

the Pediatric Emergency Messenger



NEWSLETTER OF THE
PEDIATRIC EMERGENCY MEDICINE COMMITTEE,
TENNESSEE CHAPTER, AMERICAN ACADEMY OF PEDIATRICS

Volume 6, Number 1 Spring/Summer 2006

2006 PEDIATRIC EMERGENCY MEDICINE CONFERENCE IN KNOXVILLE

Please plan now to join us for the fifth annual collaborative statewide conference, now titled "An Update on Acute and Emergency Pediatric Care," to be hosted by East Tennessee Children's Hospital (ETCH) on November 10-11, 2006. This year's conference, sponsored by the Tennessee Chapter of the American Academy of Pediatrics (TNAAP), the Tennessee Emergency Medical



Services for Children (TEMSC) Foundation, and the four Comprehensive Regional Pediatric Centers in Tennessee, will be held at the Marriott Hotel along the river in downtown Knoxville. The conference agenda this year will include lectures and breakout sessions of interest to clinicians and nurses who care for children in offices or the emergency department. Topics this year include Child Abuse Evaluation, Methamphetamine Exposure, Pediatric Death in the ED, Sports Injuries, Asthma Update, Update on Head Injuries, Poisonings Update and many others.

You are also invited to join us Friday evening, November 10, for the

"Jump Shots for Tots" fundraiser to be held at the Basketball Hall of Fame, located next to the Marriott Hotel. This function, to benefit the TEMSC Foundation and ETCH, will include heavy hors d'oeuvres, live and silent auction items, friendly competition on the court (wear your tennis shoes!), and an opportunity to visit the museum.

For more information please contact Kelley Cantrell or Lisa Jones at (865) 541-8618. Conference registration and information will also be available on-line at www.ETCH.org.

Lise Christensen, MD
Course Director

Thanks, Bob!

The *Pediatric Emergency Messenger* was the idea of Robert Lembersky, MD, who brought the first issue to press in 2002. Since then he has served as its editor. Bob is a pediatric emergency medicine physician in Knoxville who has been active in the Tennessee Chapter of the American Academy of Pediatrics since 1999. In addition to his role as editor, Bob has served the chapter as Program Chair and has been a Board of Directors member since 2001. Bob combines tireless enthusiasm with creativity and great organizational ability. He is preparing to enter a new phase in his medical career by starting an anesthesiology residency in July, 2006 in Chicago. He is not abandoning pediatrics, however. His ultimate career goal is to practice pediatric anesthesiology. Best of luck, Bob. We will miss you!

Steve Riley, MD
Vanderbilt Children's Hospital
Nashville

THANK
YOU!

Tickborne Rickettsial Diseases

Tickborne rickettsial diseases in the United States include Rocky Mountain Spotted Fever (RMSF), human monocytotropic ehrlichiosis (HME) and human granulocytotropic anaplasmosis (HGA, formerly known as human granulocytotropic ehrlichiosis or HGE). RMSF is caused by *Rickettsia rickettsii* and is most frequently transmitted by the American dog tick (*Dermacentor variabilis*) in the southeastern United States. *Ehrlichia chaffeensis* is responsible for HME and is transmitted to humans by the lone star tick (*Amblyomma americanum*). The blacklegged tick (*Ixodes scapularis*) is the vector of *Anaplasma phagocytophilum*, which is responsible for HGA.

While cases of RMSF, HME and HGA are reported throughout the year, the majority of cases (90%-93%) are reported from April—September. RMSF and HME are more frequently reported in the southeastern and south central United States. However, RMSF has been reported in all 48 contiguous states, except Vermont and Maine. HGA is reported most frequently in New England and the north central states.

While a history of tick bite is helpful in establishing a diagnosis, a specific history of tick bite within 14 days of illness is only reported in 60% of RMSF cases and 68% of ehrlichiosis cases. Tick bites frequently go unnoticed since they are painless and often occur in areas not readily visible. Smaller, immature forms of ticks can also transmit infection. One need not

be hiking in the woods to be bitten either. Ticks can be found in home gardens and yards. A clinician must suspect tickborne rickettsial disease in anyone presenting with suggestive symptoms regardless of tick bite or recreational history.

While RMSF, HME and HGA are distinct entities, they share similar early signs and symptoms. These symptoms include fever, headache, nausea, vomiting, malaise and myalgias. The majority of patients first seek medical attention before the development of rash. In RMSF, the rash generally appears 2-4 days after onset of fever. Eventually up to 90% of children develop rash with RMSF. Approximately 2/3 of children with HME develop rash; rash is uncommon with HGA. The rash with RMSF often begins as blanching macules on the wrists, ankles and forearms. It evolves into a petechial rash and can spread throughout the entire body.

Initial laboratory evaluation should include a CBC and comprehensive metabolic panel. Hyponatremia, thrombocytopenia and mild elevation of hepatic transaminases may be found in RMSF. Patients with HME or HGA may have leukopenia, thrombocytopenia and elevation of hepatic transaminases. Absence of these lab abnormalities should not be used to exclude these diseases from your differential



diagnosis. Confirmatory testing includes indirect immunofluorescence antibody (IFA) assay, ELISA, or PCR. It is important to remember that patients may lack diagnostic IgG and IgM antibody titers in the first week of illness.

Clinicians should initiate therapy immediately when tickborne rickettsial disease is suspected. Delaying therapy may lead to severe disease or even fatal outcome. Doxycycline is the treatment of choice for all tickborne rickettsial diseases in children and adults. Doxycycline dosing for children is 2.2 mg/kg per dose given twice per day for at least 5-7 days. The adult dose is 100 mg twice per day. Several studies have suggested that limited courses of doxycycline do not cause significant tooth staining in children. Prophylactic use of antibiotics after a tick bite is not recommended.

For a more thorough review of current recommendations regarding diagnosis and treatment of tickborne rickettsial diseases, read MMWR (*Morbidity and Mortality Weekly Report*) March 31, 2006. The web site is www.cdc.gov/mmwr/.

Steve Riley, MD
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Female Dog Tick



Male Lone Star Tick



New Toxicologist Joins TPC

The Tennessee Poison Center, formally known as the Middle Tennessee Poison Center, now provides service to the entire state of Tennessee since the closing of the Poison Center in Memphis in January, 2004.

The Tennessee Poison Center recently added another medical toxicologist to their staff. Dr. Saralyn R. Williams joined the Tennessee Poison Center on January 1, 2006. Dr. Williams is board certified in Emergency Medicine and Medical Toxicology and was previously a faculty member at the University of

California, San Diego. Dr. Williams joins Dr. Donna Seger in providing medical toxicology back-up for the poison center. One of the medical toxicologists is available for phone consultation 24 hours a day to discuss the diagnosis or management of poisoned or envenomed patients.

Inhalant abuse has markedly increased in the State of Tennessee according to the National Inhalant Coalition. Common methods of abuse include "sniffing" the inhalant directly, "huffing" which means inhaling from a liquid soaked material, or "bagging" during which the

substance is sprayed or poured into a bag that is then placed over the face. Inhalant abuse is associated with sudden cardiac death in healthy kids. Long-term abuse may result in white matter degeneration in the brain, peripheral neuropathy, hepatic injury, renal tubular acidosis, and bone marrow depression.

The national poison center number, 1-800-222-1222, will connect you to the poison center serving your area.

Saralyn Williams, MD
Tennessee Poison Center, Nashville

Clues to Fracture Recognition

Fracture recognition in kids involves knowing pertinent historical findings, anatomy, where to examine a child and reading x-rays. Time constraints offer little time for additional questions, a brief exam or to even read an x-ray. But with just a few extra moments, an accurate history can help focus the exam, which can direct x-ray ordering and reading,

thus saving time and avoiding errors. Clues in the history which raise the suspicion of fracture include falls, collisions, being struck by an object, feeling a pop or pops, swelling or deformity. Always have the child point to where it hurts, and the physician should push on the bone at the level of the physis (you must know the anatomy as the physis feels no different than adjacent bone). Bone pain in a child with an injury mechanism is a fracture regardless of the x-ray findings. Swelling may or may not be present and frequently is not present in buckle or Salter-Harris I fractures.

Getting comfortable reading your own x-rays takes practice and feedback from your radiology or orthopedic colleagues. Don't rely on readings from radiology residents or readings the following day. To make the diagnosis of fracture there is no substitute to having the patient and x-ray directly in front of you at the same time. The exam directs you where to look on the x-ray. If there is an abnormality on the x-ray you can always go back and re-examine. It also allows you

to educate the patient and parent about where the fracture is located and what it looks like. If in doubt, don't be afraid to splint it and have the patient follow up with an orthopedic surgeon or sports medicine physician in a week. Fractures frequently follow patterns and with a little practice can be easily and accurately recognized.

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Do you have any pediatric emergency issues you would like to see addressed in this newsletter? We welcome your comments and suggestions. Please email the editor at: steve.riley@vanderbilt.edu. Views expressed in the Pediatric Emergency Messenger are not necessarily endorsed by the Tennessee Chapter of the American Academy of Pediatrics. Reprint permission may be requested from the editor.



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Fellow's Corner

Controlled Delivery of High vs Low Humidity vs Mist Therapy for Croup in Emergency Departments

Scolnik, Coates, Stephens, Da Silva, Lavine, Schuh, JAMA, March 15, 2006

Parents of patients with croup often ask about the utility of humidified air. Theories supporting the beneficial effects of humidity include soothing inflamed mucosa, decreasing viscosity of secretions and facilitating air flow. This randomized, single blind, controlled trial attempts to compare the efficacy of 3 methods for delivering humidified oxygen to children with moderate to severe croup in the emergency department (ED).

One thousand three hundred and fifteen children presented to the ED with croup during the study period. Eligibility criteria included age 3

months to 10 years and a croup score of 2 or higher on the Westley croup score. Ultimately, only 140 children were randomized for study inclusion. After a required 30-minute pre-study resting period, children were assigned to receive 30 minutes of either blow-by humidity (48), 40% relative humidity (46) or 100% humidity (46). The study found no significant difference between the Westley score at 0, 30 or 60 minutes nor did it find a significant difference in changes in respiratory rate, heart rate or oxygen saturation.

On the surface, the study appears not to advocate the use of humidified oxygen for patients with moderate to severe croup. However, one might argue that as no child worsened during the study period and no true placebo existed, this conclusion is not valid. Additionally, none of the study

patients required steroids, epinephrine or any additional intervention during the study period, creating the question of how sick these children actually were to begin with. Given that as emergency physicians we have at our hands a number of clinically proven treatment options for patients with croup, the utility of humidified oxygen does seem limited in an ED setting. However, this study would not prevent me from suggesting a cool mist humidifier at home to help ease worried parents of children with mild croup symptoms.

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