On Children with Pyelonephritis, CPR Protocols, and Expenditures for Spine Problems

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Each month, Dr. Nahum Kovalski reviews a handful of abstracts from, or relevant to, urgent care practices and practitioners. For the full reports, go to the source cited under each title.

Duration of IV Antibiotic Treatment for Children with Pyelonephritis

Key point: **Rates of renal scarring were similar in children who received long- or short-course IV antibiotics.**

Citation: Bouissou F, Munzer C, Decramer S, et al. Prospective, randomized trial comparing short and long intravenous antibiotic treatment of acute pyelonephritis in children: Dimercaptosuccinic acid scintigraphic evaluation at 9 months. *Pediatrics*. 2008;121:e553-e560.

Whether the mode and duration of antibiotic treatment prevent development of renal scars in children with pyelonephritis remains controversial. In this multisite, prospective study, French investigators analyzed data from 383 children (age range, 3 months to 16 years; mean age, 34 months) with first acute episodes of pyelonephritis; they were randomized to receive either intravenous antibiotics for eight days or IV antibiotics for three days followed by five days of oral antibiotics.

Children with grade 4 or grade 5 vesicoureteral reflux (VUR) or evidence of renal hypoplasia were excluded. Children underwent dimercaptosuccinic acid scintigraphies at six to nine months after enrollment to assess the incidence of renal scars.

The percentage of children with renal scars was similar in the long- and short-duration IV treatment groups (17% vs. 13%, respectively). Risk factors significantly associated with renal scarring included grade 3 VUR (odds ratio, 4.61) and enlarged kidney on initial ultrasound (OR, 3.19).

These results confirm that the duration of IV antibiotics does not affect development of renal scars in children with pyelonephritis and that oral and IV antibiotics are equivalent (*J Watch Pediatr and Adolesc Med*, April 8, 2005). However, the effect of antibiotic treatment on children with grade 4 or grade 5 VUR is unclear because these children were excluded from the study. Although grade 4 or grade 5 VUR is unlikely in children with normal prenatal ultrasounds, voiding cystography often is not performed for weeks after pyelonephritis diagnosis and after decisions about antibiotic treatment have been made. [Published in *J Watch Pediatrics and Adolesc Med*, March 26, 2008—Howard Bauchner, MD.] ■

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New CPR Protocol

Key point: **Survival to discharge increased from 1.8% before minimally interrupted cardiac resuscitation training to 5.4% afterwards.**

Bobrow BJ, Clark LL, Ewy GA, et al. Minimally interrupted car-

diac resuscitation by emergency medical services for out-of-hospital cardiac arrest. *JAMA*. 2008;299:1158-1165.

Patients with out-of-hospital cardiac arrest have a dismal chance of survival. In this study, investigators sought to determine whether survival of such patients would improve with minimally interrupted cardiac resuscitation (MICR). This novel approach, aimed at maximizing cerebral perfusion, involves:

- an initial series of 200 uninterrupted chest compressions
- rhythm analysis, with a single defibrillator shock if indicated
- 200 immediate post-shock chest compressions before pulse check or rhythm reanalysis
- administration of epinephrine as soon as possible, repeated with each cycle of compressions and rhythm analysis
- delay of intubation until after three cycles of chest compression and rhythm analysis.

The researchers trained emergency medical services staff in two Arizona metropolitan areas to perform MICR. They then assessed records for patients with out-of-hospital cardiac arrest before and after the training.

In a separate analysis that included data from 60 additional Arizona fire departments, they also compared outcomes in patients who received MICR according to the protocol with those in patients who did not.

The main outcome of interest in both analyses was survival to hospital discharge.

A total of 886 patients with cardiac arrest from January 2005 through June 2007 were included in the two-city analysis. Survival-to-hospital discharge increased significantly, from 1.8% before MICR training to 5.4% after training (odds ratio, 3.0).

In 174 patients with witnessed arrest and ventricular fibrillation, survival rates increased from 4.7% to 17.6% (OR, 8.6). The rate of compliance with the MICR protocol was 61%.

In the larger analysis, involving 2,460 patients with cardiac arrest between January 1, 2005, and November 22, 2007, survival to discharge was significantly better in patients who received MICR than in those who did not (9.1% vs. 3.8%; OR, 2.7).

Minimally interrupted cardiac resuscitation was associated with improved survival-to-hospital discharge in patients with out-of-hospital cardiac arrest.

Encouraging as these results are, the study is limited by its observational design and by the possibility of the Hawthorne effect, whereby a short-term improvement is caused by observing worker performance. These findings are quite promising, but need validation before being adopted into practice. [Published in *J Watch Cardiol*, March 11, 2008—JoAnne M. Foody, MD. ■

Healthcare Expenditures for Spine Problems Have Increased

Key point: **Expenditures are up, but patient functioning has decreased.**

Citation: Martin BI, Deyo RA, Mirza SK, et al. Expenditures and health status among adults with back and neck problems. *JAMA*. 2008; 299:656-664.

Neck and back problems are prevalent in the U.S., yet little is known about national trends in healthcare expenditures for them or whether newer diagnostic and treatment methods improve outcomes. To address these issues, researchers analyzed data from the nationally representative Medical Expenditure Panel Survey of adults (>17 years) from 1997 through 2005.

Neck or back problems were reported by 13.6% of 23,045 respondents in 1997 and by 14.3% of 22,258 respondents in 2005. Mean age-, sex-, and inflation-adjusted medical expenditures among respondents with spine problems were significantly greater in 2005 than in 1997, both per respondent (US $6,096 vs. $4,695) and in total ($85.9 billion vs. $52.1 billion); total expenditures increased 65%.

Self-reported measures of mental health, physical functioning, and work, school, and social limitations among respondents with spine problems were worse in 2005 than in 1997. From 1997 through 2005, pharmacy expenditures for spine problems increased 171%, outpatient expenditures increased 74%, emergency department expenditures increased 46%, and inpatient expenditures increased 25%.

In the U.S., only healthcare expenditures for heart disease plus stroke substantially exceed those for spine problems. One disturbing finding of this study is that costs for spine problems increased sharply during less than a decade.

This change can be attributed to factors such as greater use of expensive new drugs, imaging studies, and surgery, as well as high patient expectations.

Even more disturbing is that dysfunction related to spine problems has worsened while costs have increased.

Spine problems represent an enormous opportunity, both generally and in the ED, to reduce healthcare expenditures without detriment to patient outcomes. [Published in *J Watch Emerg Med*, February 29, 2008—John A. Marx, MD, FAAEM, FACEP.] ■