Continue Chest X-Rays in Highly Febrile Children With Leukocytosis

Radiographic Pneumonia in Young, Highly Febrile Children With Leukocytosis Before and After Universal Conjugate Pneumococcal Vaccination.
Rutman MS, Bachur R, Harper MB;
Pediatr Emerg Care; 25 (January): 1-7

Pneumonia rates, while decreasing a bit, may still be high enough to continue to warrant chest radiographs in children with high fevers, leukocytosis, and no other source of infection.

**Background:** The diagnosis of bacterial illness in young children is difficult. Most children with fever and illness have a viral etiology, but a small number may have pneumonia. The efficacy of a chest x-ray has been debated in the workup of fever in children. Before the pneumococcal conjugate vaccine (PCV) was introduced, the incidence of non-occult pneumonia was thought to be 40%; occult pneumonia had an incidence of 19% in children with concerning laboratory values. This has declined significantly since the vaccine was introduced.

**Objective:** To determine the impact of the pneumococcal vaccine in the incidence of occult and non-occult pneumonia as diagnosed by radiograph.

**Design/Participants:** Retrospective cohort study of emergency department records in a pediatric hospital. Patients were eligible if they were <5 years of age and had presented between 1996 and 2005 with a temperature >39C, had a white blood cell count 20,000/L, and had a chest x-ray performed. Those with an identifiable source of infection other than pneumonia were excluded.

**Methods:** Patients were divided into 2 groups (before and after universal use of PCV). Pneumonia was defined as a focal infiltrate (or consolidation) on chest x-ray as read by a radiologist. Occult pneumonia was defined as the diagnosis of pneumonia by radiograph without clinical respiratory symptoms.

**Results:** Of the >235,000 children <5 years of age seen in the emergency department over the 10-year period, 889 met the criteria for the cohort in the pre-PCV era and 335 met the criteria in the post-PCV era. This was due in part to the significant decrease in the number of complete blood cell counts performed since PCV was introduced. Pneumonia was seen on x-ray in 21% of children pre-PCV and 18% after. Occult pneumonia was diagnosed in 15% of children pre-PCV and 9% after. When looking only at children <2 years of age, radiographic pneumonia was diagnosed in 17% pre-PCV and 10% after.

**Conclusions:** Pneumonia rates, while decreasing a bit, may still be high enough to continue to warrant chest radiographs in children with high fevers, leukocytosis, and no other source of infection. The incidence of pneumonia as diagnosed by chest x-ray has declined a bit since the introduction of PCV, but the incidence is still reasonably high. The decrease is likely not significant enough to warrant changing current recommendations.

**Reviewer's Comments:** I was surprised that the incidence of pneumonia did not change more than it did. However, I was surprised that is was as high as it was at all. Still, this paper does not give enough new evidence to warrant changing the recommendation.

**Additional Keywords:** Pneumonia

**print tag:** () Refer to original journal article.
Does the PCV7 Effectively Prevent Pneumococcal Meningitis?

Effect of Pneumococcal Conjugate Vaccine on Pneumococcal Meningitis.

Hsu HE, Shutt KA, et al;
N Engl J Med; 360 (January 15): 244-256

The PCV7, although given to children only, has a substantial effect in reducing pneumococcal meningitis in all ages.

**Objective:** To determine the effectiveness of the pneumococcal conjugate vaccine (PCV) in preventing meningitis.

**Methods:** Data from the Active Bacterial Core surveillance database were reviewed. The information is collected from multiple sites that look at the strain types and resistance as well as the demographics of the patients. The timeline of the study was 1998 through 2005. The heptavalent pneumococcal conjugate vaccine (PCV7) was introduced in 2000. The authors looked at which serotypes and resistance were present in the meningitis. Children and adults, including patients with HIV infections, were studied.

**Results:** There were 1379 cases (age range, 2 months to 93 years) of pneumococcal meningitis. The fatality rate was 8.4% in children and 22% in adults. Case fatality rates in patients who had or did not have HIV infection were similar. Overall, the rates dropped 30% from 1998 through 2005, with an incidence of 1.13 to 0.79 per 100,000. In patients <2 years old, the rate decrease was 64% and in people >65 years, the incidence dropped 54%. In patients aged 18 to 39 years, the incidence dropped by 28% after the vaccine was licensed for use. When looking at serotypes that were included in the vaccine, the incidence of meningitis dropped 0.18 from 0.66 cases per 100,000 (a decline of 73%). For non-PCV serotypes, the rate increased from 0.32 to 0.51 per 100,000. There was an increase in children <2 years old of 275% of non-vaccine serotypes. There was an increase in those 18 to 39 years old, but it was not statistically significant. Five serotypes that were not in the vaccine in particular increased over the time period, especially serotypes 19A and 22F. In 1998, they were 1% of the cases and rose to 11% of the cases in 2005. The incidence of antibiotic resistance decreased for penicillin, meropenem, and cefotaxime overall. However, an increase in resistance occurred in non-vaccine serotypes. There was no resistance to vancomycin and 99% susceptibility to rifampin and levofloxacin.

**Conclusions:** The overall incidence of pneumococcal meningitis dropped after PCV7 was introduced across most age groups. However, there was a higher incidence of non-serotype strains with increased drug resistance.

**Reviewer's Comments:** The significant drop in meningitis shows the remarkable induction of immunity across all ages. The vaccine, while only given to children <5 years old, showed a significant effect in people who care for or have contact with these young children, This was particularly seen in the senior citizen age group, the so-called "grandparent effect."

**Additional Keywords:** Pneumococcal Conjugate Vaccine

**print tag:** () Refer to original journal article.
Antibiotic-Resistant Pneumococcus Still Prevalent


Richter SS, Heilmann KP, et al:
Clin Infect Dis; 48 (February 1): e23-e33

While the proportion of pneumococcal isolates resistant to penicillin has decreased, there continues to be a high rate of intermediate and total resistance to penicillin among pneumococcal isolates.

Objective: To describe antimicrobial susceptibility profiles and serotype distribution of pneumococcal isolates causing invasive and noninvasive infections in the U.S. during the 2004-2005 respiratory illness season.

Methods: Data about pneumococcal isolates were collected from 41 medical centers and compared with data from 1994-1995 and 1999-2000, before the introduction of pediatric 7-valent pneumococcal conjugate vaccination (PCV-7).

Results: 1647 isolates were characterized, 20% from 0- to 5-year-olds, 8% from 6- to 20-year-olds, and the others from adults; there were 60 serotypes. Serotypes included in PCV-7 accounted for 16.3%; 28.4% were genetically related to PCV-7 strains, and 55.3% were unrelated. Serotypes in middle ear and sterile body fluids were more likely to be PCV-7 related and less likely to be PCV-7 serotypes than specimens from other sites. One-third of the isolates were not susceptible to penicillin; 50% were resistant and 50% had intermediate resistance. Since 2000, intermediate penicillin resistance has increased (13% to 18%) and penicillin resistant isolates decreased (22% to 15%). Specimens from the middle ear and sinuses were most likely to be resistant (20% to 25%). Sterile body fluid and eye specimens were most likely to have intermediate resistance to penicillin (30%); 1% of specimens were resistant to fluoroquinolones, 29% to erythromycin, and 20% demonstrated multidrug resistance. The proportion of erythromycin resistance increased since 2000 from 26% to 29%; the proportion of multidrug resistance remained stable. Of the isolates seen in 0- to 5-year-olds, 25% were serotype 19A, which is related to one of the PCV-7 strains. Only 7.5% of this serotype were sensitive to penicillin; 23% had intermediate penicillin resistance, 35% were resistant to penicillin, and 33.1% were multidrug resistant. An additional 24% of isolates were serotype 19F, 24% of which were penicillin resistant and 20% multidrug resistant. Because the PCV-7 largely targeted penicillin-resistant serotypes, it is not surprising that the percentage of PCV-7 serotypes among the penicillin-resistant ones decreased >50%, from 89.4% to 40.4%. However, 19F, which comprised 25% of isolates in young children, is one of the serotypes included in PCV-7. This confirms other studies showing little impact of the PCV-7 on the prevalence of 19F.

Conclusions: While the proportion of pneumococcal isolates resistant to penicillin has decreased, there continues to be a high rate of intermediate and total resistance to penicillin among pneumococcal isolates. In this study 33% of isolates showed at least some resistance to penicillin, with specimens from the middle ear and sinuses being most likely to be resistant.

Reviewer's Comments: Even with the PCV, we still need to think about S. pneumoniae, particularly penicillin-resistant strains, as a cause of infection in our patients.

Additional Keywords: Antibiotic Resistance

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Preemptive Inhaled Corticosteroids May Reduce Need for Oral Corticosteroids

Preemptive Use of High-Dose Fluticasone for Virus-Induced Wheezing in Young Children.

Ducharme FM, Lemire C, et al: 

When used preemptively for viral-induced wheezing, inhaled fluticasone may impair growth, even if it reduces the need for oral corticosteroids.

Background: Wheezing is a frequent complication of upper respiratory tract infection (URI) seen in pre-school children accounting for frequent acute care visits. Several strategies have been studied to prevent virus-induced wheezing, including the use of oral corticosteroids, leukotriene-receptor antagonists, and inhaled corticosteroids.

Objective: To determine if high-dose inhaled fluticasone initiated at the onset of a URI decreases the severity of virus-induced wheezing episodes.

Design: Blinded, parallel-group, randomized, placebo-controlled trial.

Participants: 129 children, 1 to 6 years of age.

Methods: Eligibility criteria included at least 3 previous wheezing episodes, no intercurrent symptoms, and at least 1 course of systemic corticosteroids in the previous 6 months. Exclusion criteria were previous intubation, neonatal respiratory conditions, and allergies to aeroallergens. After a 7- to 14-day run-in period, children were randomized and treated. Monthly contact was made to gather information on recurrent URIs, medication use, health care use, and adverse health events. Data collected included height, weight, bone mineral density, and cortisol levels. The primary outcome was rate of systemic corticosteroid courses. Other outcomes included hospitalizations, symptoms, discontinuations, use of rescue beta 2 agonists, changes in growth, and bone density.

Intervention: 750 g fluticasone or placebo twice daily at the onset of a URI for a maximum of 10 days for 6 to 12 months.

Results: Systemic corticosteroids were used in 8% of URIs in the fluticasone group compared to 18% in the placebo group. Significantly fewer children in the fluticasone group received systemic corticosteroids (39% vs 63% for placebo). URI symptoms and acute care visits were not different between groups. Symptom duration was shorter and beta 2 agonist use was less in children receiving fluticasone. Gains in height (6.23 ± 2.62 cm vs 6.56 ± 2.90 cm) and weight (1.53 ± 1.17 kg vs 2.17 ± 1.79 kg) were significantly lower in children treated with fluticasone compared to placebo, respectively. No differences were seen in cortisol levels, bone mineral density, and adverse events.

Conclusions: Prophylactic high-dose fluticasone used at the onset of URI symptoms reduced the need for oral corticosteroids, but treated children had smaller gains in height and weight. Long-term adverse events should be evaluated before recommending this therapy.

Reviewer’s Comments: Because the selection criteria for entry into the study led to a high screen failure rate, the generalizability of these results to a broader population, especially older children and those with aeroallergen sensitivity, cannot be determined. Given the risk of over utilizing inhaled corticosteroids and findings with regard to growth, it is prudent not to universally treat children with inhaled corticosteroids at the onset of a URI.

Additional Keywords: Wheezing

print tag: () Refer to original journal article.
Does Prednisolone Help Treat Viral-Induced Wheezing?

**Oral Prednisolone for Preschool Children With Acute Virus-Induced Wheezing.**

Panickar J, Lakhanpaul M, et al:  

In preschool children with mild to moderate wheezing, there were no differences in treating with oral prednisolone versus a placebo.

**Objective:** To determine whether oral prednisolone is effective in treating viral- induced wheezing.

**Methods:** This study was done in England over 2 years at 3 hospitals with pediatric emergency departments. Children that were 10 months to 60 months were enrolled with symptoms of a wheezing attack after a viral infection (as defined by a clinician). The reason for choosing 10 months was to reduce recruitment of infants with bronchiolitis. Children with shock, bacterial sepsis, on immunosuppressive therapy, and active or recent exposure to varicella were excluded from the study. Children were enrolled if they had continued wheezing after at least 10 puffs of albuterol inhaler with a spacer or albuterol nebulization. Five minutes after enrollment, they received another dose of albuterol and had an assessment using the Preschool Respiratory Assessment Measure (PRAM), which assesses the severity of the wheeze in the child. Double-blinded randomization occurred to either get oral prednisolone or placebo in 10 mL of a strongly flavored drink. Based on recommendation from the British Thoracic Society, 10 mg daily for 5 days were given to children 24 months of age and 20 mg were given daily for 5 days for children >24 months. Discharge times were recorded as well as follow-up PRAM scores.

**Results:** 687 children were enrolled, with an even split between treatment and placebo groups. Actual discharge times in the hospital were similar 13.9 hours for the placebo and 11.0 hours in the treatment group (not statistically significant). There were no differences in albuterol actuations between groups. Some children were designated as high risk for asthma, and there were no differences in this subset between treatment and placebo groups. Parents filled out symptoms scores 7 days after discharge and there were no difference between the groups.

**Conclusions:** In preschool children with mild to moderate wheezing due to a virus, there were no differences in treating with oral prednisolone versus placebo.

**Reviewer’s Comments:** Using corticosteroids in children should be avoided when possible. The conclusion here showed that steroids did not significantly reduce time spent in the hospital, albuterol usage, and symptom scores. The only concern was the low dosage used in the article; most pediatricians will use 2 mg/kg for dosing prednisolone; 10 and 20 mg dosage may have been sub-therapeutic if a child was heavier. Using a weight base calculation for dosing prednisolone might have a different outcome on this study for children who weigh more than average. It also would have been interesting to see if a specific virus (respiratory syncytial virus, influenza) would have a response to steroid treatment.

**Additional Keywords:** Oral Prednisolone

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Challenging Value of Chest X-Rays in Cases of Bronchiolitis

A Cost Effectiveness Analysis of Omitting Radiography in Diagnosis of Acute Bronchiolitis.

Yong JHE, Schuh S, et al:
Pediatr Pulmonol; 44 (February): 122-127

Routine chest x-rays in infants presenting with typical bronchiolitis lead to increased health care costs, unnecessary antibiotic use, and do not identify a substantial number of alternate diagnoses, including pneumonia.

Objective: To determine the effect of eliminating routine chest x-rays for infants with typical acute bronchiolitis on incremental cost-effectiveness and diagnostic accuracy.

Participants/Methods: The study evaluated 256 previously healthy infants aged 2 to 23 months presenting with typical bronchiolitis at a tertiary care hospital pediatric emergency department (ED) in Toronto. Infants with comorbidities, neonatal ventilation history, prematurity, and wheezing history were excluded. All patients received chest x-rays after the ED physician evaluation. Before viewing the x-ray, the ED physician provided his/her suspicion of pneumonia and treatment plan (disposition, antibiotic therapy). Final treatment decisions were made after the ED physician interpreted the x-ray. Two radiologists blinded to the details of the patient's presentation independently evaluated the x-ray and had 98% agreement. The ED physician's x-ray interpretation was compared to the radiologist's to determine the false-negative and false-positive rate of alternate diagnoses and pneumonia, respectively. The primary outcome was the false-negative rate (eg, percentage of missed cases) of alternate diagnoses. Secondary outcome measures were false-positive and false-negative rates for identifying pneumonia. The cost analysis assessed direct health care costs (physician evaluation, testing, medication, inpatient stay) with a time horizon restricted to the acute episode. Sensitivity analyses were conducted to assess the impact of radiography rate, false-negative rate, inpatient length of stay, ED overhead, and chest radiograph costs on the results.

Results: The average age of infants enrolled was 7.7 months. The false-negative rate of detecting alternate diagnoses was 100%. The false-negative rate of detecting pneumonia decreased from 88.2% pre-radiography to 58.8% post-radiography. The false-positive rate increased from 3.4% pre-radiography to 11.4% post-radiography for alternate diagnoses and 10.5% to 16.1% for pneumonia. The additional false-positive pneumonia diagnoses post-radiography led to a 5-fold increase in the rate of antibiotic therapy. Omitting routine x-rays saved $59.09 (Canadian dollars) per patient. The cost-savings was most sensitive to rate and cost of x-ray followed by length of inpatient stay.

Conclusions: Elimination of routine chest x-ray appears to save money in a single payer health care system, decrease unnecessary antibiotic use, and does not result in a significant number of missed cases of pneumonia or other alternate diagnoses.

Reviewer's Comments: Routine use of chest x-ray in infants with typical bronchiolitis does not result in a substantial number of missed alternate diagnoses or cases of pneumonia, but does increase the rate of unnecessary antibiotic therapy 5-fold. Omitting routine chest x-rays in infants with typical bronchiolitis can save CDN $59.09 in the single-payer Canadian health care system.

Additional Keywords: Chest Radiograph

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AAP Recommendations for LP in Infants Should Be Revisited

Simple Febrile Seizures: Are the AAP Guidelines Regarding Lumbar Puncture Being Followed?
Shaked O, Pena BMG, et al:
Pediatr Emerg Care; 25 (January): 8-11

The recommendations to perform lumbar puncture on children <12 months with a simple febrile seizure may no longer be relevant.

**Background:** Simple febrile seizures are not uncommon, occurring in 2% to 5% of all children, and are the most common reason for seizures in children <5 years of age. The American Academy of Pediatrics (AAP) has recommended for over a decade that a child <12 months of age with a febrile seizure get a lumbar puncture (LP) as part of a fever workup because it is difficult to make a diagnosis of meningitis clinically in this population. Past work, though, has shown that very, very few children with bacterial meningitis present with a simple febrile seizure and no other serious symptoms. This, of course, was all before the introduction of the pneumococcal conjugate vaccine (PCV), which has made meningitis even more unlikely.

**Objective:** To examine if the AAP recommendations for lumbar puncture are being followed and to determine the rate of meningitis in those who did receive LP, and to see if factors were associated with the decision to do LP.

**Methods:** This was a retrospective chart review. Patients were eligible if they were between 6 and 12 months of age and presented with a simple febrile seizure to the emergency room between January 2001 and November 2005. Patients with known neurological disorders were excluded. Data abstracted included a clinical history, laboratory data, and demographic data.

**Results:** Over this time period, 242 records were identified, of which 56 met inclusion criteria; >50% of these patients received LP. There was no association between age and whether LP was performed. Ten children received antibiotics before the visit to the emergency room, and of these, 4 had LP performed. Children pretreated with antibiotics were no more likely to have LP performed than children who had not received antibiotics. All LP examinations were negative.

**Conclusions:** The recommendations to perform LP on children <12 months with a simple febrile seizure may no longer be relevant. The recommendations of the AAP with respect to LP for simple febrile seizures in children <12 months of age are being followed haphazardly. With the advent of the pneumococcal vaccine, however, these recommendations may be out of date and no longer necessary. The AAP should either update this recommendation or explain why it is still necessary.

**Reviewer’s Comments:** It is interesting that the introduction of PCV seems to have warranted changing some recommendations while failing to do so in others. This is one area where we can likely stop being so invasive. The recommendations should be revisited.

**Additional Keywords:** Lumbar Puncture

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Elbow Extension Test May Identify Fractures

Elbow Extension Test to Rule Out Elbow Fracture: Multicentre, Prospective Validation and Observational Study of Diagnostic Accuracy in Adults and Children.


In both adults and children with elbow trauma, those unable to fully extend their elbows should have radiography performed because the risk of fracture is nearly 50%.

**Objective:** To assess the value of full elbow extension as a test to rule out fracture in patients with elbow injury.

**Design/Participants:** For the adult patients, the study was a multicenter prospective validation study of the rule. For children, it was an observational study.

**Methods:** Patients, including children >3 years of age, presenting to 5 emergency departments in southwest England from 2004 to 2006 within 72 hours of an elbow injury were eligible for the study. In adults, those with full extension did not undergo radiography and were discharged with analgesia and a sling as needed. A structured follow-up phone call was done in 7 to 10 days to assess outcome. For children, the elbow extension test was done, but x-rays were obtained at the discretion of the emergency room provider. Again, patients had follow-up by phone in 7 to 10 days. Final outcome measures, particularly the presence of a fracture or no suggestion of problems at 7 to 10 days, were determined by the follow-up phone calls, any follow-up information obtained from a subsequent orthopedic clinic appointment if that was needed, and from the x-ray reports of a radiologist blinded to the results of the elbow extension test.

**Results:** Of 2127 patients presenting with elbow injury, 1740 participated in the study, of which 780 were children between 3 and 15 years of age. Of the 1138 adults unable to fully extend their elbows, fractures were found in 521 (43%). Of the 491 children unable to fully extend, fractures were found in 210 (43%). On the other side, of the 598 adults with full extension who had follow-up, fractures were ultimately found in 17 (3%). Of the 289 children with full extension, fractures were ultimately found in 12 (4%). None required operative intervention.

**Conclusions:** The elbow extension test can be useful in clinical decision making. In both adults and children, those unable to fully extend their elbows should have radiography done because the risk of fracture is nearly 50%.

**Reviewer's Comments:** The authors "advise caution" in the use of the elbow extension test as a single clinical decision rule for universal use in children with elbow trauma because of the potential in children for occult supracondylar fractures as well as the higher false-positive rate (4% compared with 3% for adults). The inference is that other aspects of the examination need to be considered in children with elbow injuries including assessment of pulses and capillary filling and of the ability to extend all fingers of the affected hand as well as other testing of peripheral nerve function.

**Additional Keywords:** Full Elbow Extension Test

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Worldwide Use of Antiemetics Varied and Not Evidence Based

Antiemetic Medications in Children With Presumed Infectious Gastroenteritis—Pharmacoepidemiology in Europe and Northern America.

Pfeil N, Uhlig U, et al:
J Pediatr; 153 (November): 659-662

Patterns of worldwide prescribing for antiemetic therapy for gastroenteritis are varied and typically not evidence based.

**Background:** It is estimated that 3 to 5 billion persons <5 years of age will develop gastroenteritis each year. While oral rehydration and rapid realimentation are recommended by numerous health organizations, there are no recommendations regarding various therapies used as antiemetics and limited data demonstrating efficacy (with the exception of ondansetron).

**Objective:** To evaluate the pattern of antiemetic use for vomiting in gastroenteritis in industrialized countries.

**Methods:** Information was retrospectively reviewed for 2005 from international databases from the Institute of Medical Statistics and the AOK Research Institute in Germany. These included prescription data from Canada, the United States, and various European countries encompassing 2.2 million children on the use of various antiemetic medication, including ondansetron, dimenhydrinate, diphenhydramine, metoclopramide, domperidone, and promethazine, in the setting of suspected infectious gastroenteritis.

**Results:** There was a wide range in the frequency and type of medication used in the treatment of gastroenteritis. In the United States, 23% of patients received prescriptions, with the most common medication being promethazine. France, Spain, and Germany were next in frequency with 15% to 17% of patients receiving prescriptions. In France, Spain and Italy, the most common antiemetic prescribed was the dopamine receptor antagonist domperidone. Only 3% of patients in Canada and 2% of patients in the U.K. were prescribed medication for vomiting. In Germany, >90% of prescriptions were written for dimenhydrinate and diphenhydramine. Ondansetron, the only medication shown to be effective in randomized controlled trials, was used in a minor proportion of prescriptions (essentially 0% in Germany, Canada, Spain and Italy, 3% in the United States, and 6% in the United Kingdom).

**Conclusions:** Antiemetic medications are prescribed frequently in children with gastroenteritis. Prescription types vary greatly among different industrialized countries. Ondansetron is infrequently prescribed.

**Reviewer's Comments:** In this era of evidence-based therapy, the results demonstrate that old prescribing patterns die hard. Why the low use of ondansetron, the only proven effective therapy? Certainly, the high cost has been a deterrent. And this study shows patterns in 2005, which is before some of the more widely publicized studies (particularly in the *New England Journal of Medicine*) became available and touted its benefits in treating gastroenteritis. It is concerning that from this survey data of U.S. prescriptions that the leading therapy is promethazine. A 2004 Food and Drug Administration black box warning cautioned against the use of promethazine in children <2 years of age because of the risk of fatal respiratory depression. Pediatricians still using that form of treatment should reconsider.

**Additional Keywords:** Antiemetic Medications

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PEG Achieves Greater Tx Success Than Other Options

Currently Recommended Treatments of Childhood Constipation Are Not Evidence Based: A Systematic Literature Review on the Effect of Laxative Treatment and Dietary Measures.

Pijpers MAM, Tabbers MM, et al:
Arch Dis Child; 94 (February): 117-131

There is limited evidence to support the use of a particular laxative or dietary treatment for childhood constipation.

Background: Despite the high prevalence of functional constipation in children, guidelines for treatment have been based on literature reviews that lacked quality assessment of studies, making these guidelines authority based rather than evidence based.

Objective: To evaluate the current evidence for use of dietary measures and laxatives for treatment of childhood constipation.

Methods: Comprehensive literature searches were conducted through MEDLINE and Embase through December 2007. Publications were included if the study population was restricted to youth 0 to 18 years old, the study was a randomized-controlled trial, comparative clinical trial or crossover study, and 1 of the goals was to assess medical and dietary treatment of functional constipation. Studies were further screened for delineated treatment types and outcome measures. The quality of studies was determined by a standardized list of criteria.

Results: 28 studies were included for review, for a total of 1912 children evaluated for constipation. Only 10 studies met "good quality" standards, and studies lacked uniform outcome measures. In the single high-quality study that compared polyethylene glycol (PEG) to placebo, PEG was more likely to increase defecation frequency. Eight studies revealed greater treatment success with PEG versus other laxatives. Four studies demonstrated PEG as superior to lactulose for treatment success, including greater number of children with soft or normal stools. With regard to defecation frequency, overall results were conflicting, though lactulose was equally or less effective than other laxatives, including PEG, liquid paraffin, and senna. Conflicting evidence was also found for the effect of senna compared to lactulose, mineral oil, placebo, or no medication, with senna generally proving less or equal efficacy. Dietary fiber showed no statistically significant benefit over placebo for defecation frequency.

Conclusions: For treatment of functional constipation in childhood, PEG achieved more treatment success than other laxatives, but a varying effect on defecation frequency. Due to lack of placebo-controlled trials, there is insufficient evidence to support the use of a particular laxative or dietary treatment for functional constipation.

Reviewer's Comments: These authors strongly assert the difficulty in determining a preferred treatment for functional constipation. Their systematic review reveals heterogeneity between pertinent studies (definition of functional constipation, participants, and interventions), lack of uniform outcome measures (including varying definitions of "treatment success"), and lack of high quality studies (including placebo-controlled trials). Strangely, of the 28 studies included for analysis, only 1 was conducted in a primary care setting. However, until further evidence is available, let us not overlook that PEG seems to achieve greater treatment success than other available options. Albeit based on the personal experience and conviction of the involved committee members, recent guidelines for management of childhood constipation recommend PEG as a safe, effective, and well-accepted treatment option.

Additional Keywords: Laxatives/Dietary Fiber

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Mania, Psychosis-Possible Adverse Effects of ADHD Medications

Hallucinations and Other Psychotic Symptoms Associated With the Use of Attention-Deficit/Hyperactivity Disorder Drugs in Children.

Mosholder AD, Gelperin K, et al:
Pediatrics; 123 (February): 611-616

Although rare, psychosis and mania can occur as a result of ADHD medication administration.

Background: During a recent Food and Drug Administration (FDA) Pediatric Advisory Committee meeting, concern surrounding potential drug-related psychiatric adverse events was raised.

Objective: To better understand the ability of psychostimulant medications to induce adverse psychiatric reactions and to measure their frequency.

Design: Database review.

Methods: Data was retrieved and evaluated from 2 sources: 49 randomized clinical trials and the FDA Adverse Event Reporting System (AERS) database. The clinical trials included reviews of Adderall XR, Focalin, Focalin XR, Concerta, Metadate CD, Ritalin LA, Strattera, and Provigil. Manufacturers of these drugs were asked to complete a pre-specified string search of their electronic clinical trials database for terms related to mania or psychosis. The rate of events per 100 persons-exposed to any attention-deficit/hyperactivity disorder (ADHD) medication was then calculated and compared to the rate in the placebo groups of these trials. The AERS database was also searched for reports of psychosis or mania associated with the administration of ADHD medications. Manufacturers were then asked to compare these cases against their database to confirm by the presence of time association, de-challenge and re-challenge information, if an alternative explanation existed and if the symptoms were confirmed by medical personnel.

Results: The data from the clinical trials revealed that adverse events of mania or psychosis occurred in every medicine reviewed except Adderall XR. The rate of events was 1.5 per 100 person-years. This compared to no events in the ADHD patients in the placebo group. For the AERS analysis, no incident rate was provided in the study; however, all drugs, including Adderall XR, had cases of associated psychosis or mania. The majority of cases occurred in pediatrics, and there was typically resolution of symptoms upon withdrawal or de-challenge of the drug. There was also resumption of symptoms, a positive re-challenge, in some cases. Finally, there were no risk factors that could account for the symptoms in any of the cases.

Conclusions: Although the incident rate of psychosis or mania was small, there were no reported cases in the placebo group, thereby suggesting a causal relationship between the medications and the adverse events.

Reviewer's Comments: This study was the result of communal concern that psychiatric symptoms, such as mania or psychosis, may be related to the administration of psychostimulant medications. Though this is a good initial surveillance study that starts to answer the question, it is designed to only seek associations and not causal relationships. Therefore, it is premature of the study to suggest a causal relationship. However, it has proven that the concern is valid and that a prospective trial is merited.

Additional Keywords: Psychosis/Mania

print tag: () Refer to original journal article.
Majority of TTM Treatments Ineffective in Children

Franklin ME, Flessner CA, et al:
J Dev Behav Pediatr; 29 (December): 493-500

TTM, a condition of pathologic hair-pulling, is associated with significant problems in social and academic functioning, and multiple types of treatments, including medications, have relatively low efficacy.

Background: Trichotillomania (TTM) is pathologic hair pulling accompanied with behavioral and psychological components, including impairments in daily living. Compared to adults, there are less data on multiple aspects of this disease in pediatric age patients.

Objective: To describe multiple aspects of the clinical presentations, functional impairments, and treatments utilized in children and adolescents with TTM.

Design: A convenience sample study that used anonymous, web-based survey methods to gather information about pediatric TTM.

Methods: For a 3-month period in 2006, a survey on TTM was linked to a website run by the Trichotillomania Learning Center, which has membership and participants of approximately, of whom 1 in 3 were estimated to have a younger family member with TTM. DSM-IV criteria involving hair pulling with loss and impairment were used to diagnose TTM. Surveys were completed by both the parent and the affected participant, who had to be between 10 and 17 years of age; the survey was called the Trichotillomania Impact Survey. The parental section addressed the extent of hair pulling, functional impact, and treatment history. The adolescent's section also looked at the history of hair-pulling and functional impact, particularly related to school. Several self-report scales examining depression and anxiety were also included.

Results: 133 surveys were completed; 72% involved girls and 95% of respondents were white. Mean age was about 14.5 years and approximately 66% had previously been diagnosed with TTM. Among the patients, 85% reported pulling hair from the scalp. 50% pulled eyelashes, and nearly 40% pulled eyebrows. Sixty percent experienced tension before pulling hair and 80% felt better after pulling hair; 55% of parents reported that their child avoided social events as a direct result of pulling. Fifty-five percent felt that TTM made it more difficult to study. Among respondents, 25% were diagnosed by parental report with anxiety disorder and 18% with mood disorder. Approximately 65% had received at least 1 forms of treatment (49% pharmacotherapy, 32% behavioral or psychotherapy, 12% a support group, and 10% hypnosis). Prozac and Zoloft were the most common medications prescribed. Only 17% of those who received any treatments said they were very much or much improved. Nearly 60% were unchanged or worse.

Conclusions: This is the largest survey of TTM in youth conducted to date and it describes psychopathology of the condition, its functional impact, and the inadequacy of current treatments.

Reviewer's Comments: One is struck when examining this article of the broad spectrum of therapies attempted; I count 28 in their listing of medications, behavioral treatments, and alternative therapies as a means to relieve the problem. Yet, in less than 1 in 5 cases does significant improvement occur. Few randomized controlled trials have been done in regard to mental health issues in children, and in general, the results are disappointing.

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Transition From Pediatric to Adult Care: What We Need to Work On

Transition From Pediatric to Adult Care: Internists’ Perspectives.

Internists are concerned about a number of issues in caring for patients transitioning from pediatric providers, especially a lack of training.

Background: Almost 1 in 5 children have some chronic condition that requires increased health care utilization. These days, >90% of children with such conditions survive into their 20s and beyond. Because of this, there is a significantly increased need to transition from child to adult health care; in the past, children with such conditions never required an internist. Unfortunately, there is a relative lack of successful transition programs.

Objective: To determine the concerns of adult providers with respect to transitioning patients with chronic conditions from pediatric to adult practitioners.

Design/Methods: This was a random cross-sectional survey in which 200 random internists were selected from the 2000 American Board of Medical Specialties directory. An additional random 200 female providers were selected as well. Only those for whom accurate contact information could be found were included. A 2-stage Delphi survey was used. The first stage asked open-ended questions, probing for concerns about transition. Responses were gathered and used to create a second survey with 45 unique items asking participants to rate each item. Demographic data were also collected for analyses.

Results: Of the 241 surveys sent out, 107 were later excluded for various reasons. Of the 134 remaining eligible surveys, 67 were completed, for a response rate of 50%. In stage 1, there were a variety of responses, with only 3 items cited by >5 participants. These concerns included difficulty in getting records, lack of training for these conditions, and difficulty with parents letting children become independent. The stage 2 surveys were sent to 118 potential participants who answered stage 1 or did not respond at all. The highest rated concerns included lack of training in these conditions, difficulty with patients’ psychosocial needs, the need for a superspecialist, lack of adolescent training, handling end-of-life issues with relatively new patients, visit times, and the high expectations of families.

Conclusions: Internists are concerned about a number of issues in caring for patients transitioning from pediatric providers, especially a lack of training. The lack of training for internists caring for patients transitioning out from pediatric providers should be corrected immediately. Other issues, such as family expectations and psychosocial issues require a better transition process.

Reviewer’s Comments: This is one of those issues we should have seen coming. Of course, as we improve the management of pediatric chronic conditions, adult doctors are going to learn to have to care for these patients. Fortunately, many centers are developing clinics for adults who have previously been treated for chronic conditions at pediatric hospitals.

Additional Keywords: Chronic Pediatric Conditions

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Teen Conduct Disorder Source of Social, Health Impairments Into Adulthood

Outcomes of Conduct Problems in Adolescence: 40 Year Follow-Up of National Cohort.

Colman I, Murray J, et al:
BMJ; 338 (January 8): a2981

Conduct disorder identified in the teenage years increases the likelihood of long-term social, economic, and mental health impairments up to 4 decades later.

**Background:** Conduct disorders are types of externalizing behaviors that can reveal patterns of overt antisocial actions (confrontation and fighting) and covert activities (stealing and lying). When persistent into adulthood, conduct disorder is then commonly categorized as adult antisocial personality disorder.

**Objective:** To describe the long-term outcomes associated with externalizing behavior in adolescence.

**Design/Methods:** This is a longitudinal study utilizing information collected in the Medical Research Council National Survey of Health and Development, a British survey of data on every child born in England, Scotland, or Wales during 1 week in March 1946. Of all births, 5362 were selected for long-term follow-up, which consisted of prospective visits on 17 occasions up to age 26 years and then 4 more times between ages 31 and 53 years. Teachers of 3652 survey members, when these students were aged 13 and 15 years, were asked to assess behavioral problems, including possible features of conduct disorder. A standardized questionnaire was used. Of those who scored the poorest on the survey, the bottom 348 (10%) were considered to have severe externalizing behaviors including truancy, disobedience, lying, and poor response to discipline. In total, 1051 (28%) had mild externalizing behaviors and 2253 (62%) had no externalizing behaviors. At ages 36, 43, and 53 years, survey members were evaluated for mental health in adulthood, family life, employment, and educational outcomes. The authors created a composite category--global life adversity--to measure adult adjustment problems.

**Results:** Adolescents with severe behaviors were 4 times more likely to drop out of school compared to those with no externalizing behaviors. Also, in this group as adults, anxiety and depression were more likely (adjusted OR, 1.3; 1.0 to 1.7), teenage parenthood more likely (adjusted OR, 2.4; 1.3 to 4.4), 1 divorces more likely (adjusted OR, 2.1; 1.4 to 3.2), and financial difficulties more likely (adjusted OR, 2.1; 1.4 to 3.2). In those with severe externalizing behaviors, 40% scored in the top quarter of that composite global life adversity category. Those with mild externalizing behaviors also had problems, but significantly fewer.

**Conclusions:** Teenagers with externalizing behaviors consistent with conduct disorder experience multiple impairments later in life, including poor mental health, relationship difficulties, and economic problems.

**Reviewer’s Comments:** This study from Britain demonstrates that mental health pathology identified in the teenage years has significant long-term repercussions. Just as the metabolic syndrome puts obese teenagers at risk for cardiovascular complications, conduct disorder increases the likelihood of long-term social, economic, and mental health impairments.

**Additional Keywords:** Long-Term Effects

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Decreasing Risky Behavior on Social Networking Sites

Reducing At-Risk Adolescents’ Display of Risk Behavior on a Social Networking Web Site: A Randomized Controlled Pilot Intervention Trial.

Moreno MA, Vanderstoep A, et al:
Arch Pediatr Adolesc Med; 163 (January): 35-41

E-mail interventions may be effective in decreasing online displays of risky behavior.

Background: >90% of teenagers have Internet access, and more than half have joined social networking sites (SNSs), such as MySpace.com and Facebook.com. Members of SNSs can choose to display their pages publicly ("public profile") or limit access to their pages to selected "friends" ("private profile"). Many teens display information about personal behavior that may pose health risks and may attract sexual predators.

Objective: To determine if an online message from a physician reduces references to risky behavior by teens on SNSs.

Design: Randomized controlled intervention trial.

Participants: Self-described 18 to 20-year-olds with MySpace.com pages.

Methods: One author became a member of MySpace.com with a username of "Dr Meg" and a public profile with her medical and research credentials. Authors searched the web site for members from a single zip code (randomly selected from 10 low-income urban areas) who described themselves as age 18 to 20 years with public profiles. Those members whose Web profile had at least 1 reference to tobacco use and at least 1 reference to alcohol use were eligible for the study and were randomly assigned to the intervention or control group. The intervention group received 1 e-mail from Dr Meg's MySpace profile, which provided information about the riskiness of disclosing personal information online and a link to a web site with information on sexually transmitted diseases and free chlamydia testing. The control group was not contacted by the researcher. Web profiles were examined at baseline and 3 months after the intervention for references to substance use and sexual behavior.

Results: 1340 public profiles were available, and 190 profiles met inclusion criteria for the analysis. Overall, 85.3% had references to substance use and 54.2% displayed sexual references. A total of 13.7% of intervention and 5.3% of control profiles eliminated sexual references, and 26.0% of intervention and 22.0% of control profiles eliminated substance use references. In addition, 10.5% of intervention and 7.4% of control profiles were set as "private" at the 3-month follow-up. When adjusted for demographic and risk factors, the intervention group was 4.2 times more likely to remove sexual references than the control group. Females in the intervention group were more likely than males to remove sexual references from their profiles.

Conclusions: The authors conclude that e-mail interventions may be effective in decreasing online displays of risky behavior.

Reviewer’s Comments: Although the results are intriguing, it must be noted that this is a small study of a geographically limited population. I was stunned that there were >1300 young adults aged 18 to 20 years in a single zip code with public profiles. Many teens may not be aware of the implications of having a public profile. Perhaps the take-home message is that we need to discuss SNSs with our teen patients and encourage them to limit access to their profiles to people whom they know.

Additional Keywords: Risk Behaviors

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Parent-Based Language Intervention Effective in Children With Expressive Speech Delay

Parent Based Language Intervention for 2-Year-Old Children With Specific Expressive Language Delay: A Randomised Controlled Trial.


A short parent-based group language intervention may be effective in 2-year-old children with expressive speech delay.

**Background:** Language delay is one of most frequently encountered developmental problems in toddlers. Early language intervention treatment models range from individual child-directed interventions to parent-based group interventions. Few published studies of parent-based group interventions exist.

**Objective:** To examine the effectiveness of a structured, short parent-based language intervention, the Heidelberg Parent-based Language Intervention (HPLI), for children aged 2 years with specific expressive language delay (SELD).

**Design/Methods:** This was a randomized controlled trial of HPLI conducted in Germany. Children with SELD that was identified by parental screening questionnaires were enrolled during routine developmental check-ups at 21 to 24 months. All children received baseline language, cognitive, and audiometric testing, as well as a neurologic evaluation from a pediatric neurologist prior to study entry to exclude children with abnormal non-verbal cognitive abilities and sensory deficits. Using a stratified randomization based on gender and maternal education, children were randomized to receive the HPLI or to wait, because speech therapy in the area is usually not initiated before age 4 years. A comparison group of children with normal language ability was matched by age, sex, birth order, and maternal education. The HPLI is an interactive program and uses picture books as one of its main program topics. The HPLI was conducted with parent groups of 5 to 10 and comprised seven 2-hour sessions for 3 months plus a 3-hour session 6 months later. Standardized and norm referenced instruments were used to measure expressive language at 6 months and 12 months after intervention.

**Results:** 47 children completed the study after randomization. At 6 months, the children receiving the HPLI had greater improvement than the waiting group in vocabulary, morphology, syntax, and language production, while the normal language group scored higher than either group across all domains. One year after enrollment, the intervention group still had significantly higher scores in vocabulary, morphology, and language production compared to the waiting group, while the normal language group continued to score higher than either group. By 1 year, 75.0% of the intervention group compared with 43.5% of the waiting group had normal language scores, and these differences could not be explained by gender or maternal education. Finally, the authors conducted a simple cost calculation to show that the HPLI is 4.5 times cheaper per child than individual therapy.

**Conclusions:** The Heidelberg Parent-based Language Intervention is effective in German children with specific expressive language delay and is cheaper than individual-based therapy.

**Reviewer’s Comments:** A parent-based group language intervention program in 2-year-olds may be cheaper than and as effective as an individualized language intervention. The beneficial effect of a parent-based group language intervention may be sustained beyond the time of the intervention.

**Additional Keywords:** HPLI

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Can Breast Milk Help Prevent Viral Pneumonia in Infants?

Breastfeeding Prevents Severe Disease in Full Term Female Infants With Acute Respiratory Infection.
Libster R, Hortoneda J, et al:
Pediatr Infect Dis J; 28 (February): 131-134

In this study, breastfeeding was more protective in female infants for lower respiratory infections compared to formula-fed infants. There were no differences in male infants with either feeding choice.

**Objective:** To determine whether breastfeeding is protective for the severity of acute respiratory infections in boys and girls.

**Methods:** The study was conducted during the winter months of Buenos Aires in 2002. Children who were aged <1 years were considered for the study. Children who came to the clinic or emergency department for the first time with an acute respiratory illness were enrolled. Children with immune suppression, abnormal swallowing, congenital heart disease, or oral facial malformations were excluded, as were premature infants <36 weeks of age. Parents completed questionnaires to determine if the child had been breastfed. There were additional questions about smoking in the home and crowded living conditions. Lower respiratory infections were defined by wheezing, pneumonia, or stridor. Nasal swabs were obtained to look for respiratory viruses including human metapneumovirus, respiratory syncytial virus (RSV), parainfluenza, and influenza types A and B.

**Results:** 323 infants were included in the study. Of these, 64% were male; 25% were aged <3 months and 56% were <5 months. Fifty-four percent had evidence of lower respiratory infections. The rate of acute viral pneumonia was decreased in breastfed girls compared to formula-fed girls. There was no difference in boys who were either breast or formula fed.

**Conclusions:** Breastfeeding was more protective in female infants for lower respiratory infections compared to formula-fed infants. No differences were found in male infants with either feeding choice.

**Reviewer's Comments:** This is another reason to recommend breastfeeding to all mothers. Further research to determine why there is a difference in genders will need to be performed. Research studies that included a more diverse population could be helpful to see if this is a worldwide issue or just a South American phenomenon. The authors did not mention this, but it would have been interesting to see if breastfeeding had any specific protection to the common lower respiratory infections such as influenza or RSV.

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How Accurate Is Parental Palpation for Fever in Infants?

Fever Determination in Young Infants: Prevalence and Accuracy of Parental Palpation.

Katz-Sidlow RJ, Rowberry JP, Ho M:
Pediatr Emerg Care; 25 (January): 12-14

Although many parents own thermometers, they still rely on palpation to measure fever in their infants.

**Background:** Since newborns and small infants have unreliable symptoms when infected, providers regularly tell parents to bring any infant <3 months of age who has a fever in for evaluation. Unfortunately, parents often do not use a thermometer to measure temperature; this means that pediatricians are often presented with an afebrile child in clinic with a report of a tactile temperature at home. The reliability of such a report is unknown.

**Objective:** To examine how often parents rely on palpation to determine fever in infants, and how accurate these assessments are.

**Design/Methods:** This was a prospective study of infants presenting to an emergency department over a 1-year period in 2004 to 2005. Parents of children <3 months of age were given a survey consisting of scripted questions about fever measurement. Parents were asked if the child had a fever. They were then watched to see if and where they palpated the infant after that question. Those who did not were then asked to palpate the infant. Parents were also asked if they owned and used a thermometer. Vital signs were measured on all infants in the emergency department.

**Results:** A total of 96 infants took part in this study. Of the parents, 57% reported that palpation was the usual method to check for a fever; 87% reported using palpation at least occasionally. Although almost 80% of parents reported owning a thermometer, almost half still reported using palpation as a regular means of checking for fever. Overall, parents palpating their infants had test characteristics for accurately identifying fever (sensitivity, 81%; specificity, 82%; positive predictive value, 59%; and negative predictive value, 91%). However, some of these parents had used a thermometer at home. When these parents were eliminated from the analysis, the remaining parents were less accurate in identifying fever (sensitivity, 67%; specificity, 84%; positive predictive value, 33%; and negative predictive value, 95%).

**Conclusions:** Many parents continue to use palpation to measure for fever in their infants, even if they own a thermometer. Palpation seems to overestimate the presence of a fever, but it is more accurate when a child is afebrile. We should continue to encourage parents in the proper use of thermometers in order to obtain accurate measurements of temperature.

**Reviewer's Comments:** What is amazing is that most of these people own thermometers, yet still trust their hands more. We really need to do a better job of teaching parents to use the thermometers they have!

**Additional Keywords:** Palpation

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Trends in Hospitalizations for Neonatal Jaundice and Kernicterus

Contrary to popular opinion, the incidence of hospitalizations for kernicterus declined rapidly after publication of the AAP guidelines in 1994 and has remained low since that time.

Background: Kernicterus, the chronic form of bilirubin encephalopathy, is a serious condition in newborns and is associated with cerebral palsy, hearing loss, and intellectual disabilities. A serum bilirubin level >30 mg/dL in an otherwise healthy infant is thought to increase the risk of kernicterus. Guidelines have been in place for more than a decade to monitor and treat hyperbilirubinemia in order to prevent kernicterus. Recent reports, however, have raised concerns that the incidence of kernicterus is once more on the rise.

Objective: To use nationally representative data to determine the trends in diagnosis and management of jaundice and the incidence of kernicterus in the United States.

Methods: The data for this analysis came from the Nationwide Inpatient Sample and the Kids' Inpatient Database. Data were combined for the years 1988 to 2005. Records were abstracted for those with an ICD-9 code for jaundice or kernicterus in the first 30 days of life. First, the overall rates of newborns diagnosed with both jaundice and kernicterus were calculated. They were then stratified by prematurity, race, insurance, income, geographic region, and year of discharge. Rates of phototherapy and exchange transfusion were also calculated. Kernicterus rates were analyzed in 3-year groups since the incidence is so small. Kernicterus cases were also checked for accompanying phototherapy and/or exchange transfusions in order to reaffirm the diagnosis.

Results: When looking only at the affirmed cases of kernicterus, the incidence of kernicterus was 2.7 per 100,000 over the entire time period; the incidence of jaundice was 15.6%. The rates of diagnosis of jaundice were falling before publication of the American Academy of Pediatrics (AAP) guidelines, and then increased from 1997 to 2005 after the guidelines. The rates of kernicterus, however, trended downward throughout the entire study period. Most of the decline occurred immediately after publication of the AAP guideline in 1994; the rate was 5.1 per 100,000 in 1988, then 1.5 per 100,000 in the 1994 to 1996 years, and has remained somewhat constant since then.

Conclusions: The rates of kernicterus have been low and declining since publication of the AAP guidelines. This is likely due to an increased rate of diagnosis of jaundice. We should continue to be vigilant for hyperbilirubinemia and continue to prevent kernicterus as much as possible.

Reviewer's Comments: In many circles, it has become accepted fact that kernicterus is on the rise. The data in this study seem to show otherwise. On the other hand, it is clear that we are doing a much better job of preventing kernicterus since the 1994 guidelines than before. That trend should continue.

Additional Keywords: Hyperbilirubinemia

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Fetal ultrasounds showing dilated loops of intestine and increased echogenicity may indicate problems for the newborn.

Neonatal Outcomes Associated With Intestinal Abnormalities Diagnosed by Fetal Ultrasound.

Hyperechogenic and dilated bowel found on fetal ultrasound are associated with increased rate of fetal death.

**Background:** With increased use of fetal ultrasonography (US), many findings may disappear in time, while others indicate potential problems for the fetus and stress for the parents. Although little attention has been paid to findings in the intestinal tract, 2 patterns—hyperechogenicity and intestinal dilation—can be detected, creating the need to determine the long-term significance of these findings.

**Objective:** To assess the frequency of postnatal abnormalities in children who were noted to have abnormal intestinal findings on antenatal US.

**Participants:** 68 fetuses were identified as having either hyperechogenicity or intestinal dilation, 12 were lost to follow up, and 12 had prenatal demise from major problems or unexplained causes; 44 fetuses were followed up and studied.

**Results:** Hyperechogenicity was twice as common as dilated loops of bowel. Eleven of the total group had abdominal pathology; 33 were normal at birth. Of the 20 who had intestinal dilation, 2 died in utero, and 8 (53%) of the survivors had problems. Six had jejunal atresia, 1 had gastroschisis, and 1 had a left congenital diaphragmatic hernia. There was a fetal mortality rate of 20%. At delivery, 3 (10%) of those with hyperechogenicity had problems (2 had meconium peritonitis and 1 had meconium ileus). Three of the 6 with jejunal atresia had short bowel syndrome (SBS).

**Conclusions:** Hyperechogenicity was twice as common as intestinal dilation, but intestinal dilation is the more serious condition as jejunal atresia and SBS. There was a higher rate of fetal demise in patients who had hyperechogenicity.

**Reviewer's Comments:** With improved imaging devices, more information is available about the developing fetus. This study is important as it actually documents the incidence of intestinal problems of increased echogenicity and dilated bowel loops. The clinical conditions are not surprising. Intestinal meconium will cause increased echogenicity, and, in most cases, it will disappear in time. Dilated loops of bowel may be secondary to the meconium plug but may indicate problems (such as atresia) that were found in this study. With this information, one can be better prepared to answer parents' questions as well as be on the alert for possible clinical problems.

**Additional Keywords:** Interpretations

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Are Obese or Hypertensive Children Identified in Hospital?

Do Hospitalized Pediatric Patients Have Weight and Blood Pressure Concerns Identified?

Sleeper EJ, Ariza AJ, Binns HJ: J Pediatr; 154 (February): 213-217

Many children with elevated blood pressures or obesity are not assessed during their hospitalization.

**Background:** As the prevalence of obesity increases, it is expected that more children will be found to be hypertensive. Prompt treatment is indicated if blood pressure (BP) is >99th percentile for age yet, although BPs are measured during a child's hospitalization, there are no guidelines to identify children with high readings. Similarly, children may not have height measurements during their hospital stay, obviating the ability to calculate body mass index (BMI) and perform nutritional assessments.

**Objectives:** To identify if height and BP measurements and growth assessments in children are obtained during hospitalization, and if there is recognition of an abnormal admitting BP.

**Design:** Retrospective chart review.

**Participants:** 317 hospitalized children aged 3 to 18 years from a tertiary care center, representing a sample of 1143 children.

**Methods:** Demographics, admitting height, weight, BP, growth charts, discharge diagnoses, and clinical notes for the first 48 hours were collected. Charts were reviewed to determine if notations related to elevated BPs or nutritional assessments were obtained. Subjects were divided in 4 groups by their BMI percentile: underweight (<5th), healthy (5th to 84th), overweight (85th to 94th) and obese (95th). Patients were also divided into 4 groups by the highest systolic or diastolic BP percentile: <90th, 90th to 94th, 95th to 99th + 5 mm Hg and >99th + 5 mm Hg.

**Results:** All records had weights measured, but only 87% (277 of 317) had a measurement of height. The median age was 9.2 years, and median length of hospitalization was 3 days. Obesity was present in 20% of subjects, and 8% were underweight. Only 35% had BMI calculated, plotted, or both. Only 1.3% of obese children had obesity noted as a discharge diagnosis. Nearly every child (99%) had BPs measured, but just 26% of subjects with BP >99th percentile + 5 mm Hg had a notation regarding the elevated reading, and 5% with BPs between the 95th and 99th percentile + 5 mm Hg had a notation. Nutrition referrals were obtained in 61% of underweight subjects and 39% of obese subjects. Using weight for height to identify underweight children was insensitive (61%) with a high false-positive rate (51%). The sensitivity of weight for height as a measurement of obesity was 54%, and the false-negative rate was 9%.

**Conclusions:** Obese and underweight children as well as those with elevated BPs are commonly admitted to tertiary care hospitals, but interpretation of these findings and the opportunity for evaluation are missed.

**Reviewer's Comments:** BPs obtained on admission in children are not ideal measurements and could normalize during hospitalization, although mention of the elevated reading would indicate recognition by the clinician. Electronic medical records will facilitate documentation of BMI and possible increase evaluations for children who are underweight or overweight.
For Chronic Dermatitis Mysteries, Think Nickel

Clinically Relevant Patch Test Reactions in Children—A United States Based Study.
Jacob SE, Brod B, Crawford GH:
Pediatr Dermatol; 25 (5): 520-527

Nickel, perfume, and cobalt chloride are the most common causes of allergic contact dermatitis.

Background: Allergic contact dermatitis is not diagnosed frequently in children as this rash appears the same as more common atopic dermatitis or irritant dermatitis. Since the diagnosis is infrequently made, there is little information about patch testing in children.

Objective: To report on the results of positive patch tests from 2 centers and a review of the literature.

Design: Retrospective case study of 65 children from age 1 to 18 years with recalcitrant or deteriorating atopic dermatitis and localized dermatitis.

Participants: Patients referred to dermatology departments for patch testing.

Results: 11 studies were reviewed. The most common allergens in these studies were nickel sulfate, fragrance mix, cobalt chloride, thimerosal, Myroxylon pereirae (balsam of Peru), potassium dichromate, neomycin, lanolin, thiuram mix, and para phenylenediamine. From the authors' patients, the most common allergens were nickel sulfate, thimerosal, balsam of Peru (found in fragrances), cocamidopropyl betaine, a nonionic surfactant used in No More Tears and baby washes, neomycin, carbamates cinnamic aldehyde, and cobalt chloride. Five of 6 patients who were allergic to cobalt were also sensitive to nickel. Both of these metals are found in orthodontic braces, coin rolling, school chairs, and ballet balance bars. Thimerosal exposure was related to vaccines. Blue and yellow dyes (common irritants) are found in dyes in clothing. Three patients were allergic to corticosteroids.

Conclusions: Contact dermatitis should be considered when the patient has chronic dermatitis. Patch testing is a helpful test to diagnose this problem.

Reviewer's Comments: As in many studies, this patient population produces a bias that is often ignored when making conclusions. In this trial, the study patients were referred for patch testing, indicating that the referring doctors selected patients who were likely to have a positive patch test. This led to the authors' conclusions that contact dermatitis is more common than previously thought. If that statement is ignored, the information about common offending agents is quite helpful to the clinician's history taking when asking about exposure to metals, fragrances, clothing dyes, and, surprisingly, corticosteroids.

Additional Keywords: Patch Testing

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Treatment Failures in Osteomyelitis—Prolonged IV vs Oral Antibiotics

Prolonged Intravenous Therapy Versus Early Transition to Oral Antimicrobial Therapy for Acute Osteomyelitis in Children.

Zaoutis T, Localio AR, et al:
Pediatrics; 123 (February): 636-462

With equivalent treatment success and decreased rates of central line-related complications, early transition to oral antibiotics may soon become the new standard of care for treatment of osteomyelitis.

Background: It has long been the standard of care that cases of osteomyelitis were treated with 4 to 6 weeks of IV antibiotics. However, as the burden of catheter-related adverse events becomes better understood, some clinicians have tested early transition to oral antibiotics with success. No study to date, however, has compared this treatment's failure rate against standard IV antibiotic administration.

Objective: To compare the effectiveness of early transition from IV to oral antibiotics versus prolonged IV antibiotic therapy to treat pediatric osteomyelitis.

Design: Retrospective cohort study.

Participants: 1969 children aged 2 months to 17 years with a diagnosis of acute osteomyelitis. Exclusion criteria included co-morbidities known to complicate osteomyelitis such as any immunodeficiency, pyogenic arthritis, cellulitis, and/or osteomyelitis of the face, orbits, or head.

Methods: Investigators utilized the Pediatric Health Information System (PHIS), a database with information from 40 children's hospitals that includes information on demographics, diagnoses, procedures, medications, and re-hospitalizations. Children with an ICD-9 code of osteomyelitis were divided into 1 of 2 groups: transition or prolonged IV therapy. The primary outcome was treatment failure, which was defined as re-hospitalization within 6 months with an ICD-9 code of acute or chronic osteomyelitis, a complication associated with acute osteomyelitis, or a surgical procedure related to osteomyelitis. Secondary outcomes looked at re-hospitalization within 6 months for any reason or catheter-related complications. Finally, validation of data collection through PHIS was performed by chart reviews at 13 hospitals.

Results: The treatment failure rates between the 2 groups were equivalent at approximately 5%. Children in the prolonged IV group experienced more catheter-related complications and were more likely to be re-admitted for any reason. Validation of the data collected showed no statistically significant discrepancies.

Conclusions: There was no increased rate of treatment failure in the group with early transition to oral antibiotics. However, those in the prolonged IV antibiotic group demonstrated higher rates of catheter-related complications and re-hospitalization for any reason.

Reviewer's Comments: This article did an excellent job designing a study to assess how best to treat acute osteomyelitis. It looked at the potential harm and an increase in failure rate, as well as possible benefits and decreased complications to help readers make a well-educated decision. Since the treatment failures were equivalent but the complication rate was decreased, it seems that early transition to oral antibiotics would be a preferred treatment plan. However, the one flaw of the study is that it does not define "early transition." Practitioners are left to determine that for themselves.

Additional Keywords: Oral vs IV Antibiotics

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Vicks VapoRub Increases Mucus Secretion in Animal Models

*Vicks VapoRub Induces Mucin Secretion, Decreases Ciliary Beat Frequency, and Increases Tracheal Mucus Transport in the Ferret Trachea.*

Abanses JC, Arima S, Rubin BK: Chest; 135 (January): 143-148

The use of Vicks VapoRub around the nostrils in young children should be discouraged because it is not recommended by the manufacturer and because animal models suggest it may cause increased mucus secretion.

**Background:** Vicks VapoRub (VVR) is an aromatic that has been used to treat colds and congestion in children. The active ingredients are camphor, menthol, and eucalyptus oil. While the compound provides a sensation of increased airflow, objective measurements have not demonstrated increases in airflow or decreases in nasal resistance with its use. There are no data regarding its effects on mucociliary function or possible increases of inflammation in the respiratory tract.

**Objective:** To evaluate, in an animal model, the effect of the application of VVR on tracheal mucus secretion and clearance, airway inflammation, and pulmonary vascular fluid leakage with and without exposure to bacterial endotoxins.

**Methods:** Ferret airways were used for the study because of their similarity to humans. To study tracheal mucin secretion and tracheal mucociliary transport velocity (MCTV) ex vivo, trachea were removed from 15 ferrets and then submerged in either water-soluble jelly or VVR. Assays measured mucin secretion and transport velocity by timing the movement of mucus across the trachea. In addition, video microscopy was used to measure ciliary beat frequency. In another component to study airway inflammation, ferrets were intubated and VVR (and a control) was layered on the outside of the endotracheal tube both with and without exposure of the trachea to a bacterial endotoxin (Escherichia coli lipopolysaccharide [LPS]). After the animals were killed, the trachea was again analyzed for mucin secretion and mucociliary transport velocity.

**Results:** In the in vitro tracheal specimens study, trachea exposed to VVR had 63% increased mucin secretion ($P <0.05$) compared to controls. In the lungs exposed to LPS, VVR increased MCTV by 34% ($P \approx 0.002$).

**Conclusions:** In the LPS-inflamed ferret airway, VVR resulted in an increase in mucin secretion and MCTV, which mimics acute inflammatory stimulation seen in exposure to irritants in other studies. This may lead both to increased nasal and small airway resistance due to increased obstruction.

**Reviewer’s Comments:** This study was prompted by the clinical presentation of an 18-month-old child brought to an emergency department with worsening respiratory distress that temporally began after her grandparents had placed VVR under her nostrils. The authors postulated that the VVR had increased inflammation and mucus secretion and sought to prove their theory on the ferret model. The results received widespread publicity, particularly since it involved a product that has been a common remedy since 1890. The parent company, Procter & Gamble, asserted that VVR was not recommended for patients <2 years and is not recommended to be put under the nostrils. One urban legend that is safer (although still unproven) is the use of VVR to stop cough by application to the bottom of the feet and then covering by socks at bedtime. Many grandmothers swear by this one.

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