The Medical Teacher

The second edition continues the intention of the first edition to provide a useful set of ‘hands-on’ ideas which can be used in medical education and teaching.

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SECOND EDITION

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Preparing students for continuing education

Curriculum in conformity with adult education theory

**PROVIDING SKILLS AND TECHNOLOGY:**

- Strategies include -
  - Practice with self-learning methods and self-paced learning
  - Practice in self-assessment and identification of learning needs
  - Introduction of technology to assist with information retrieval and analysis
  - Developing skills in critical assessment of clinical evidence
  - Teaching management skills and effective use of time
  - Involving students in CME research

**WHY PREPARE STUDENTS FOR CONTINUING EDUCATION?**

Lifelong learning is increasingly acknowledged to be a characteristic of professionalism. Houle has written "Every occupation that lays claim to the distinction conferred by the term profession seeks constantly to improve itself in certain distinctive ways. These characteristics — such as increased competence in solving problems, a capacity to use more complex knowledge, and a more sensitive awareness of ethical problems — are related to the entire life career of the individual practitioner and to the stature of the occupation to which he or she belongs. Therefore, a lifetime of learning is required to establish, maintain or evaluate the
level of accomplishment suggested by each of these characteristics' (Houle 1978).

New information is being generated with increasing rapidity and doctors must be able to cope with it. It is estimated that the biomedical literature is expanding at a compound rate of 6-7% per year (Price 1980); thus it doubles every 10-15 years and increases tenfold across the 35-40 years of an individual's life in practice. Furthermore, society's needs are undergoing rapid changes and doctors need to be flexible and able to change with them.

Even where mandatory requirements for continuing education exist, practising doctors have to take the responsibility for initiating their involvement in the educational programmes of their choice, whether these lectures are seminars or periods of journal reading, listening to tapes, watching videos, or using interactive computer programmes in personal study. It is a matter of concern to their colleagues and to professional bodies that a proportion of doctors is known to be out-dated in knowledge and practice, and that some are using hazardous practices. Directors of continuing medical education (CME) recognize a wide spectrum in the priorities doctors give to CME and the time they invest in it (Richmond et al, 1984)

Doctors, then, ought to be concerned as part of their professional obligation about the quality of care they provide. Accountability for quality should be seen as a professional obligation and not just as a response to the pressures of consumerism (Hunter 1981). Concern about quality of care will lead inevitably to the conviction that lifelong learning is an obligation which doctors cannot refuse to accept.

HOW DO ADULTS LEARN?

Knowles (1973), in arguing that most of the scientific theories of learning have been derived from the study of animals and children observes that "the theory and technology on which most of our graduate education is based are at least a generation behind what we know about learning". Interest in the process of adult learning has, however, been increasing in recent years. Tough (1978) surveyed research into adult learning and showed that the basic situation is remarkably consistent from one population to another. Approximately 90% of persons conduct at least one major learning effort per year. Of these learning projects, in excess of 70% are self-planned, 10-15% are group projects and the remainder are discussion-type projects on a one-to-one basis with either peers, a professional assistant, or a non-human resource such as a computer. Studies such as those by Manning and Dennison (1979), Ellsworth and Graeber (1971) and Guptill and Graham (1976) illustrate the importance of self-learning in the field of medicine.

Preferences for learning methods differ from person to person. Houle (1978) notes that "In all curricula... attention must be given to individual differences. In continuing education particularly, where the establishment of individual ways of work, of specialization of practice, and of various settings of employment all accentuate diversity, special efforts must be made to avoid a monotonous uniformity of training activities... a much greater individualization than at present must be provided so that the whole program does not rest on a single process, however established its traditions or intriguing in novelty may be". Thorpe (1979), reporting exercise designed to discover the learning styles of medical practitioners, found what he believed to be differences in the approach to CME by medical specialty; psychiatrists, for example, tended to learn best by abstract, introspective reasoning through literature and encounter groups, surgeons from one to one instruction or personal preceptorship. Whether or not these generalizations hold true for the specialities, there is no doubt that there is a wide range of preferences for learning styles between individuals.

Research indicates that adult education is most effective and interesting when it has relevance to the professional needs of the individual. As Houb (1978) summarizes it, "The chief lessons learned by a professional during the years of active service are the intentional or unintentional products of the work itself... when the professional enters the service, the problems presented by particular cases become the absorbing centre of attention. The confrontation of these problems is the most significant throughout... Margulies engineers experience two? The problem so determined learning p... anticipated to result immediate, the content... oft imparting b standing w...ation, etc.

In this to Knowles (1973), adult learning is the result of the de reorganisation theory assuring those things... mental phases as workers... the adult activity large inadequacy He wants to today'.

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significant stimulus for continuing education throughout the whole course of an active career. Margulies and Raia (1976) asked 290 scientists and engineers 'What was the most fruitful learning experience you have had over the past year or two?' The most frequent response was 'on the job problem solving'. Tough (1971) was interested to determine what motivated adults to begin a learning project and found that his subjects anticipated several desired outcomes and benefits to result . . . some of the benefits were immediate, e.g. satisfying their curiosity, enjoying the content itself, enjoying practising a skill . . . others longer term; producing something, imparting knowledge and skills to others, understanding what will happen in some future situation, etc.'

In this theory of adult learning (andragogy) Knowles (1973) makes several assumptions about adult learners. One of these is that, as an individual matures, 'his readiness to learn is decreasingly a product of his biological development and academic pressure and is increasingly the product of the development tasks required for the performance of his evolving role. Andragogical theory assumes that learners are ready to learn those things they `need' because of the developmental phases they are approaching in their roles as workers . . . . ' Another assumption is that 'the adult . . . . comes into an educational activity largely because he is experiencing some inadequacy in coping with current life problems. He wants to apply to tomorrow what he learns today'.

The basis of B.F. Skinner's theory of behaviour (Skinner 1971) is that behaviour is determined by its consequences, and that the way to change behaviour is change the consequences and therefore rearrange the `contingencies of reinforcement'. According to his theories, behaviour which has reinforcing consequences (rewards) is more likely to occur again; and behaviour which has aversive consequences (punishments) is less likely to recur. In a sense, the latter could be characterised as 'learning from one's mistakes'. In the world in which doctors live, the 'rewards' for developing and practising 'good' behaviour has thus far proved to be extremely difficult; and where rewards have been given for 'good' behav-
of intensive cramming in order to accumulate 'facts' Could it be that the sheer intensity of this learning process suppresses forever the joy of learning?

The need to evaluate student progress. The danger here is of an examination-oriented curriculum encouraging examination-oriented student approaches to learning. Unfortunately, it is also a problem which has dogged many CME programs because their organizers are biased towards undergraduate-type evaluation methods.

Many medical school teachers have no experience of life as an isolated practitioner out in the world. Most have regular exposure to hospital-based learning and peer review programs and ease of access to colleagues for informal discussion. Hence they may not be able to coach students in effective self-initiated learning methods.

Medical school teachers may be unfamiliar with technological advances in information retrieval and delivery systems which are going to alter radically the world of informatics in the near future.

Students are seldom able to observe their teachers in the role of learners in CME, peer review and quality assurance type activities, and therefore, have no role models to follow. Despite increasing time spent in clinical activities, and in electives, projects and essays, students still have little involvement in deciding what they need to learn and the rate at which they must learn. Hence, personal responsibility for planning lifelong learning is not fostered.

There are penalties for admitting 'ignorance' as a student. Does this suppress the ability to honestly evaluate one's learning needs at a later date?

**HOW MAY STUDENTS BE PREPARED FOR CONTINUING EDUCATION?**

Two aspects must be considered:

**Developing positive attitudes**

It may be more important to begin by attempting to influence the teachers' attitudes to CME rather than the students'. Strategies which may be helpful include:

1. Setting as an explicit curricular goal the preparation of students for lifelong learning and ensuring that each department evaluates how a teaching seeks to meet that goal.

**Awakening Interest in CME Within the School.**

*Why not:*

1. ask each department to describe the way its programs specifically prepare students to be lifelong learners?
2. A commitment by medical school administrators to encourage teachers to use continuing education opportunities themselves.
3. Involvement of university faculties of medicine in responsibility for organizing CME.

**Strategies aimed at students' attitudes could include:**

1. Selecting students with appropriate attitudes. Psychological testing may allow medical schools to select students who have 'inquiring minds' (Gunzburger [1980]; Finestone et al. [1981]) but whether this will lead to greater involvement in CME as well as, for instance, interest in research is not entirely clear.
2. The introduction of teaching information about the theory and practice of CME including teaching about adult education theory, the need for continuing education, information about opportunities for continuing education and a discussion of students' attitudes to it. Caplan (1977) has reported the limited knowledge which medical students have about opportunities for methods of CME.
3. Planning undergraduate courses which include consistent elements of adult education theory and practice. These could include providing students with opportunities for self-assessment of progress — including developing their own criteria for achievement — encouraging them to take part in peer review techniques, allowing them to observe their teachers' involvement in peer review of CME as learners, requiring students to obtain increasingly substantial amounts of information from sources such as the library and journals rather than from lectures and handouts and a switch in the philosophy of teaching to encourage 'evolutionary thinking' by emphasizing what is yet known, recognizing that this may be why the teacher may try...
known, and what is likely to change; and the recognition that most of today's biomedical 'truth' may yet be subject to challenge. At every level of the medical course, it must be clear to students that these approaches are being taken. Approaches try to

Developing positive attitudes to CME

Why not:
* Organize discussion groups on selected cases from the annual reports of medical defence agencies, medical disciplinary bodies or legal publication where sub-optimal practice was an issue?
* Prepare information on areas of medical practice in which knowledge and/or techniques have changed so much in the last 20 years as to alter the clinical management of patients radically — e.g. trends in management of angina pectoris, myocardial infarction

Encouraging interest in peer review.

Why not:
* During small group clinical instruction, have students observe one another's techniques of history-taking and physical examination and critique them, the teacher monitoring the process?
* Have students mark each other's case histories and comment on them according to guidelines drawn up in collaboration with the teacher?

Providing skills and technology

Appropriate strategies might include:
1. Providing practice with self-learning methods and self-paced learning in some areas of the undergraduate course, for example, reading about clinical cases, developing skills in using audiotape, videotape, and computer-based instruction.
3. Emphasis on technology which will enable students to discover more easily information they need, e.g. computerized literature searching, developing personal filing systems, or skills in data transmission. Medical schools must increasingly be involved in the developing computerized information networks both within the hospital and in the wider community medicine.

4. Developing skills in critical assessment of clinical evidence and the medical literature. Faced with the burgeoning literature the practitioners of the future must have skills. In deciding what is worth reading and assimilating (Dept of Clin. Epid & Biostats., McMaster University 1981). Courses in critical assessment ought to be mandatory as part of every curriculum.

5. Teaching management skills and the effective use of time.

6. Involving students in CME research or in projects relating to CME so that they begin to get a 'feel' for involvement in it (Jewell & Schneidermann 1978). Approaches to try.

* Provide experience in self-learning. Why not:
  * require that with every case-history written, the student also provides a minimum of two pages of referenced discussion on some aspect of the patient's problem, from sources other than textbooks?
  * Organize sections of the course to include self-paced learning as exemplified, for instance, by Brewer (1977)?

Developing Skills in the Assessment of Learning Needs. Why not:
* Following written formative evaluations — including MCQs — have students use their marked exam scripts as the basis for listing areas of knowledge deficiency; and these in turn to determine the subject matter of a subsequent series of brief assignments?

ARE THESE APPROACHES SUCCESSFUL?

The literature on the motivation of students towards CME is sparse. So far there has been little evaluation of the effect of problem based learning and other relatively new curricular approaches on the behaviour of the graduate in terms of involvement in CME. This is mainly because the more modern schools which have opted for radically different curricular approaches have yet to graduate enough classes to be able to evaluate the outcome on a long-term basis. It will be important
for those schools to investigate this question if the validity of the approaches they are taking is to be established. When validity is established, schools which have thus far opted for a more traditional curriculum, will have a greater incentive to consider other educational approaches.

REFERENCES


Department of Clinical Epidemiology and Biostatistics, McMaster University Health Sciences Centre 1981 How to read clinical journals. Canadian Medical Association Journal 124: 577–81, 703–10, 869–72, 985–90, 1156–62


Gunzburger C F 1980 Characteristics identified upon entrance to medical school associated with future participation in professional education. Annual Conference in Research in Medical Education 19: 117–22


Jewell S E and Schneiderman L J 1978 Students in CME. Journal of Medical Education 53: 1008–9


Lembke P A 1956 Medical auditing by scientific methods, illustrated by major female pelvis surgery. Journal of the American Medical Association 162: 646–655

Price D S 1980 Warren K S Coping with the biomedical literature, Praeger, New York


Tough A 1971 The adult's learning projects. Ontario Institute for Studies in Education, Toronto


Thorpe J H 1979 Learning Styles in CME. American Medical Association Continuing Medical Education Newsletter 8: (8) 9