

Translating Best Evidence into Best Care

Editor's Note: Journals reviewed for this issue: *Archives of Disease in Childhood*, *Archives of Pediatrics and Adolescent Medicine*, *British Medical Journal*, *Journal of the American Medical Association*, *Journal of Pediatrics*, *The Lancet*, *New England Journal of Medicine*, *Pediatric Infectious Diseases Journal*, and *Pediatrics*. Gurpreet K. Rana, BSc, MLIS, Taubman Medical Library, University of Michigan, contributed to the review and selection of this month's abstracts.

—John G. Frohna, MD, MPH

Pediatric cardiologists can accurately use physical examination to identify pathologic murmurs in neonates

Mackie AS, Jutras LC, Dancea AB, Rohlicek CV, Platt R, Beland MJ. Can cardiologists distinguish innocent from pathologic murmurs in neonates? *J Pediatr* 2009;154:50-4.

Question Among neonates with suspected congenital heart disease (CHD), how accurate is the clinical assessment as performed by pediatric cardiologists?

Design Prospective cohort.

Setting Montreal Children's Hospital, Canada.

Participants Neonates (n = 201, median age 12 days [range 2-31 days]) referred for outpatient evaluation of a heart murmur.

Intervention After a clinical evaluation, the cardiologist documented whether the murmur was "likely innocent" or "likely pathologic." The cardiologist repeated his/her assessment after electrocardiography was performed.

Outcomes Sensitivity and specificity of cardiologist evaluation, with echocardiography used as the gold standard.

Main Results The prevalence of CHD in this population was 56% (113 of 201). Clinical assessment alone identified patients with CHD with a sensitivity of 80.5% (95% CI, 73.2-87.8), specificity of 90.9% (95% CI, 84.9-96.9), positive likelihood ratio of 8.8 (95% CI, 4.8-28.3), and negative likelihood ratio of 0.21 (95% CI, 0.13-0.32). The addition of an electrocardiogram did not improve these test characteristics. Features that were predictive of CHD were murmur quality ($P < .0001$), location ($P = .02$), and timing ($P = .04$). No patients requiring catheter or surgical intervention were missed by clinical assessment.

Conclusions The prevalence of CHD in this referral population was high. Clinical assessment detected all complex CHD, although some simple lesions were missed. Murmur quality, location, and timing were predictive of CHD.

Commentary Given the current economic climate and the emphasis placed by the Obama administration on reform of the United States health care system on the basis of reigning in costs, this study is timely. Ninety-one of the 113 infants with CHD were accurately identified. Of the 22 false-negative results, 15 were believed to have peripheral pulmonic stenosis (PPS), and only 7 were classified as innocent murmurs. None of the misdiagnosed patients had significant lesions that would require early intervention. Only 8 of the 201 infants evaluated were thought to have CHD where none existed. Interestingly, the years of physician practice did not impact

diagnostic accuracy, nor did having an ECG before the examination. This study extends previous published observations to a group of particularly difficult patients. The neonatal cardiac examination is often quite challenging because of heart and respiratory rate, movement, and the soft quality of many murmurs. The data presented here underscore the value of having an exam performed by a trained subspecialist, particularly when the murmur is present in an otherwise healthy-appearing neonate, before obtaining expensive diagnostic testing. On the basis of the confidence of the practitioner in their assessment, one could also argue that conservative observation without performing an echocardiogram would be an appropriate course of action in several cases. In an era of increasing focus on cost containment, the role of the subspecialist remains very important in reducing unnecessary expensive testing. This role is even more relevant when considering the increasing complexity of pediatrics and the reduction of the time a general pediatrician spends learning basic cardiology skills during their training.

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Elbow extension test is helpful in decreasing the likelihood of an elbow fracture in children

Appelboam A, Reuben AD, Bengler JR, Beech F, Dutson J, Haig S, et al. Elbow extension test to rule out elbow fracture: multicentre, prospective validation and observational study of diagnostic accuracy in adults and children. *BMJ* 2008;337:2428-32.

Question In patients presenting with an elbow injury, does the elbow extension test accurately rule out bony injury?

Design Adults: multicenter prospective interventional validation study. Children: multicenter prospective observational study.

Setting Five emergency departments in southwest England.

Participants A total of 2127 adults and children admitted to the emergency department with acute elbow injury.

Intervention Elbow extension testing during routine care by clinical staff to determine the need for radiography in adults and to guide follow-up in children.

Outcomes Presence of elbow fracture on radiograph or recovery with no indication for further review at 7 to 10 days.