ABSTRACTS IN URGENT CARE

On the Value of Cardiac Risk Factors, Pediatric vs. General EDs, Diagnosing Appendicitis in Children, Detecting Coronary Vascular Disease, Peripheral Blood Cultures, and Comparing Walk-in Centers and EDs

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Each month, Dr. Nahum Kovalski will review 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.

Are Cardiac Risk Factors of Value in ED Diagnosis of ACS?

Citation: Zane RD. *J Watch Emerg Med*. March 9, 2007.
URL: *http://emergency-medicine.jwatch.org/cgi/content/full/2007/309/3?q=etoc*

The Role of Cardiac Risk Factor Burden in Diagnosing Acute Coronary Syndromes in the Emergency Department Setting

Citation: Han JH, Lindsell CJ, Storrow AB, et al. *Ann Emerg Med*. 2007;(2):145-152. Epub Dec 4, 2006.
URL: *http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=retrieve&db=pubmed&list_uids=17145112&dopt=Abstract*
Key point: Cardiac risk factors are of no discriminatory value in emergent evaluation of patients >40 with suspected ACS.

Population-based studies have shown that diabetes, hypertension, smoking, hypercholesterolemia, and family history of coronary vascular disease are correlated with an increased lifetime risk for cardiovascular disease. Clinicians often use cardiac risk factors in the assessment of patients with suspected acute coronary syndrome (ACS), but Bayesian theory dictates that the diagnostic value of the risk factors would not apply to individual patients. In a retrospective analysis of nearly 11,000 emergency department (ED) patients with suspected ACS, researchers evaluated the association between risk factor burden (number of factors) and ACS.

Patients were considered to have ACS if they underwent revascularization within 30 days, had a discharge diagnosis within one of the diagnostic-related groups for ACS, or had positive cardiac markers at admission and died within 30 days. Researchers divided patients into three groups based on age (<40, 40–65, and >65) and calculated positive and negative likelihood ratios by age group and by number of risk factors.

Overall, ACS was diagnosed in 8.1% of patients. In patients younger than 40, those with four or five risk factors were 22.5 times more likely to have ACS than those with no risk factors. ■

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Emergency Care for Children in Pediatric and General Emergency Departments

Citation: Bourgeois FT, Shannon MW. *Pediatr Emerg Care*. 2007;23(2):94-102.
URL: *http://www.pec-online.com/pt/re/pec/abstract.00006565-200702000-00006.htm;jsessionid=FxrSPB035PjbqJJ3MhhylTND3tLFWd9Smn21WhGLB2x7fQHXLW7Q!315358234!-949856145!8091!-1*

Key point: Significant differences exist between pediatric visits to pediatric and general EDs.

The authors examined the pediatric ED population and their clinical course in pediatric versus general EDs and identified potential factors contributing to differences in performance metrics between the two ED settings.

This was a retrospective analysis of pediatric visits to nationally representative EDs participating in the National Hospital Ambulatory Medical Care Survey from 1995 to 2002. Differences between pediatric and general EDs were examined in terms of patient characteristics and clinical course.

Pediatric EDs treated more children with medical problems than general EDs, which treated more children with injuries. Visits by children to pediatric EDs were associated with longer wait times to see a physician (median, 40 vs. 25 minutes; $P<0.001$) and longer stays in the ED (median, 130 vs. 98 minutes; $P=0.006$).

In multivariate analysis, the type of ED treating a pediatric patient was a significant determinant of wait time (percent change for pediatric EDs, 23.1), length of stay (percent change for pediatric EDs, 23.0), and rate of discharge (odds ratio for pediatric EDs, 0.75). Children in pediatric EDs seemed to be sicker than those in general EDs. ■

The Use of White Blood Cell Count and Left Shift in the Diagnosis of Appendicitis in Children.

Citation: Wang LT, Prentiss KA, Simon JZ, et al. *Pediatr Emerg Care*. 2007;23(2):69-76.

URL: *http://www.pec-online.com/pt/re/pec/abstract.00006565-200702000-00001.htm;jsessionid=F1hLjyrnJ8RFCMTh6vJ1KQGVGmNdrx1mMgh1V2PwnRpMzWp5h7nJ!-1081107103!-949856145!8091!-1*

Key point: The presence of both high WBC count and left shift has the highest specificity (94%).

The use of white blood cell (WBC) count and left shift in the diagnosis of appendicitis in pediatric patients is unproven. It is commonly thought that children with appendicitis have an elevated WBC count with a left shift; however, most data supporting this belief stem from studies conducted on appendicitis in adults, not children. The purpose of this investigation was to determine the value of WBC count and differential in the diagnosis of appendicitis in children presenting to the ED with acute abdominal pain.

Seven hundred twenty-two pediatric ED patients with a primary complaint of nontraumatic abdominal pain were identified by prospective and retrospective methods. White blood cell count with differential was performed on patients with history and physical examination findings that were felt to warrant laboratory investigation. Results of WBC counts were determined as low, normal, or high, with or without a left shift, based on normal age-related values per laboratory protocol for pediatric patients.

The diagnosis of appendicitis was made in 10.2% of all patients presenting to the ED with acute abdominal pain.

- Thirty percent of toddlers (1- to 3.9-years-old) with high WBC counts had appendicitis, whereas 0% of toddlers with low WBC counts and 4.8% of toddlers with normal WBC counts had appendicitis. A normal WBC count did not rule out appendicitis in toddlers; however, the negative predictive value (NPV) for normal or low WBC count was high (NPV=95.6%).
- In the child age group (4- to 11.9-years-old), high WBC count was both sensitive and specific for the diagnosis of appendicitis in children (sensitivity=71%, specificity=72%), and the NPV for normal or low WBC count was high (NPV=89.5%).
- Lastly, 43.9% of adolescents (12- to 19-years-old) with high WBC counts had appendicitis, whereas 0% of adolescents with low WBC counts and 8.3% of adolescents with normal WBC counts had appendicitis. The NPV for a low or normal WBC count was also high in the adolescent group (NPV=91.9%).

Left shift was also strongly associated with appendicitis.

- Among toddlers, 40% of patients with a left shift had appendicitis, whereas 1.8% of toddlers without a left shift had appendicitis (NPV=98.2%).
- Similarly, left shift was strongly associated with appendicitis in children and adolescents. Among children, 54.3% with a left shift had appendicitis, whereas 5.4% without a left shift had appendicitis (NPV = 90.5%).
- Among adolescents, 53.5% of patients with a left shift had appendicitis, whereas 6.1% of adolescents without a left shift had appendicitis (NPV=93.9%).
- In patients with a left shift, 51.2% had appendicitis, whereas 3.7% of patients without a left shift had appendicitis (NPV=96.3%).

The determination of WBC count and differential is useful in the diagnosis of appendicitis in children presenting to the ED with nontraumatic acute abdominal pain, regardless of age. High WBC counts and left shift are independently, strongly associated with appendicitis in children aged 1 to 19 years. In fact, for this subset of patients older than 4 years, the most common diagnosis in the setting of an elevated WBC count was appendicitis.

The presence of an increased WBC count or left shift carries with it a high sensitivity (79%), and the presence of both high WBC count and left shift has the highest specificity (94%). Although not absolute, the WBC count and left shift can be helpful in the diagnosis and exclusion of appendicitis. ■

CT Scan vs. Nuclear Stress Test for Low-Risk Chest Pain

Citation: Zane RD. *J Watch Emerg Med.* March 16, 2007.
URL: *http://emergency-medicine.jwatch.org/cgi/content/full/2007/316/1*

The Diagnostic Accuracy of 64-Slice Computed Tomography Coronary Angiography Compared with Stress Nuclear Imaging in Emergency Department Low-Risk Chest Pain Patients

Citation: Gallagher MJ, Ross MA, Raff GL, et al. *Ann Emerg Med.* 2007;49:125-136.
URL: *http://emergency-medicine.jwatch.org/cgi/external_ref?access_num=16978738&link_type=MED*
Key point: The two tests have similar diagnostic accuracy for detecting coronary vascular disease.

Patients with low-risk chest pain often undergo provocative testing in the ED or in an ED observation unit before discharge. Recent studies have demonstrated that computed tomography (CT) coronary angiography correlates highly with cardiac catheterization in detecting coronary artery stenosis, and that CT results predict future cardiac events. In this prospective study, researchers compared the diagnostic accuracy of CT coronary angiography with nuclear sestamibi stress testing.

A convenience sample of 85 patients who were admitted to an ED observation unit for evaluation of low-risk chest pain and who had negative serial ECGs and negative cardiac markers underwent both tests. Patients with positive stress test results (reversible deficits) and positive CT coronary angiography results (>50% stenosis or calcium score >400) underwent cardiac catheterization.

Overall, seven patients had coronary artery stenosis. Stress testing was negative in 85% of patients, and CT was negative in 86%. Sensitivity was 71% for stress testing and 86% for CT, and specificity was 90% and 92%, respectively. Negative predictive values for stress testing and CT were 97% and 99%, and positive predictive values were 38% and 50%, respectively. None of the differences reached statistical significance.

This small study suggests that CT angiography is as good as nuclear stress testing at detecting coronary vascular disease, but was not powered to differentiate ability to predict cardiac events within 30 days of presentation. CT angiography offers much more rapid results than nuclear testing, which takes several hours. ■

Do Peripheral Blood Cultures Taken in the Emergency Department Influence Clinical Management?

Citation: Howie N, Gerstenmaier JF, Munro PT. *Emerg Med J.* 2007;24:213-214.
URL: *http://emj.bmj.com/cgi/content/abstract/24/3/213*
Key point: Blood cultures rarely directly influenced patient management.

Blood cultures are used routinely to investigate suspected sepsis in the ED, despite several studies demonstrating their limited influence on patient management.

This was a retrospective study of blood cultures taken in the ED between January 1, 2003 and December 31, 2004. Microbiology results and patient records were reviewed to determine the influence of positive cultures on subsequent patient management.

Over the study period, 2,213 blood cultures were taken in the ED. Of those, 132 (6%) yielded a positive result. Three positive cultures cases had incomplete information. Of the remaining 129 positive cultures, 30 (1.4% of all cultures) were "true positives" and four (0.18%) influenced subsequent patient management.

Blood cultures taken in our ED rarely yield bacterial growth and over two years, only four seemed to directly influence patient management. ■

Comparing Care at Walk-in Centres and at Accident and Emergency Departments: An Exploration of Patient Choice, Preference and Satisfaction

Citation: Chalder M, Montgomery A, Hollinghurst S, et al. *Emerg Med J.* 2007;24:260-264.
URL: *http://emj.bmj.com/cgi/content/abstract/24/4/260*
Key point: Patients attending walk-in centers were just as likely to be satisfied overall with the care they received as their counterparts who were treated in the ED facility.

The purpose of this study, which was conducted in the United Kingdom, was to explore the impact of establishing walk-in centers alongside EDs on patient choice, preference and satisfaction. This was a controlled, mixed-method study comparing eight EDs with co-located walk-in centers with the same number of "traditional" EDs. This paper focuses on the results of a cross-sectional questionnaire survey of users.

Survey data demonstrated that patients were frequently unable to distinguish between being treated at a walk-in center or at an accident and emergency (A&E) department and, even where this was the case, opportunities to exercise choice about their preferred care provider were often limited. Few made an active choice to attend a co-located walk-in center. Patients attending walk-in centers were just as likely to be satisfied overall with the care they received as their counterparts who were treated in the co-located A&E facility, although walk-in center users reported greater satisfaction with some specific aspects of their care and consultation. ■