What does the family want?

What are my colleagues doing?

Quality and Safety Mandates

What if I get it wrong?

Featured Stories

• Ethics Consultant: A sick 5 week old and a disagreement

• Hospitalists On-line: A 13 year old who doesn’t have what the specialist wanted to treat

YOU ARE THE HOSPITALIST: 2 Year Old Boy with 3 Days of Intermittent Grunting and Fevers
Our Vision

The Section on Hospital Medicine of the American Academy of Pediatrics is dedicated to the health of all children in the hospital setting through advocacy, education and service—incorporating the core principles of safety, effectiveness, timeliness, efficiency and equitability in family-centered health care.

Our Mission

Advocacy

The Section is dedicated to being a leader in inpatient pediatric hospital medicine in the Pediatric community—advocating for the health and safety of hospitalized children.

Education

The Section is dedicated to being a leader in educating health care providers, patients and families.

Service

The Section is dedicated to being a leader in identifying the professional needs of Pediatric Hospitalists.

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Hospitalist On-Line — Jennifer Maniscalco, MD, FAAP, Editor

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LETTER FROM THE CHAIR OF SOHM

Making the Rounds

Laura Mirkinson, MD, FAAP
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This year marks, in a sense, the tenth anniversary of the Section on Hospital Medicine. The process of growth from a small interest group in 1999 to one of the largest and most rapidly growing AAP groups ten years later has been fascinating to watch. Our place within the Academy is now well established, and we appreciate the full support of the AAP’s leadership. This is a good time to congratulate the two newest members of the SOHM Executive Committee, who will be joining us in October at the NCE: Steve Narang and Erin Stucky. Dan Rauch, Chairperson-Elect, will be taking over as Chair of the Section at that time as well. It’s great to see the Executive Committee and the Section as a whole evolve and grow over time. We now have over 800 members and multiple subcommittees including a newly approved Subcommittee on Evidence Based Medicine.

In the first years of the Section’s development, the Executive Committee primarily dealt with issues of membership and educational programs. We developed a listserv®—still one of our most active and strongest assets—open to Section members and non-members so that pediatric hospitalists could communicate with each other and discuss clinical and non-clinical issues. We developed a website of our own to house resources of particular interest to pediatric hospitalists, and we produced a modest newsletter. Over time, we incorporated subcommittees, grants, developed scientific poster sessions and recognized excellence with research awards.

Now the Section is producing an ambitious News Journal, we are anticipating sending out an important salary survey that will provide critical information about the salaries and benefits of pediatric hospitalists across the country, and we have participated in the Society of Hospital Medicine Core Competencies for pediatric hospitalists (look for a future article in AAP News). In addition, we assisted in producing a PREP study kit targeted to pediatric hospitalists as well as an eQipp module on inpatient asthma. Recently, we also initiated a Visiting Professor Consultation Grants Program. So you can see that the Section has been busy, and this doesn’t even touch upon the many activities of the subcommittees and the day-to-day work of the Executive Committee.

This entire review serves a purpose—to give you an appreciation of the scope of the work of the Section and to offer my personal thanks to all of the people I have worked with in the Section and on the Executive Committee over the past 10 years. When I step down as Chairperson of SOHM in October, I will be the last of the original six members of the 1999 Steering Committee to cycle off. When I joined that small group, we grappled with the questions of how to define ourselves within the larger group of pediatricians and how to become accepted in our roles as hospitalists. Now before us are larger questions of the future of pediatric hospital medicine. I encourage you to participate in the dialogue.

My best regards to all.

Corrections

• “Central Venous Cather related Blood Stream Infections: Prevention Strategies” on page 24 of Issue 1 2009 Hospital Pediatrics contains an error. Amy E Vinson, MD, should have been listed as the first author and Linda K Snelling, MD, FAAP, as the second author.

• A portion of the table from the “Billing and Coding Corner” on page 7 of Issue 1 2009 Hospital Pediatrics was inadvertently left out. The complete table has been placed in the SOHM library at www.sohmlibrary.org

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LETTER FROM THE EDITOR

What’s interesting about being the editor of Hospital Pediatrics …

Jennifer Daru, MD, FAAP, FHM
jadaru@gmail.com

… is that I get to be a part of documenting the evolution of pediatric hospital medicine. As we as a field grow, so does the news journal in its size, its columns and its perspectives. A few months ago I was asked to attend the pediatric hospital medicine Roundtable (see page X for a write up), a gathering of PIHM leadership with a focus on creating a mission statement and achievable goals for the field. As someone who was brought onto the AAP SOHM Executive Committee by Dr Jack Percelay as the “young” member (I think I am old now though no one is saying anything), it was quite an honor to sit in a room with my colleagues from the listserv® and beyond (everyone is very good looking by the way).

Jokes aside, the field is ours to shape, create and plan with the input of our colleagues in medicine (adult and pediatric), and as long as our enthusiasm persists, our supporters and impact will grow. If we stick to the mission of being “dedicated to all children in the hospital setting,” I think we can accomplish safety, quality, access and the other issues we face. Of course, the job may never be fully complete, and perhaps thirty years from now I will sit as an old member thinking about what you can accomplish in a lifetime and how much more there is to do.

I hope you find Hospital Pediatrics to be as intriguing this month as I do. Don’t skip Ethics Consultant on page X and Hospitalists Online on page X. The first presents a patient with fever, the second a patient with leg swelling. What would you do? Feel free to tell me at the pediatric hospital medicine 2009 conference in Tampa, FL, or by writing to jadaru@gmail.com

There’s plenty more to say!!

WRITERS WANTED!!

or

What’s up with you?

What’s going on in your hospital or in your city?

A conference or workshop?

An intriguing case? A new perspective, procedure or protocol?

Share what you do!

If you have an idea for an article that might interest your colleagues across the continent, let us know because we’re looking for new contributors to Hospital Pediatrics!

Contact Jennifer Daru, Editor-in-Chief, at jadaru@gmail.com.
Legislative Update from the American Academy of Pediatrics Annual Legislative Conference

Susan Wu, MD, FAPP, Hospital Medicine Program, suewu@chla.usc.edu
Division of General Pediatrics, Children’s Hospital Los Angeles and University of Southern California Keck School of Medicine

Editor’s Note: Congratulations to Dr. Susan Wu, the recipient of the Section on Hospital Medicine grant to attend the AAP Legislative Conference this past April. Here are her thoughts on her experience.

I was fortunate to have the opportunity to attend the annual AAP Legislative Conference this past April in Washington, DC, on behalf of the Section on Hospital Medicine. It was a wonderful opportunity to learn from national experts and AAP leadership, as well as to work with pediatricians around the country with an interest in child health advocacy. I was excited to see that nearly one third of the attendees were residents, including some grantees of the Community Pediatrics Training Initiative program.

Representatives from the AAP included members of the AAP Committee on Federal Government Affairs, members of the AAP Committee on State Government Affairs, and the AAP President David Tayloe. We were also honored to hear insights from U.S. Senators Kay Hagan (D-NC) and Amy Klobuchar (D-MN). Workshops included informational sessions on topics such as health reform and health insurance, and skills sessions such as coalition building and media training. On the second day, the attendees were split into groups to role play visits with legislative staffers. Attendees also participated in the “Capitol Insights” simulation, where each group represents an elected official, who must make hard decisions in a short amount of time, and manage the consequences of each decision on committee assignments, fundraising and re-election. On the last day of the conference, attendees visited their own legislators to put these skills to use.

This year was an exciting time to participate in the legislative conference. President Obama campaigned on a platform that included mandatory health insurance coverage for all children, and he has committed more than $600 billion dollars to invest in health care reform. Already in the first few months of the year, legislation has been passed which will have a significant impact on children’s health, including the Children’s Health Insurance Program Reauthorization Act (CHIPRA), and the American Recovery and Reinvestment Act (ARRA).

After a disappointing veto of the Children’s Health Insurance Reauthorization bill in 2007, and after a change in administration, CHIPRA was signed into law on February 4, 2009. CHIP is a federal-state partnership intended to provide health insurance coverage for low income children who do not qualify for Medicaid. The authorization period is for five years and includes $32.8 billion in new spending that is paid for by a $0.62 per pack increase in cigarette taxes. CHIPRA allows continued coverage of the over 6 million children currently on CHIP programs, and includes an expansion to cover an addition 4.1 million children. CHIPRA also contains several new features:

• Creates a contingency fund to help states that have shortfalls
• Establishes performance bonuses to states that enact provisions to increase enrollment in Medicaid
• Limits income eligibility to 300% federal poverty level, except those states who already have CMS waivers to expand beyond 300%
• Repeals the five-year ban on Medicaid/CHIP eligibility for legal immigrant children and pregnant women
• Phases out coverage of childless adults

For his time and energy, I give Yong my wholehearted thanks. On behalf of the Executive Committee during the spring election and will begin their terms of service on November 1, 2009.

A Big Thank You to Yong Han!

Yong is completing his last term on the SOHM Executive Committee later this year. He has been a very active member of the Section for a number of years. His contributions to inpatient coding—in workshops at many events and to the coding manual available in a few months—have been critical. Fair and balanced coding is essential to document the Pediatric Hospitalists’ efforts, categorize our impact, and obtain appropriate reimbursement. Since many large data sets are based on billing codes, coding has a direct impact on research as well. The Section’s steady progress in this area is mostly due to Yong’s tireless efforts.

Beyond coding, it has been a pleasure to work with Yong. I advise anyone who visits him in Houston to ask him to take you to a local eatery to get the true flavors of the local community. I expect that Yong will continue to remain active in the Section and that he will spur his colleagues at Texas Children’s to be as active (yes, the gauntlet is being thrown).

On behalf of the Executive Committee and the whole SOHM I give Yong my wholehearted thanks for his time and energy.

Daniel Rauch, MD, Chairperson-Elect

Drs Stucky and Narang were elected to the Executive Committee this past April in Washington, DC, on behalf of the Section on Hospital Medicine grant to attend the annual AAP Legislative Conference this past April. Here are her thoughts on her experience.

Congratulations to our newly elected SOHM Executive Committee Members!
YOU ARE THE HOSPITALIST — LISA ZAOUTIS, MD, FAAP, EDITOR

Case: 2 Year Old Boy with 3 Days of Intermittent Grunting and Fevers

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You are the pediatric hospitalist taking admissions in August when you accept a 16-month old boy with a chief complaint of respiratory distress and fever. After obtaining a history from the Emergency Department (ED) staff and the patient’s parents, you learn that your patient has had intermittent episodes of respiratory distress over the past three days. His mother describes these as high-pitched “sighing” noises, which do not seem to disturb the patient. These episodes seem to worsen when the patient is crawling, and he often rests for a few minutes during play which seems to lead to resolution of the episodes. Additionally, he has a 2-day history of spiking fevers to 102°F, and he developed loose non-bloody stools on the day of admission. He has had no cough, rhinorrhea, or other symptoms of an upper respiratory tract infection. He has no rash. He has been drinking and eating well and has had normal urine output.

His past medical and surgical history are noncontributory. He was a full term male with no perinatal complications. His growth and development have been normal. His family history is significant for a diagnosis of asthma in his father. He lives at home with his parents, and he does not attend daycare. There are no sick contacts. He takes no medications and has no known allergies. He is fully immunized.

His vital signs on arrival include a temperature of 37°C (98.6°F) orally, heart rate 162 beats/minute, blood pressure 88/68 mm Hg, respiratory rate 48 breaths/minute, and oxygen saturation 100% while on room air. The patient is alert and playful, and he appears well hydrated. His pulmonary exam is significant for tachypnea, mild intercostal retractions and intermittent grunting. He has good air entry in all lung fields with no crackles or wheezes. He is tachycardic, with a regular rhythm, normal S1 and S2, and no murmurs, rubs, or gallops. His abdomen is soft and non-tender with no hepatosplenomegaly. He is well perfused distally, with capillary refill less than 2 seconds. He has no rashes and the remainder of his physical exam is unremarkable.

While in the ED, the patient was initially treated with nebulized albuterol, with no improvement of his respiratory symptoms. His laboratory workup from the ED includes a normal basic serum chemistry panel and urinalysis. His white blood cell count was 10.5 thousand/uL with 53% neutrophils and 40% lymphocytes; the remainder of his complete blood count was normal. His C-reactive protein was mildly elevated at 2.0 mg/dL (normal <1.0mg/dL). A chest radiograph was obtained in the ED, which showed no pulmonary infiltrates but findings of prominent pulmonary vasculature and mild cardiomegaly (see Figure 1). An echocardiogram (ECG) was obtained, which demonstrated sinus tachycardia with age-appropriate voltages. An echocardiogram revealed a moderate pericardial effusion, moderate pulmonary insufficiency, and mild left ventricular dysfunction (shortening fraction of 30%) and a structurally normal heart.

As part of your investigation into the etiology of this child’s myopericarditis, you decide to perform one laboratory test that is most likely to be diagnostic:

A. Influenza polymerase chain reaction (PCR) assay from the nasopharynx
B. Urine organic acid profile
C. Enterovirus PCR assay from the blood and stool
D. Troponin-I and Creatinine Kinase-MB fraction from the blood

Continued on page 8
New Venue for Collaboration: Complex Care Special Interest Group (CC-SIG)

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Thanks to the leadership of Rishi Agarwal, MD, MPH, of Children’s Memorial Hospital, the provisional Complex Care Special Interest Group (CC-SIG) has been formed. The group, sponsored by the Academic Pediatric Association (APA), held its inaugural event in May, 2009 at the Pediatric Academic Societies (PAS) Meeting in Baltimore, MD.

The purpose of the CC-SIG is to bring together practitioners of diverse backgrounds to foster collaboration in the common interest of caring for medically complex children (MCC). Forty-three practitioners from a wide range of backgrounds, including generalists and specialists, inpatient and outpatient providers, trainees, and experienced pediatricians who care for MCC, attended the meeting. Although the definition of MCC remains elusive, the majority of participants agreed that MCC are a subset of children with special health care needs who require more intensive care coordination and who are high utilizers of medical services.

Dr Agarwal and Jay Berry, MD, MPH of Children’s Hospital Boston presented a report on a survey to pediatricians that gauged their interest in MCC. This convenience sample yielded over 150 responses from clinicians in 35 states and Canada. The respondents stressed the importance of increasing academic visibility for complex care, as well as the need for collaboration among institutions in creating practice guidelines, developing programs, sharing clinical knowledge and conducting research. The CC-SIG attendees reiterated these same issues. They called for an inclusive CC-SIG where clinicians of all types, from various clinical settings and backgrounds, could come together to collaborate on issues of MCC.

The SIG attendees divided into four working groups (clinical, education, research and advocacy) to develop an agenda for the upcoming year. The groups strategized four initial goals pertaining to MCC to be developed: to understand various models of care and identify best-practices to develop clinical care guidelines and educational curriculum to pursue a research agenda including projects on the definition of MCC and their health services to create an advocacy platform, including use of the “Speak Now for Kids” Campaign (http://www.speaknowforkids.org)

The CC-SIG will meet again in 2010 at the PAS Meeting in Vancouver, BC. At our next meeting, we will discuss updates from the SIG working groups. We hope that our work leads to increased academic visibility of pediatric complex care. Over the next year, the groups will collaborate through emails and phone conferences to achieve their goals.

If you are interested in being part of this passionate group and their efforts, then please contact Rishi Agarwal at ragarwal@childrensmemorial.org

Editors note: The AAP SOHM also has a Subcommittee on Complex Care. If you are interested please contact: Allison Ballantine, MD, FAAP ballantine@email.chop.edu

To register, visit www.academicpeds.org.
Answer: C

Discussion
Enterovirus is a genus of RNA viruses associated with a wide spectrum of disease and is one of the most recognizable viral causes for myopericarditis. There are more than 90 different subtypes of human enteroviruses (HEVs) which, as of the year 2000, have been classified into 5 species (poliovirus, and HEV A, B, C, and D). These HEVs may be more familiar to many by the previous serotyping classification that included echoviruses, coxsackieviruses, and enteroviruses. Enteroviruses cause more than 20 million infections in the United States each year and although some enteroviruses tend to cause certain tissue infections, the serotype/disease association is not specific.

Enterovirus infections occur throughout the year, but in temperate climates the rates of infection are highest in the summer and fall. The viruses are transmitted mainly by the fecal-oral route, but can also be transmitted by respiratory droplets or indirectly via contaminated water or fomites. The virus initially enters the oral/respiratory mucosa, replicates in the lymphoid tissue and then spreads to the blood at which point it can cause viremia and seed the central nervous system, heart, liver and/or lungs.

Clinical Presentation
Symptoms and signs of enteroviral myopericarditis are similar to acute myopericarditis due to a wide range of infectious and noninfectious causes. In older children and adults, dyspnea, cough, fatigue, exercise intolerance, and chest pain are prominent symptoms. In younger children, myopericarditis most often presents with respiratory symptoms, specifically cough and grunting. In infants, nonspecific symptoms of fussiness, poor feeding, diaphoresis, or tachpnea may be most common. Physical finding may include a pericardial friction rub, a gallop rhythm, hepatomegaly, or other evidence of heart failure, but these vary with the severity and rapidity of onset of the illness, and the age of the patient.

Differential Diagnosis
This boy presented with cough, fever and intermittent grunting. Respiratory symptoms are most often a manifestation of an infectious, pulmonary or cardiac problem, but can also be presenting symptoms for oncologic and inflammatory etiologies. However, once the chest radiograph was obtained, showing the enlarged cardiac silhouette and prominent pulmonary vasculature, a primary cardiac process became the most likely.

With the short duration of symptoms and normal past medical history (especially normal growth and development) the diagnosis of an acute cardiac problem, such as myopericarditis, or dilated cardiomyopathy became a strong consideration. Alternatively, a previously undetected congenital heart disease such as an atrial septal defect or ventricular septal defect exacerbated by a febrile viral infection leading to acute cardiac decompensation would have been another good consideration. The ECG and echocardiogram confirmed the diagnosis of dilated cardiomyopathy and pericardial effusion consistent with myopericarditis and showed no evidence of congenital heart disease.

The most common etiology of dilated cardiomyopathy in children is viral myopericarditis. Enteroviruses and adenovirus were the most common pathogens, but parvovirus B19 and human herpes virus 6 may be increasingly important. Others viruses associated with viral myopericarditis include cytomegalovirus (CMV), Epstein Barr virus (EBV), mumps virus, influenza A virus and respiratory syncytial virus (RSV). Other causes of dilated cardiomyopathy include metabolic derangements such as carnitine deficiency and propionic acidemia, nutritional deficiencies such as selenium deficiency, and toxins such as anthracyclines. Given this patient’s normal development and the relative rarity of these disorders, they are lower on the differential.

Diagnostic Studies
The diagnosis of myopericarditis is based on the clinical features and supportive laboratory and imaging studies. A chest radiograph may reveal increased cardiac size, which, as in this case, may be an important clue in patients thought initially to have a primary respiratory illness. An electrocardiogram is abnormal in only about half the cases and the changes are often nonspecific, but they include sinus tachycardia, non-specific T-wave changes, or diffuse ST-segment elevation or depression. Echocardiography can confirm the myocardial dysfunction or pericardial effusion. Recently cardiac magnetic resonance imaging (MRI) has been shown to be useful in confirming the diagnosis, but is not widely available.

The gold standard for the diagnosis of myocarditis is an endocardic biopsy showing inflammatory cellular infiltrate. A negative biopsy does not exclude the diagnosis because a random sample can miss patchy areas of myocardial involvement. Because of the risk of the procedure, the possibility of a false negative result, and the availability of other studies to support the diagnosis, this invasive test is not always necessary.

Polymerase chain reaction (PCR) assay is a diagnostic test that can rapidly and accurately confirm an enteroviral infection. Enterovirus PCR can detect the virus from multiple sources: serum, urine, cerebrospinal fluid, stool, and throat. A patient may shed virus in the stool well after clearing the virus from the blood. The assay targets a region of the genome which allows detection of a broad range of viruses in the Enterovirus genus.

The Other Choices
A. Although influenza is a recognized cause of myopericarditis, the summertime presentation for this patient makes enterovirus a more likely etiology.
B. While metabolic disease such as carnitine deficiency and propionic acidemia are causes of myocarditis in the pediatric population, this child’s normal growth and development, reassuring past medical history, and general well appearance make these diagnoses very unlikely.
C. While measurement of cardiac enzymes is commonly used to trend the disease progression, this is not a useful diagnostic test for myocarditis as these assays are neither sensitive nor specific for myocarditis.
Treatment

Treatment of viral myopericarditis is centered on support for the left ventricular dysfunction. In symptomatic children with moderate to severe cardiac dysfunction inotropes such as milrinone are used in the acute phase followed by angiotensin-converting enzyme (ACE) inhibitors in the recovery phase. In severe cases further support with left ventricular assist device, extracorporeal membrane oxygenation (ECMO) or cardiac transplantation may be necessary.

The role of antiviral drugs in enteroviral infections is currently under investigation. In particular, pleconaril, a broad spectrum antiviral agent which works by preventing viral uncoating and attachment to host cell receptors, shows promise in the treatment of mild enteroviral respiratory infections and enteroviral meningitis. This might translate to clinical utility in the treatment of enteroviral myopericarditis. Based on some early studies, some pediatric institutions use intravenous immunoglobulin (IVIG) routinely for enteroviral myopericarditis.

Outcome

Results of the enterovirus PCR assays of his blood and stool were positive on day 2 of his hospitalization, which confirmed current or very recent infection and precluded the need for further tests for etiology. He was observed in the hospital where he did well, requiring no supportive therapy. Although he was febrile briefly later on the day of admission, he remained afebrile thereafter, and his respiratory symptoms showed steady improvement over the next 2 days. He was discharged to home with a follow-up appointment with his primary care physician the next day and with cardiology in 2-4 weeks.

References

Program History and Overview

The Department of pediatric hospital medicine at the Alaska Native Medical Center (ANMC) in Anchorage, Alaska began in 1999 as the first pediatric hospitalist group in Alaska. The Alaska Native Tribal Health Consortium and the Southcentral Foundation, two Alaska Native owned and operated organizations dedicated to providing the highest quality health care to their customer-owners, manage ANMC. The hospitalists serve the Alaska Native population and focus on delivery of health care that emphasizes sensitivity to their culture. Although the patient base comes from thousands of miles of Alaska's geography, they are unified by a shared sense of community, and the pediatric hospitalists remain respectful and compassionate to their heritage and cultural identity. The mission of the hospitalist group is to exceed the standard of care in the delivery of tertiary medical services to over 55,000 of Alaska Native children, as well as to offer expertise as pediatric consultants to the providers who care for these children across the state.

Using a variety of shifts (described below), eight-FTE hospitalists cover a 19-bed inpatient unit, a 12-bed level II NICU, a procedural sedation service, and a newborn nursery with approximately 1,600 deliveries per year. In addition, the hospitalists provide a pediatric consultation service for physicians working throughout the Alaska Native health system.

The Service

The pediatric hospitalists at ANMC staff several different services to provide inpatient coverage to Alaska Native children. The inpatient pediatric service is staffed by the ward physician, and provides care to Alaska Native children aged 0-18 years who require admission to ANMC. These patients are either admitted directly from the local Anchorage community or are referred from one of the many outlying regional and rural village clinics. The pediatric ward physician conducts daily family-centered rounds that are attended by nurses, a respiratory therapist, a dietitian, a social worker, a speech therapist, a physical therapist, and a pharmacist. Through this multidisciplinary approach, communication with patients and families is tightly coordinated and treatment plans are organized with input from all the services involved.

The nursery/NICU service provides care to all term and preterm newborns admitted to the newborn nursery or NICU at ANMC. The hospitalists work closely with the obstetricians to ensure the highest quality of care for high-risk newborn deliveries (approximately 700 per year). Pediatric hospitalists attend these high-risk deliveries and admit those infants who require higher level neonatal care to the 12-bed level II NICU. Level III patients are transferred to another facility.

ANMC hospitalists staff a busy consult/sedation service, providing both telephone and second-opinion consultation for outpatient providers associated with ANMC (ten pediatricians and forty family practitioners), emergency department providers, and surgical providers. The consult physician also provides inpatient consultation on patients admitted to the pediatric ward on other services (i.e. general surgery, ENT, etc.). Moreover, the hospitalists are available 24/7 as telephone consultants to outlying providers, in order to answer questions regarding the care of Alaska Native children from across the state. Typically, these consultations are requests for advice regarding care in one of three categories: 1) management of acutely ill children in the outpatient or inpatient...
setting, 2) ongoing management of children with chronic health care needs, 3) assistance in transporting children from outlying communities to the inpatient pediatric unit at ANMC. Finally, the consult/sedation physician staffs the pediatric sedation service at ANMC and is responsible for providing sedation and analgesia to pediatric patients requiring radiologic imaging or minor surgical procedures.

The ANMC pediatric service also includes a four-bed pediatric intensive care unit, with the hospitalists managing pediatric intensive care patients that are admitted to the pediatric service. Typically, these are either chronically ventilated children or children who require non-invasive, mechanical ventilation. Children requiring more support are transferred to the PICU service, which is staffed by one of three pediatric intensivists at ANMC.

The pediatric hospitalists also offer their medical expertise in outpatient settings by staffing pediatric field clinics at distant regional facilities across Alaska in Kodiak, Dillingham, Nome, Kotzebue, and Barrow. Working in conjunction with these children’s primary care providers, the hospitalists offer pediatric specialty care to high-risk infants and children, in particular those with chronic health care needs who reside in remote villages.

A separate hospitalist staffs each of the three services (inpatient pediatrics, nursery/NICU, and consult) Monday through Friday, when the services are busiest. To provide 24-hour daily coverage, an on-call physician covers the three services overnight. Call is usually done in-house. On the weekends and holidays, when patient volume is typically lower, a single hospitalist covers the services during daytime hours while the on-call physician covers the services at night.

**Education**

Because ANMC functions as the tertiary medical center for the Alaska Native health system, the hospitalists at ANMC regard the education of trainees and outlying providers in pediatrics as one of the most important aspects of the program. Residents from the Alaska Family Medicine Residency program rotate through the level II NICU and newborn nursery to gain experience in caring for the health problems associated with premature and term infants. In addition, they gain experience in neonatal resuscitation by attending deliveries of high-risk infants. Finally, the hospitalist program regularly provides inpatient pediatrics training to pediatric residents, physician assistant students, and medical students who have an interest in practicing in Alaska after their training is completed.

The hospitalists at ANMC are dedicated to educating providers across the State of Alaska with the goal of ensuring that the highest quality of care is consistently delivered to all Alaska Native children. To accomplish this goal, the hospitalists travel throughout Alaska to provide training courses (NRP, PALS, and STABLE) and educational conferences on pediatric topics, while offering their expertise as pediatric medicine consultants.

**Research**

The hospitalist program at ANMC is also extensively involved in research. The program works closely with the CDC Arctic Investigations Unit studying a number of health-related issues in the Alaska Native population. In addition, several hospitalists are involved with researchers at Oregon Health and Sciences University studying a newly discovered variant of carnitine palmitoyl transferase-1A (CPT-1A) deficiency that is common in many populations in the Arctic. Finally, all of the hospitalists are involved in quality improvement initiatives to improve both the quality and value of care during pediatric inpatient stays at ANMC.

For more information, contact Matthew Hirschfeld, MD/PhD, Medical Director, Department of pediatric hospital medicine, Alaska Native Medical Center, 4315 Diplomacy Dr., 2W458, Anchorage, AK 99508, (907) 729-1084, mjhirschfeld@anmc.org

**Interested in seeing your hospitalist group featured in Practice Profile? Email Susan Wu at suwu@chla.usc.edu.**
Apparent Life Threatening Event – Why Doing Less is Likely Best

Ricardo A. Quinonez, MD, FAAP, raquinon@texaschildrenshospital.org
Faculty Inpatient Service, Baylor College of Medicine, Texas Children’s Hospital

Few diagnoses can be as disheartening, especially for pediatric hospitalists who may be concerned with efficient use of the hospital and its resources, as that of ALTE. ALTE, or “apparent life threatening event,” is a common entity encountered in the level II or infant care nurseries in the hospital. This condition can be both challenging and frustrating to physicians and parents alike, as up to 50% of the patients admitted to the hospital leave without a specific diagnosis or etiology that explains the event. Part of the frustration has to do with the fact that what little evidence exists is mostly retrospective, not multi-centered and sometimes lacking in sufficient sample sizes to effectively guide management. However evidence does exist and awareness of this evidence may relieve some of the frustrations associated with this difficult entity. This article will briefly define ALTE and review some of the available evidence on the subject; focusing in particular on the yield of diagnostic testing in general and for some specific conditions.

ALTE is not a disease but rather a chief complaint.

It is important to note that ALTE is not a disease but rather a chief complaint. The National Institutes of Health (NIH) defines ALTE as “an episode that is frightening to the observer and that is characterized by some combination of apnea (central or occasionally obstructive), color change (usually cyanotic or pallid but occasionally erythematous or plethoric), marked change in muscle tone (usually marked limpness), choking, or gagging.” This event is by definition frightening to the observer and in some cases the observer fears the patient has died. The worrisome nature of this event has led to erroneous terms of “near-miss SIDS” or “aborted crib death” to describe this condition. Although the definition of ALTE does not specify an age limit, it’s typically considered a condition which primarily affects infants. Peak incidence is between 1 week to 10 months of age, and most events occur in infants less than 10 weeks. Population based studies have estimated an incidence of 0.5 to 1 percent.

A 2004 systematic review evaluated the most common discharge diagnoses in ALTE. 643 infants were included from 8 separate studies in which ALTE was clearly defined. A total of 728 diagnoses were assigned with the most common being gastroesophageal reflux disease (n=227), seizure (n=83), lower respiratory tract infection (n = 58), and unknown or idiopathic (n = 169). There were a total of five deaths, but of note, all of the deaths occurred in children with underlying medical problems. The authors estimated that a thorough physical examination and history would have been enough to make the diagnosis in over 50% of the children in which one was found.

Many articles have examined the yield of diagnostic testing in ALTE. One of these in particular focused on the inpatient evaluation. The authors conducted a retrospective review of 243 patients admitted to a tertiary care unit for an episode which met the above mentioned NIH definition of ALTE. The charts of 243 patients were examined. A total of 3776 tests were performed (an average of 15 tests per patient). Out of all the tests obtained, only 17.7% of these were positive; however, only 5.9% actually contributed to the eventual diagnosis.

Outpatient studies have yielded similar or perhaps even less favorable data for diagnostic testing. A 2004 study evaluated 122 emergency department patients less than 6 months of age who met criteria for ALTE. Of these patients, only 2.5% had positive results from their initial ER evaluation and, even though over 76% were admitted, only 7% of those admitted had significant medical interventions as inpatients. Most of the patients which had significant medical interventions had easily identifiable risk factors such as prematurity or pre-existing medical problems.

Other studies have looked at particular diagnoses and their association with ALTE. Because of its previously mentioned frequency as a diagnosis in ALTE, gastroesophageal reflux disease (GERD) has been a common subject of study. The majority of studies about GERD, as it relates to ALTE, have had difficulty proving causality. In one such study Arad-Cohen et al. evaluated 67 infants admitted to the hospital for ALTE. Of these patients, 21 had episodes of apnea and reflux as determined by polysomnography and pH monitoring. In over 80% of the apneic episodes no relationship to reflux was found, and in 93.6% of these, apnea preceded reflux. The majority of apneic episodes were obstructive in nature.

The neonatology literature is full of examples about the lack of temporal relationship between apnea and GERD. In one of these studies the authors evaluated 119 preterm infants with inductance plethysmography, heart rate, oxygen saturation (SaO2), and esophageal pH monitoring. They documented a total of 6255 episodes of reflux. Only 1% of these episodes had an effect of clinically significant apnea (>15 seconds). They also found that there was no difference in apnea rate before, during or after GERD and that GERD did not prolong apnea or have any effect on SaO2 or heart rate during apnea.

You are unlikely to see a patient admitted to the hospital with ALTE without an EKG or Chest X-ray in the chart. Cardiac causes for ALTE are a common subject of exploration. There is some available evidence regarding cardiac evaluation in ALTEs. A study by Wolf et al. evaluated 100 full term previously healthy infants admitted for ALTE with 24 hour Holter monitor. Interestingly, they found that 32% had a QTc greater than 2 standard deviations above the mean and up to 25% had premature ventricular depolarization (PVD). However, there were no deaths or clinically significant dysrhythmias at 1-32 month follow-up. They concluded...
that cardiac monitoring in ALTE rarely influences therapy.10 The authors also pointed out that most cases of structural heart disease presented with symptoms at the time of evaluation.

Infectious causes are often explored as well. To date there is no study which particularly addresses the yield of sepsis evaluation in patients presenting with ALTE who are afebrile and well appearing on initial evaluation. Some of the studies looking at yield of diagnostic testing overall found very poor yields in infectious work-ups as a whole.6,7 One study in particular found 3 cases of meningitis out of 79 spinal taps performed. However, all of these patients had contributory history and physical examinations. Of the patients who had non-contributory history and physicals, none had meningitis.8 Some conditions, such as urinary tract infection (UTI) and respiratory syncytial virus (RSV) infection, have some evidence behind their association with ALTE.9,10 These two conditions merit particular attention when evaluating infectious causes of ALTE.

Neurological work-ups are often undertaken in the evaluation of ALTE. Again as with infectious causes, the yield of tests such as electroencephalograms (EEG), computed tomography (CT) or magnetic resonance imaging (MRI) of the brain is extremely low when history and physical are non-contributory.6 A recent study evaluating the long term neurological outcomes of patients with ALTE found a rate of around 5% of adverse neurological outcomes over a five year period. However, neurological evaluation at the time of presentation with an ALTE was of low yield in helping to identify these patients.11

Lastly, one very important diagnosis in the evaluation of ALTE which should be considered is non-accidental trauma (NAT). The incidence of NAT as a cause of ALTE varies depending on the study, however in most it is below 5%.1,3,5 Some studies have suggested screening all children with ALTE with fundoscopic examination or cranial imaging.14,15 One study in particular found an incidence of retinal hemorrhages as high as 8.3%.16 However, a recent study which looked at diagnostic clues for NAT in patients presenting with an ALTE, found that history and physical examination had a higher sensitivity for abuse than screening fundoscopic examination, skeletal surveys or head CT. They also described certain historical and physical findings which should prompt an NAT evaluation such as blood in the mouth or nose, recurrent ALTE, varying history among caregivers and a history of sudden infant death syndrome (SIDS) within the family.17 One recent observation in ALTE as it relates to abuse, comes from the previously mentioned study on neurological outcomes in ALTE. In this study, which is one of the few to follow children with ALTE on a long term basis, found that up to 11% of children who presented with ALTE were subsequent victims of child abuse.13 This finding was unexpected and the authors found no plausible explanation for it. As with many other observations in ALTE, it is likely that the explanation is multifactorial given the vast differential diagnosis of this challenging entity.

ALTE is a prime example of a condition that because of its very nature and ultimate implication, there is ample room for both parents and practitioners to overreact. Unfortunately for practitioners there are no national guidelines to aid in the diagnosis and management of ALTE. Evidence-based guidelines aim to standardize practice in commonly seen conditions in order to improve efficiency and decrease the use of unproven practices. Although ALTE is also a condition in which evidence-based guidelines are desperately needed, such guidelines may be complex given the heterogeneous nature of this condition.

An ALTE guideline or approach which recommends a specific or required minimum work-up for all cases of ALTE would simply not be evidence-based with the information currently available.

Standardizing practice in ALTE is likely the wrong approach. None of the evidence presented here justifies any particular screening test in the evaluation of ALTE, however certain test such as urine analysis, testing for RSV during RSV season, screening EEG and evaluation for non-accidental trauma may have higher yields than many other tests commonly done. It is very important to point out that no single laboratory test or radiographic evaluation has ever been shown to affect outcomes. The Consensus Document of the European Society for the Study and prevention of Infant Death published in 2004 says: “There is no standard minimal work-up in the evaluation of an ALTE.”1 As in that document, most of the evidence presented here argues for a particularly individualized approach to diagnosis and management, based on a thorough medical history and physical, with a minimal and focused diagnostic work-up. An ALTE guideline or approach which recommends a specific or required minimum work-up for all cases of ALTE would simply not be evidence-based with the information currently available. Parents and practitioners on the other hand should be reassured by the fact that their greatest fear is unlikely to come to pass when dealing with an ALTE. The lack of causal relationship between ALTE and SIDS has been well established. One reason for this observation is the fact that efforts to prevent SIDS, such as supine sleeping, have dramatically decrease the incidence of SIDS, but have done little to affect that of ALTE.13 Also, SIDS occurs mostly at night, whereas ALTE seems to be a daytime phenomenon.

This lack of a relationship between both entities should remind us that the word “apparent” in “ALTE” is there for a reason. The prognosis of infants presenting with ALTE is excellent.3 Thus, the first step in the evaluation of children presenting to the hospital with a chief complaint of “not breathing” should probably be to first take a deep breath ourselves.

References

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Pediatric Quality Improvement – Who’s Driving This Bus and Where’s My Seat?

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Quality Improvement (QI) in health care has received significant attention over the past years, yet a crucial question remains unanswered: who is leading this charge for pediatrics and where are we going? For hospitalized children, the issues are acute and the need for improvement is evident on a daily basis. QI includes both traditional clinical quality—focused on health outcomes, and with it process and other measures—as well as more specific patient safety initiatives which are focused on elimination of harm. QI is dynamic by nature, which makes it attractive to those of us too impatient to wait for clinical research to be published, validated by other studies, and finally cross the chasm to the patient’s bedside. QI is a form of research—arguably even translational research at the “sharp end” of patient care, focused on measuring and refining the implementation of proven therapies and testing. It is meant to be shared openly, rapidly, and without hesitation, with errors often as helpful as successes, all features that distinguish it from traditional research. Finally, QI is ultimately advocacy and an attempt to meet the Institute of Medicine’s expectation that health care is safe, efficient, effective, patient-centered, equitable and timely. It is something “anyone can do” with a bit of training, and certainly should be part of our daily thought processes and actions as we deliver care to a single patient or to populations.

TJC will soon be publishing a work that includes information on the role of pediatric hospitalists in the hospital system.

At issue is the disorganization of pediatric QI efforts, with many well intended local, state, and national groups performing responsive, reactive, and innovative QI in many settings without coordination. On no front are we well connected, whether we are responding to external regulators, reacting to an acute safety event in our institution, or innovating care to improve clinical outcomes. Some hope, however, is on the horizon, and pediatric hospitalists will be front and center in this mission. The Joint Commission (TJC), the deemed reviewer for the Center for Medicare and Medicaid Services (CMS), has moved in the past years to a model inclusive of clinical outcomes and best practices. More importantly for us, they have identified pediatric hospitalists as a novel and potentially pivotal group to champion QI in the inpatient setting. In fact, TJC will soon be publishing a work that includes information on the role of pediatric hospitalists in the hospital system.

This recognition along with our partnership efforts with TJC will help us to not only respond to new regulations but to proactively advise on pediatric-specific elements. It will also place us more firmly at the table with both TJC and our own facilities that will have increased interest in our roles as QI leaders.

Reactive QI remains sensitive and in an immediate newborn state of cooperative learning. Although efforts to share incidents in Patient Safety Organizations (PSOs) have been supported by the federal government, these entities have not yet created a real identity and their future is as yet unclear. Sharing errors in pediatric inpatient health care does have a life at the state and national levels, via pharmacy reporting systems and reporting and sharing of drug/device vendor-related errors.

Perhaps more enticing to some, innovative QI is active at the local, state and national levels. The California Perinatal Quality Care Collaborative and National Association of Children’s Hospitals and Related Institutions (NACHRI)’s work on elimination of catheter-associated blood stream infections, Utah’s Pediatric Partnership to Improve Health care Quality on prevention and treatment of obesity, and the Vermont Oxford Network (VON) multiple efforts over the past many years are some examples of well functioning, mature collaboratives in pediatric health care. These exceptional groups are however exclusive by their own definitions, limiting transformation of care to certain venues and providers.

For pediatric hospitalists, it is critical to openly define quality initiatives which we uniquely control, those which we can influence or on which we can advise, and those which demand our leadership in innovation.

Now armed with this (brief) bit of information on QI, what does it really mean for the pediatric hospitalist? Whether at a 12-bed community facility or a 400-bed tertiary center, the majority of us live more often in the responsive and reactive segments of QI and perform the innovative due to intellectual curiosity combined with a commitment to delivering the best evidence-based care. Our level of engagement and roles in QI at our institutions are varied but have the common theme of responsibility. Our employers and the facilities in which we work expect us to help the organization succeed in maintaining TJC certification in the minimum. Many strive for a badge of excellence from other players in the quality world, whether employer groups

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with a financial driver or a group of like hospitals sharing data on clinical outcomes. Many of these organizations overlap in membership and somewhat in purpose. All are dynamic, responding to legislative actions regarding MRSA screening, initiatives for safe medication management, financial payment for improved clinical outcome for asthma or withholding of payment for “never events” such as urinary catheter-related infections. Within this changing environment, the lines between facility payment and control of outcome and that of the clinician-provider are becoming blurred.

For pediatric hospitalists, it is critical to openly define quality initiatives which we uniquely control, those which we can influence or on which we can advise, and those which demand our leadership in innovation. Our symbiotic relationship with our facilities depends on clear understanding of these roles. In addition, although in 2009 patients and families may not understand our position in the system, it is certain their expectations of us will quickly evolve as we become more central to effective performance of pediatric health care systems.

Most of us would acknowledge that the unknown is more disturbing than the known. Our success in QI depends on knowing our partners and allies, leveraging our positions, and determining where we need to push forward on our own. We need to influence regulations, drive collaborative projects, and ensure that each of us has a common QI skill set with which we are comfortable. The pediatric hospital medicine Roundtable QI workgroup is actively pursuing these goals. The table below is part of that work. It is a first attempt at an environmental assessment – a catalog of the current state of affairs relevant to our work in health care for pediatric inpatients. It is not exhaustive, missing allies in partner disciplines of nursing, pharmacy and others. It does not include state or regional QI groups, nor does it include current initiatives for each entity. It does, however, include the key organizations with whom we all should be at least generally familiar. Each are driving the QI agenda, some with a clearer focus on the child than others.

Our job then is to be an advocate, active and influential with most or all of these key leaders and to drive QI in the right direction for hospitalized children.

<table>
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<th>Entity</th>
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<td>Leapfrog Group</td>
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<td>Mission: To support research designed to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. The research sponsored, conducted, and disseminated by the Agency for Health care Research and Quality (AHRQ) provides information that helps people make better decisions about health care</td>
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<td>• Safer Health care for Kids</td>
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<td>Certifying pediatricians. Re-certification requires quality project involvement. (^) Approves QI projects for re-certification. QI projects approved: BSI, CPQCC, CHCA codes, Cincinnati ADHD, Access, others.</td>
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<td>Create and disseminate pediatric-specific measures; ensure adoption by regulatory agencies and vendors</td>
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Late Preterm Infants:
Not just “near term”

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Since 1990 the number of preterm births has risen 21% with 12.3% of all births occurring before 37 weeks gestation. This dramatic rise has been attributed to multiple etiologies including an increasing number of multiple births, pregnant women over 35 years old, and medically indicated deliveries secondary to better surveillance of the mother and the fetus. Infants born between 34 and 36 weeks gestation, previously known as “near term infants,” are now defined as “late preterm infants” to reflect the increased morbidity and mortality of this population. Late preterm infants (LPI) are increasing in number with 75% of all preterm birth being 34-36 weeks gestation.

Despite the increasing numbers of LPIs, these infants are not well studied. Short-term complications are well documented (Table 1) yet only recently has new data revealed that there may be long-term implications to being born “near term.” Hospitalists working in the nursery setting will routinely manage late preterm infants, often in the well newborn/Level I nursery. This article will focus on the short-term morbidities and associated management strategies in addition to highlighting new data on long-term outcomes of late preterm infants.

### Neonatal Issues
Growing research reveals that the morbidity and mortality of late preterm infants was previously underestimated with the risk reported at 6-8.5 times that of term infants. Compared with term infants, late-preterm infants have higher frequencies of respiratory distress, temperature instability, hypoglycemia, kernicterus, apnea, and feeding problems. McIntire and Leveno showed decreasing morbidity rates with increasing gestational age from 34% at 34 weeks to 17% at 36 weeks compared to 14% at term (39 weeks). This data emphasizes that the risk of morbidity escalates the further an infant is delivered from term gestation.

Evaluation of the mortality rates for late preterm infants emphasizes the need for vigilant care after delivery with the maximum risk of death occurring in first few days of life. Khasu et al showed the mortality rate for LPIs on day of life 1 is 11 fold that of term infants compared to 3.5 fold for day of life1 to one year of life2. Despite the increased risk of complications and mortality, late preterm infants are often cared for in the well newborn nursery receiving the same care as term infants. Many LPIs may be the size of term infants and care providers may not recognize that they are physiologically and metabolically immature. The assumption, despite evidence to the contrary, is that near term is nearly normal. Caring for this vulnerable population requires an understanding of the morbidities they face.

### Feeding Difficulties
Multiple issues can impact the late preterm infant’s ability to feed. With a high-energy demand yet low energy stores, the late preterm infant depends on feeds to provide crucial calories and energy. The closer to 34 weeks gestation, the sleepier these infants are with fewer and shorter awake periods. Some of these infants may have difficulty with suck/swallow coordination and may have a weak suck. This can lead to delayed lactogenesis if mom is not also pumping or hand expressing. Lactogenesis may also be delayed because of the maternal issues which lead to the early delivery. LPIs may feed well initially then deteriorate which can lead to dehydration and poor weight gain. Close follow-up is particularly critical for LPIs born by vaginal delivery who may only be observed 36-48 hours in the newborn nursery.

### Table 1
- Neonatal Morbidity
  - Considerations for a Late Pre-term Infant
  - Apnea and bradycardia
  - Excessive sleepiness
  - Poor feeding
  - Excessive weight loss
  - Hyperbilirubinemia
  - Hypothermia
  - Hypoglycemia
  - Respiratory distress
  - Sepsis

LPIs are also at risk of apnea of prematurity, airway instability when upright, ALTEs and SIDS. Apnea of Prematurity occurs in 4 to 7% of LPIs versus 1-2% in term infants. ALTEs and SIDS occur with greater frequency in late preterm infants. Because of the increased risk for airway instability, the AAP Committees on Injury, Violence and Poison Prevention and Fetus and Newborn recently published recommendations on monitoring all preterm infants in their car seat for at least 90 minutes prior to discharge from the hospital.

### Airway/Breathing
Preterm infants have a greater risk of cardiopulmonary compromise necessitating closer observation after delivery and in the neonatal period. Respiratory distress is 4.5 times more likely in late preterm infants versus term infants. Transient tachypnea of the newborn (TTN) and respiratory distress syndrome (RDS) due to lack of clearance of lung fluid and/or relative deficiency of pulmonary surfactant remain central to the pathophysiology of these disorders respectively. Delivery by elective caesarean section without preceding labor can exacerbate these conditions. During the transition period after delivery, these infants must be observed closely. Consider observation on a cardiopulmonary monitor in a level II or III nursery for 12-24 hours, particularly for infants born at 34 weeks gestation or less.


Management strategies for feeding the late preterm infant vary according to institution and gestational age, and the research supporting these methods is scant. The goal is to achieve 8-10 feeds in 24 hours until birth weight regained and the mother has a good milk supply. Maximizing the short alert periods of late preterm infants with effective feeding is key. For infants closer to 37 weeks, they may have adequate energy to successfully breastfeed with little additional pumping or supplementation. For 34-35 week infants, this may mean limiting time at the breast to 1-2 feeds per day and limiting feed duration to 45 minutes to prevent tiring the infant out. Encouraging the mother to pump or hand express starting in the first 24 hours will ensure she is receiving enough stimulation even if the baby has an ineffective or weak suck. Table 2 summarizes feeding management for the LPI. The feeding plan will need to be reassessed frequently to address the changing needs of the infant.

### Temperature instability
Late preterm infants are prone to temperature instability due their inability to generate heat as well as term infants, their poor energy stores, and their increased rate of heat loss. Maintaining normal temperature helps to regulate energy use. Frequent vital signs should include routine temperature measurement to ensure temperature greater than or equal to 36.5 degrees Celsius. Smaller preterm infants may need time in an isolette to maintain their temperature and to allow weight gain. For LPIs in the well newborn nursery, encourage skin to skin contact and proper bundling/hat use.

### Hypoglycemia
The insufficient metabolic response to loss of maternal glucose supply leads to the development of hypoglycemia in late preterm infants during the first 12-24 hours of life. Serum glucose can drop within 1-2 hours of birth and remain low. Management should involve checking blood sugars within 1 hour of delivery and feeding within 1 hour of delivery. Continue to check blood sugars before feeds until at least 2 normal results are obtained. Allow no more than 3 hours between feeds and aggressively manage low blood sugars.

### Jaundice
Late preterm infants have increased bilirubin production and delayed excretion leading to a prolonged and delayed peak at 5-7 days. Poor feeding contributes to their higher risk of jaundice. LPIs have a 7-13 fold increased risk of readmission for jaundice. Strategies for avoiding hyperbilirubinemia include optimizing feeding, preventing exaggerated weight loss, assessing jaundice risk factors and monitoring bilirubin levels until the peak is reached. The AAP’s clinical practice guideline on management of hyperbilirubinemia provides treatment guidelines for infants 35 weeks and greater. Late preterm infants, especially if breastfed, should be followed closely once discharged from the hospital to evaluate for jaundice.

### Sepsis
The incidence of suspected and proven sepsis is greater than 5 times higher in late preterm infants. Preterm labor and rupture of membranes can be the result of maternal infection leading to higher risk in the preterm infant. When maternal risk factors are present, observe the infant closely. Consider sepsis screening labs if GBS unknown and preterm delivery was not for maternal reasons (i.e. PIH). Consider full sepsis evaluation and initiating antibiotic therapy with significant risk factors including preterm premature rupture of membranes and chorioamnionitis.

### Central Nervous System
The brain of an infant at 35 weeks gestation is 60% of the weight of a term infant with significantly fewer sulci. This leads to immature self-regulation with excessive sleepiness. Additionally, decreased tone increases the risk of apnea from airway obstruction and LPIs have a two-fold risk of SIDS compared to term infants. Routine imaging is not recommended but practitioners should have a low threshold to evaluate an infant with a head ultrasound or other imaging if there are abnormal findings or behaviors. Long-term outcomes are not well known, but new evidence is being published (see below).

### Going home
Late preterm infants are at higher risk for readmission once discharged home. Since a large number of preterm infants are cared for in the well newborn nursery, discharge timing will parallel that of term infants: 48 hours for vaginal delivery, 72-108 hours for cesarean section. This provides very little time to observe the LPI and ensure readiness for discharge. Early discharge at less than 4 days of life makes readmission in the short term more likely. The reasons for readmission include (in order of frequency): jaundice, suspected sepsis and feeding problems. Late preterm infants at highest risk for readmission include first-born child, maternal complications in labor and delivery.

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**Table 2. Feeding Management of a Late Pre-term Infant**

- **Example feeding plans:**
  - 10-15 minutes at each breast then bottle/spoon feeding expressed milk or formula.
  - Feeding at breast with expressed milk/formula provided via feeding tube (Supplemental Nursing System or “SNS”)
  - Infants born at 34-35 weeks may only breast feed 1-2 times per day due to low energy, poor suck and sleepiness
- **Consider formula supplementation from Day 1 if mom’s milk production is low.**
- **Suggested feeding volumes:**
  - Day 1: 5-10 ml every feed
  - Day 2: 10-20 ml every feed
  - Day 3: 20-30 ml every feed
  - Day 4 on depends on gestational age and energy requirements
- **Watch weight closely to monitor for excessive weight loss.**
- **Some babies need gavage feeds as a back-up if unable to take enough volume by mouth.**
- **If not gaining weight with adequate volume, may need to increase the caloric density of breast milk/formula**

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breast-feeding at discharge, public insurance at time of delivery, Asian/Pacific Islander descent, and vaginal delivery. Early discharge at less than 48 hours is not recommended. Minimum discharge criteria based on the AAP Clinical Report by the Committee on the Fetus and Newborn are presented in Table 3.

Long-term outcomes

Recent studies have revealed that there are longer-term implications to being born before 37 weeks. Late preterm infants have greater morbidity and total health care costs and these differences persist throughout the first year of life. Chyi et al showed that compared to term infants, late preterm infants had

1) lower reading scores,  
2) higher special education participation with greater learning difficulties, and  
3) a higher need for an Individualized Education Plan (IEP) in Kindergarten and first grade.

A recent Norwegian study found that birth at 33-36 wks without evidence of disability was associated with lower net income and lower chance of completing university education. Petruni et al. found that children born late preterm time were greater than three times as likely as children born at term to have cerebral palsy. Modest association with developmental delay/mental retardation was also found. Grey et al found 19-20% of cohort born at 34-36 wks had clinically significant behavior problems at 8 years old, a higher rate than term cohorts. These findings are concerning and further research is needed to determine if these differences persist into adolescence and adulthood.

Summary

Special consideration must be given to the susceptible late preterm infant. Increased morbidity and mortality puts them at higher risk especially when receiving the same care as term infants in the newborn nursery. Further resources need to be dedicated to this population with research focusing on short and long term management. New endeavors are being undertaken including the Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN)’s Late Preterm Infant Initiative which addresses the special needs of infants born between 34 and 36 completed weeks of gestation. As physicians in the nursery setting, hospitalists have a unique opportunity to educate parents and staff regarding LPIs and to develop future research to guide our clinical management.

References:


2. Raju T, Higgins F, Stark A, Leveno K. Optimizing Care and Outcome for Late-Preterm (Near-Term) Infants: A Summary of the Workshop Sponsored by the National Institute of Child Health and Human Development. Pediatrics 2006; 118; 1207-1214.


The Society of Hospital Medicine, American Academy of Pediatrics and the Academic Pediatric Association sponsored a strategic planning meeting in February 2009 that brought 22 experts in pediatric hospital medicine together to discuss the future of pediatric hospital medicine. The meeting began with a brief review of the events leading to this Roundtable and an overview of basic organizational strategic planning processes. Using health care strategic planning methods, the goals of the meeting were to:

• Develop a strategic vision for the role of pediatric hospital medicine (PHM) in the future of child health care;
• Describe the current gaps between the vision and today’s reality;
• Develop a common understanding on current initiatives in pediatric hospital medicine domains of quality, practice, workforce and research;
• Determine the method(s) by which participants can be organized to accomplish additional initiatives to implement the vision;
• Identify and prioritize key strategic initiatives; and
• Assign accountability and determine next steps and timeline to implement the selected initiatives.

The vision that came out of pre-work and brainstorming at this planning session was wide-ranging and ambitious.

"Pediatric hospitalists will transform the delivery of hospital care for children.”

• We will ensure that care for hospitalized children is fully integrated and includes the medical home.
• We will design and support systems for children that eliminate harm associated with hospital care.
• We will develop a skilled and stable workforce who are the preferred providers of care for most hospitalized children.

• We will use collaborative research models to answer questions of clinical efficacy, comparative effectiveness, and quality improvement, and we will deliver care based on that knowledge.
• We will provide the expertise that supports continuing education in the care of the hospitalized child for pediatric hospitalists, trainees, midlevel providers and hospital staff.
• We will create value for our patients and organizations in which we work, based on our unique expertise in PHM clinical care, research, and education.
• We will be leaders and influential agents in national health care policies that impact hospital care

Following development of a vision, the members then undertook an analysis of the gaps between the current state and vision, organizing around four topics—clinical practice, research, workforce issues, and quality. Prior to the meeting, members assigned to each of the four workgroups collated and assessed available data relevant to their domain area. The current state of affairs and draft set of distinct goals were presented in a focused brief 15-minute summary by each previously designated group leader. Presentations were reviewed by the members jointly as well as in small groups during a gallery walk. These groups were purposefully chosen to include members of each workgroup to enhance diversity and encourage cross-domain interactive discussion and assessments. From this, all concluded that despite our best intentions, harm is still common, and as a group of physicians we do not consistently provide evidence-based care. We also found that while our workforce has many strengths, it is not yet stable. Quality and safety activities are currently dispersed throughout multiple national entities working in silos. The predominant focus is on meeting National Patient Safety Goals with limited work on inpatient clinical quality. A review of current research activities showed that much of our PHM research is fragmented with a lack of effective research networks and collaborative efforts to ask and answer the questions needed to provide optimal care.

Collectively the members made recommendations to each workgroup and then identified which elements of the vision were to be addressed by one or more workgroups. Then each of the original four content-based workgroups used their own work product and input from the above sessions to create three to four strategic initiatives. The members then used these to identify a series of initiatives designed to address the gaps between our current state and the vision. We identified the need to merge clinical practice and workforce, given the overlay of initiatives. Members identified ten initiatives, developing specific deliverables and identifying leaders within the three core workgroups for each project.

Initiatives included the following

• Undertake environmental assessment of PHM participation on key quality and safety committees, societies, and agencies to ensure appropriate PHM representation in liaison and/or leadership positions.
• Create a plan for a QI collaborative by assessing the needs and resources available; draft plans for two projects (one safety and one quality) which will improve care for children hospitalized with common conditions treated by PHM physicians.
• Develop an educational plan supporting the PHM Core Competencies addressing both hospitalist training needs including the role as formal educators.
• Create a clinical practice monitoring dashboard template for use at PHM hospitals and practices.
• Develop a descriptive statement that can be used by any PHM that defines the field of PHM and answers the question “who are we?”
• Develop a communications tool describing “value added” of PHM.
• Develop a tool to assess career satisfaction among PHM physicians with links to current SHM work in this area.
• Create a collaborative research entity by restructuring the existing research network and formalizing relationships with affiliated networks.

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• Create a pipeline/mentorship system to increase the number of PHM researchers.
• Formalize an organizational infrastructure for oversight and guidance of PHM Strategic Planning Roundtable efforts with clear delineation of the relationships with the AAP, APA, and SHM.

The next steps of the planning project will include recruitment of PHM physicians around the country to participate in the above Strategic Initiative projects over approximately 16-18 months under the guidance of workgroup leaders. This summary of the Roundtable events and the preliminary results of the Strategic Initiatives will be reported at the 2009 PHM meeting in Tampa this summer, with a more detailed presentation at the 2010 PHM meeting. Further development of these initiatives is anticipated, and longer term planning (2-5 years) will be evaluated by the PHM Strategic Planning Roundtable Members.

**PHM Strategic Planning Roundtable**

**Facilitator**
Sanford Melzer, MD, MBA

**Planning Committee**
Mary Ottolini, MD
Jack Percelay, MD
Dan Rauch, MD
Erin Stucky, MD
David Zipes, MD

**Members**
Doug Carlson, MD
Jennifer Daru, MD
Vincent Chiang, MD
Patrick Conway, MD
Matt Garber, MD
Christopher Landrigan, MD, MPH
Pat Lye, MD
Jennifer Maniscalco, MD
Sanjay Mahant, MD, FRCPC
Steve Narang, MD
Mario Reyes, MD
Beth Robbins, MD
Jeff Sperring, MD
Raj Srivastava, MD, FRCPC, MSCE
Lisa Zaoutis, MD

**Definition of “participant” or “Strategic Planning participant”:** Any PHM who engages in work on the Strategic Planning Initiatives exclusive of the PHM Strategic Planning Committee or Planning Members.

**RESOURCES FOR MEMBERS**

**Pediatric Hospitalist Programs of North America – Newly Updated**

The Pediatric Hospitalist Programs of North America resource can be used by individuals and programs to network as well as by members to seek out contacts and job opportunities in a location of interest. Visit the SOIH web site at www.aaphospmed.org for more information.

**Neonatal/Pediatric Transport Team Database – Newly Updated**

The Neonatal/Pediatric Transport Team Database is a resource for professionals who are interested in reviewing transport programs across the country. Visit the Section on Transport Medicine web site at www.aap.org/sections/transmed for additional information.
Diagnostic Errors: What are they and how can they be prevented?

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Case Presentation

A 13-year-old male with no past medical history is admitted with fever, bilateral thigh swelling, and abnormal liver enzymes. He received a course of azithromycin and ceftriaxone as an outpatient for presumed pneumonia and cellulitis. Physical exam reveals a febrile but alert and well-appearing male adolescent. The thighs are warm, edematous, and tender to palpation. The symmetry of the findings is striking and unexpected. He is unable to walk secondary to thigh swelling and pain. The patient was initially evaluated in the emergency room and a rheumatology consult was initiated – the full evaluation is still pending. You are perplexed by his clinical presentation. The patient’s mother is Spanish-speaking but, after speaking to her through an interpreter, you are still unsure of the diagnosis.

Osteomyelitis crosses your mind but does not seem to make sense given the symmetry of the findings and the elevated transaminases. You consider serum sickness as a diagnosis and are reassured that the right consultants, i.e. rheumatology, are on board and can assist with the management of that illness. Later, the rheumatology attending pages you and relates his suspicion that the patient has scleroderma. “What is that?” you ask, and he explains that this illness can be associated with streptococcal infections and is treated with penicillin. Of course, while ASO titers and other laboratory findings are helpful, ultimately the diagnosis is a clinical one. You review PubMed, Up-to-Date and also conduct an Internet search, but cannot find any published case reports in support of the rheumatologist’s diagnosis. However, you cannot think of any other diagnostic possibilities.

The next day, which happens to be Friday, the residents ask you about osteomyelitis and the need for an MRI. The patient has been started on empiric intravenous penicillin and already seems better, so you decide to wait on the MRI. That evening, you receive a call from the rheumatologist who recommends starting high-dose steroids. You agree – you are already late for home and the recommendation seems reasonable in light of the possible diagnosis of scleroderma, even though you do not fully understand it. The following Monday, a new rheumatology attending evaluates the patient and recommends an MRI of the thighs. The MRI revealed multifocal osteomyelitis with moth-eaten bone. The patient is diagnosed with chronic multifocal methicillin-resistant Staphylococcus aureus osteomyelitis and myositis. He remained hospitalized for six weeks because of persistent fevers. The patient underwent three separate drainage procedures by orthopedics during the hospital course. The patient is now well and will remain on chronic suppressive therapy for at least two years.

Diagnosis is the foundation of medicine.

Introduction

Diagnosis is the foundation of medicine. Often, the diagnosis is obvious, and effective therapy can be started right away. But when the diagnosis is uncertain, clinical reasoning and advanced medical decision-making skills must be applied to reach the correct conclusion. The term “diagnostic errors” refers to diagnoses that are delayed, missed, or incorrect and may jeopardize patient safety. This article will review the common features associated with diagnostic errors, strategies for reducing diagnostic errors in your own clinical practice, and tips for teaching others about the topic.

Why do diagnostic errors occur?

As famously stated in the Institute of Medicine’s “To Err is Human” report, at least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of preventable medical errors. The available literature broadly classifies errors into three categories: those that relate to diagnosis, to treatment, or surgery/procedures. Among these, errors in diagnosis (missed, delayed or wrong) are the least understood and have received the least attention in terms of prevention.

There are few studies in adult or pediatric medicine examining the incidence of diagnostic errors, but it is a common cause of malpractice litigation. Most research in this area has focused on why diagnostic errors happen in the first place – usually because of cognitive errors, or errors in thinking. Making the correct diagnosis is often a difficult task and physicians, as human beings, are susceptible to errors in thinking. Furthermore, it has been suggested that physicians at all levels of training have little insight into the cognitive underpinnings of diagnostic errors.

These concepts were explored in the lay book entitled How Doctors Think, by Dr. Jerome Groopman. A more formal evaluation occurred in a landmark study conducted by Dr. Mark Graber, an internist, who reviewed 100 cases of diagnostic errors identified through autopsy discrepancies, quality assurance activities and voluntary reports. He found that 74% of the cases had an identifiable cognitive cause that contributed to the wrong diagnosis. Systems-related factors contributed to diagnostic errors 65% of the time. An example of a system-related error is inadequate access to prior medical records or an ineffective handoff between providers. Of note, inadequate knowledge was uncommon, occurring in only 4% of the cases.

Graber categorized the cognitive causes of diagnostic errors into four types: faulty synthesis, faulty context generation, faulty perception, and premature closure. Faulty synthesis or information processing refers to an over- or underestimation of the salience of a finding. Faulty context

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generation refers to a lack of awareness or consideration of other aspects of the patient’s situation that are relevant to the diagnosis. Failure to notice a sign or a symptom is termed faulty perception. Finally, premature closure is the failure to consider reasonable diagnoses once an initial diagnosis is reached.

Redelmeier et al. also reviews premature closure and discusses two related types of cognitive errors. Framing of information may affect an individual’s thought process and ultimately their final decision. For example, a consultant might reach a different conclusion depending on how the information is presented or framed by the hospitalist. The statement “I am very worried about this patient” may influence the consultant differently than “I don’t really want a consult but the parent is insisting.” On the flip side, blind obedience refers to the situation in which an individual stops thinking about a problem when presented with a solution by someone with authority. For example, a hospitalist may accept a diagnosis from a senior consultant without question.

Redelmeier et al. also discusses two heuristics, or methods, to help solve problems that may lead to diagnostic errors. The availability heuristic is an approximation strategy, used when the probability of the disease being considered for diagnosis is closely related to the ease of remembering specific instances related to that diagnosis. When used correctly, it can expedite clinical decision-making. However, it can lead to cognitive biases when used by those with less experience. For example, a patient presenting with cough, congestion, and tachypnea in the winter season may automatically be thought to have RSV bronchiolitis, but other diagnoses such as pertussis are not considered.

The anchoring heuristic refers to the situation in which an individual sticks with an initial impression or diagnosis despite the accumulation of refuting evidence. The diagnosis stays “anchored” in a person’s mind. This heuristic is on the spectrum with premature closure. In premature closure, the diagnosis made by another clinician is accepted and the clinician does not consider other diagnoses. In “anchoring”, the clinician does not consider other diagnoses, despite refuting evidence, because the diagnosis is now “anchored.”

Effective use of intuition and metacognition is the key to expediting the development of clinical expertise and ultimately reducing the likelihood of diagnostic errors.

What makes an expert an expert? Cognitive psychology is the field that examines the process of reasoning, and how individuals formulate judgments and make decisions. One facet of cognitive psychology is metacognition, or the knowledge of one’s own cognitive system. Metacognition is used in learning situations and involves active control over the process of thinking. In clinical medicine, physicians use metacognition when taking a reflective approach to problem solving, or stepping back from the immediate problem to examine and reflect on the thinking process.

Seasoned clinicians develop expertise by blending both intuition and metacognition. Intuition is an immediate comprehension of a situation by the mind without intervention of any reasoning process. It is the state of being aware of something without having to discover or perceive it. In contrast, metacognition involves active monitoring and managing of the thinking process. One is a rapid and unconscious process while the other is a deliberate and conscious process. Objective rules and facts cannot capture the knowledge acquired by an expert during thousands of prior clinical situations. However, to solve a complex clinical problem, the expert still needs to contemplate a plan before the thinking episode, regulate the thought while thinking, and reflect on the thought process to revise the plan for future practices. Ultimately, experience gained from metacognition is collected and stored as organized knowledge that can be retrieved rapidly as a form of intuition during subsequent problem-solving.

Such clinical expertise is a process, not a product. It can be taught and learned. Novices become expert learners by trying to recognize their intuition. Metacognition allows novices to become fully aware of their state of knowing, thus enhancing their confidence of their intuition. Effective use of intuition and

Table 1
Specific Strategies for Reducing Diagnostic Errors

1. Emphasize the importance of the clinical exam.
2. Promote a systematic approach to common problems.
3. Expand your knowledge base using the best available evidence in the literature for easy access when needed.
4. Promote the use of time-outs or pauses. Ask the team to step back and rethink the diagnosis or ask a colleague for a second opinion.
5. Consider using the “worst case scenario” strategy to generate a differential diagnosis. But take care not to order unnecessary laboratory or radiographic studies, as this too might lead to an error.
6. Keep asking questions. Why does this lab value not make sense? Why does the family seem skeptical of the diagnosis? What can I not explain?
7. Acknowledge your feelings about a patient or family. Positive or negative feelings may bias your approach.
8. Slow down. When individuals are rushed, more mistakes may occur.
9. Learn, understand, and recognize the features of the cognitive process that can lead to a diagnostic error.
10. Admit your mistakes. This can lead to reflection and change in behavior.
11. When you make a diagnostic error, conduct a “cognitive autopsy.” (see box)
entertain other diagnoses despite questions from other team members. Furthermore, the hospitalist was influenced both by time pressures and the need to “tuck in” the patient before the weekend. Both things, in effect, “anchored” the diagnosis to the patient.

References

Suggested Readings for Educating Medical Learners about Diagnostic Errors and Critical Thinking Skills

Table 2
Guidelines for Conducting Cognitive Autopsies11
1. Conduct the “cognitive autopsy” as soon as possible after the error occurs.
2. Avoid immediate discussion with others.
3. Make sure you are well-rested.
4. Find a secluded place to avoid interruptions.
5. Beginning with the start of the day or shift during which the error occurred, list the items that led up to or influenced the event. Recall your thoughts and feelings related to the events of that day or shift. Pay close attention to ambient conditions.
6. Write everything down, no matter how trivial it may seem.
7. When ready, discuss your findings with others and record their comments and observations.
8. Review your thought process, as well as others’ thought processes.
9. Identify the cognitive errors that were made and reflect upon their respective impacts.

Table 3
Tips for Teaching Medical Learners10,11
1. Review the principles of clinical reasoning with medical learners.
2. Use strategies that force deliberate cognitive processes. Experienced clinicians will often rely on intuition because it is fast and easy. Role-modeling deliberative diagnostic thinking will encourage the learner to practice this skill and potentially avoid cognitive errors.
3. Encourage learners to give pertinent details and highlight discriminating features that will likely lead to the most appropriate differential or final diagnosis. Paying too much attention to irrelevant or non-discriminating features may lead to premature closure.
4. While discussing the case, keep the differential diagnosis in mind. This will focus the attention on the presence or absence of specific features that will lead to the possible diagnosis.
5. Ask learners to capture the “big picture” by summarizing the case in one sentence at a high level of abstraction. Such problem representation provides a conceptual understanding about the case.
6. Encourage the learner to commit to a working diagnosis, but allow them to express uncertainties.
7. When interacting with the learner, focus on clinical reasoning. Ask probing questions. Use the metacognitive strategy to explore and create a comprehensive list of relevant differential diagnoses.
8. Build teaching points on the areas of uncertainty expressed by the learner. Change the culture from one that discourages the expression of uncertainty to one that encourages it.

metacognition is the key to expediting the development of clinical expertise and ultimately reducing the likelihood of diagnostic errors.1 Tables 1, 2 and 3 include specific strategies for reducing diagnostic errors, as well as tips for teaching medical learners and fostering the development of clinical expertise.

Back to the Case
The case presented at the beginning of the article included several examples of cognitive errors that ultimately led to the wrong initial diagnosis and treatment, as well as a delay in the institution of effective therapy for the correct diagnosis. Challenge yourself by reading the case again and identifying the cognitive errors that occurred. Answers are listed right.

1. **Framing effects:** The emergency room inadvertently created a framing effect by consulting rheumatology and packaging the patient as an “unknown.” The ward team subsequently viewed the patient as having an array of symptoms that only rheumatology could address.
2. **Premature closure:** The hospitalist considers osteomyelitis as a diagnostic possibility, but ultimately settles on serum sickness as a more likely etiology for the child’s condition. The hospitalist hoped that rheumatology would confirm the diagnosis and guide the treatment.
3. **Blind obedience:** Despite evidence to the contrary, the hospitalist did not challenge the diagnosis of scleroderma made by the specialist and did not pursue other diagnostic possibilities.
4. **Anchoring heuristic:** The hospitalist and the rheumatologist did not...
When a Parent Refuses Medical Advice for Their Child

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The febrile infant

A mother brings her 5-week-old previously healthy daughter to the emergency room with a 101°F fever. The infant has a 12-hour history of fussiness, decreased breastfeeding (q3h instead of q2h) and nasal congestion. No vomiting, diarrhea, cough or rash. Past history is notable for a home birth at 39 weeks after an uncomplicated pregnancy. The group B strep status is unknown. Birth weight was 3.12 kg. The infant has not had any vaccines. Mother wants to postpone the hepatitis B shot until the child is a year old. A 2-year-old sibling currently has a common cold.

On exam the infant appears alert but mildly ill. Vitals were: temp 101.6°F rectal, pulse 175, BP 84/60, O2 sat 97%, weight 3.85 kg. HEENT exam reveals some nasal congestion, but is otherwise normal. Auscultation of the chest reveals coarse upper airway sounds. The breathing is unlabored. Capillary refill is fair at 3 seconds with mild mottling of distal extremities. Remainder of the exam is within normal limits.

Disagreement

The ER doctor recommends a standard evaluation for sepsis, including drawing a CBC and blood culture, catheterization for urine, obtaining a chest X-ray and performing a lumbar puncture. Mother initially resists all interventions, but finally agrees to blood work and urine cath. The WBC was 16,500 with 68% neutrophils and 8% bands. Hemoglobin is 12 g/dl and platelets 225,000/microliter of blood. The urinalysis is normal. Because of the high white blood cell count, the mother agrees to a chest X-ray, which is read as normal. Concerned that no source of infection has been found, the ER doctor again recommends an LP. The mother refuses. Her daughter appears better now, and she wants to go home. The ER doctor explains the risk of meningitis and occult bacteremia. He argues strongly for hospitalization. The hospitalist is called to the ER to give a second opinion. It has now been 5 hours since the baby’s arrival to the ER. Acetaminophen has reduced the fever. The temp is now 99.2°F, pulse 150, RR 28. The child appears non-toxic and the mottled skin has resolved. The exam is normal. The hospitalist reiterates the risk of a serious bacterial infection and recommends an LP, then admission for IV antibiotics for 48 hours pending culture results. Mother again refuses the LP. She begins to waver on the idea of admission for observation, so the hospitalist and ER doctor step into another room to debate the next step.

The infant’s white count and initial illness appearance would disqualify her from meeting the low risk criteria on the Rochester protocol. Standard of care would be performing an LP and admitting for IV antibiotics. Options at this point would include:
1. Allowing the mother to take the child home AMA.
2. Convincing the mother to allow the child to be admitted for observation without giving antibiotics, since no LP was done.
3. Convincing the mother to allow the child to be admitted and starting antibiotics, with the plan of giving 2 days of antibiotics pending the other cultures.
4. Same as 3, but plan on a full 10 day course of antibiotics if no LP is done.
5. Taking custody of the infant and obtaining consent for an LP from Child Protective Services, then admitting and starting antibiotics for at least 2 days pending culture results.

The phrase “in the best interests of the child” is frequently used in family courts, and some judges may apply that concept. Other courts are more reluctant to override parents’ wishes unless the child is exposed to a risk of harm that is above some significant threshold. This has been called the Harm Principle.1

One difficulty of the hospitalist model is that trust between doctor and parent/patient needs to be established for the first time during an episode of stress.

The most common situation in pediatric medicine for dealing with a parent’s refusal regarding medical advice is the parent who declines to vaccinate his/her child. The AAP Committee on Bioethics has a policy statement that encourages accommodating these families.2

Threshold for intervention

Modern medical ethics strongly promotes autonomy. Medical ethics has a well-established principle that adults with decisional capacity have the right to refuse recommended care. However, the ethics of a parent refusing medical treatment for his/her child is more complex. Parents have the responsibility and authority to be the surrogate decision makers. The law presumes that the parents will typically be the best advocates for their own children.

Beneficence is another important component of medical ethics. Pediatricians are trained and professionally motivated to utilize specialized scientific knowledge, skills, and experience to promote children’s health. As mandatory reporters of neglect and abuse, health care providers form society’s safety net to protect children from harm. This includes harm when exaggerated fears, pseudoscience, or other ideological agendas adversely affect a parent’s decision making. Note that this professional role plays out through the legal system. It would be unacceptably paternalistic for the physician to unilaterally usurp a parent’s decision-making authority. Balancing the rights of the parents with the State’s interest in protecting children (known as parens patriae) is the province of a judge.

The classic case taught in pediatric ethics is a parent refusing a blood transfusion for her child due to religious reasons. In essentially all cases, a judge will override the parent’s wishes and
order life-saving transfusions be given to keep the child alive until the child is old enough to make religious decisions for himself. But what about cases where:

1. the harm is less likely to be lethal,
2. the risk is smaller,
3. the danger is less imminent, and/or
4. the basis for the refusal is more sanctioned?

Case law which deals with those variables can be very instructive to medical ethics. The phrase “in the best interests of the child” is frequently used in family courts, and some judges may apply that concept. Other courts are more reluctant to override parents’ wishes unless the child is exposed to a risk of harm that is above some significant threshold. This has been called the Harm Principle. The threshold of harm that prompts intervention varies by jurisdiction and local medical and legal customs. One recent case in Idaho, Mueller v. Auker, sets a very high threshold, as might be expected given the local culture favoring individual rights over government power. In a case with facts similar to the case here, the judge used a standard that “no reasonable parent would decline the treatment.”

Pediatricians should advocate for the child. Hospitalists faced with these situations would be well advised to seek counsel from the hospital’s lawyer, or the risk management office, or local physicians with expertise and experience in dealing with child abuse cases. The law is keen on proper procedures being followed if the State does intervene. For instance, one procedural error in the Mueller case was the failure to notify the parent not present in the ER when custody was taken.

Modern medicine as a team effort
Dealing with conflicts like this also highlights the importance of hospital medicine as a team effort. The ER doctor in this case appropriately consulted the hospitalist early. A common error would be for one doctor to acquiesce to the parent’s demand for non-standard care and then expect other staff (nursing, on-call doctors) to follow along with implementing that decision. Hospital medicine, with its frequent handoffs, requires coordinated teamwork. A discussion of a case similar to this on a pediatric emergency listserve revealed that some doctors might reluctantly admit the child for observation without the LP while others would refuse to compromise the standard of care.

Some would let the mother leave AMA while others would report that action as neglect. Decisions will vary depending on the particular facts of the case. Hospitalists should know the tendencies of their colleagues in these situations and have a mechanism for addressing variations. Discussing cases such as this at group meetings will reveal the approaches that colleagues might take in similar situations.

Trust
One difficulty of the hospitalist model is that trust between doctor and parent/patient needs to be established for the first time during an episode of stress. Many conflicts between patients and physicians occur because parents have a preexisting distrust of the system, or an underlying rejection of a particular scientific outlook. These variables need to be identified and coping strategies invoked. Getting the primary care doctor involved, if there is one who has already established a trusting relationship with the family, can be very helpful.

Accommodation
Accommodating cultural diversity is an ethical virtue. Accommodation could be considered a corollary to promoting social justice but probably deserves to be elevated in status to be its own principle. Embracing cultural diversity is part of the mission statement for many institutions. The most common situation in pediatric medicine for dealing with a parent’s refusal regarding medical advice is the parent who declines to vaccinate his/her child. The AAP Committee on Bioethics has a policy statement that encourages accommodating these families. However, the policy statement acknowledges that a minority of pediatricians will dismiss from their practice those families who refuse vaccination. Research puts that minority as large as 39%. The law recognizes that physicians are generally free to determine whom they accept as patients. The inpatient environment has factors that may restrict this freedom in comparison to outpatient pediatrics, mostly related to the immediate availability of alternate care providers.

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Accommodation
Accommodating cultural diversity is an ethical virtue. Accommodation could be considered a corollary to promoting social justice but probably deserves to be elevated in status to be its own principle. Embracing cultural diversity is part of the mission statement for many institutions. The most common situation in pediatric medicine for dealing with a parent’s refusal regarding medical advice is the parent who declines to vaccinate his/her child. The AAP Committee on Bioethics has a policy statement that encourages accommodating these families. However, the policy statement acknowledges that a minority of pediatricians will dismiss from their practice those families who refuse vaccination. Research puts that minority as large as 39%. The law recognizes that physicians are generally free to determine whom they accept as patients. The inpatient environment has factors that may restrict this freedom in comparison to outpatient pediatrics, mostly related to the immediate availability of alternate care providers.

Case law which deals with those variables can be very instructive to medical ethics. The phrase “in the best interests of the child” is frequently used in family courts, and some judges may apply that concept. Other courts are more reluctant to override parents’ wishes unless the child is exposed to a risk of harm that is above some significant threshold. This has been called the Harm Principle. The threshold of harm that prompts intervention varies by jurisdiction and local medical and legal customs. One recent case in Idaho, Mueller v. Auker, sets a very high threshold, as might be expected given the local culture favoring individual rights over government power. In a case with facts similar to the case here, the judge used a standard that “no reasonable parent would decline the treatment.”

Pediatricians should advocate for the child. Hospitalists faced with these situations would be well advised to seek counsel from the hospital’s lawyer, or the risk management office, or local physicians with expertise and experience in dealing with child abuse cases. The law is keen on proper procedures being followed if the State does intervene. For instance, one procedural error in the Mueller case was the failure to notify the parent not present in the ER when custody was taken.

Modern medicine as a team effort
Dealing with conflicts like this also highlights the importance of hospital medicine as a team effort. The ER doctor in this case appropriately consulted the hospitalist early. A common error would be for one doctor to acquiesce to the parent’s demand for non-standard care and then expect other staff (nursing, on-call doctors) to follow along with implementing that decision. Hospital medicine, with its frequent handoffs, requires coordinated teamwork. A discussion of a case similar to this on a pediatric emergency listserve revealed that some doctors might reluctantly admit the child for observation without the LP while others would refuse to compromise the standard of care.

Some would let the mother leave AMA while others would report that action as neglect. Decisions will vary depending on the particular facts of the case. Hospitalists should know the tendencies of their colleagues in these situations and have a mechanism for addressing variations. Discussing cases such as this at group meetings will reveal the approaches that colleagues might take in similar situations.

Trust
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National Conference & Exhibition
Sunday, October 18, 2009 (H2015)

Moderator: Daniel Rauch, MD, FAAP
Education and Program Chairperson

8:30 am Poster Session and Presentation of the 2009 Pediatric Hospital Medicine Abstract Research Award
Award Recipient: Samir Shah, MD, FAAP

9:30 am Top 10 Articles and Issues in Pediatric Hospital Medicine 2009
Faculty: Shaeen Ralston, MD, FAAP

10:30 am Break

10:45 am Update on AHRQ Activities
Faculty: AHRQ Representative

11:45 am Break

12:00 pm Section Business Meeting – Grab Lunch and Talk
Chairperson: Laura Mirkinson, MD, FAAP

1:00 pm Pediatric Hospitalists Involved in Transport
Faculty: Bryan Fine, MD, FAAP and Keith Meyer, MD FAAP

2:00 pm Break

2:15 pm Breaking Bad News
Faculty: Janet Serwint, MD, FAAP

3:15 pm Adjourn

List of Posters

Obesity In Hospitalized Pediatric Patients
Marsha E. Medows, M.D., FAAP, NYU Medical Center; Badrelin Bedri, M.D., Woodhull Medical Center; Katarzyna Dudycz-Sulicz, M.D., Woodhull Medical Center; Rajesh Pandey, Woodhull Medical Center; Daniel Rauch, MD, FAAP, New York University

Cardiorespiratory (CR) Event Recording In Admitted ALTE (Apparent Life Threatening Event) Patients In a Tertiary Pediatric Hospital
Arti Lal, MD, Arkansas Children’s Hospital; Supriya Jambhekar, Arkansas Children’s Hospital; Laura Sisterhen, Arkansas Children’s Hospital

Intravenous Immune Globulin In Children with Streptococcal Toxic Shock Syndrome
Samir S. Shah, MD, MSCE, FAAP, The Children’s Hospital of Philadelphia; Matthew Hall, PhD, Child Health

Corporation of America; Raj Srivastava, MD, MPH, FAAP, University of Utah; Anupama Subramony, MD, MBA, Morgan Stanley Children’s Hospital; James E. Lecin, MD, Children’s Hospital of Pittsburgh

Family Care Coordination Competency
Holly H. Colby, RN, MS, Children’s Hospital of Wisconsin; Debra Jablonski, RN, Children’s Hospital of Wisconsin; Mary Krauthoefer, RN, Children’s Hospital of Wisconsin; Carrie Wachowski, RN, Children’s Hospital of Wisconsin; Anne Juhlmann, RN, Children’s Hospital of Wisconsin; Rachel Kryfke, MBA, Medical College of Wisconsin; John Gordon, MD, Medical College of Wisconsin; Matthew C. Scanlon, Medical College of Wisconsin

A Novel Mechanism in Pediatric Chronic Enteropathies
Raafe Rashad Ghouse, M.D., Inova Fairfax Hospital for Children; Catherine Chao, Inova Fairfax Hospital for Children; Lynn Duffy, Inova Fairfax Hospital for Children; Peter Lee, Inova Fairfax Hospital for Children; Ian Leibowitz, Inova Fairfax Hospital for Children; Otto Louis-Jacques, Inova Fairfax Hospital for Children; Oral Alpan, M.D., O & O Alpan, LLC, Center for Immunology

Resident Perceptions of a Pediatric Academic Hospitalist Service and Private Hospitalist Services in a Tertiary Care Children’s Hospital
Jeffrey Foti, M.D., Phoenix Children’s Hospital; Ryan S. Bode, M.D., Phoenix Children’s Hospital
Phase II Trial with Canakinumab (ACZ885) to Evaluate Safety and Preliminary Efficacy in Children with Systemic Juvenile Idiopathic Arthritis (sJIA)  
N. Ruperto, Pediatria-II PRINTO, IRCCS G. Gaslini; P. Quartier, Unité d’Immunologie, Hospital Necker Enfants Malades, Hematologie et Rhumatologie Pediatrique; N. Wulffraat, Dept Pediatric Immunology, University Medical Center Utrecht; P. Woo, Centre of Paediatric & Adolescent Rheumatology, The Windeyer Institute; A. Loy, Pediatria-II PRINTO, IRCCS G. Gaslini; A. Mouny, Unité d’Immunologie, Hospital Necker Enfants Malades, Hematologie et Rhumatologie Pediatrique; B. Bader-Meunier, Unité d’Immunologie, Hospital Necker Enfants Malades, Hematologie et Rhumatologie Pediatrique; B. Prakken, Dept Pediatric Immunology, University Medical Center Utrecht; E. Noseda, Novartis Institutes For Biomedical Research, Novartis; R. Belpet, Novartis Institutes For Biomedical Research, Novartis; J. Leclot, Novartis Institutes For Biomedical Research, Novartis; C. Rordorf, Novartis Institutes For Biomedical Research, Novartis; A. Martin for PRINTO, Pediatria-II PRINTO, IRCCS G. Gaslini

How Reliable Is Urinalysis to Predict Urinary Tract Infections?  
Muhammad Waseem, MD, Lincoln Medical & Mental Health Center; Govinda Paudel, Lincoln Medical & Mental Health Center; Nirdesh Sharma, Lincoln Medical & Mental Health Center

Factors Influencing Health Care Satisfaction in Families of Medically Complex and Fragile Children  
Mary Krauthoefer, RN, Children’s Hospital of Wisconsin; Rachel Kryèke, MBA, Medical College of Wisconsin; Holly H. Colby, RN, MS, Children’s Hospital of Wisconsin; Mary Krauthoefer, RN, Children’s Hospital of Wisconsin; Debra Jablonski, RN, Children’s Hospital of Wisconsin; Ann Kareclas, RN, Children’s Hospital of Wisconsin; Anne Juhlmann, RN, Children’s Hospital of Wisconsin; Vandita C. Nanchal, MHA, Children’s Specialty Group, Medical College of Wisconsin, and Children’s Hospital and Health System; John Gordon, MD, Medical College of Wisconsin

The Use of Wipe Boards in Patient Rooms to Improve Discharge Communication  
Keith A. Boell, DO, FAAP, Geisinger Medical Center

Outcomes Associated with Obesity for All Hospitalizations Among Kids in United States, 2006  
Veerajalandhar Allareddy, MD, MBA, University Hospitals, Rainbow Babies Children’s Hospital.; Sankeerth Rampa, BE, Cleveland State University; Veerasathpurush Allareddy, BDS, MBA, PhD, Harvard University

Association Between Delay of DTP and MMR Vaccination and Increase of Seizure Development in Pediatric Epilepsy Patients  
Sung Koo Kim, Hallym University; Joon Woo Park, Hallym University

Updated: June 25, 2009

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Grant Recipients

**NICHQ Conference Travel Grant**
*Awarded to Drs Brian Skrainka and Anand Sekaran*

SOHM offers two $500 travel grants to attend the NICHQ Annual Forum for Improving Children’s Health care Conference. For additional information visit www.nichq.org

**AAP Legislative Conference Grant**
*Awarded to Dr. Susan Wu*

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**Resident Travel Grant**
*Awarded to Drs. Vivian Tang; Michael Rinke; and Corey Lachman*

(Section on Medical Students, Residents, and Fellowship Trainees Liaison)

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Section on Hospital Medicine

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