.6)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>10(16.1)</td>
<td>9(14.3)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>26(41.9)</td>
<td>26(41.3)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>8(12.9)</td>
<td>10(15.9)</td>
<td></td>
</tr>
<tr>
<td>Previous medications, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ß-2 agonist</td>
<td>59(95.2)</td>
<td>58(92.1)</td>
<td>0.48</td>
</tr>
<tr>
<td>Inhaled corticosteroid</td>
<td>22(35.5)</td>
<td>21(33.3)</td>
<td>0.80</td>
</tr>
<tr>
<td>Combined ß-2 agonist/ corticosteroid</td>
<td>3(4.8)</td>
<td>5(7.9)</td>
<td>0.72</td>
</tr>
<tr>
<td>Initial SaO₂, %, median(IQR)</td>
<td>95(93.96)</td>
<td>95(93.96)</td>
<td>0.21*</td>
</tr>
<tr>
<td>Initial RSS, median (IQR)</td>
<td>7(6.8)</td>
<td>6(6.8)</td>
<td>0.78*</td>
</tr>
</tbody>
</table>

IQR-interquartile range | *Mann-Whitney U

Note: Room locations are subject to change. Double-check on-site.
Table 2. Clinical course in ED

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (n=62)</th>
<th>Group 2 (n=63)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone dose, mg, median (IQR)</td>
<td>12(10,16)</td>
<td>12(10,16)</td>
<td>0.36*</td>
</tr>
<tr>
<td>Vomited dose in ED, n (%)</td>
<td>5(8.1)</td>
<td>4(6.3)</td>
<td>0.74**</td>
</tr>
<tr>
<td>Parenteral dexamethasone, n (%)</td>
<td>1(1.6)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>β-agonist treatments (IQR)</td>
<td>3(3,4)</td>
<td>3(3,3)</td>
<td></td>
</tr>
<tr>
<td>No. continuous nebulizer, n (%)</td>
<td>7(11.3)</td>
<td>8(12.7)</td>
<td>0.81</td>
</tr>
<tr>
<td>RSS at dispo (IQR)</td>
<td>7(6,8)</td>
<td>6(6,8)</td>
<td>0.71*</td>
</tr>
<tr>
<td>Admission rate from ED, n (%)</td>
<td>7(11)</td>
<td>11(17.5)</td>
<td>0.33</td>
</tr>
<tr>
<td>Time in ED, min (IQR)</td>
<td>169(136,208)</td>
<td>150(120,180)</td>
<td>0.11*</td>
</tr>
</tbody>
</table>

IQR-interquartile range
*Mann-Whitney U
**Fischer's exact test

Table 3. Primary and secondary outcomes

<table>
<thead>
<tr>
<th>Primary outcome</th>
<th>Group 1 (n=52)</th>
<th>Group 2 (n=48)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of relapse:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission after ED discharge, n (%)</td>
<td>1(1.9)</td>
<td>2(4.2)</td>
<td>0.61*</td>
</tr>
<tr>
<td>Unscheduled follow up with PCP/ED, n (%)</td>
<td>5(9.6)</td>
<td>9(18.8)</td>
<td>0.19</td>
</tr>
<tr>
<td>New course oral steroid prescribed, n (%)</td>
<td>8(15.4)</td>
<td>2(4.2)</td>
<td>0.09</td>
</tr>
<tr>
<td>Time to resolution of symptoms, days (IQR)</td>
<td>3(2.3)</td>
<td>3(2.4)</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Secondary outcome

<table>
<thead>
<tr>
<th>Compliance</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Filled prescription, n (%)</td>
<td>N/A</td>
<td>44(91.7)</td>
<td></td>
</tr>
<tr>
<td>Administered dexamethasone dose, n (%)</td>
<td>N/A</td>
<td>39(81.2)</td>
<td></td>
</tr>
<tr>
<td>Dose vomited at home, n (%)</td>
<td>N/A</td>
<td>2(4.2)</td>
<td></td>
</tr>
<tr>
<td>Parent satisfaction</td>
<td>42(80.8)</td>
<td>39(81.2)</td>
<td>0.95</td>
</tr>
</tbody>
</table>

*Fischer's exact test

9. (11663) Accessory Muscle Use in Pediatric Patients with Acute Asthma Is Associated with Reduced Lung Function and Decision to Hospitalize

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Purpose: Percent predicted forced expiratory volume in one second (%FEV₁) is an accepted criterion standard for severity of airways obstruction in acute asthma, but is frequently not available in acute care settings. Accessory muscle use is a readily available, easily identifiable bedside physical finding. We sought to assess the severity-dependent relationship of pre-treatment accessory muscle use with both %FEV₁ and disposition decision among pediatric patients with acute exacerbations.

Methods: We prospectively enrolled participants ages 5 to 17 years with asthma and signs or symptoms of an acute exacerbation who presented to our urban, tertiary care pediatric emergency department (PED). We defined accessory muscle use as any visible use of the scalene, sternocleidomastoid-suprasternal, intercostal or subcostal muscles. Accessory muscle use was quantified as none, one group, or two or more muscle groups. The clinical team made the disposition decision (hospitalization/discharge) and was blinded to %FEV₁ values. We compared pre-treatment accessory muscle use with simultaneous %FEV₁ for participants meeting all American Thoracic Society (ATS) spirometry criteria, and with disposition decision.

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for the entire cohort. We used the Kruskal-Wallis and Chi-square tests, respectfully, for these analyses, and adjusted for age, gender and race in a third, multivariable model.

**Results:** Between April, 2008, and December, 2009, 541 eligible patients were enrolled and 478 unique participants were included for analyses. Median age was 8.8 years (IQR 6.8, 11.5), 60% male, and 56% African-American; 75% were discharged to home, 17% admitted to the floor, and 8% to the PICU. All participants attempted spirometry, and 257 (54%) met all ATS criteria. %FEV₁ (IQR) was 76% (58, 87) in those without use of any, 49% (39, 63) in those with use of one, and 34% (24, 43) in those with use of two or more accessory muscle groups (P<0.001, Figure). Of the entire cohort (n=478), accessory muscle use was noted in 244 (51%). The clinical team hospitalized 28 (12%) of those without accessory muscle use, 37 (28%) of those with use of one group, and 54 (48%) of those with use of more than one group (p<0.001). Accessory muscle use remained associated with increased odds of hospitalization when adjusted for age, gender and race in the multivariable model (OR=4.57 95%CI: 2.78-7.49, P<0.001).

**Conclusion:** Accessory muscle use in pediatric patients with acute asthma exacerbations is associated with both decreased %FEV₁ and with the decision for asthma hospitalization in a severity-dependent fashion. Accessory muscle use assessment is of value to clinicians because it is simple, low cost, relatively objective, and physiologically plausible, as it is indicative of increased work of breathing.

**Figure:** Top: Boxes comprise interquartile ranges with median lines. Fences are 1.5 x IQR beyond IQR bounds. Bottom: Disposition of entire study cohort according to accessory muscle use.

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**10. (11795) Comparison of a Breath-Actuated Nebulizer Versus a Conventional Continuous-Output Nebulizer in Treating Acute Asthma in a Pediatric Emergency Department: An Ongoing Randomized Controlled Trial**

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**Purpose:** A Breath-Actuated Nebulizer (BAN) is a newer type of nebulizer that creates aerosol only during a patient’s inhalation. Theorized advantages of BANs over conventional continuous-output nebulizers include delivery of a higher percentage of aerosolized drug doses to patients’ lungs and decreased loss of drug to the environment. Little is known regarding effectiveness of BAN devices in treating pediatric asthma patients. No known studies have compared patient satisfaction with BANs versus continuous-output nebulizers. The purpose of this ongoing randomized controlled trial is to compare effectiveness of and patient satisfaction with a BAN versus a standard continuous-output nebulizer for treatment of acute asthma in a pediatric emergency department (ED).

**Methods:** Participants are children aged 1 through 17 years presenting to a pediatric ED for treatment of acute asthma. Following an initial bronchodilator treatment with a conventional continuous-output nebulizer, participants requiring further treatments are randomly assigned to receive treatments with either a BAN or standard continuous-output nebulizer until meeting established discharge criteria. In each group, participants are treated with an identical regimen of frequent bronchodilator treatments and oral dexamethasone with clinical reassessment every twenty minutes according to a standardized asthma care algorithm. In addition, participants complete a survey regarding satisfaction with the assigned device at the end of their ED visit.

**Results:** A total of 151 children aged 1 to 17 years have participated to date (76 in the BAN group; 75 in the continuous nebulizer group). Target study enrollment is 240 participants. Study groups are similar thus far in terms of demographics and baseline asthma severity. The initial mean Pulmonary Index Score is 8.09 for participants in the BAN group, and 8.03 for participants assigned to the continuous nebulizer group. Overall, 25 (32.9%) of 76 patients in the BAN group have required hospitalization compared with 33 (44%) of 75 in the continuous nebulizer group. Completed satisfaction surveys are available for 150 participants (99.3%). Forty-one (53.9%) out of 76 respondents in the BAN group “strongly agreed” that they would feel comfortable receiving treatments with the same type of nebulizer in the future, compared to 20 (27%) of 74 respondents in the continuous group.

**Conclusion:** Among participants enrolled thus far, the rate of hospitalization for acute asthma is lower in those assigned to the BAN group compared to those in the continuous-output nebulizer group. A greater percentage of participants have indicated a high level of comfort with use of the BAN device.

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