What's up in medical informatics?

R. Brian Haynes, MD, PhD; Alejandro R. Jadad, MD, DPhil; Dereck L. Hunt, MD

any physicians will be only vaguely familiar with the meaning of "medical informatics," but that shouldn't surprise anyone. First, this emerging field hasn't contributed much to the everyday practice of medicine — at least not yet. Second, medical informatics is evolving rapidly, and there is neither universal agreement about what it means among its potentates and practitioners nor any way to define it that will stick.

Most people equate medical informatics with computers, which is logical enough, but we think the field should be considered in a much broader way, as the science of information and communication related to medical care, whether or not computers are involved. Of course, many informaticists love computers for their own sake, and there are fewer safeguards against false advertising about computer applications in health care than there are for the get-rich schemes that hound us.

The field is, relatively speaking, in its infancy. Many of its leaders are true pioneers, with no formal training in informatics, and because it has such a brief research tradition it has produced relatively few findings that can be applied directly in clinical practice.

Still, medical informatics is developing at a phenomenal rate and is already producing specialized subfields. Accordingly, jargon unique to the field is growing at a prodigious rate and communication among the new subdisciplines is beginning to cause problems within the field itself. With this happening, consider what our communication with the outside world must be like!

Some of the subdisciplines are artificial intelligence, coding and classification of information, information retrieval, image processing, telemedicine, psychocyberepistemology and information systems. Readers who want to learn more about medical informatics can get free information from **www.cpmc.columbia.edu/edu/textbook**.

It's easy to get lost in detail in trying to describe what's going on in the field, so we won't try. Instead, we're going to point to some recent developments that are of particular clinical relevance now or will be in the near future.

Reminder systems can help physicians do the right thing at the right time. Many trials have already revealed improvements in the timely delivery of preventive and acute medical care.[1] Computers can also deliver the right information at the wrong time, as one group of researchers learned when they tried to remind doctors about preventive care for medical inpatients.[2]

Although it would be difficult to justify the introduction of a computer-information system for an office or hospital solely to provide reminders, such systems can be integrated into office appointment systems and hospital information systems. Preventive care systems can take their cues from routinely collected data such as the age and sex of patients. Acute care reminders need more complex rules and inputs — for example, laboratory values.

Looking for answers in an evolving field: (from left) Judi Padunsky and Drs. Brian Haynes, Alejandro Jadad and Dereck Hunt

For a system to be worth while, it should be based on evidence that implementation of the reminder system is more likely to do good than harm. Unfortunately, most system developers haven't a clue about what solid health care evidence is. This created an opening for a new life form: the evidence-based medicine informaticist!

One of the most important recent advances in informatics is the development of secondary databases of summarized evidence that is ready for clinical application. A landmark in this area is the US National Library of Medicine's provision of free MEDLINE searches on the Internet via 2 different search engines, Internet Grateful Med (**igm.nlm.nih.gov**) and PubMed (**www4.ncbi.nlm.nih.gov/PubMed**). PubMed also includes embedded search strategies for optimizing the yield of clinically useful studies (**www4.ncbi.nlm.nih.gov/PubMed/clinical.html**). Ovid Online (**www.ovid.com**), Silver Platter (**www.silverplatter.com**) and several other vendors provide more comprehensive — and expensive — services, including access to full-text articles.[3]

For some disciplines, specialized compendiums of evidence for clinical practice have been developed, notably the *Cochrane Library* and *Best Evidence*, both of which are available through the CMA Member Service Centre, 800 663-7336 x2307.

A growing number of incredible, in both senses of the term, resources are becoming available on the Internet, but user beware: the information ranges from valid to fanciful. However, physicians who lack access to these resources risk being ambushed by their patients.

It has always been difficult for physicians to use traditional journals in trying to keep up to date because it is hard for doctors to find the time or acquire the skills to sort out preliminary studies from valid and useful ones that can be applied in clinical practice. This problem is now being solved by secondary publications that do the initial sorting of evidence using explicit methods, then provide concise abstracts and commentaries that permit readers to quickly discern whether the information applies to their patients. These publications are typically thin and publish relatively infrequently, calling into question the

> ## Jargon unique to medical informatics is growing at a prodigious rate.

lament that new knowledge is being generated so quickly that it is impossible for physicians to keep pace with it.

In 1991 the *ACP Journal Club* became the first of these "evidence-based" publications, followed by *Evidence-Based Medicine* in 1996; both are available through the CMA Member Service Centre. *Evidence-Based Nursing* and *Evidence-Based Mental Health* will come on stream in 1998.

Most recently, evidence-based textbooks that are kept up-to-date have begun to emerge. These are currently somewhat primitive. However, the basic principle that physicians' practices should be based on current best evidence is present in their evolution. *Scientific American Medicine* and *UpToDate* are heading in this direction, as are several others. These developments mean that doctors will need CD-ROM drives in their computers if they want to stay on top of developments.

What promises should clinicians include in their 1998 list of New Year's resolutions? They should subscribe to the periodical of evidence-based abstracts that best suits their discipline, ensure that their computer has both a CD-ROM drive and an Internet connection, and subscribe to the "look-up" publications that provide access to evidence-based information. If you can afford it, invest in a reminder system for preventive care and needed follow-up care.

References

1. Balas EA, Austin SM, Mitchell JA, Ewigman BG, Bopp KD, Brown GD. The clinical value of computerized information services. A review of 98 randomized clinical trials. *Arch Fam Med* 1996;5:271-8.

2. Overhage JM, Tierney WM, McDonald CJ. Computer reminders to implement preventive care guidelines for hospitalized patients. *Arch Intern Med* 1996;156:1551-6.

3. Hersh W. Evidence-based medicine and the Internet. *ACP J Club* 1996;125:A-14.

Drs. Haynes, Jadad and Hunt are with the Health Information Research Unit and the Department of Clinical Epidemiology and Biostatistics, and Drs. Haynes and Hunt are also with the Department of Medicine, McMaster University Faculty of Health Sciences, Hamilton, Ont.