

rently funding, through the medical education levy, training in research and managerial skills for specialist registrars. As we move towards a health service in which the focus is primary care, it seems unusual that this opportunity is not available for those pursuing a career in general practice. Higher professional education is a concept which has been promoted by the College⁸ and included in the proposals to develop education and training in general practice.⁹ One of the strengths of general practice is the diversity in its mode of delivery; it seems likely that higher professional education programmes will need to cover a range of learning opportunities, from the practical, practice-based skills to those of academic general practice. A modular approach to course provision may be one solution, allowing doctors to define their own programmes, perhaps with the help of a mentor. Many of the modules could build on existing programmes, encouraging multi-disciplinary learning. Not all doctors completing vocational training will want to become principals in general practice.¹⁰ It seems that there is need to look imaginatively at the years beyond vocational training, creating new, time-limited posts which could meet a service need, such as development of inner city practices, together with an opportunity for the individual doctor to enhance their own skills. Some doctors may want to pursue an academic career—there are currently few opportunities to gain research skills in general practice—and two regions have already identified funding to develop research practices,¹¹ but these initiatives need to be supplemented by the creation of new posts which will prepare future leaders in general practice for an academic career and increase the evidence base of primary care.

If our health service is to be truly led by primary care, then all professions working in the health care system need to understand the strengths and limitations of primary care. We will need confident, competent general practitioners, who are able to lead their practice team and develop good working relationships with health authorities so that effective commissioning is established. We will also need to work with secondary care health professionals to strengthen relationships and use resources appropriately. What is essential is that general practice continues to be the main provider of primary care, and that the health service builds on the

strengths of the clinical generalist, valuing breadth of knowledge as much as depth, and skills in listening and empathy as much as those of high-tech intervention.

JACKY HAYDEN

*Regional adviser in general medical practice,
Department of Postgraduate Medicine and Dentistry,
The University of Manchester*

References

1. The Medical Practices Committee. *Medical practices recruitment survey*. London: The Medical Practices Committee, 1995.
2. General Medical Services Committee. *Medical workforce-task group report*. London: British Medical Association, 1996.
3. McBride M, Metcalfe D. *General Practitioners' low morale: reasons and solutions* [editorial]. *Br J Gen Pract* 1995; **45**: 227-229.
4. Leese B, Bosanquet N. Changes in general practice organization: survey of general practitioners' views on the 1990 contract and fund-holding. *Br J Gen Pract* 1996; **46**: 95-99.
5. NHS Executive. *Primary care: the future. The Debate*. London: Department of Health, 1996.
6. The Royal College of General Practitioners. *The nature of general medical practice. Report of a Working Party*. Exeter: Royal College of General Practitioners, 1996.
7. Hasler JC. *The primary health care team*. London: Royal Society of Medicine Press, 1994.
8. Royal College of General Practitioners. *Education and training for general practice policy statement number 3*. London: Royal College of General Practitioners, 1994.
9. NHS Executive. *Hospital doctors: training for the future. Supplementary reports by the working groups commissioned to consider the implications for general medical practice, overseas doctors and academic and research medicine*. London: NHS Executive, 1995.
10. Baker M, Williams J, Petchey R. GPs in principle but not in practice: a study of vocationally trained doctors not currently working as principals. *BMJ* 1995; **310**: 1301-1304.
11. Pereira Gray D. Research practices [editorial]. *Br J Gen Pract* 1995; **45**: 516-517.

Address for correspondence

Dr Jacky Hayden, Department of Postgraduate Medicine and Dentistry, The University of Manchester, Gateway House, Piccadilly South, Manchester M70 7LP.

Experts and evidence

General practitioners have traditionally been the recipients of expert advice. With literally thousands of medical journals in existence, no general practitioner can satisfactorily follow all the original work in every field of medicine, or even one or two. Therefore, we have increasingly relied on the specialist, particularly through the medium of the clinical review article.

However, Antman *et al*¹ found that, when traditional review of literature by clinical experts was compared with meta-analysis² of trial results, the expert reviews did not identify important advances demonstrated by meta-analysis, and conversely, recommended other treatments for which evidence was equivocal. It is increasingly recognized that reviews of the conventional sort are likely to be seriously flawed.^{3,4} There is a distinct tendency for traditional reviewers to exert subjective selectivity, whether consciously or unconsciously, in what is included in their review. Indeed, Sackett⁵ only half-humorously suggested that '... the reason for this deficiency in reviews lies in the tradition of calling upon content-area experts to produce them. By the virtue

of their expertise, these authors begin their task with a conclusion, backed up especially by their own work, and invested with not a little of their personal reputations....'

Unsystematic review is only part of the problem. Traditional reviews may not distinguish good from poor research, and much research is of poor quality. Altman⁶ described how the twin pressures of poor research training and the need for clinicians in training to produce publications in order to secure promotion conspire to produce what he characterized as 'the scandal of poor medical research'. Publication in a peer-reviewed journal is no guarantee that the research is scientifically sound. Both the current and past editors of the *British Medical Journal* have expressed serious reservations about the system of peer review,^{7,8,9} although there may be no better alternative. The unacceptable face of increasing pressure to publish for the purpose of promotion is increasing evidence of scientific dishonesty, exploitation¹⁰ and outright deception,⁹ all of which is difficult to detect.

And there are biases which are not fundamentally the responsibility of the reviewer but which arise from the very nature of scientific publication itself. These include the known bias against publication of negative as opposed to positive results and the large volume of 'grey' literature (such as doctoral theses) which is technically published but very inaccessible. There is also the arrogance of language which tends to exclude non-English language journals.¹¹

However, a wave of reform is sweeping rapidly across the medical world. Firstly, the 'global village' is becoming a reality.¹² Through the international computer networks, anyone can access extensive literature databases with little difficulty and decreasing expense.

In theory, at least, electronic communications could provide all of us with direct access to all or any original published work, but the volume of available work will defeat all but the most determined of 'self-reviewers'. Therefore, we are likely to be even more dependent on expert reviews of literature.

Consequently, the second major change is of crucial importance. The fundamental principle is the application of scientific method to the process of reviewing original research, typified by the work of the Cochrane Centre¹¹ and the International Cochrane Collaboration.¹² As presaged by Sackett,⁵ these systematic reviews are generally conducted by a new breed of expert: experts in the science of assessing evidence, rather than knowledge-based specialists (although the two may overlap).

The main element of systematic review¹⁴ is transparency. The aims of the review and the methods which have been used are clearly stated. The latter should include an attempt to locate all important original research on the topic, the criteria used to assess the methodological quality of studies and the methods used to produce conclusions which are as objective as possible.

What implications do these developments have for general practitioners?

Evidence-based medicine may be seen as a threat to clinical freedom. Some of the reasons for this, described by Antman *et al.*,¹ include that the personal experience of the physician may be at odds with the very large-scale trials which are necessary to produce an objective assessment, especially where the event rate of the condition in question is low. These authors contrasted the tendency of physicians to ignore the thrombolytics that had been proven to reduce mortality from myocardial infarction (because physicians had individually seen or heard of the side-effect of bleeding) with their enthusiasm for lidocaine that had not (because many had witnessed an apparently good effect on imminently fatal ventricular arrhythmia). Another reason is that clinical trials are performed under deliberately artificial conditions for highly specific indications, and usually exclude patients with concomitant diseases and therapy.^{15,16} In the real world, once the drug is released its use is extended beyond the validity of available evidence. A corollary of that is that trial evidence is only a limited guide in the management of individual patients.

Therefore, we must be aware of the limitations of even good-quality evidence.¹⁷ This, and the fact that good evidence does not exist for most treatments,^{18,19} means that common sense and wise judgement will remain the hallmarks of a good physician for the foreseeable future.

Clinical freedom should not be used as an excuse to fly in the face of evidence, but equally, evidence should not be viewed in too narrow a way. There are many types^{20,21,22} and gradations of evidence, particularly at the level of dealing with individuals. Nor should evidence be confused with rationality. It is the judicious consideration of evidence in the humane advocacy of the rights and needs of the individual that may prove to be our most

difficult task in the context of increasing pressures on funding of health care.

For the 'consumers' of expert advice, which must potentially include patients, the public and the media as well as general practitioners, the new transparency is a major advance. As Eddy¹⁹ demonstrated not so long ago, received wisdom in textbooks and medical journals usually had no basis in evidence. Later expert reviews at least involved the presentation of evidence, but in a way that we now see was open to subjectivity and bias that could not be assessed by the reader. The essence of the latest change is that the reader can critically assess the quality and findings of the expert reviewer, in much the same way that he could assess the quality of the original research itself, but with very great savings in the reader's time.

This presupposes the ability to do so and that ability, which is not difficult to acquire, will be one of the most important skills for all doctors, including general practitioners.

Huth²³ suggested that, because the strength of a profession lies in knowledge differentials, professional societies should develop new and superior kinds of information sources in order to support the expertness of their members. An alternative view might be that the days of the knowledge expert are numbered.

Medical practice in the context where anyone can be an 'expert' (regardless of how few or many choose to do so) will destroy, not before time, the last vestiges of Richard Gordon's²⁴ empire: the old hierarchical and patronising world of medicine, ring-fenced by superior knowledge.

However, there must be some apprehension about what comes next, because we have not yet fully adjusted to the new world. This is not necessarily an age-related phenomenon: young doctors may resist change as strongly as older ones.

As researchers working for patient pressure groups and more individual patients start to access medical literature, the consultation (both generalist and specialist) will become much more of a meeting of equals—a forum for counselling and negotiation. This is already becoming apparent. Some patients will have a balanced grasp of the facts, but most will have the incomplete and unbalanced understanding that a little knowledge (probably filtered through the media) brings. Patience and time will increasingly be needed, but both will remain in short supply unless major changes are made to the way in which we work.

The keys to the future will undoubtedly be based on superior skills rather than superior knowledge. This is well reflected in the General Medical Council's recent reforms of the undergraduate curriculum.²⁵ A major part of that will be full exploitation of appropriate technology. David Eddy pointed out that medicine is far too complex an activity to be conducted by human minds unaided by computer: 'We've been trying for two millennia and look where we've got to.'¹⁹ As computers progressively relieve us of the considerable burden of retrieving, storing and analysing information, and even increasingly start to help us make rational decisions, what will be left that computers cannot do as well or better than humans?

One paradox may be that expansion of knowledge increases rather than decreases uncertainty, primarily because there is such a long way to go before practice is even substantially evidence based. As David Naylor¹⁸ pointed out, 'Clinical medicine seems to consist of a few things we know, a few things we think we know (but probably don't), and lots of things we don't know at all.' One view is²⁶ that the power of medicine in the eyes of the public is more to do with uncertainty than with scientific information or technical expertise. In an atmosphere of increasing uncertainty, in part created by increasing but incomplete knowledge of phenomena that were previously taken for granted, people need someone they can trust to act in their best interests.

It may be the ability of physicians to advise in the face of uncertainty, to help patients make good and helpful decisions on the basis of inadequate data, as much as their ability to act on the basis of evidence, that will retain their value to society.

ROSS J TAYLOR

Senior lecturer, Department of General Practice,
University of Aberdeen

References

1. Antman E, *et al.* A comparison of the results of meta-analysis of randomised controlled trials and recommendations of clinical experts. *JAMA* 1992; **268**: 240-248.
2. Bulpitt CJ. Meta-analysis. *Lancet* 1988; **ii**: 93-94.
3. Mulrow CD. The medical review article; state of the science. *Annals of Internal Medicine* 1987; **106**: 485-488.
4. Haynes RB. Loose connections between peer-reviewed clinical journals and clinical practice. *Ann Int Med* 1990; **113**: 724-728.
5. Sackett DL. Proposals for the health sciences: 1. Compulsory retirement for experts. *J Chron Dis* 1983; **36**: 545.
6. Altman DG. The scandal of poor medical research. *BMJ* 1994; **308**: 283-284.
7. Smith R. Problems with peer review and alternatives. *BMJ* 1988; **296**: 774-777.
8. Smith R. Promoting research into peer review. *BMJ* 1994; **309**: 143-144.
9. Lock S. A difficult balance. London: British Medical Journal, 1990.
10. Editorial. Are academic institutions corrupt? *Lancet* 1993; **342**: 315-316.
11. Chalmers I, Dickersin K, Chalmers TC. Getting to grips with Archie Cochrane's agenda. *BMJ* 1992; **305**: 786-788.
12. Laporte RE. Global public health and the information superhighway. *BMJ* 1994; **308**: 1651-1652.
13. Godlee F. The Cochrane Collaboration. *BMJ* 1994; **309**: 969-970.
14. Sackett DL, Haynes RB, Guyatt GH, Tugwell P. *Clinical epidemiology*. London: Little, Brown, 1991.
15. Charlton BG. Medical practice and the double-blind, randomized controlled trial. *Br J Gen Pract* 1991; **??**: 355-356.
16. Rothwell PM. Can overall results of clinical trials be applied to all patients? *Lancet* 1995; **345**: 1616-1619.
17. Marmot MG. Epidemiology and the art of the soluble. *Lancet* 1986; **i**: 897-900.
18. Naylor CD. Grey zones of clinical practice: some limits to evidence-based medicine. *Lancet* 1995; **345**: 840-842.
19. Smith R. Where is the wisdom ...? *BMJ* 1991; **303**: 798-799.
20. Eisenberg L. Science in medicine: too much or too little and too limited in scope? *Am J Med* 1988; **84**: 483-491.
21. McCormick J. The place of judgement in medicine. *Br J Gen Pract* 1994; **44**: 50-51.
22. Smith BH, Taylor R J. Medicine—a healing or a dying art? *Br J Gen Pract* 1996; **46**: 249-251.
23. Huth E. The underused medical literature. *Ann Int Med* 1989; **110**: 99-100.
24. Gordon R. *Doctor in the house*. London: Michael Joseph, 1954.
25. General Medical Council. *Tomorrow's doctors*. London: General Medical Council, 1993.
26. Logan RL, Scott PJ. Uncertainty in clinical practice: implications for quality and costs of health care. *Lancet* 1996; **347**: 595-598.

Address for correspondence

Dr Ross J Taylor, Senior Lecturer, Department of General Practice, University of Aberdeen, Foresterhill Health Centre, Westburn Road, Aberdeen AB9 2AY.

RCGP

Research
Funding



Applications are now being invited for grants for research in or relating to general medical practice, for consideration by the Scientific Foundation Board. In addition to its general fund, the Board administers a number of special funds

including the Windebank Fund for research into diabetes.

The Scientific Foundation Board's definition of research is catholic and includes educational research, observational as well as experimental studies, and accepts the methodologies of social science as valid. It does not fund educational activities.

If the study involves any intervention or raises issues of confidentiality, evidence of Local Research Ethics Committee approval should be provided as part of your application, or justification given of why it is not necessary to obtain such approval.

Studies which do not, in the opinion of the Board, offer a reasonable chance of answering the question posed will be rejected. It may be useful to seek expert advice on protocol design before submitting an application.

Care should be taken to ensure that costs are accurately forecast and that allowance is made for inflation and salary increases.

The annual sum of money available is not large by absolute standards and grant applications for sums in excess of £5,000 are unlikely to be successful.

Application forms are obtainable from the Clerk to the Board at: The Scientific Foundation Board, The Royal College of General Practitioners, 14 Princes Gate, London, SW7 1PU. The Board considers applications for funding three times a year, usually in January, May and October. The closing date for applications is eight weeks prior to the date of the meeting. Information on precise closing dates can be obtained by contacting the Clerk to the Board. Any forms received after the closing date will, unfortunately, be ineligible for consideration at the meeting.

Chairman's action can be taken between meetings to approved grants of up to £1,000. This may be particularly appropriate for applications for funding of pilot studies.