Box 2: Stages that individuals go through in a change process
- Pre-contemplation (not yet acknowledging that a change needs to occur)
- Contemplation (acknowledging that there is a problem but not yet ready or sure of wanting to make a change)
- Preparation (getting ready to change)
- Action (making the change)
- Maintenance (maintaining the change)

implemented, everyone has great expectations for immediate improvements in productivity. However, as the implementation begins the staff's productivity goes down abruptly.[4] Not only does productivity decline, but possible conflicts could arise. Various reasons exist for the temporary losses in productivity such as the time spent on training and self learning on the new system, adjusting to new procedures and working relationships, dealing with unrelated pre-existing problems surfaced by the change, calming the anxieties and fears of loss of security, autonomy, control, or respect and self esteem if the system is not quickly mastered.

These issues might cause some people to stop using the new system and revert to the "good old way" of doing things. Assuming that adequate communication and training were completed earlier, you need to maintain your sense of perspective, be very visible to the staff, have good communication, and provide some end stage fun—possibly a celebration for the implementation process and where you are today.

Since more than 50% of information systems either fail or people fail to use the system to its full capacity, the preparation, action, and maintenance stages need to be completed properly. If not, frustration may result and lead to a higher probability of failure. Unfortunately, we have no magic dust to make the transition to ehealth applications easy. But if the issues outlined here are ignored, you might end up continuously reinventing the wheel.

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1 Lorenzi NM, Riley RT. Managing change: an overview. *J Am Med Informatics Assoc* 2000;7:116-24.
2 Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. *Amer Psychol* 1992;47:1102-13.
3 Prochaska, JO, Goldstein MG. Processes of smoking cessation: implications for clinicians. *Clin Chest Med* 11991;2:727-35.
4 Lorenzi NM, Riley RT. *Organizational aspects of health informatics: managing technological change*. New York: Springer, 1994.

Will e-learning improve clinical judgment?

Not until doctors build collegial learning into practice

At the turn of the 20th century, when "modern" medical education was just getting up and running, a clarion call of the reformers was to reduce the overload on students' minds. "Medical educators of the latter nineteenth century were the first physicians in history to feel the real shock of the information explosion."[1] But wait a minute, that's just what the problem seems to be today, and so it was in the 1980s as described in the famous report on "the general professional education of the physician," and in the1960s when an earlier study of medical education in the United States was published.[2 3] This complaint about overload by medical students and their teachers seems to be a constant one and may reflect a tendency to complain rather than the sudden emergence of an unbearable weight of knowledge that needs to be absorbed. The real problem is the matter of selection, and the tenacity of the complaint serves to remind teachers of our poor performance in the first and probably hardest role of the teacher—helping students to learn how to separate the wheat from the chaff.

The problem is even more difficult when the "student" is a practising doctor. At first glance, selection of material for practitioners should be less of a mysterious enterprise. For medical students, by necessity, describing the nature of their "practice" is a theoretical task, but the practice of doctors is by definition a given so that the curriculum for their ongoing educational programmes should be easily knowable. If doctors were to keep proper records of what they do, for example by entering and tracking their work on computers, the geniuses who brought us the likes of Amazon.com or GroceryGateway.com should be able to put together a demand based "smart data" system that could create an accurate depiction of any doctor's practice, as quickly as Amazon.com can remind book buyers of what their favourites are. A next step might prove more complex, but once a doctor's pattern of practice has been established empirically, smart searches (for example, Google or Inktomi) could be done to direct the most relevant available material to their desktops to ensure that no breaking news will be missed.

The difficulty, however, is that all of this available information, helpful though it may seem at first, will serve only to exacerbate the problem of overload. Doctors will now be overwhelmed not just by the availability of information in general but also by the availability of an excess of information that now may be actually relevant to their practices. This brings us back to the issue of selection.

Ironically, information itself, even sufficiently integrated into what might be called knowledge, is a necessary but not sufficient requirement for correct action. The needed ingredient is that hard won dimension of expert action known as judgment; what sociologists call "knowing in action."[4] Despite the hugely increased public availability of information about health, there seems to be no parallel decline in demand for the judgment of doctors. Patients may now come armed with data, but they are still searching for meaning and right action. Patients come to doctors to pose difficult, contingency laden questions—typically,

"What am I to make of this threatening disruption in my routine, what are you [the doctor] proposing to do about it, and what overall effect might the situation, and your proposed solutions have on my life?" As Erving Goffman has said, doctors have the special job of informing their patients "who they are going to have to be."[5] Although the answers to these existential questions may depend on facts, they are fundamentally buried in context and judgment.

How does this relate to e-learning? Simple. The strength of e-learning is also its weakness. What we have come to recognise as the information revolution is just another, albeit amazingly effective, way to deliver information, but it only makes the challenge of selection more stark. We confuse information with knowledge and knowledge with judgment. While correlations certainly exist among these dimensions, the pathways from one to the other are unclear and variable. Just getting the theoretical knowledge about β blockers into the hands of doctors is patently not enough. Getting them to do the right thing at the right time is the trick. So the real challenge to e-learning enthusiasts is to enhance the judgment of practitioners, to find ways to ensure that that "expert judgment" can be transferred to doctors in the field.

Few examples exist of how this can be done. The problem is that, in our zeal to encourage right action, we usually send out facts and rules rather than useful guides to judgment. If we are to learn any lesson from our early enthusiasm for practice guidelines, it should be that medical practice is too complex to be dependent on rules that presume that context and content can be encapsulated in simple operating procedures. "Each patient is a universe of one," as Eric Erikson reminded us,[6] and I suppose the rest is commentary.

The clue that we need to follow depends not only on new technology, but also on our oldest tool, which is human interaction. Call it what you will; detailing, apprenticeship, peer mentorship, or discussion groups are all different responses to the necessity for judgment to be "come upon" in practice. "I get by with a little help from my friends," as the Beatles said.

Medical education has enshrined apprenticeship as one of its critical tools. Thus the almost universal requirement for observed traineeships with graded responsibility as part of education and licensure, and the rhetoric we use when assuring the public of the role of peer review in the maintenance of high standards of practice. The ubiquity of these requirements is at least partly explained by our tacit recognition that, unlike information and knowledge, the transfer of judgment demands a working collaboration. I am reminded of hours spent with students, residents, and fellows in conversations that might well have sprung from Schon's book on the reflective practitioner.[4]

Student (leaving the examining room with the attending doctor): "Why did you ask that in that particular way?"

Teacher: "Well I'm not sure but it seemed at the moment in this particular situation that Ms B needed to hear those words before she could agree to surgery."

When technology can help forge that kind of relationship, I'm ready to buy.

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1   Ludmerer K. *Learning to heal*. New York: Basic Books, 1985:66.
2   Muller S. Physicians for the twenty-first century: report of the project panel on the general professional education of the physician and college preparation for medicine. *J Med Educ* 1984;59:part 2.
3   Coggeshall L. *Planning for medical progress through education*. Evanston, Il, Association of American Medical Colleges, 1966.
4   Schon D. *The reflective practitioner*. New York: Basic Books, 1983.
5   Goffman E. Stigma: notes on the management of spoiled identity. New York: Simon and Schuster, 1963.
6   Erikson E. *The nature of clinical evidence*. In: Lerner D, ed. Evidence and inference. Glencoe, Il: Free Press of Glencoe, 1958.

The first generation of e-patients

These new medical colleagues could provide sustainable healthcare solutions

For many citizens of most developed countries, the internet has become a powerful and familiar healthcare tool.[1–3] About half of adults in the United States have looked for health information on the net, making this the third most popular online activity.[2] E-patients (we include both those who seek online guidance for their own ailments and the friends and family members who go online on their behalf) report two effects of their online health research—"better health information and services, and different (but not always better) relationships with their doctors."[2] Based on our own observations, the expert opinions of colleagues, a variety of e-patient and provider surveys, and a few more rigorous trials, we offer five tentative conclusions regarding the emerging world of the e-patient.

Firstly, many clinicians have underestimated the benefits and overestimated the risks of online health resources for patients. We agree with Eysenbach that many medical researchers have become so "distracted by focusing on the negative aspects of the internet" that they have overlooked the benefits it provides.[1] Reports of patients coming to harm as the result of online advice are rare, whereas accounts of those who have obtained better care, averted medical mistakes, or saved their own lives are common.[4 5] Many e-patients say that the medical information and guidance they can find online is more complete and useful than what they receive from their clinicians.[5 6]

A reading list and web resources are on bmj.com