Bringing evidence to the point of care

Evidence-based medicine calls for the integration of our clinical expertise and our patients' values with the best available external evidence (1). To accomplish this, we must translate our information needs into answerable questions and then seek the best information with which to answer them (2). Critics of evidence-based medicine have appropriately suggested that its practice may require time and resources unavailable to busy clinicians (3). Davidoff and colleagues suggested that a general physician would need to read 17 articles each day to keep up with the current medical literature (4). Clinicians have little time to set aside for keeping up-to-date or for reading in between seeing patients, and self-reported weekly reading times reflect this: Consultants report reading from 30 to 45 minutes each week, while house officers report from 0 to 20 minutes (5). Further, some clinicians don't have quick access to the evidence and may have to travel several floors, blocks, or even miles to visit their local library to find it.

Proponents of evidence-based medicine are meeting these challenges in various ways. The development of the Cochrane Library, along with the growing number of evidence-based journals of quality- and relevance-filtered secondary publications (e.g., *Evidence-Based Medicine* and *Evidence-based Health Policy and Management*) and the creation of "best evidence" sections in a number of established journals (e.g., *Journal of Pediatrics* and *Journal of Family Practice*), have resulted in better accessibility of high-quality evidence for clinicians. The Cochrane Library is available on CD and on the Internet for electronic searching.

Family physicians have expressed great interest in having patient-education materials, drug information, and overviews of treatment recommendations available on computers (6). Housestaff have stated they like having access to high-quality evidence at the bedside but would prefer to have it available for use within 30 seconds (7). These sur-

veys suggest that we need to find ways of speedily delivering high-quality evidence to the point of care.

Several groups are working to find ways to provide quick access to the evidence. We recently used an evidence cart (7) that included a notebook computer containing Best Evidence (a CD containing *ACP Journal Club* and *Evidence-Based Medicine*), the Cochrane Library, MEDLINE, and a collection of 149 one-page summaries of critically appraised topics (CATs) created in response to clinical questions posed by previous members of our clinical teams (8). The cart (housed in a seminar room between our wards) was used on our clinical and teaching rounds and whenever a member of the clinical team posed a question. The resources that could be accessed the fastest (we could find specific 1-page summaries in under 12 seconds) were used most frequently and most often resulted in a successful search. Our speed of access to evidence using these resources was probably more rapid because these resources were developed by our clinical teams for this purpose and, therefore, their contents were well known to us. However, such customised information is being developed in a number of settings. We could access specific entries in Best Evidence in 23 seconds (about the upper limit of time we were willing to devote to searching during our rounds) and found that we could answer 16 questions using this resource on the ward in the time it took us to answer just one using the library (4 floors away). MEDLINE was successful at answering our questions (59% of the time) but was so slow (mean time for a successful search was 90 seconds) that most searches were completed outside of rounds. Similarly, the evidence in the Cochrane Library was superb, but it took too long to find during rounds. The evidence found altered the clinical approach of at least 1 team member 48% of the time. During the month after removal of the cart, the team iden-

tified several occasions when they needed evidence but only carried out searches on 12% of these.

This experience convinced us that our housestaff (and patients) would benefit from rapid access to high-quality evidence. Because our team felt that the "worst thing" about the evidence cart was its bulk, we abandoned the cart and issued every team member a hand-held (Toshiba or Epson) computer (8). These were radio-linked to our hospital's network, which provided CATs; Best Evidence; a lab handbook; the Cochrane Library; MEDLINE; and the lab results for individual patients, which were linked to relevant CATs. During this 2-week pilot, our housestaff searched an average of 10 times per day. As before, the most frequent, quickest, and most successful searches were for CATs, and the Cochrane Library was used least frequently and with the least success. Because the current generation of hand-held computers are too slow for routine use, we are turning our attention to evaluating radio-linked laptops that can be carried on the chart rack and taken to the bedside.

Other groups have tested similar approaches for bringing rapid evidence to the point of care. Helwig and colleagues (9) are providing Newton MP2000 palm-top computers containing some evidence-based materials to medical students completing an ambulatory medicine rotation. Students were able to find answers to clinical questions within 30 seconds. Further analysis of this project is ongoing. Ebell and colleagues (10, 11) have developed an application for Newton hand-held computers that provides critical appraisals from the *Journal of Family Practice* (Patient-Oriented Evidence that Matters [POEMs]), collection of systematic reviews from the Cochrane Library, practice guidelines, clinical prediction rules, and a Bayesian calculator with information on diagnostic tests and physical exam manoeuvres. In their pilot project, 7 medical students

were each given a Newton computer at the beginning of their clerkship. The students most frequently consulted the drug information database and the POEMs.

Applications for other microcomputers, such as the Palm Pilot, are also being developed (12). Their formal testing will contribute to our understanding of what to provide and how to provide it.

All of this work suggests that clinicians, at all levels of training and expertise, want rapid access to evidence at the point of care but can only spare seconds to get at it. We still have a long way to go in getting it to them quickly enough.

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Correction

Strata SE. Bringing evidence to the point of care. *Evid Based Med* 1999;4:70–71. The author's surname should be spelled 'Sharon E Straus'.

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