



## **Pediatric Literature Update: Will These Articles Change Your Practice?**

The emergency physician is constantly faced with the challenge of keeping up with the expanding emergency medicine literature. This course is designed specifically to review the pediatric emergency medicine from the past 12 months and discuss the articles that will have an impact on the emergency physician's practice.

- List and discuss the most important articles from the pediatric literature during the past year.
- Recognize the trends and changes as they emerge in the literature.

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3:00 PM - 4:55 PM  
Room # N204  
Las Vegas Convention Center

### **FACULTY**

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## LITERATURE REVIEW IN PEDIATRIC EMERGENCY MEDICINE

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### Infectious Disease Topics

#### Evaluation of The Febrile Child

##### **Febrile Infants at Low Risk for Serious Bacterial Infection-An Appraisal of the Rochester Criteria and Implications for Management**

The Rochester criteria applied to a set of conditions that, when applied to young infants, have been proven in prior studies to be predictive of children who are not at risk for serious bacterial infection. The criteria include the following:

1. Well appearance.
2. Negative past medical history.
3. No focus of infection.
4. White blood count  $\leq 15,000$ , band form count  $< 1,000$  per mm<sup>3</sup>, negative urine, and stool gram stains if indicated.

Recommended evaluations of these children include cultures of blood, spinal fluid, and urine.

1,057 infants were eligible for the study of which 931 were well appearing. Of this group 437 met the remaining low risk criteria. 5 low risk infants had serious bacterial illnesses including 2 infants with bacteremia. The negative predictive value for the low risk criteria was 98.9% for serious bacterial illnesses and 99.5% for bacteremia. The authors claim that this study confirms the ability of the low risk criteria to identify infants unlikely to have SBI. They recommended infants who meet these criteria be managed by observation without administering antimicrobial agents.

*Jaskiewicz JA: Pediatrics 1994; 94:390.*

## The Efficacy of Routine Outpatient Management Without Antibiotics of Fever in Selected Infants

The authors utilized a protocol for outpatient management of febrile infants judged to be at low risk for serious bacterial illness. This protocol included children 29-60 days of age who presented to an emergency department of a children's hospital with rectal temperatures of 38C or higher. All children underwent a standard evaluation which included a complete history, physical examination, and standard laboratory tests including a CBC urinalysis, chest film, LP, and bacterial cultures of blood, urine, and spinal fluid. The study was carried out involving 422 infants, 29-60 days of age.

Of the 422 febrile infants enrolled, 101 (24%) were prospectively identified as low risks for SBI, and safe for discharge without antibiotics. None of the 43 infants with serious bacterial illnesses were identified by the protocol to be at low risk for SBI.

The authors conclude that the protocol for outpatient management without antibiotics of febrile infants at low risk for SBI remains practical, reliable, and safe.

Baker M, pediatrics, 1999;103:627-631

## Neonatal Fever: Utility of the Rochester Criteria in Determining Low Risk for Serious Bacterial Infections

Ferrera PC, American Journal of Emergency Medicine, 1997, 15:299-302.

### Identification of Febrile Neonates Unlikely to Have Bacterial Infections

A brazen study, prospectively carried out, this study evaluated the usefulness of low risk criteria within a sub group of febrile neonates. 250 consecutive infants 28 days of age or less who had rectal temperatures of at least 38C had a complete history, physical examination and sepsis work up. 131 of these infants were classified as low risk and hospitalized and closely observed without the use of antibiotics. The low risk criteria included well appearance, absence of physical signs of localized infection, a white blood cell count of 5-15,000, a band count <1,500, a spun urine specimen that was normal, and a C-reactive protein value of less than 20. The remaining 119 febrile neonates who did not meet the low risk criteria were hospitalized and given empiric antibiotics pending culture reports.

Within the total population of 250 infants the overall incidence of bacterial infections was 16.4%. Of the 131 low risk neonates only 1 (.8%) had a bacterial infection (UTI) compared with 40 among the 119 who did not meet the criteria.

The authors conclude by the low risk criteria a substantial number of febrile neonates at low risk for bacterial infections can be identified and managed safely as inpatients without antibiotics.

*Chiu C, Pediatric Infectious Disease Journal, 1997;16:59-63*

### **Bacterial Infections in Infants 60 Days and Younger**

A study carried out retrospectively of all positive blood, urine, and CSF cultures in children 60 days or younger over a 3 year period. The studies were obtained from both in and out patients. The case series was utilized to determine the frequency of the pathogens responsible for such infections in this age group.

While there was a large variety of pathogens discovered, 77% were in the urine only, 13% in blood, 3% in spinal fluid, and almost none in the blood and urine together. No *Listeria* was isolated. Of the 96 gram negative rods isolated, 70% were ampicillin resistant. All were sensitive to gentamicin and cefotaxime.

The major take home message from the study is that expensive coverage for *Listeria* beyond the perinatal period is not warranted. In addition, adjustments must be made to take in to consideration the presence of gram negative ampicillin resistant rods.

*Sadow KB, Archives Arch Pediatric Adolescent Medicine, 153;61 I-614,1999*

### **The Febrile Infant**

*McCarthy PL: The Febrile Infant. Pediatrics 1994; 94:397*

### **Duration of Fever and its Relationship to Bacteremia in Febrile Outpatients 3-36 Months Old**

*Teach SJ. Pediatric Emergency Care 13;317-319, 1997.*

### **Clinical Applications of C-Reactive Protein in Pediatrics**

If you were ever looking for an article describing everything you ever wanted to know about C-reactive protein and its use clinically, this is the reference for you.

*Jaye M, Pediatric Infectious Disease Journal, 1997; 16:735-47*

<b>Temperature Measurement</b>
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### **Maternal screening of childhood fever by palpation**

*Graneto JW, Pediatric Emergency Care, 12:183-185, 1996*

### **Subjective Assessment of Fever by Parents**

*Hooker EA. Annals of Emergency Medicine, 28:313-317, 1996*

### **Analysis of Parental Estimates of Children's Weights in the Emergency Department**

*Leffler S. Annals of Emergency Medicine 30:167-170, 1997*

### **Reliability of Infrared Tympanic Thermometry (ITT) in the Detection of Rectal Fever in Children**

*Brennan DF: Annals of Emergency Medicine 1995; 25:21.*

<b>Disposition of the Febrile Child</b>
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### **Effect of Antibiotic Therapy on the Outcome of Outpatients with Unsuspected Bacteremia**

What happens to children who leave our Emergency Departments after receiving antibiotic therapy for suspected bacteremia? The records of 559 consecutive outpatient children with unsuspected bacteremia were reviewed. When compared with patients receiving oral or parenteral antibiotics, those patients who received no antibiotics at the initial visit were found, in follow-up to be:

- 1) less likely to be improved (32% versus 86%);
- 2) more likely to be febrile (75% versus 28%);
- 3) more likely to be hospitalized (67% versus 22%);
- 4) more likely to have persistent bacteremia (28% versus 3%);
- 5) more likely to have new focal infections (13% versus 5%).

When comparing patients who received parenteral versus oral antibiotics, the oral group less likely to be improved (81% versus 89%), and more likely to have persistent bacteremia (5% versus 0%). No patients receiving parenteral antibiotics at the initial visit had positive blood or spinal fluid cultures at the follow-up visit.

The authors conclude that these findings extend earlier observations that antibiotic therapy improves the outcome with unsuspected bacteremia, particularly with parenteral administration.

*Harper MD, Pediatric Infectious Disease Journal, 14:760-767, 1995*

### **Occult Pneumococcal Bacteremia: What Happens to the Child Who Appears Well at Re-Evaluation?**

*Korones DN: Pediatr Infect Dis J 1994; 13:382.*

#### **Low Risk of Bacteremia in Febrile Children with Recognizable Viral Syndromes.**

An interesting study performed on patients who had recognizable viral syndromes (RVS). The objective of the study was to determine the rate of bacteremia in children 3 to 36 months of age with fever and RVS. The authors performed a retrospective analysis of all patients 3 to 36 months of age with a temperature greater than 39 C seen during a 5 year period. From this group those with a discharge diagnosis of croup, varicella, bronchiolitis or stomatitis and no apparent bacterial infection were considered to have an RVS. The rate of bacteremia was determined for those subjects with RVS who had blood cultures.

Of 21,216 patients, 6% were diagnosed with an RVS (1347). Blood cultures were obtained in 876 (65%) of RVS patients. Of patients who had blood cultures, true pathogens were found in only 2 of 876 subjects with RVS. The rate of bacteremia was near zero in all patients.

The authors conclude that highly febrile children 3 to 36 months of age with uncomplicated croup, bronchiolitis, varicella or stomatitis have a very low rate of bacteremia and need not have blood drawn for culture.

*Greens DS, Pediatric Infectious Disease Journal, 7999; 18:258-61*

### **Enterococcal Bacteremia in Children: A Review of 75 Episodes in a Pediatric Hospital**

There have been increasing reports of enterococcal bacteremia. This is a prospective study to determine the characteristics of such bacteremia in children within the Emergency Department. The authors studied patients with proven episodes of enterococcal bacteremia during a 3 year period.

75 episodes were identified. Serious underlying disease was present in 67 (89%) episodes, and in 48 (64%) episodes, patients had received antibiotics during the two weeks preceding enterococcal bacteremia. 47 episodes were nosocomial and 26 were polymicrobial. 50 (66%) episodes occurred in children 1 year old or less. A source of bacteremia was noted in 44% of the episodes with intravascular devices the most common identified sources. The overall mortality rate was 7.5%.

The conclusion of the authors was that enterococcal bacteremia in children comprises a heterogeneous group.

## Meningitis

### **Bacterial Meningitis in the United States in 1995**

This study contained data collected from active population-based surveillance for cultured confirmed meningitis during 1995 from laboratories serving all acute care hospitals in 22 counties in 4 states. The total population of the surveillance area was greater than 10 million. The infection rates detected by this survey were compared to those obtained in 1986 to estimate the effect of vaccination against H influenzae on meningitis rates.

There were 248 laboratory confirmed cases of bacterial meningitis. The meningitis rate per 100,000 in 1995 was 1.1 for *S pneumoniae*, 0.6 for *N meningitidis*, and 0.3 for group B streptococcus. The rate was 0.2 for H influenza. Group B strep was the most common pathogen among neonates, *Neisseria* the most common of children aged 2 to 18 years, and *S pneumoniae* was the most common among adult patients. The highest fatality rate (21%) was associated with pneumococcus.

Using this information, it can be estimated that 5,755 cases of bacterial meningitis caused by these organisms occurred in the U.S. in 1995. In 1986 the corresponding number was 12,920. The reduction was therefore 55%. The median age of those infected with bacterial meningitis increased from 15 months in 1986 to 25 years in 1995.

The authors conclude that since the introduction and widespread use of H flu vaccine there has been both a reduction in the number of H flu cases of meningitis and a reduction in the total number of overall cases in general.

*Schuchat A, New England Journal of Medicine, 337:970-976,1997*

### **Dexamethsone as Therapy in Bacterial Meningitis: A Meta-Analysis of Randomized Clinical Trials since 1998**

A literature search was conducted for randomized control trials of Dexamethsone therapy in pediatric bacterial meningitis published from 1988 to 1996. The literature identified 16 studies, of which 11 were eligible. In H flu pediatric meningitis, Dexamethsone treatment reduced severe hearing loss whether it was given before or with antibiotics. In pneumococcal meningitis, only studies with early administration suggested protection which was significant for hearing loss. 2 days of Dexamethsone treatment appeared as effective as longer courses. The only adverse effect associated with Dexamethsone was secondary fever.

This **meta** analysis confirms a benefit of Dexamethsone in H flu meningitis and if therapy is initiated early, in pneumococcal meningitis.

*McIntyre PB, JAMA, 278:925-931, 1997*

### **Cerebrospinal fluid shunt complications: an emergency medicine perspective**

This is an excellent review article which provides valuable information for the Emergency Medicine physician regarding VP shunts. Points made within this publication include:

1. As many as **2/3** of shunted patients experience shunt complications at sometime.
2. Shunt malfunction may be seen with headache, nausea, and vomiting, lethargy, ataxia, and even coma.
3. Shunt obstruction may be proximal by tissue debris or migration of the catheter into the parenchyma. Kinking, infection, or venous occlusion may cause distal obstruction.
4. As many as 15% of shunt placements are complicated by infection, usually with organisms of low virulence (cutaneous flora), but 5 to 10% of the infections are caused by gram negative organisms.
5. **Lack** of fever does not exclude shunt infection, and infected shunts may result in abdominal symptoms.
6. VA shunt infection may be associated with glomerulonephritis or serious cardiac complications such as septic emboli, cardiac tamponade, or perforated septum.

*Key CB, Pediatric Emergency Care, 1995; 11:265-273*

### **Rapid Diagnosis of Bacterial Meningitis with Reagent Strips**

*Moosa AA, Lancet, 345:1290-1291, 7995.*

### **Prognostic Factors In Childhood Bacterial Meningitis**

*Kaarensen PI, Acta Paediatr, 84:873-878, 1995.*

### **The Efficacy of Routine Head CT Prior to Lumbar Puncture in the Emergency Department**

*Baker ND, Journal of Emergency Medicine, 12:597-601, 1994.*

## Febrile Convulsions

### **Practice Parameter: The Neurodiagnostic Evaluation of the Child with a First Simple Febrile Seizure**

This excellent review provides recommendations as put forth by the AAP Sub-Committee on Febrile Seizures. The authors, within the text, analyzed interventions of direct interest to the clinician, namely LP, EEG, neuroimaging, and blood analysis.

The recommendations of the committee are as follows:

1. Lumbar Puncture - The AAP recommends that after a first seizure with fever in infants younger than 12 months, performance of a lumbar puncture be strongly considered. Older children, on the basis of their more obvious presentations, should be judged on a case by case basis. In infants and children who have had febrile seizures and have received prior antibiotics, a high degree suspicion should be maintained.
2. EEG - The AAP recommends that an EEG not be performed in the evaluation of a neurologically healthy child with a first simple febrile seizure.
3. Blood studies - The AAP recommends that the following determinations not be performed routinely in the evaluation of a child with a first simple febrile seizure: electrolytes, calcium, phosphorous, magnesium, CBC, or blood glucose.
4. Neuroimaging - The AAP recommends that neuroimaging not be performed in the routine evaluation of a child with a first simple febrile seizure.

*Pediatrics, 97:769-771, 1996.*

### **Long Term Intellectual and Behavioral Outcomes of Children with Febrile Convulsions**

398 children with a history of febrile convulsions were evaluated comprehensively at 10 years of age. These children were part of a cohort of 14, 676 enrolled in a national population based study in the United Kingdom. Final analysis included 287 children with simple febrile convulsions and 94 with complex febrile convulsions. Data on academic progress, intelligence and behavior were collected and compared with data on the rest of the cohort.

The 2 groups did not differ significantly in academic progress, intelligence or behavior. Children with recurrent episodes of febrile convulsions had outcomes comparable to those of only of 1 episode.

The study demonstrated that academic progress, intellect, and behavior at 10 years did not differ significantly between children who had febrile convulsions and those who had not.

*Berity CM, New England Journal of Medicine, 338:1723-1 728, 1998*

## Otitis Media

### **Acute Otitis Media: Management and Surveillance in an Era of Pneumococcal Resistance**

The objective of this study was to provide consensus recommendations for the management of acute otitis media (AOM) and the surveillance of drug resistant streptococcus pneumonia (DRSP). The authors posed five questions:

1. Can Amoxicillin remain the best initial agent for treating AOM?
2. **What** are suitable alternative agents for use if Amoxicillin fails?
3. Should empiric treatment of AOM vary by geographic region?
4. Where can clinicians learn about resistance patterns in their patient population?
5. What modifications to laboratory surveillance would improve the utility of the information for clinicians treating acute otitis media?

The authors gathered evidence from published and unpublished data summarized from the scientific literature and experience from experts within the therapeutic working group of the CDC. The conclusions of the working group were as follows:

Oral Amoxicillin remains the first line antimicrobial agent for treating AOM

In view of the increasing prevalence of DRSP, the safety of Amoxicillin at higher than standard dosages and evidence that higher dosages of Amoxicillin can achieve effective middle ear fluid concentrations, an increase in the dosage used for empiric treatment from 40 to 45 milligram per kilogram per day to 80 to 90 milligram per kilogram per day is recommended.

For patients with clinically defined treatment failure after 3 days of therapy, useful alternative agents include oral Augmentin, Ceftin, and intramuscular Ceftriaxone.

Local surveillance data for pneumococcal resistance are not available for most areas in the United States. Recommendations to improve surveillance include testing middle ear fluid or nasal swab isolates in individual communities. The authors conclude that the management of otitis media has entered a new era with the development of DRSP.

*Dowell SF, Pediatric Infectious Disease Journal, 1999;18:1-9*

### **Otitis Media: Back to Basics**

This is an excellent review article designed as a CME activity within the Pediatric Infectious Disease Journal. Its sections include the differentiation of acute otitis media versus otitis media with effusion, the frequency and duration of otitis media episodes, defining the term “otitis prone,” and a discussion of factors that lead to the development and recurrence of otitis media.

*Faden H, Pediatric Infectious Disease Journal, 1998; 17: 1105-13*

### **Persistent Acute Otitis Media: Causative Pathogens**

Patients who have failed previous courses of antibiotics for the treatment of acute otitis media (AOM) often present to the Emergency Department with recurring symptoms and signs. This study, involving tympanocentesis, was performed to obtain samples of middle ear fluid from 200 ears of 137 children whose AOM failed to respond to 1 or 2- 10 day courses of antibiotics. Drugs most often utilized included Amoxicillin, Pediazole, Augmentin, or Suprax.

No pathogen was recovered in 49% of the patients with persistent AOM. Approximately one-fourth of the patients grew *S pneumoniae*, and the remainder had a wide range of pathogens isolated. One-fifth of the *S pneumoniae* isolates were resistant to penicillin. Ten of 12 H flu isolates and all 11 *M catarrhalis* isolates produced Beta-lactamase.

The authors conclude that patients with persistent AOM after empiric antibiotic treatment may have either sterile middle ear inflammation or infection caused by a penicillin resistant or Beta-lactamase producing pathogen.

*Pichichero ME, Pediatric Infectious Disease Journal, 14: 178- 183, 1995*

<b>Treatment of Otitis Media</b>
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### **Efficacy of Auralgan for Treating Ear Pain in Children with Acute Otitis Media**

The study carried out to determine the efficacy of Auralgan otic solution compared with an olive oil placebo in the management of moderate to severe ear pain in children with AOM.

Children 5 years or older who presented with ear pain and findings indicative of AOM were randomly assigned to treatment with Auralgan or olive oil instilled into the external auditory canals. All children were also treated with APAP. Ear pain was assessed by means of 2 visual analog scales. A baseline ear pain score of at least 3 points was required for study entry. 4 outcome measures regarding ear pain score at 10, 20 and 30 minutes were used. Participants included 54 children.

The study and placebo groups were comparable with regard to age, sex, race and ear pain score at onset. By each of the 4 measures used, the response to treatment consistently favored the Auralgan group.

The authors conclude that in children with AOM associated ear pain topically applied Auralgan appears likely to provide additional relief in varying degrees within 30 minutes.

*Hoberman A, Arch Pediatric Adolescent Medicine, 1997;151:675-678*

### **Comparison of Ceftriaxone and Bactrim for Acute Otitis Media**

*Barnett ED. Pediatrics ,99:23-28, 1997.*

### **Single Dose Ceftriaxone Versus Ten Days of Cefaclor for Otitis Media**

*Chamberlain JM, Clinical Pediatrics, 33:642-646, 1994.*

### **Comparison Of Ceftriaxone And Bactrim For Acute Otitis Media**

*Barnett ED, Pediatrics, 99:23-28, 1997.*

### **Pseudomonas Otitis Media And Bacteremia Following A Water Bath**

*Parker PC, Pediatrics, 98:653, 1996*

### **Acute Mastoiditis (AM) in Children: A 12 Year Retrospective Study**

*Harley EH. Otolaryngol Head Neck Surg, 116:26-30, 1997.*

## Meningococemia

### **Pathophysiology, Treatment And Outcome Of Meningococemia: A Review Of Recent Experience**

*Kirsch EA, Pediatric Infectious Disease Journal. 15:967-979, 1996.*

### **Evaluation of Febrile Children with Petechial Rashes: Is There Consensus Among Pediatricians?**

There still exists a high degree of controversy regarding the evaluation and disposition of children with fever and petechiae. Although many of these children have viral infections, on occasion such patients may be infected with *Neisseria Meningitidis*. The purpose of the study was to investigate differences in practice trends in the management of these patients among pediatric specialty groups.

The authors surveyed 833 pediatricians in 4 specialties (community hospitals, academic general pediatrics, emergency medicine physicians, and infectious disease specialists). These 4 groups were provided with 4 hypothetical non toxic appearing febrile children ages 1, 2, 5 and 7 years. The patients differed with regard to clinical appearance, distribution of petechiae and CBC results.

The survey was completed and returned by 50% of those surveyed (416). There was substantial variation in the evaluation of the 2 younger febrile children without sources for their petechiae. For the 1 year old the overall blood culture rate was 82% with the emergency medicine group (91%) more often requesting blood cultures than either the CGP (76%) or AGP (73%) groups. The overall hospital admission rate was 31%.

For the 2 year old the overall rate of blood culture was 95%, lumbar puncture was 41% and admission was 44% with no significant differences among groups. For the scenarios involving 2 older febrile children with sources for their petechiae, the majority of respondents choose neither lumbar puncture or admission.

The authors conclude that there are substantial differences among pediatricians in the evaluation and management of these patients.

*Nelson DG, Pediatric Infectious Disease Journal, 1998; 17: 1135-40*

## Ocular Infections

### **A Comparison of Ciprofloxacin and Tobramycin in Bacterial Conjunctivitis in Children**

Topical Ciprofloxacin is a safe and effective treatment for bacterial conjunctivitis in adults. Animal studies prohibit the use of Ciprofloxacin in children suggesting its possible relationship to the development of arthropathy. A randomized double blinded trial was performed to compare Ciprofloxacin with Tobramycin for the treatment of bacterial conjunctivitis in children.

The **study** included 257 children with bacterial conjunctivitis. The patients were randomized to receive either preparation. Conjunctival swabs were obtained for culture at baseline and on day 7 of treatment.

H flu was recovered from about half of patients and S pneumoniae from 30%. In 90% of patients in the Ciprofloxacin group and 80% of the Tobramycin the infecting bacteria was eradicated. Cure rates were identical. Neither drug had any adverse effects.

The authors conclude the Ciprofloxacin offers a safe and effective treatment for pediatric bacterial conjunctivitis. No side effects were noted.

*Gross RD, Clinical Pediatrics, 36:435-444, 1997*

### **Acute Periorbital Swelling: Evaluation Of A Management Protocol**

*Dudin A, Pediatric Emergency Care, 12: 16-20, 1996.*

### **Changing Bacteriology Of Periorbital Cellulitis**

*Schwartz GR, Annals of Emergency Medicine, 28:617-620, 1996.*

## Oral Infections

### **Peritonsillar Abscess: Incidence, Current Management Practices, And A Proposal For Treatment Guidelines**

An exceptionally broad based review of current methodology in the treatment of peritonsillar abscesses (PTA). A national survey was carried out of PTA management practices involving 2,000 randomly selected ENT physicians.

The survey included a 73% response rate. 96% of the respondents reported treating an average of 7 PTAs per year. Needle aspiration, incision and drainage, or tonsillectomy was used for initial drainage. 62% used penicillin to treat PTAs. Analysis demonstrated a needle aspiration success rate in 94% of patients. The recurrence rate ranged from 10-15%. Penicillin resistant bacteria were found in 0-56% of patients with PTA

The authors conclude that a set of clinical guidelines should be proposed. Needle aspiration should be the first procedure done for all patients with PTA Treatment should be rendered in an outpatient setting. Penicillin should be given to all patients without allergy. Pain medication is a must. About 30% of patients with PTA will have relative indications for tonsillectomy.

*Herzon FS, Laryngoscope, 105:1-17, 1995*

### **Streptococcal Pharyngitis in a Pediatric Emergency Department**

A study of the prevalence and clinical features of GABHS in Australian children with acute pharyngitis. The case group consisted of 271 patients with pharyngitis who had not received antibiotics. A control group was chosen of 135 age matched children with no infection.

GABHS was isolated from 24 of the case groups and 7% of the controlled group. Factors significantly associated with GABHS were: age 4 years or more, tender cervical lymph nodes, tonsillitis, absent coryza, and scarlatiniform rash. Only 4% of children younger than 4 years of age had GABHS. Most case subjects had no rash.

The authors conclude that in children younger than 4 years, GABHS is an unlikely cause of acute pharyngitis. Symptomatic treatment alone should be considered.

*Edmond KM., Medical Journal Australia, 165:420-423, 1996.*

### **Streptococcal Score Card Revisited**

Some clinicians utilize a scoring system as a predictor of obtaining a positive throat culture for GABHS. This was a study carried out prospectively to see how accurate the scoring system was. It was performed within an Emergency Department at a children's hospital. Patients studied were 365 children between the ages of 2-16 years with a complaint of sore throat and a history of or documentation of fever within the preceding 24 hours.

The streptococcal score involved a 6 point method in which the features were:

- 1) age
- 2) season
- 3) temperature of at least 38.3 C
- 4) adenopathy
- 5) pharyngeal, erythema, edema, or exudate
- 6) no symptoms of a viral URI

Throat cultures were performed on all patients.

A score of 5 or 6 predicted at positive GABHS in 59 and 75% of children respectively. In patients with evidence of acute pharyngitis, the combination of age between 5-15 years, fever and absence of URI predicted a positive culture in 72% of patients, The authors conclude that the score can be used to predict the likelihood of a positive throat culture.

*Wald ER., Pediatric Emergency Care ,14:109-111, 1998*

## Treatment of GABHS

### Macrolides in the Management of Streptococcal Pharyngitis/Tonsillitis

The most frequent bacterial cause of pharyngitis in children is group A beta hemolytic streptococci (GABHS). Prevention of acute rheumatic fever is the principle goal of treatment, although antibiotic therapy may also relieve signs and symptoms of infection, shorten the infective period, and prevent complications. Penicillin remains the drug of choice. Alternatives are required, however, for patients allergic to penicillin and may be needed as the rate of bacteriologic failure with penicillin observed during the past decade continues,

Erythromycin is effective but its use is restricted by the need of multiday doses, and a high rate of gastrointestinal side effects. The newer Macrolides, clarithromycin and azithromycin offer more convenient dosing. Because of its' prolonged tissue half life the recommended duration of azithromycin therapy is 5 days, compared with 10 days for penicillin, azithromycin and clarithromycin. These Macrolides are rational alternatives for the treatment of streptococcal pharyngitis in penicillin allergic pediatric patients.

*Tarlow MJ, Pediatric Infectious Disease Journal, 1997; 16:444-8*

### Evaluation Of The Efficacy, Safety And Toleration Of Azithromycin Versus Penicillin In The Treatment Of Acute Streptococcal Pharyngitis In Children

*Schaad UB, Pediatric Infectious Disease Journal, 15:791-795, 1996.*

**Evaluation Of Penicillins, Cephalosporins, And Macrolides as Therapy Of GABHS**  
*Shulman ST, Pediatrics, 97:955-959, 1996.*

**Dental Bacteremia in Children**

A disturbing study performed in London. Blood samples were obtained 30 seconds after dental operative procedures in 735 anesthetized children. Ages were from 2-16. The frequency of bacteremia was significantly higher than the baseline value of 9.4% after the following 4 procedures:

- 1) polishing (24.5%)
- 2) intraligamental injection (96.6%)
- 3) rubber band placement (29.4%)
- 4) matrix band wedge placement (32.1%)

Toothbrushing alone produced bacteremia rates of 38.5%. The organisms isolated were typical of odontogenic bacteremia, half being varieties of viridans streptococci.

The authors demonstrate that a greater variety of dental procedures than previously believed will cause bacteremia in children.

Editors note: the presence of 40% bacteremia with the simple act of toothbrushing begs the question as to when to provide prophylactic antibiotics to patients with predisposing conditions. This certainly reinforces the use of these antibiotics when any dental procedures are carried out.

*Roberts GJ, Pediatric Cardiology, 18:24-27, 1997.*

<b>Respiratory Infections</b>
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<b>Pneumonia</b>
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**Etiology of Childhood Pneumonia: Serologic Results of a Prospective, Population-Based Study**

A study performed in Finland to investigate the etiology of pediatric community acquired pneumonia. Patients were less than 15 years of age. Total number of patients studied was 201. Chest x-rays were available for all cases and serologic assays were available for greater than 90% of cases. The methods included assays

for antibody response to pneumococcus, and conventional antibody tests for mycoplasma, chlamydia, and viral infections.

Serologic evidence of specific microbial etiology was obtained in 133 (66%) of the pneumonia patients. Bacterial infection was diagnosed in 102 cases (51%) and viral infection in 51 cases (25%). *Streptococcus pneumoniae* was the most common agent (28%) followed by *Mycoplasma* (22%) RSV (21%) and Chlamydia (14%). H flu was identified in only 6% of cases. *Mycoplasma* infections were seen mostly in patients > 5 years and chlamydia infections in patients >10 years.

The authors concluded that their results confirmed the importance of *S.pneumoniae* in the etiology of community acquired pneumonia in children of all ages. *Mycoplasma* and chlamydia are important from the age of 5 years onwards,

*Kosma T, Pediatric Infectious Disease Journal, 1998;17:986-91*

#### **Utility Of Blood Cultures In Pediatric Patients Found To Have Pneumonia In The Emergency Department**

*Hickey RW, Annals of Emergency Medicine, 27:721-725, 1996.*

#### **Editorial: Blood Culture In Children With Pneumonia**

An editorial addressing the prior article. The author points out that the first and most important test in evaluating patients with pneumonia remains the clinical evaluation. The standard of care for all children with fever with possible bacterial infections involves the following elements: vital signs, behavior, hydration, distress, and specific secondary survey items. It is well established that children with fever without source not undergo routine chest x-rays in the absence of pulmonary signs. The author also points out that obtaining a blood culture at the time of diagnosis in no way guides the decision to admit since results are not available for 24-48 hours. Certainly ill children who are hospitalized will benefit from the results of these cultures. He also points out that the majority of pediatric pneumonia is viral in origin and with the availability of chlamydia, RSV, and other viral cultures, decision making may be more precise within the emergency department.

*Baraff LJ, Annals of Emergency Medicine, 527:774-776, 1996.*

#### **Occult Pneumonias: Empiric Chest Radiographs in Febrile Children with Leukocytosis**

A prospective cohort study at a large urban hospital. All records of emergency department patients with WBC > 20,000, a triage temperature 39 C or higher, age 5 years or less, were reviewed daily for 12 months. Physicians completed a

questionnaire to note the diagnosis, the presence of respiratory symptoms and signs, and the reason for the chest radiograph. Pneumonia was defined by an attending radiologist's reading of the radiograph.

225 patients received **CXRs**. Reasons included: 79 because of respiratory findings suggestive of pneumonia and 146 because of leukocytosis and no identifiable major source of infection.

Pneumonia was found in 32 of 79 of those with findings suggestive of pneumonia and in 38 of 146 (26%) of those without clinical evidence of pneumonia.

The authors conclude that empiric chest radiographs in highly febrile children with leukocytosis and no findings of pneumonia frequently reveal occult pneumonias. Chest radiography should be considered a routine diagnostic test of children with a temperature of 39 C or greater and a **WBC** of 20,000 or greater without an alternative major source of infection.

*Bachur R, Annals of Emergency Medicine, 1999;33:166-173*

### **Evaluation Styles for Well Appearing Febrile Children: Are you a "Risk Minimizer" or a Test Minimizer?"**

An interesting editorial related to the prior article addressing the various pros and cons of utilizing lab work in evaluating children with fever without source. The authors point out that the prior study, although quite revealing, only involved a small number of children.

*Green SM, Annals of Emergency Medicine, 1999;33:211-214*

<b>Croup</b>
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### **Nebulized Budesonide for Children with Mild to Moderate Croup**

*Klassen TP, New England Journal of Medicine, 331:285-289, 1994*

### **Nebulized Budesonide is as Effective as Nebulized Adrenaline in Moderately Severe Croup**

*Fitzgerald D, Pediatrics, 97: 722-725, 1996.*

### **Use of Dexamethasone in the Outpatient Management of Croup**

Previous studies have shown that IM steroids shorten the duration and severity of illness in hospitalized patients with croup. The authors of this study attempted to determine if dexamethasone has a role in the outpatient management of these patients as well.

Patients 6 months to 5 years of age with a Croup Score of at least 2 and a disposition of discharge were randomized in a double blind fashion to receive a single IM shot of dexamethasone, 0.6 mg/kg, or an equal volume of normal saline prior to discharge to the ED. Patients were excluded if they required more than 1 racemic epinephrine treatment. Patients were followed-up by telephone 1 day and 7 to 10 days after discharge. Secondary outcomes included the parents' perception of how the child was doing in 24 hours.

Of the 38 patients within the study group, 19 received steroids. The number of patients requiring racemic epinephrine was similar in both groups. Five patients sought additional medical attention within 48 hours. Four of the five patients had received placebo. At the 24 hour follow-up, significantly more patients in the dexamethasone group had a score consistent with improvement compared with placebo.

The authors conclude that the use of dexamethasone was associated with the reduction in severity of illness within 1 day after treatment. They recommended its use within the Emergency Department.

*Cruz MN, Pediatrics, 96:220-223, 1995.*

### **Sixteen Years of Croup in a Western Australian Teaching Hospital; Effects of Routine Steroid Utilization**

*Geelhoed GC, Annals of Emergency Medicine, 28:621-626, 1996.*

### **Safety and Efficacy of Nebulized Racemic Epinephrine In Conjunction With Oral Dexamethasone and Mist in the Outpatient Treatment of Croup**

*Ledwith CA, Annals of Emergency Medicine, 1995; 25:331.*

### **Racemic Epinephrine in the Treatment of Croup: Can We Identify Children for Outpatient Therapy?**

*Prendergast M, American Journal of Emergency Medicine, 1994; 12:613.*

### **Use of Racemic Epinephrine, Dexamethasone, and Mist in the Outpatient Management of Croup**

*Kunkel NC, Pediatric Emergency Care, 1996;12:156-160*

### **Aerobic and Anaerobic Microbiology of Bacterial Tracheitis**

A retrospective review of specimens obtained from 14 children with BT that were cultured on admission. A total of 30 bacterial isolates were recovered, 17 aerobic and 13 anaerobic. Aerobic bacteria only were present in 43% specimens, anaerobics only in 21%, and mixed in 36%. Polymicrobial flora were recovered in 10 of 14 specimens. The predominant organisms were *S aureus* (5), *H flu* (4), *Peptostreptococcus* (4), *Fusobacterium* (2), and *M catarrhalis* (2). Two organisms were also recovered from the blood of two patients (both *H flu*). All isolates of *S aureus* and *M catarrhalis* and 2 each of *H flu* were Beta lactamase producers.

The bacteriologic data confirms the predominance of *S aureus* and *H flu* in causing bacterial tracheitis in children.

*Brook I, Pediatric Emergency Care, 13:16-18, 1997*

<b>Bronchiolitis</b>
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### **Acute Otitis Media in Children with Bronchiolitis**

It is well known that many children with bronchiolitis are prone to the development of otitis media. This is a study carried out to determine whether AOM in such children is due entirely or mainly due to RSV, in which case routine antimicrobial treatment would not be appropriate. They studied children aged 2-24 months with RSV. In patients diagnosed with AOM, nasal washings for RSV were done, and bacterial and viral cultures were performed on samples obtained from middle ear aspirates.

Forty two children with bronchiolitis were enrolled. 62% had AOM at entry or developed AOM within 10 days. An additional 24% eventually developed otitis media with effusion. Only 14% remained free of both AOM and otitis media with effusion throughout the 3 week period. All patients with AOM had 1 or more bacterial pathogens isolated from 1 or both middle ear aspirates. Of the 33, *S pneumococcus* was isolated in 15, *H flu* in 8, *M catarrhalis* in 8, and *S aureus* in 2. RSV was identified in 71% of 24 patients with AOM.

The authors conclude that most patients who develop AOM with bronchiolitis will have bacterial pathogens at work and antibiotics are indicated.

*Andrade MA, Pediatrics, 101:617-619, 1998*

### **Risks for Bacteremia and UTI in Young Febrile Children with Bronchiolitis**

A study comparing the risk for bacteremia in UTI in young children with and without bronchiolitis. A convenience sample of 432 previously healthy febrile patients 24 months or younger were studied. Patients were divided into groups based on the presence (163) or absence (269) of wheezing and or retractions on examination. Blood cultures were obtained from all patients and urine cultures were obtained from female patients and male patients aged 6 months or younger. Chest x-rays were obtained on patients with lower tract signs, and those with **lobar** pneumonias were excluded. The remaining 156 patients were characterized as the bronchiolitis group and 261 characterized as control patients.

None of the 156 patients with bronchiolitis had bacteremia versus 2.7% of the 261 controls. 1.9% of patients with bronchiolitis had UTI versus 13.6% of the controls.

The authors concluded that previously healthy febrile children aged 2 years or younger with bronchiolitis are unlikely to have bacteremia or UTI.

*Kuppermann N, Arch Pediatric Adolescent Medicine, 1997;151:1207-1214*

### **Dexamethasone in Bronchiolitis: A Randomized Controlled Trial**

*Roosevelt G, Lancet, 348:292-295, 1996.*

### **Efficacy of Bronchodilator Therapy in Bronchiolitis: A Meta Analysis**

*Kellner JD, Arch Pediatr Adolescent Medicine, 150:1166-1172, 1996.*

<b>Pertussis</b>
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### **Clinical and Microbiologic Features of Children Presenting with Pertussis to a Canadian Pediatric Hospital during an Eleven Year Period**

A study outlining the characteristics and clinical findings involved with 975 cases of pertussis between 1980 and 1990. Peak occurrences were in the late summer and early autumn. The overall median patient age was 30 months, but there were specific peaks in the those younger than 6 months and older than 5 years. Nearly one-fourth of the patients were admitted to the hospital and stayed for an average of 5 days. Coughing was nearly universal at the time of admission, but only 44% of patients had a typical whoop. Episodic apnea was the most frequent finding in infants younger than 6 months of age. Of interest, three-fourths of the children had apparently received age appropriate vaccination. Seventeen patients required ICU monitoring, and 12 of them received ventilation.

This case series demonstrates the severity and complication risk of pertussis when involving children younger than 6 months of age. A high degree of suspicion must be maintained in all cases of paroxysmal coughing when seen in infancy. The authors advise admission of these patients to the hospital for careful observation to rule out the potential for apnea.

*Gordon M, Pediatr Infect Dis Journal, 13:617-622, 1994*

## Urinary Infections

### Urinary Tract Infections in Young Febrile Children

An excellent review outlining the prevalence, definition, laboratory findings, and treatment recommendations for children with urinary tract infections. In addition, a lengthy discussion takes place as to which imaging studies are recommended for follow-up and what long term sequelae may occur in these affected patients.

*Hoberman A, Pediatric Infectious Disease Journal, 1997; 16:1 I-I 7*

### Management of Febrile Children with Urinary Tract Infections

A study of the management of children with fever and UTI. It was conducted to identify factors associated with initial admission, outpatient treatment, and outpatient treatment failure.

A retrospective chart review identified children 3 months to 16 years of age with an ED diagnosis of UTI, a positive urine culture, and an ED temperature greater than 38 C. 69 patients (90% female) were studied. 19% were admitted initially. Age younger than 2 years was associated with admission. Of those initially discharged, 63% received parenteral (usually IM ceftriaxone) antibiotics, followed by oral antibiotics. 9% failed outpatient treatment. Outpatient failure was associated with higher initial temperatures (median 40.1 degrees C versus 39.2 C) but was unrelated to age, initial WBC or use of parenteral antibiotics. These results indicate that most children with fever in UTI do not require hospital admission and those with temperatures of 40 degrees C or greater are at increased risk for outpatient failure.

*Nelson DS, American Journal of Emergency Medicine, 1998;16:643-647*

### Suprapubic Bladder Aspiration Versus Urethral Catheterization in Ill Infants; Success, Efficiency, and Complications Rates

*Pollack CV: Annals of Emergency Medicine 1994; 23:225.*

## Various Infections

### **Sudden Death of a Child Who Had Pain in the Knee and Varicella: A Case Report**

Afrightening case report of a 4 year old girl who died after being seen for pain in the knee and varicella. She died of sepsis with group A Streptococcus and the post mortem examination revealed bacteremia. Although the pain in the knee was initially thought to be secondary to septic arthritis, the pain was secondary to a septic thrombophlebitis associated with fulminant group A Streptococcal septicemia.

*Hamer DL, J Bone Joint Surg Am, 78A:594-596, 1996.*

### **A Case-Controlled Study of Necrotizing Fasciitis During Primary Varicella**

An increase in the incidence of necrotizing fasciitis (NF) occurring in previously healthy children with primary varicella was noted in the Washington State area between December 1993 and June 1995. The objective of the study was to investigate ibuprofen use and other risk factors.

Cases were defined as a child with NF hospitalized within 3 weeks of primary varicella. 19 cases were identified. Controls were children hospitalized with a soft tissue infection other than NF within 3 weeks of primary varicella (29).

After controlling for gender, age, and group A strep isolation, cases were more likely than controls to have used ibuprofen before hospitalization. In most children, ibuprofen was initiated after the onset of symptoms of secondary infection. Children with NF complicated by renal failure and/or streptococcal toxic shock syndrome were more likely than children with uncomplicated NF to have used ibuprofen.

The conclusion of the study was that ibuprofen use was associated with NF in the setting of primary varicella. Additional studies are needed to further establish a direct relationship.

*Zerr DM, Pediatrics, 1999;103:783-790*

### **Oral Antibiotic Therapy for Uncomplicated Bacterial Skin Infections in Children**

A lengthy review article outlining the current demographics of skin infections occurring in pediatric patients. Outlines for diagnostic testing as well as antibiotic therapy are provided. A valuable reference.

*Darmstadt Y, Pediatric Infectious Disease Journal, 1997; 16:227-240*

## **Emergency Department Presentation of Lyme Disease in Children**

An article attempting to review the clinical characteristics and diagnostic evaluation of children with Lyme disease evaluated in an endemic area. The study was retrospective involving a 3 year period totaling 29 children ranging in age from 3 to 19 years. Most of these patients were diagnosed with Lyme disease subsequent to their ED visit.

4 patients had early localized disease with erythema migrans and varying degrees of systemic symptoms. 10 had early disseminated Lyme disease, with multiple rashes, neuralgic involvement (including 3 patients with pseudotumor), or carditis. 15 cases of late Lyme disease with arthritis were identified. Recognition of Lyme arthritis proved particularly difficult, since most children had elevated sedimentation rates and elevated white counts obtained from joint aspirates.

The authors conclude that Lyme disease is a very difficult diagnosis to make on initial presentation to the emergency department. Early disseminated and late disease predominate. Recognition by emergency medicine practitioners require familiarity with its epidemiology and its' multiple presentations.

*Bachman DT, Pediatric Emergency Care, 1998;14:356-63*

## **General Respiratory Complaints**

### **Grunting Respirations in Infants and Children**

Grunting respirations are recognized as a sign of serious illness in infants and children but have not been well studied beyond the neonatal period. This text presents 3 cases and results of a descriptive study which helps describe the causes of grunting in infants and children.

All patients between 1 month and 18 years of age who presented to a PED during a 5 month period with grunting respirations were prospectively identified. The 51 pediatric patients with grunting respirations fell into 3 groups based upon presentation:

1. 55% presented with respiratory signs and symptoms, and each one had a respiratory or cardiac condition
2. 25% presented with high fever but without respiratory signs and symptoms and all had an infectious cause (three quarters of them had an invasive bacterial disease)
3. 20% presented with neither fever nor respiratory signs and had one of a variety of conditions which appear to cause pain

The authors present a discussion on describing their approach to patients who present with grunting respirations.

*Poole SR, Pediatric Emergency Care, 11:158-161, 1995.*

### **Positive-Pressure Technique for Nasal Foreign Body Removal in Children**

All of us have had the frustrating experience of trying to manually remove various imaginative foreign bodies trapped in the nasal passages of adventurous children. This article review a positive pressure technique which may prove more efficacious in the removal of these nuisance items. A retrospective chart review in a community hospital over a 2 year period yielded 64 cases of pediatric nasal foreign bodies. 8 cases are presented in which the positive pressure technique was used.

The technique involves occlusion of the unaffected nasal passage with the finger of the parent with simultaneous positive pressure delivered through the mouth of the child. This positive pressure is delivered in a short burst. The authors recommend that if the initial attempt fails repeated attempted may prove efficacious. The authors also recommend the use of nasal vaso constrictive agents mucosal edema is present.

*Backlin SA, Annals of Emergency Medicine, 1995; 25:554*

### **Removal of Nasal Foreign Bodies in the Pediatric Population**

*Kadish HA, American Journal of Emergency Medicine, 15:54-56,1997*

### **Use of Nebulized Adrenaline to Aid Expulsion of Intranasal Foreign Bodies in Children.**

*Douglas AR, Laryngol Otol, 110:559-560, 1996.*

## **Asthma**

### **Delivery of Albuterol in a Pediatric Emergency Department**

*Williams JR, Pediatric Emergency Care, 1996; 12:263-267.*

### **Metered-Dose Inhalers with Spacers Versus Nebulizers for Pediatric Asthma**

*Chou KJ, Arch Pediatrics Adolescent Medicine, 149:201-205, 1995.*

### **Efficacy and Safety of Continuous Albuterol Nebulization in Children With Severe Status Asthmaticus**

Many clinicians feel that continuous albuterol nebulization (CAN) may reduce the need for more toxic interventions. This study reports experience with 17 children with status asthmaticus who received CAN as part of a prospective study. Patients ranged in age from 20 months to 17 years. Serial measurements of creatinine phosphokinase (CPK) were obtained, and various risk factors for cardiotoxicity were recorded.

CAN therapy lasted for a mean of 12 hours. None of the patients had signs of clinical deterioration develop, including chest pain or arrhythmias. None required isoproterenol treatment or mechanical ventilation. CPK elevations were noted in three patients, only one of whom had an elevated CPK-MB fraction. Four days later this normalized. The only adverse effects of treatment were nausea and tremors in two patients.

The authors conclude that for children with status asthmaticus, CAN appears to be a safe treatment. Cardiopulmonary monitoring should be available.

*Craig VL, Pediatric Emergency Care ,1996; 12:1-5*

### **Efficacy of Nebulized Ipratropium in Severely Asthmatic Children**

Recent publications have advocated the use of nebulized ipratropium as an adjunct in the treatment of the moderate to severe asthmatic child. The study was carried out to determine the effect of adding this agent to standard therapy when compared to standard therapy alone for acute to severe asthma. Children were chosen if their PEFr was less than 50% predicted. 90 children aged 6 to 18 years were randomly assigned to two groups in a prospective double blinded study. All children received nebulized albuterol solution every 30 minutes, and all received oral steroids with a second dose of albuterol. Group one patients received ipratropium, with the first and third dose of albuterol, those in group 2 received saline. Every 30 minutes up to 120 minutes pulmonary functions were measured.

Children in the ipratropium group had a significantly greater improvement in percent of predicted PEFr than the placebo group at 60 minutes, 90 minutes, and 120 minutes. The improvement in percent predicted FEV1 was significantly greater for children in the ipratropium group only at 120 minutes. With regard to admissions, 9 children (20%) from the ipratropium group and 14 (31.1%) from the control group were noted. No significant adverse effects were noted.

The authors conclude that they detected significant improvement in pulmonary function studies over 120 minutes in children with severe asthma who received ipratropium compared to albuterol alone.

a prescription, syringe, and a demonstration of how to measure out the correct dose; and group 3 received a prescription, a syringe with a line marked at the correct dose, and a demonstration. All parents were then observed administering a dose to their child. After observation, all parents were given a syringe with a line marked at the correct dose. The children were seen again at about 1 month and the parents showed how much medication was given.

Children in group 1 were given 37% to 147% of the correct dose. Only 37% of this group received the correct dose. 83% of the group 2 parents gave the correct dose. In group 3, all dosages were correct.

The authors concluded better parental education effectively reduces errors in medication dosing among English and Spanish speaking parents.

*McMahon SR, Pediatrics, 100:330-333, 1997*

#### **Effects of Parental Presence During Children's Venipuncture**

*Wolfram RW, Acad Emerg Med, 1996;3:58-64*

#### **Preferences of Parents for Pediatric Emergency Physicians Attire**

*Gonzalez-delRey JA, Pediatric Emergency Care, 1995;11:361-364*

#### **The Preparedness of Pediatricians for Emergencies in the Office: What is Broken, Should We Care, and How Can We Fix It?**

*Flores G, Arch Pediatr Adol Med, 1996; 150:249-256*

<b>CNS Complaints</b>
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#### **Hyponatremia as the cause of seizures in infants**

Hyponatremia is often diagnosed in infants with seizures, particularly those younger than 6 months. The incidence of hyponatremic seizures, severity, and outcomes associated with this entity, and the usefulness of clinical indicators in diagnosing this problem were investigated retrospectively.

All patients younger than 2 years admitted to an Emergency Department during a 5 year period with seizures and/or electrolyte imbalance were studied. The patients were divided into two groups on the basis of normal or low serum sodium status. Seizure severity and outcome were also compared. The diagnostic value of findings available at or shortly after admission in the identification of hyponatremic seizures were analyzed.

59 patients without a suspected cause for seizures were studied and thirty-three (56%) were hyponatremic. The incidence of hyponatremia was 70% among infants younger than 6 months. Compared with normal sodium status, hyponatremic infants had lower core body temperatures and significantly higher serum glucose levels. They also had longer seizures, a higher incidence of status, and a lower incidence of brief seizures. Their seizures required more anticonvulsant medication for control than normal seizures. Thirty-six percent of hyponatremic infants necessitated emergency intubation as opposed to none for the other group. There were complications in 12% of the hyponatremic and none of the normonatremic infants, Hypothermia was the strongest clinical predictor of this entity, and a need for increased anticonvulsant therapy was also significantly predictive.

The authors conclude that hyponatremia is a frequent cause of seizures in infants younger than 6 months. In seizing infants who present with hypothermia and no obvious cause, the possibility of hyponatremia should be investigated.

*Farrar HC, Annals of Emergency Medicine, 1995;26:42-48*

### **Syncope in Childhood**

A descriptive study outlining the causes, symptoms, laboratory findings, and prognosis of syncope children involving 108 cases. Done over a 7 year period, 66 cases were identified retrospectively and 42 prospectively. Syncope was defined as any episode in which there was a complete or transient loss of consciousness. All patients who did not receive another diagnosis were considered to have had vasovagal syncope.

The study group contained an equal number of boys and girls with a mean age of 11.5 years. Vasovagal syncope accounted for 75% of cases, migraine for 11%, seizures for 8%, and arrhythmia for 6%. Nearly half of the episodes lasted less than 1 minute. Lightheadedness preceded the episode in 61% of cases, dizziness in 23%, and vertigo in 12%. A history of exertion before the **syncopal** episode was present in 3 of 6 children with cardiac arrhythmia versus 1 of 102 children without. Two thirds of those with seizures had abnormal EEGs. Recurrent syncope was common, occurring in 67% of children with vasovagal syncope and 96% with other causes.

The conclusion of the study that a significant minority of children seen with syncope in a pediatric emergency room will have a serious and treatable cause.

*McHarg ML, Pediatric Cardiology, 18:367-371, 1997*

### 3 Unusual Cases of Pediatric Syncope: A Reaffirmation for the Screening Electrocardiogram

This manuscript describes 3 cases of syncope involving children who, upon screening evaluation in the emergency department, were found to have electrocardiographic abnormalities. The first case is a 12 year old boy who presented after passing out at school. He arrived asymptomatic within the emergency department and his physical examination was entirely normal. A screening EKG revealed a corrected QT interval of .52 seconds in lead 2. Further work-up revealed a markedly depressed serum calcium. The patient was admitted to the hospital and the etiology of his hypoglycemia was due to pseudohypoparathyroidism. The patient was discharged from the hospital on oral calcium supplementation.

The next case was a 5 year old child who experienced a fainting episode while shopping with her mother. She presented prior to fainting with abdominal pain and fell to the floor. She awakened 15 seconds later returning to baseline. Her physical examination was entirely normal within the emergency department. Initial EKG revealed diffuse low voltage and inverted T waves in all precordial leads. A chest radiograph was remarkable for a wide transverse diameter of the heart with a prominence of the left ventricular contour. An echocardiogram demonstrated a large solid intramyocardial tumor near the intraventricular septum. After stabilization, she underwent surgical resection of her tumor and had an excellent post operative course. Pathology of the tumor revealed a benign fibroma.

The third case involved a healthy 15 year old girl who presented to the emergency department with a chief complaint of multiple near *syncopal* events over the past several months occurring upon standing from a prolonged supine position. Physical examination was entirely normal. Her pulse rate ranged from 48 to 66 beats per minute and at times had an irregular rhythm. The cardiogram was significant for Wenckebach second degree AV block best seen in lead 2. The remaining evaluation within the emergency department was entirely normal. Halter monitoring revealed variable AV conduction. Echocardiography was normal. Stress testing showed normal AV conduction and excellent exercise capacity. The cause of her intermittent heart block was felt to be secondary to excessive vagal tone.

These cases are presented by the authors to illustrate the importance of obtaining a screening cardiogram in all cases of patients who present with syncope. An excellent review of the pathogenesis of syncope is also presented.

*Maffei FA, Pediatric Emergency Care, 1998; 14:342-345*

### Headache Etiology in a Pediatric Emergency Department

A study examining the spectrum of diagnoses for the pediatric department population with a chief complaint of headache. Carried out in a 54,000 visit emergency

department, 696 patients (1.3%) had a chief complaint of headache within a one year period. Half of these visits were analyzed, totaling 288.

Patients ages ranged from 2 to 18 years (2-5 years, 24%; 6-12 years, 57%; 13-18 years, 18%). The spectrum of diagnoses included viral illness (39%) sinusitis (16%) migraine (15%) post-traumatic headache (6%), streptococcal pharyngitis (5%), and tension headache (4.5%). No cases of brain tumor or bacterial meningitis were identified at the time of the ED visit. The only serious neurologic conditions diagnosed were 15 cases of viral meningitis, one shunt malfunction, one newly diagnosed hydrocephalus, and one hemorrhage post head trauma. Positive findings were: 46% of sinus radiographs, 16% of rapid strep tests, 60% of lumbar punctures, 19% of brain imaging studies.

The authors conclude that serious conditions presenting with a chief complaint of headache are not common. The most frequent diagnoses included viral illness, sinusitis, and migraine, in contrast with adult studies. Only 6% had serious neurologic diagnoses. Of the serious conditions in this study, 80% were viral meningitis.

*Burton LJ, Pediatric Emergency Care, 1997;13:1-4*

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## **Cardiorespiratory Complaints**

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### **Tietze's Syndrome in Children and Infants**

Tietze's syndrome refers to a benign, isolated swelling and tenderness of the upper costochondral area. Its etiology is unknown. Classic literature describes most cases in the second to the fourth decades of life. This article describes 10 cases of Tietze's syndrome in infants and children.

Occurring over an 18 month period, the study involved 6 boys and 4 girls, ages ranging from 10 months to 12 years. 5 were infants aged 1 year or less. All had a mass 1-4 centimeter diameter in the anterior chest wall with no systemic signs or fever. It was tender in all patients. Laboratory evaluations including WBC and sedimentation rates were normal in most patients. There were no abnormalities in the 4 patients who underwent bone scanning. Treatment consisted of analgesics and all patients were followed-up until recovery which took 1 week to 2 months. There were no recurrences.

This article highlights the presence of this disease entity in the pediatric patient.

*Mukamel, Journal of Pediatrics, 131:774-775, 1997*

### **A Dangerous Cause of Colic: Anomalous Left Coronary Artery Presenting with Paroxysms Variability**

An extremely interesting case. A 12 week old boy who was examined multiple times in the ED with chief complaints of irritability. A diagnosis of colic was entertained. Upon his third arrival in the ED he presented with signs of respiratory and cardiac failure involving cardiomegaly and an enlarged left ventricle. ECG findings demonstrated the presence of myocardial infarction and an echocardiogram showed a left coronary artery originating from the pulmonary artery. The patient underwent successful surgical repair.

Anomalous left coronary artery originating from the pulmonary artery (ALCAPA) can lead to myocardial infarction in an infant with a mortality rate of 85%. It must be considered in the workup of infants with suggested diagnosis of colic, particularly when respiratory distress is present. Most patients also experience tachypnea, diaphoresis, and prowaking. It is imperative to obtain a cardiogram and chest radiograph to rule out cardiomegaly from the diagnosis.

*Mahle WT, Pediatric Emergency Care, 14:24-27, 1998*

### **Myocardial Infarction in Children**

A review article which outlines the many faces, signs, and symptoms of MI in children. The various etiologies of this disorder are well outlined in an excellent literature review. Discussion involves history and physical examination findings, EKG findings in children, and an analysis of the usefulness of cardiac enzymes as a means of diagnosing MI in children.

*Riach JD, American Journal of Emergency Medicine, 1998; 16:296-99*

### **Sudden Death From Cardiac Causes in Children and Young Adults**

*Liberthson RR, New England Journal of Medicine, 1996;334:1039-1044*

### **Adenosine and Pediatric Supraventricular Tachycardia in the ED: Multi Center Study and Review**

A study involving a multicenter description of patients ranging 18 years of age and younger who received intravenous adenosine for presumed SVT. 82 patients were enrolled in the study with 98 presumed SVT episodes.

25 episodes occurred in children younger than 1 year of age. 8 patients had congenital heart disease, 59 had a history of SVT, 43 were taking cardiac

medications, 13 had a history of asthma, and 25 presented in compensated cardiac shock.

A total of 193 IV doses of adenosine were administered. Doses were classified as low, medium or high (less than 0.1 mg/kg, 0.1-0.2 mg/kg, greater than or equal to 0.2 mg/kg). A total of 95 patient events were determined to be SVT, all but 5 of which were AV node-dependant. The overall cardioversion success rate of adenosine was 72%. Cardioversion was successful for 4 patients at a low dose, 44 at medium dose, and 23 at a high dose of adenosine. Adverse effects occurred in 22 patients.

The authors conclude that IV administration of adenosine led to successful cardioversion of 72% of pediatric SVT events. A dose range of 0.1-0.3 mg/kg was found to be most effective.

*Loseck JD, Annals of Emergency Medicine, 1999;33:185-191*

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## Abdominal Complaints

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### Clinical Outcomes of Children With Acute Abdominal Pain

A total of 1,141 consecutive children ages 2 to 12 with a complaint of non-traumatic abdominal pain of less than 3 days duration were identified through a chart review. Data were collected relative to demographics, signs and symptoms, records from repeat visits within ten days, test results, and telephone follow-up.

The prevalence was 5.1%. The most common associated symptoms were history of fever (64%) emesis (42%) decreased appetite (36%), cough (35%) headache (29%) and sore throat (27%). The 6 most prevalent final diagnoses, accounting for 84% of all final diagnoses, were URI and/or otitis (18%), pharyngitis (16%) viral syndrome (16%) unknown etiology (15%) gastroenteritis (10%), and acute febrile illness (7%). One percent of children required surgical intervention. Approximately 7% recurred within 10 days, 11 of which had treatable medical diseases and 4 had surgical interventions necessitated.

The authors conclude that the complaint of acute abdominal pain is often accompanied by multiple complaints and is usually attributed to a self limited disease.

*Scholer SJ, Pediatrics, 1996;98:680-685*

### **Evaluation of the Erythrocyte Sedimentation Rate in Children Presenting with Lymph, Fever, or Abdominal Pain**

This is a study evaluating the diagnostic significance of the ESR in the pediatric population. The methods included analysis of records of all children younger than 18 years without previous ailments known to elevate ESR.

The ESR tests performed during the study totalled 2,316 patients. Illnesses were classified as serious or benign. Increased ESR correlated directly with likelihood of serious disease. 102 patients, 57 with an ESR higher than 50 had serious disease versus 27% of those with an ESR 20-50, and 8% within an ESR lower than 20. An ESR higher than 100 was an even stronger predictor; 78% of such patients had serious diagnosis.

Further evaluation is advised for a patient with non specific symptoms but a very high ESR. High ESR with abdominal pain and limp are specific for serious disease.

The authors conclude that an interpretation of a given ESR must be based on symptoms probability of illness and the result itself. An ESR is probably most helpful in guiding the physician to obtain further investigative test.

*Huttenlocher A, Clinical Pediatrics, 36:339-334, 1997*

### **Early Childhood Appendicitis is Still a Difficult Diagnosis**

*Paajanen H, Acta Paediatr, 1996;85:459-462*

### **A Retrospective Review of Pediatric Patients with Epididymitis, Testicular Torsion, and Torsion of Testicular Appendages**

A retrospective study comparing historical features, physical examination findings, and testicular color Doppler ultrasound in pediatric patients with epididymitis, testicular torsion, and torsion of appendix testis.

90 patients included in the study. 64 had epididymitis, 13 had testicular torsion, and 13 had torsion of appendix testis. Historical features did not differ among groups except for duration of symptoms. Of 13 patients with torsion all had a tender testicle and an absent cremasteric reflex. When compared with the testicular torsion group, fewer patients with epididymitis had a tender testicle (69%) or an absent cremasteric reflex (14%). 62 of 64 patients with epididymitis had a tender epididymis and 43 of 64 had scrotal redness or swelling. Doppler ultrasound showed decreased or absent blood flow in 8 patients, 7 of whom were diagnosed with torsion.

The authors conclude that the physical examination is helpful in distinguishing among these 3 entities. Patients presenting with a tender testicle and an absent

The authors conclude that IKH is the most common cause of hypoglycemia in children beyond infancy. Its typical presentation involves previously healthy 1-5 year old children with normal growth and development who present with the first episode of symptomatic fasting hypoglycemia and appropriate degrees of ketonuria. All symptoms resolve with the administration of glucose. An extensive work-up for endocrinopathy or inborn error of metabolism is not necessary.

*Pershad J, Pediatric Emergency Care, 1998;14:268-271*

### **Diagnostic Use of Anion and Osmolal Gaps in Pediatric Emergency Medicine**

An excellent review article outlining the usefulness and application of these laboratory measurements in the pediatric emergency department. Helpful tables and case presentations are contained within the text.

*Chabali R, Pediatric Emergency Care, 13:204-210, 1997*

### **Outpatient Rapid Intravenous Rehydration to Correct Dehydration and Resolve Vomiting in Children with Acute Gastroenteritis**

*Reid SR, Annals of Emergency Medicine, 1996;28:318-323*

### **Rapid Rehydration of Pediatric Patients**

*Luten RC, Annals of Emergency Medicine, 1996;28:353-355*

### **The Evolution of Therapy for Dehydration: Should Deficit Therapy Still be Taught?**

*Holliday M, Pediatrics, 98:171-177, 1996.*

<b>Pediatric Trauma</b>
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<b>General Trauma</b>
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### **Management of Burn Injuries in Children**

This is an excellent review article outlining the appropriate steps necessary for the management for pediatric burns.

*Slator R, European Journal of Plastic Surgery, 19:207-212, 1996*

### **Using the Hand to Estimate the Surface Area of a Burn in Children**

It is important to obtain an accurate estimate of the extent and depth of a burned surface. A practical method useful in children described in the past suggest that the

palm approximates 1% of the total body surface area (TBSA). The palm and the entire surface of the hand were compared to determine which measure more closely approximates 1% of the TBSA in children.

Height, weight, and standard nomograms were used to determine the body surface area of 100 children. A photocopy of the hand of each child was used to determine the surface area of the palm and the entire **palmar** surface of the hand. 91 children were utilized. The mean value for the percent of TBSA represented by the entire palm surface was **0.94%**, compared with 0.52% for the palm alone. The authors conclude that in a child, the entire palm surface of the hand approximately 1% of the TBSA.

Nagel TR, *Pediatric Emergency Care*, 13:254-255, 1997

### **Delayed Diagnosis of Injury in Pediatric Trauma**

Furnival RA, *Pediatrics*, 1996;98:56-62

## **Head Trauma**

### **Minimal Head Trauma in Children Revisited: Is Routine Hospitalization Required?**

The authors evaluated a case series of pediatric trauma admissions of patients with normal results of head CT scans and neurologic examinations during a 3 year period. These cases were reviewed to evaluate whether admission for isolated head trauma was truly obligatory and whether automatic admission in this situation was necessary

There were 62 patients with a mean age of 7 years. All had closed head injury, initial Glasgow Coma score of 15, and normal neurologic exams and head CT scans. Falls occurred in 45% of the patients and vehicular crashes in 23%. The mean length of stay was 1.2 days. Significant CNS sequelae warranting hospital admission was not found for any child. For these hospitalizations, total charges were \$177,874.

The authors concluded that there does not seem to be a risk for significant CNS sequelae in children who present with normal CNS examination and normal head CT results. Unnecessary hospitalizations may therefore be avoided.

Roddy SP, *Pediatrics*, 101:575-577, 1998

### **The Use of Cranial CT Scans in the Triage of Pediatric Patients with Mild Head Injuries**

Most clinicians agree that children with head injuries who have normal CT scanning in the Emergency Department can be safely discharged home. This study was performed to provide a close follow-up of these children for a longer period of time to see if any injuries were missed or negative sequelae occurred.

The authors performed a retrospective case series study involving a 1 month follow-up period. Over a 4 1/2 year period, 400 children were enrolled in the study. All had an initial Glasgow Coma Score of 13-15 and a normal CT scan.

Four of the 400 children were re-admitted for neurologic reasons within one month after the head injury. Three of the four required observation only, 2 for concussive symptoms and 1 for symptomatic hemorrhagic contusion. This patient was managed non-operatively. An additional patient who was taking anti-coagulants for a heart condition required neurosurgical drainage for a subdural hematoma.

The authors concluded that very few children with mild head injury and a normal CT scan will have delayed sequelae requiring intervention. This study confirms the current practice of discharging these children from the Emergency Department.

*Davis RL, Pediatrics, 95:345-349, 1995*

### **Pediatric Basilar Skull Fracture: Do Children with Normal Neurologic Findings and No Intracranial Injury Require Hospitalization?**

It is well known that basilar skull fractures (BSF) maybe complicated by CSF leakage cranial nerve palsies, hearing impairment, meningitis, and most importantly delayed hemorrhage. This study addressed the necessity of admission in a subgroup of pediatric patients with BSF who had normal neurologic exams, GCS scores of 15, and no CT evidence of intracranial pathology.

Two years were reviewed. A subgroup of patients with normal neurologic findings, GCS scores of 15, and no CT evidence of intracranial pathology were specifically analyzed. Two hundred thirty-nine patients were identified with BSF, of which 21% were younger than 3 years, 42% 3-9 years, and 37% 10-17 years. The most common mechanism of injury were falls and motor vehicle accidents. Of the 239 patients with BSF, 21% had no clinical signs and diagnosis was only found on CT. Of the 188 patients with clinical signs, 50% had CT evidence of BSF. Clinical signs most commonly encountered were hemotympanum (65%) followed by CSF fluid leak from the ear, Battle's sign, CSF rhinorrhea and cranial nerve involvement. Vomiting was the most common complication in all groups.

The authors conclude that patients with BSF, normal exams, GCS scores of 15, and no intracranial pathology on CT are unlikely to experience complications and may represent a group that will safely be discharged from the emergency department. They recommend a larger study to confirm their reports.

*Kadish HA, Anna/s of Emergency Medicine, 1995;26:37-41*

### **Head Injuries from Children from Plastic Hair Beads**

3 cases of profound intracranial injury occurring from head injury in children wearing plastic head beads are described. All children seemed to have minor head trauma; however all 3 had depressed skull fractures. The authors conclude that severe head injury after a fall can occur in children wearing plastic hair beads.

*Geller E, Pediatric Radiology, 27:790-793, 1997*

### **Inappropriate Discharge Instructions for Youth Athletes Hospitalized for Concussions**

*Genuardi FJ, Pediatrics, 95:216-218, 1995.*

<b>Thoracic Trauma</b>
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### **Ventricular Fibrillation Following Blunt Chest Trauma From a Baseball**

*Amerongen RV, Pediatric Emergency Care, 1997;13:107-110*

### **Blunt Impact to the Chest Leading to Sudden Death From Cardiac Arrest During Sports Activities**

*Maron BJ , New England Journal of Medicine, 1995;333:337-342*

<b>Abdominal/Renal Trauma</b>
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### **Lumbar Compression Fractures Secondary to Lap-belt Use in Children**

*Sturm PF, Journal of Pediatric Orthopedics, 1995; 15:521-523*

### **Blunt Renal Trauma in the Pediatric Population: Indications for Radiographic Evaluation**

*Stein JP, Urology, 44:406-410, 1994.*

### **Indicators of Genitourinary Tract Injury or Anomaly in Cases of Pediatric Blunt Trauma**

*Ablu-Jaude WA, Journal of Pediatric Surgery, 1996;31:86-90*

## Orthopedic Trauma

### Prospective Study of Recurrent Radial Head Subluxation

*Teach SJ, Arch Pediatr Adol Med, 1996;105:164-166*

### Humeral Fractures Without Obvious Etiologies in Children Less Than 3 years of Age: When is it Abuse?

*Straight RT, Pediatrics, 1996;667-671*

### Pediatric Elbow Trauma

*Skaggs D, Pediatric Emergency Care, 13:425-434, 1997*

### Corneal Abrasion in Infants

An excellent case review of a 1 year period analyzing the charts of patients with a final diagnosis of corneal abrasion. The most important result of this study was the fact that the primary presenting symptom for all 20 infants less than 4 months of age was excessive crying or irritability. In nearly 70% of these patients this was the only sign or symptom recorded in the medical record. The authors are correct to point out to the reader that corneal abrasion should be added to the differential diagnosis of infants who present with excessive acute unexplained crying.

*Poole SR, Pediatric Emergency Care, 11:25-26, 1995.*

## Wound Repair

### Long Term Appearance of Laceration Repair using a Tissue Adhesive

Yet another article highlighting the efficacy of Histoachryl Blue (HAB) in the repair of simple, non tension lacerations in children. The objective of this study was to have the wound evaluated by plastic surgeons at follow-up visits at 2 months, and within 1 year's time.

Repairs made with HAB were comparable with those made by conventional suturing at 2 months and 1 year. The authors recommend this tissue adhesive as alternative to standard suturing techniques.

*Simon HK, Pediatrics, 99:193-195, 1997*

### Laceration Repair Using a Tissue Adhesive in a Children's Emergency Department

*Burns TB, Pediatrics, 98:673-675, 1996.*

### **Comparison of Skin Stapling Devices and Standard Sutures for Pediatric Scalp Lacerations: A Randomized Study of Cost and Time Benefit**

*Kanegaye JT, Journal of Pediatrics, 130:808-813, 1997.*

### **Removing Bee Stings (An Excellent Review of Techniques Recommended for the Removal of Stingers After Bee Stings in Patients)**

The authors point out that after the honey bee stings a human, the stinger detaches from the body of the perpetrator. It contains a segment of the bee's abdomen and a nerve complex attached to a venom sack. The extremity of the barb contains 2 curved **lancets**. Muscular movements of the detached sting which are initiated by the attached nerve ganglion move the **stylets** alternatively and help imbed the stinger further. Any attempts to use pincer techniques to remove the stinger will only help discharge more and more of the venom. The authors advocate rapid and expedient scraping of the wound to remove the entire stinger apparatus,

*Visscher PK, Lancet , 348:301-302, 1996*

<b>Pediatric Sedation and Analgesia</b>
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### **Comparison of Fentanyl/Midazolam with Ketamine/Midazolam for Pediatric Orthopedic Procedures**

The authors compare the safety and efficacy of these 2 drug protocols in the repair of orthopedic emergencies. Patients 5-15 years of age were randomized to receive IV F/M or WM. Measures of efficacy and safety were obtained.

During fracture reduction K/M subjects (130) had lower distress scores and parental ratings of pain and anxieties than did F/M subjects (130). Both regimens were well tolerated yet the orthopedists favored K/M. Recovery was 14 minutes longer for WM. Fewer K/M subjects had hypoxia (6% versus 25%) needed breathing cues (1% versus 12%) or required oxygen (10% versus 20%) than did F/M subjects. More K/M subjects vomited. Adverse emergent reactions were rare but equivalent between regimens.

The authors conclude that during emergency pediatric orthopedic procedures K/M is more effective than F/M for pain and anxiety relief. Both regimens facilitate reduction, produce amnesia, and rarely cause emergent phenomenon.

*Kennedy RM, Pediatrics, 1998; 102:956-963*

### **Lidocaine Adrenaline Tetracaine Gel Versus Tetracaine Adrenaline Cocaine Gel for Topical Anesthesia in Linear Scalp and Facial Lacerations in Children Aged 5 to 17 years**

*Ernst AA, Pediatrics, 95:255-258, 1995.*

### **Intramuscular Ketamine for Pediatric Sedation in the ED: Safety Profile in 1,022 Cases**

Quite a large study evaluating the effectiveness and complication rate encountered with the use of intramuscular ketamine. This involved a consecutive case series of children age 15 or younger given ketamine in the Emergency Departments over a 9 year period. Ketamine was administered at a dose of 4 mg/kg intramuscularly. Treating physicians were instructed to complete data forms.

1022 injections were noted. They were used mostly for laceration repair and fracture reductions. Transient airway complications occurred in 1.4%. These included airway misalignment, laryngospasm (4), apnea (2), and respiratory depression. All were quickly identified and treated without intubation. Emesis occurred in 6.7% without aspiration. Mild recovery agitation occurred in 17.6%, moderate to severe in 1.6%. No hospitalizations were required by these patients. Ketamine produced acceptable sedation in 98% of patients.

The authors conclude that in their case series intramuscular ketamine may be administered safely. It is effective, has a wide margin of safety, does not require intravenous access, and preserves protective airway reflexes.

*Green SM. Annals of Emergency Medicine 31:688-697, 1998.*

### **What is the Optimal Dose of Intramuscular Ketamine for Pediatric Sedation?**

The optimal dose of IM ketamine for ED procedural sedation is not known. The study was a consecutive case series of 1,022 children less than 15 years of age given IM ketamine in the EDs of university medical center and a county hospital over a 9 year period. Adequacy of sedation, time of discharge, and adverse effects with compared with those administered.

Doses in the sample averaged 3.96 mg/kg, with the range of .48 to 9.09 mg/kg. Children judged to be adequately sedated received higher doses compared with those inadequately sedated (3.94 versus 3.77). No significant difference or trend in type of discharge or adverse effects was noted between the children receiving less than 4 milligrams per kilogram and those receiving greater than 4 mg/kg of ketamine.

The authors conclude that ketamine doses of 4 to 5 mg/kg IM produced adequate sedation in 93% to 100% of children, suggesting that this dosing range may be optimal for ED procedural sedation.

*Green SM, Academic Emergency Medicine, 1999;6:21-26*

## And Finally:

### **Humor in the Pediatric ED: A 20 Year Retrospective**

This is an entertaining and informative review of notebook entries recorded at a pediatric center over a 20 year period. Nurses and physicians were encouraged to enter any strange or humorous utterances, incidents or phone calls that were made to that department.

#### Most Interesting Chief Complaints

Needs a circumcision because his tonsils and adenoids are so big.  
 Can't find baby's birthmark.  
 Placed tooth under pillow, now lodged in right ear.  
 Problem with his manlihood.  
 Baby is afraid of his hands,  
 Needs anus muscles checked - has been straining.

#### Suspicious Soundina Chief Complaints

Fell out of infancy.  
 Lump down in his tentacle.  
 Needs a mental extraction.  
 Romantic fever.  
 Cereal Palsy.  
 Sick as hell anemia.  
 Scrap throat.  
 Swollen asteroids.  
 Sixty-five brewster.

#### Favorite Telephone Inquiries

Hello. I would like to schedule an emergency.  
 Do you carry breast milk?  
 May I speak to Dr. Dimetapp?  
 My baby can't breathe. What time can I bring her in?  
 Is it all right for a two month old to fly if he's constipated?  
 Is there such a thing as a birth control vibrator?  
 I was beating my daughter with a belt and got my fingers caught in the buckle and they're hurting, they are bleeding. What can I do?  
 Do children born with microcephaly have headaches from their heads being so small?

Should a five year old child be wiping his own butt?

*Nelson DS. Humor in the Pediatric Emergency Department: A Twenty Year Retrospective. Pediatrics 89:1089-1090, 1992.*