Evidence-based paediatrics

Evidence-based paediatrics is the practice of child health care based on the best available evidence that we are doing more good than harm. Physicians and other health professionals who care for children are involved in four broad categories of care: prevention and screening, diagnosis, treatment, and rehabilitation.

Evidence-based paediatrics is necessary because, unless we use the best available evidence, we have the capacity to do harm, given the position of power entrusted to us by our patients and their families. Examples of harm abound, even in such presumably innocuous activities as screening. One example of harm from screening is "labelling," that is, the child, family, and community thinking that something is wrong with the child and treating him or her accordingly. Bergman and Stamm's important study done over 3 decades ago on children with heart murmurs (almost all of which were nonclinical), and the psychological and practical problems associated with carrying the label "heart murmur," describes a classic example of more harm than good (1).

Another example involves screening healthy children for cholesterol levels. No evidence exists that such screening decreases morbidity and mortality from heart disease in adults. Yet great pressure is being applied for the use of laboratory tests in the assessment of childhood illness. What is the evidence that children (with most acute or chronic childhood illnesses) who are given a battery of laboratory and radiology tests fare better than those whose diagnosis is made using a careful history and physical examination? I believe that randomised controlled trials (RCTs) of tests are unnecessary for many conditions. For example, children with primary nocturnal enuresis used to have a barrage of investigations done—uroanalysis, urine culture, vesicoureteral cystography, and up until the last 20 years or so, cystoscopy—to rule out renal disease. Most of these investigations are no longer done because some are costly, some are painful, and none have been found to be worthwhile. But surely a routine urinalysis and urine culture—painless and relatively inexpensive—should be done? The answer to that would be "yes" if children with primary nocturnal enuresis could be shown to have significantly more renal problems or urinary infections than the general population of nonenuretic children and if the diagnosis and treatment of these problems made a difference. We have recently shown that children with typical enuresis (normal growth and development, no daytime urinary problems, and a normal physical examination) are no more likely to have abnormal urinalysis results than are nonenuretic children (2).

Another example of the worthless ness of certain tests for the routine workup of common paediatric problems is the use of abdominal ultrasonography for typical childhood recurrent abdominal pain. A descriptive study (3) showed that no children were helped by the procedure, even though a fairly high number were thought to be "abnormal," which led to further investigation and consultations. The subsequent follow-up of the "abnormal" test results did not lead to a change in diagnosis or to the identification of an otherwise treatable problem in a single patient. Thus, for typical children with primary nocturnal enuresis and recurrent abdominal pain, such investigations do not appear to add benefit over and above careful clinical assessment.

What about the reassurance value of normal test results? No evidence exists in paediatrics that children who have normal test results and their families are more reassured than those who have no tests done. For that matter, little evidence exists about the reassurance value of testing in adult medicine.

Treatment, the third category of child health care, has had the most evidence compiled for benefits that exceed harms. For example, in the treatment of the commonest chronic childhood ailment, asthma, the use of prophylactic inhaled steroids clearly does more good than harm (4). The reason why evidence now exists for many safe and effective therapies in paediatrics is that the RCT has become the gold standard for evaluating treatment.

Rehabilitation, the last category, another area where RCTs are becoming indispensable, but we still have a long way to go. Dyslexia, a lifelong problem affecting about 5% to 10% of children, has been shown to be a hereditary problem of phonological processing. An RCT of reading mediation using mainly phonics has been found to be effective (5). Attention-deficit hyperactivity disorder (ADHD), another common chronic paediatric disability, has also recently been found to be mainly an inherited
problem in inhibition. Many RCTs have now been done that show methylphenidate or dextroamphetamine to be effective (6).

In summary, clinicians caring for children need to be aware of the evidence about the benefits and harms of preventive manoeuvres, diagnostic strategies, treatments, and rehabilitation techniques. Child health researchers need the motivation and the funding to do much more research to generate data to guide clinical decisions. The researchers, clinicians, and other decision makers (e.g., administrators and government officials) also need to communicate more effectively to ensure the transfer of research into clinical practice that does more good than harm to children.

We have no excuse for not practicing evidence-based paediatrics. We have no excuse for not getting more and better evidence.

William Feldman, MD
Royal College of Physicians and Surgeons of Canada
Ottawa, Ontario, Canada

References
### Journals Reviewed for This Issue*

#### Core Journals

- Am J Med
- Am J Obstet Gynecol
- Am J Psychiatry
- Am J Surg
- Ann Intern Med
- Ann Surg
- Arch Dis Child
- Arch Gen Psychiatry
- Arch Intern Med
- Arch Pediatr Adolesc Med
- Arch Surg
- Arthritis Rheum
- BMJ
- Br J Gen Pract
- Br J Obstet Gynaecol
- Br J Surg
- Circulation
- Clin Pediatr
- Cochrane Library
- Diabetes Care
- Hypertension
- JAMA
- J Am Board Fam Pract
- J Am Coll Surg
- J Gen Intern Med
- J Intern Med
- J Neurol Neurosurg Psychiatry
- J Pediatr
- J Vasc Surg
- Lancet
- N Engl J Med
- Obstet Gynecol
- Pediatrics
- Surgery

#### Journals for Continuing Review

- Age Ageing
- Am J Cardiol
- Am J Public Health
- Am J Respir Crit Care Med
- Ann Emerg Med
- Ann Med
- Arch Fam Med
- Arch Neurol
- Br J Psychiatry
- Br J Rheumatol
- Can Med Assoc J
- Chest
- Clin Invest Med
- Crit Care Med
- Fertil Steril
- Gastroenterology
- Gut
- Heart (formerly Br Heart J)
- J Am Coll Cardiol
- J Am Geriatr Soc
- J Clin Epidemiol
- J Fam Pract
- J Infect Dis

*Approximately 60 additional journals are reviewed. This list is available on request.