

Teaching critical appraisal: no quick fixes

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For decades epidemiologists and biostatisticians have striven in earnest and often imaginative ways to educate medical students in how to separate the wheat from the chaff of medical literature. Forced to confine themselves to preclinical curricula, and often trapped in vast lecture halls, they seldom brought joy to either side of the lectern and often found themselves talking in their students' sleep.

This began to change when clinicians finally awakened to the importance of acquiring skills that would enable them to determine whether the results reported in an article were likely to be true, important and applicable to the care of their patients. The pace of change accelerated when doubly trained clinical epidemiologists, working with their more classically (and more thoroughly!) trained methodological colleagues, began to generate useful ways of extrapolating the results of clinical trials to the unique biology and desires of individual patients. Critical appraisal began to compete for time in crowded curricula, sometimes extending not only into clinical practice but also into postgraduate education.

For the most part, these efforts were based on earlier pedagogic models (honoured by time, but little else) of concentrated, short bursts of classroom instruction. (The undergraduate programs reviewed by Drs. Geoffrey R. Norman and Susan I. Shannon in this issue [page 177] were as short as 3 hours, and only one was longer than 16 hours.) Borrowing from the example of the increasingly rigorous clinical literature they were using in their teaching (but in contrast with colleagues giving more established courses) several teachers of critical appraisal made efforts to determine whether their instruction was effective.

In some ways their job was made easier by the rise of randomized controlled trials (RCTs). When such trials validate the effectiveness of specific treatments in reducing morbidity and untimely death, it becomes possible to judge the success of teaching programs according to whether they lead to increased use of such treatments. This evaluation need not concern itself with tracking down and documenting patient outcomes, but only with examining the process of care.¹

But in other ways the job of evaluating the success of programs that teach critical appraisal has been terribly difficult. The evaluative culture that encourages randomization in trials of cancer therapy, for example, rarely extends to curriculum committees, and it is unusual for evaluators to be permitted to assign learners randomly to different programs even in the short term. Second, although learners are often accused of being deaf to the teaching they receive, they can never be blind to it (even though efforts can be made to keep their evaluators blind). Third, because medical education occurs in a maelstrom of information, advice and admonishment, every critical appraisal course is contaminated, and co-intervention is the rule. As a consequence, it is difficult or impossible to isolate the contribution of instruction in critical appraisal to the way that its graduates practise medicine. Finally, the turnover of clinical learners is high. This not only renders long-term evaluation difficult but also makes even medium-term educational interventions impossible. No surprise, then, that investigators who review the evidence on the effectiveness of instruction in critical appraisal conclude that the quantity and quality of the evidence are reminiscent of the pre-RCT era of therapeutic evaluation.

Norman and Shannon discuss an earlier review by Audet and associates² and



Editorial

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seek to expand on it. The resulting study, which does not look past 1995, is not claimed to be a systematic review of the literature on critical appraisal teaching. Indeed, a search of educational databases such as ERIC and the nursing database CINAHL, as well as of EMBASE (which provides a wider coverage of European journals) and the World Wide Web, yields 16 additional studies, including unpublished material. In addition to the reviews by Audet and associates and by Norman and Shannon, we know of 3 systematic reviews either in the public domain or in progress. The reviews differ in the studies included and in the enthusiasm of their overall conclusions. Audet and associates² focused on study methodology but reported improvements in some measures of knowledge and performance. Norman and Shannon, in this issue, conclude that knowledge gains among undergraduates are consistent but among postgraduates, small. Taylor and colleagues³ reported statistically significant improvement in 65% of outcomes and overall support for critical appraisal training. Burls⁴ found that teaching critical appraisal skills improved participants' self-assessed understanding and their commitment to promoting clinical effectiveness. Finally, the UK National Health Service Research Programme into the Implementation of Research Findings is supporting the lead author of this editorial in a systematic review that has found 39 relevant studies. All the published reviews have emphasized the difficulty of finding high-quality, adequately powered studies and the problems posed by brevity of follow-up.

As is frequently the case in rapidly changing fields, events have passed this debate by. Critical appraisal is now regarded as just one element of a much larger process that begins with the patient and involves asking answerable questions, finding the best evidence, assessing it, integrating the results of that assessment with the patient's unique biology and expectations, and evaluating one's performance: in other words, practising evidence-based medicine. As more curriculum planning committees become convinced of the need to teach the practice of evidence-based medicine, literature searching and critical appraisal are being taught at multiple stages in preclinical and clinical curricula and are becoming incorporated into the everyday function of the clinical teams in which learners gain the knowledge, skills and attitudes that shape their clinical performance. Evaluations of teaching programs are turning to the issue of *how*, rather than *whether*, to teach these skills. The usefulness of reviews such as that performed by Norman and Shannon must not be lost in this process. Although many educators view the continued

evaluation of the teaching of evidence-based medicine as unnecessary, we support the view that alternative methods for instilling evidence-based medicine practice should continue to be compared so that we can employ those methods that are the most effective and efficient.

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