

Clinical teaching: maintaining an educational role for doctors in the new health care environment

D Prideaux,¹ H Alexander,² A Bower,³ J Dacre,⁴ S Haist,⁵ B Jolly,⁶ J Norcini,⁷ T Roberts,⁸ A Rothman,⁹ R Rowe¹⁰ & S Tallett¹¹

Context and objectives Good clinical teaching is central to medical education but there is concern about maintaining this in contemporary, pressured health care environments. This paper aims to demonstrate that good clinical practice is at the heart of good clinical teaching.

Methods Seven roles are used as a framework for analysing good clinical teaching. The roles are medical expert, communicator, collaborator, manager, advocate, scholar and professional.

Results The analysis of clinical teaching and clinical practice demonstrates that they are closely linked. As experts, clinical teachers are involved in research, information retrieval and sharing of knowledge or teaching. Good communication with trainees, patients and colleagues defines teaching excellence. Clinicians can 'teach' collaboration by acting as role models and by encouraging learners to understand the responsibilities of other health professionals. As managers,

clinicians can apply their skills to the effective management of learning resources. Similarly skills as advocates at the individual, community and population level can be passed on in educational encounters. The clinicians' responsibilities as scholars are most readily applied to teaching activities. Clinicians have clear roles in taking scholarly approaches to their practice and demonstrating them to others.

Conclusion Good clinical teaching is concerned with providing role models for good practice, making good practice visible and explaining it to trainees. This is the very basis of clinicians as *professionals*, the seventh role, and should be the foundation for the further development of clinicians as excellent clinical teachers.

Keywords Australia; clinical clerkship, *standards; *physician's role; teaching, *standards, methods.

Medical Education 2000;34:820-826

Introduction

Clinical teaching is at the centre of medical education. Traditionally it has taken place in large teaching hospitals or academic medical centres. Indeed, education has been described as the 'heart and soul of academic

medical centres'.¹ There is now a recognition that the patient mix in teaching hospitals, with a high proportion of acute, short-stay patients is no longer representative of the distribution of disease in the wider community. Changes in demography, ageing populations, patient expectations, developments in disease treatments and information technology are significantly altering the location of care, with recent increased interest in education in ambulatory or community-based settings. Future professional boundaries are being redefined in the light of these changes.

There is increasing concern about the ability to maintain clinical teaching in what Iglehart describes as 'the new environment of health care'.² There have always been competing demands between teaching and service for clinical teachers, but this has been brought into sharp relief recently, for example, in government-funded hospital systems in the United Kingdom or Australia. As costs are cut in public hospitals the

¹Flinders University, Adelaide, Australia

²University of Queensland, Brisbane, Australia

³James Cook University, Townsville, Australia

⁴CHIME, Royal Free and University College, London, UK

⁵University of Kentucky, Lexington, KY, USA

⁶University of Sheffield, UK

⁷Institute of Clinical Evaluation, Philadelphia, USA

⁸University of Leeds, UK

⁹University of Toronto, Ontario, Canada

¹⁰Division of Endocrinology and Metabolism. Dalhousie Medical School, Canada

¹¹University of Toronto & Hospital for Sick Children, Toronto, Canada

Correspondence: Professor David Prideaux, Professor of Medical Education, Flinders University, GPO Box 2100, Adelaide 5001, Australia

pressure for clinicians to devote more time to service and less time to teaching and research mounts. In the United States, revenue for patient care has been used to subsidize medical education. The introduction of managed care has forced down revenue from clinical service and reduced the ability to maintain this subsidy. Another emerging hallmark of the new health environment is integration. Integrated care and co-ordinated care are the bases of some key expectations of health sector reforms in a number of countries. Integration offers a major opportunity for the advancement of interprofessional education.

The educational role of clinical teachers has expanded to include teaching in clinical skills laboratories, the use of simulated/standardized patients, and the use of computers and information technology. Despite this and the changing environment of health care, the necessity of providing good clinical teaching and learning in patient-care contexts remains as strong as ever. The challenge is to continue to provide 'innovative' and quality teaching in a manner which 'supports the teachers themselves', by utilizing the strengths they derive from good clinical practice.¹ This may be achieved by reorganizing the structure of teaching to meet the realities of the new environment. Ultimately however, it may well require new models and approaches to clinical teaching itself which are more appropriate for and compatible with the new clinical environment.

The Royal College of Physicians and Surgeons of Canada's 2000 Project on Canadian Medical Education Directions for Specialists (CanMEDS 2000) considered future societal health care needs and their implications for postgraduate medical education. CanMEDS 2000 has described a framework for generic competencies that are common to all specialists and sets future directions for postgraduate medical education in Canada. It is also used in another contribution to this series, as a way of conceptualizing good clinical teaching.³ The roles described within CanMEDS 2000 are: *medical expert, communicator, collaborator, manager, health advocate,*

scholar and *professional*.⁴ An understanding, and preparation for, these roles should be inculcated into all levels of medical education.

Although there are alternative models, in this paper we have chosen the CanMEDS 2000 model as a framework. We will discuss each of the roles in turn, demonstrating how teaching can be incorporated fundamentally into the core business of clinicians, how it can be adapted to the changing clinical environment and how it need not be sacrificed to service demands.

If clinical teaching is to flourish in the new environment of health care it must be thoroughly integrated into all aspects of medical practice. In this paper we will address clinical teaching at different levels. The medical educator is referred to as the clinical teacher. Medical students, residents, and registrars are referred to as 'trainees'.

The clinical teacher as medical expert

Amongst other things medical experts possess a: 'defined body of knowledge and procedural skills which are used to collect and interpret data, make appropriate clinical decisions and carry out diagnostic and therapeutic procedures...'.⁴

In many instances the benefit of the expertise residing in the experienced clinician can be transmitted effectively and efficiently to the patient only through others' work. The General Medical Council in the UK has indicated that all doctors have, as a primary function of

their expertise, a duty to contribute to the education and training of other doctors around them,⁵ in order, primarily, to ensure better patient outcomes. This may be construed as clinical supervision.⁶ However supervision in the clinical context has been defined as: 'The provision of guidance and feedback on matters of personal, professional and educational development in the context of the trainees' experience of providing safe and appropriate patient care'.⁶

It is evident that this contains a large component of activity that could equally be classified as clinical teaching; guidance, demonstration, observation,

Key learning points

- An understanding of all roles the competent practitioner must fulfil to meet future societal needs, such as those described in the CanMEDS 2000 project, must be inculcated into all levels of medical education. These roles are: *medical expert, communicator, collaborator, manager, health advocate, scholar* and *professional*.
- Clinical teaching must adapt to the realities of clinical practice in the 21st century – a changing clinical environment and increasing demands on clinical teachers' time.
- The quality of clinical teaching, and the conflict between teaching and service, can both be addressed by role modelling good practice, making it visible and explaining it to trainees.

feedback, correction and reflection. The important and overriding feature is that such activity is essential to provide sound and competent medical care to patients.

A key 'value',⁷ of this expertise is that it is kept up to date. This is possible only by research, or by information retrieval, and through the sharing of knowledge and skills; in other words, through teaching. In this case the expert may be the recipient of the teaching, i.e. the learner, but it will almost certainly be delivered by another expert. It is thus an inescapable contention that teaching activity is essential to good medical practice.

The clinical teacher as communicator

The clinical teacher communicates with trainees in various settings from the bedside to the lecture theatre and for various functions from teaching and assessment to advising and providing feedback. Trainees most certainly recognize the importance of their teachers' communication skills. The successful clinical teacher has to be a skilled communicator and must be able to adapt his or her communication skills to the various settings and contexts. Communicating expectations,⁸ discussing concepts and the importance of the material to be learned⁹ and providing relevant feedback¹⁰ are all considered by trainees to be significant attributes of good teachers. The ability to communicate effectively with trainees defines teaching excellence.

The teaching of trainees frequently occurs in the presence of patients either in one-on-one ambulatory settings or with multiple trainees and teachers in hospital settings. Several studies indicate the link between good communication and rapport with patients and excellence in teaching.¹¹ Furthermore, effective patient communication may have the potential to influence patient outcomes by increasing patient satisfaction,¹² improving medication compliance and reducing length of hospitalization.¹³ This is a powerful illustration of how clinical teaching can be effectively integrated into everyday clinical practice. Teaching by positive modelling of good communication actually contributes to some better patient outcomes.

The same argument can be applied to communication with other doctors as the clinical teacher frequently communicates with colleagues, either verbally or in writing, in the presence of trainees. Again effective communication with colleagues is not only vital to the delivery of health care but also in shaping behaviour of trainees through role modelling. Good professional written and oral communication with colleagues is characteristic of well-respected clinicians and clinical

teachers. This is evident, for example in chart entries which provide legible, concise and accurate documentation without being used to record disagreements between doctors. It is also evident in standards of verbal communication where patient details are discussed sensitively with colleagues without use of colloquial terms used in the popular press or media. Thus, for the teacher as communicator the potential conflict between teaching and service demands diminishes in importance. Good communication with trainees, patients and colleagues is good teaching and good clinical practice. The two are largely inseparable.

The clinical teacher as collaborator

The practice of medicine has long been a collaborative activity involving multiprofessional teams. In the future, effective collaboration with patients and multidisciplinary teams will be needed for provision of optimal patient care, education and research.⁴ The benefits of good teamwork to those who deliver health care, are improved patient care, financial savings and a better working environment.¹⁴ Working as a member of a team requires: negotiation skills, being willing to share and accept responsibility when making decisions, learning to understand and appreciate others' strengths and weaknesses, open-mindedness, valuing each others' opinions, individuals being prepared to evaluate and assess their own behaviour as well as the function of the team, and recognizing the contributions of different professions within the health care team; all of which need to be learned.¹⁵

The teaching of collaboration between different members of health teams has not, until recently, been a strong part of medical education, however, learning together has been recognized as an important step on the way to achieving this. Nonetheless, can we assume that by simply putting people together, effective learning will take place, or that it will produce individuals willing to collaborate in the health care environment? Experience suggests that it will not. An ambitious project involving medical, dental, nursing and pharmacy students amongst others, showed that in this situation the different professional groups tended to ignore each other, resented the presence of the other groups and felt that their learning opportunities were being diluted.¹⁶

For credibility, and to satisfy the conditions of integration of service and teaching as advocated in this paper, collaboration must be seen to be founded in reality and viewed by all participants as mutually relevant. It is counter-productive to involve groups of professionals, who will never work in the same area of patient care, in training sessions merely for the sake

of teaching convenience. Indeed, it may reinforce prejudices against collaborative learning. It is vital also to avoid the physician-centred approach to collaboration, and all health care groups must feel that they enter the learning sessions on equal standing. Setting up collaborative learning is not easy and there may be immense practical problems such as scheduling, finding appropriate venues and tutor provision to overcome.

However in the clinical setting, clinicians can 'teach' collaboration by acting as role models and also by encouraging learners to understand the responsibilities of other health professionals and to develop respect for those roles. The clinical environment in which the teacher works should reinforce this collaboration, for example the use of multidisciplinary patient conferences. Clinical teaching should highlight the importance of each professional group's contribution to the improvement in health of the population and individual patients, and should emphasize the multiplicity of expertise required.

Collaboration can help in re-orientating health systems towards the patient. There is frequently a marked difference between what the professionals describe as a positive outcome, and what the patients perceive as a positive outcome. Individuals are becoming empowered to make personal choices and they, and their families, are demanding a more cohesive team approach to care. Care-managed pathways, protocols, core skills and seamless care are all dependent on team work and shared ownership of care. The professions already possess a wide variety of core skills and knowledge, but without collaboration and education in collaborative methods, they are frequently unable to share these effectively so that the patient benefits. The challenge now is to measure the effect collaboration has on patient outcome from the patient perspective, and to demonstrate how the effective teaching of collaboration can be integrated in clinical practice and, in turn, contribute to healthier patient outcomes.

The clinical teacher as manager

Specialists need to be able to prioritize, to work effectively as part of the health care team, to be able to utilize resources, including information technology, and manage time effectively.⁴ Physicians routinely function as managers of individual patient care but have recently assumed increasing managerial responsibilities within the health care system.¹⁷ Irrespective of their position in the health system, all medical practitioners from internship onwards need to have effective management skills.

In the UK the General Medical Council has provided a document in recognition of doctors' contributions to the management of health services. This document stipulates that all doctors have some responsibilities for the use of resources, that many will be working in teams and be involved in the supervision of colleagues. They point out that recent changes in the NHS, such as clinical governance will make doctors' roles as managers more extensive and better defined. The General Medical Council of Great Britain suggests that all doctors have a professional obligation to contribute to the education and training of other doctors, must be prepared to oversee and manage less experienced colleagues, and must ensure that trainees are properly supervised.¹⁸ This includes the ability to carry out formal appraisals of them.

Clinical teachers need to be effective managers of their own workloads and thereby be role models for trainees. There is a finite amount of time available for clinical teaching. Teachers should demonstrate and teach time management throughout all their work. Clinical teachers should be role models in dealing with changing clinical environments.

Clinical teachers also need to be effective managers of learning resources, encouraging learners to take more responsibilities for their learning.¹⁹ Teachers should understand the curriculum and make it explicit to the trainees, ensure an appropriate setting for clinical teaching with appropriate patient mix, empower learners to make best use of the 'teaching moment', improve trainees' performance and change practice through feedback. In a survey of Senior House Officers in medicine in Scotland, Baldwin *et al.* found a lack of feedback, and lack of consultant's time for teaching adversely affected training.²⁰

The clinical teacher as a manager needs to recognize his/her own needs for development. The academic medical centre has a managerial responsibility to the clinical teacher and learner by ensuring that the infrastructure is in place to support staff development and that the responsibility for it is clear. Other responsibilities of the academic centre include creating a positive environment to support teaching and learning and putting in place systematic appraisal, and feedback to, clinical teachers.

It is clear that the clinical teacher has an increasing number of commitments involving the care of patients, maintaining an effective research profile, in addition to being a manager and a teacher. The development of sophisticated management skills however, are likely to make our clinical teachers more efficient and therefore more effective.

The clinical teacher as health advocate

Advocacy, the act of pleading for, or interceding on behalf of a person or persons is an attribute with particular importance in the medical profession. During the reform of medical education over the past two decades, professional competencies have been defined to include understanding the community role in health, expanding access to care, and including patients and families as partners.²¹ Advocacy activities in the social, environmental and biological arenas that determine the health of an individual patient and patients in society are viewed as essential for doctors. Evans states that 'surely a small part of each physician's responsibility should extend beyond the care of individual patients to the advocacy for changes in the community's policy and practices that influence determinants of health, causes of disease and the effectiveness of health services'.²² Several medical schools have described their programmes to expose students to their roles as community advocates.^{23,24} These programmes have focused on experiential learning activities in the community with an emphasis on observation of social and political determinants of health, participation in voluntary activities and interventions in the community with a view to improving the relationship between the student and patients.

Advocacy experiences have been addressed by authors including Lozano *et al.*²⁵ who described their paediatric residency programme experience in training residents in child advocacy. They provided illustrative examples of resident projects including educating parents on the effects of second-hand smoke, expanding child restraint law, regulating child labour in Washington State and reducing the use of infant walkers in the United States.

The clinical teacher's contribution in teaching and role modelling health advocacy is essential. The role is dependent on the mix of undergraduate, postgraduate, and continuing education learners and on the particular specialty and the setting for teaching. The programme and the teacher define opportunities to identify and discuss determinants of health and the health and social policy procedures related to the patient population. The key is to identify and teach specific knowledge and skills in this area, as well as to demonstrate a positive approach to advocacy issues, through working collaboratively with the interdisciplinary health care team, with the patients, their families and their communities. Opportunities exist to teach advocacy when clinicians and trainees engage in clinical service, either at an individual community or population level. At the individual level advocacy and its importance can be taught

during chart review, discharge planning and feedback on discharge. Home visits and attendance at clinics and meetings provide further opportunities for teaching about advocacy as do practical experiences with patients such as shopping trips for diabetic patients. These will often take place in an interdisciplinary context. Finally, clinicians should use experiences arising from discussion with patients' representatives as teaching opportunities. Rather than being locked out of such discussions trainees can learn by skilful facilitation of learning in these events.

Many clinicians are involved in advocacy at a community level. Again these provide good opportunities for teaching and learning. Clinicians can guide participation in community events, encourage involvement in community health promotion or enable trainees to benefit from involvement in prison medical services or review boards for welfare benefits.

Finally clinicians have advocacy roles at a population level which they can demonstrate to trainees and encourage their participation. Discussion of current social issues relevant to medicine, meetings with patients and consumer advocacy groups and participation in professional organizations are all valuable activities from which trainees can learn the principles and practice of advocacy.

Advocacy is an essential component of health promotion reflecting social, environmental and biological factors which determine the health of the individual patient, the practice population and the community. As Berwick²⁶ has suggested, physicians need new skills to become leaders in improving health care by becoming more active and influential citizens of their health care communities. The skills need to be passed on to the next generation of physicians. Encouraging and teaching advocacy to trainees is an important role for clinical teachers as they provide daily care to their patients.

The clinical teacher as scholar

Of all the defined roles of clinicians it is that of 'scholar' that most readily leads to a significant contribution to clinical teaching. After all the very basis of scholarship is founded in teaching and research. However, given the increased service commitments facing clinicians, as outlined earlier in this paper, it may be more appropriate to consider whether the teaching contribution of clinicians should be measured in terms of quality rather than necessarily quantity, even though many clinical course co-ordinators may be inclined to disagree.

There are three competencies for clinicians that relate to teaching in the CanMEDS 2000 project. The first involves maintaining a commitment to personal

continuing education. By modelling and making their own personal educational strategies visible, clinicians can provide powerful examples for their educational charges to follow. They can also assist trainees in facilitating self-direction in learning through assistance with goal setting and appraising. Their goal should be to help trainees to make the most of the experiences offered to them by setting goals, relating them to the curriculum and pursuing them.

Clinicians as scholars locate, use and appraise the best available evidence to inform their practice. Again the important thing is to value, model and make this explicit for those they teach. Not only should trainees be invited to existing or specifically planned critical appraisal sessions, they should be encouraged to locate, use and critically appraise evidence in ward rounds, patient presentations and throughout all of their clinical experiences. Clinical teachers need to constantly reinforce and apply the principles of evidence-based medicine and critical appraisal that their trainees have learned elsewhere.

Finally clinicians are responsible for facilitating the learning of others in their sphere of influence; patients, trainees and other health professionals. This follows on from the first of the competencies listed in this section. Clinicians need to demonstrate their own commitment to education and then establish a positive educational environment for all. Further they are in a unique position to act as brokers for the educational roles of others. They can enable residents to gain educational skills and experience through teaching students, and enable students to gain the same through teaching patients. Most importantly, clinicians can teach in a manner which recognizes the different educational needs of different groups in the clinical situation, thus demonstrating a fundamental educational principle to those associated with them.

The main conclusion to be drawn from all of the above is that clinicians are very well placed to establish a context or climate in which education can flourish. There is evidence that those being taught recognize the ability to establish a good educational climate as one of the distinguishing characteristics of effective teachers. Both Ullian *et al.*¹¹ and Irby²⁷ have put forward claims indicating that good clinical teachers are those that act as role models, effective supervisors, dynamic teachers and supportive persons. The former is based on evidence of studies of family practice residents and the latter in the literature on ambulatory teaching. It is far more productive to assess clinical teaching in these terms than just counting numbers of tutorials given or bedside encounters conducted. In order to achieve this there needs to be a climate of

change in the attitude of some employers. Good educational practice has to be seen to be a valid scholarly activity and should be subject to a reward system in the same way that other aspects of clinical practice are recognized.

The same arguments can be advanced for the scholarly roles of the clinician in research. Clinicians need to be committed to research and demonstrate such commitment to those associated with them. It may be very difficult to be an active provider of clinical service *and* teacher *and* researcher in contemporary health organizations but clinicians can make a significant contribution by the establishment of teaching and research as core values and activities in good clinical practice.

Conclusion: the clinical teacher as professional

As indicated in the introduction, this paper is concerned with the adaptation of clinical teaching to the realities of clinical practice in the 21st century. It is recognized that clinical teachers face increasing demands on their time and so need to be employed effectively. The paper, so far, has examined the opportunities for teaching arising from six of the seven roles of doctors as defined by the CanMEDS 2000 statement. What appears to be a pervasive theme throughout the discussion of the six roles is that clinical teaching is concerned with providing role models of good practice, making it visible and explaining it to trainees. If good clinical teaching is characterized in this way there is the potential to improve the quality of the teaching and perhaps to address the conflict between teaching and service. Thus it would be sensible to concentrate the efforts of senior clinical staff on these types of activities and leave the teaching of basic knowledge and skills to other staff, to other methods and in other environments.

The preceding discussions can be brought together through consideration of the seventh role, the clinical teacher as professional: 'deliver(ing) high quality care', demonstrating 'appropriate personal and interpersonal behaviour' and practising medicine in an 'ethically responsible' manner. These encompass all of the previous six roles. The important thing for trainees is that their clinical teachers act professionally, are seen to act professionally and ensure that their educational charges follow their good example. This ultimately is the single most important contribution that a clinical teacher can make as the health care environment around them changes and the nature of their work intensifies.

In essence, the message of this paper is simple; undertake good practice, demonstrate good practice

and explain good practice. This should result in good clinical teaching. This is an action agenda for those who would want to provide good clinical teaching. Faculty development should proceed from this model and value the experiences that clinical teachers bring rather than always taking them back to basic educational principles. Demonstrating and explaining good practice is not easy in the crowded days experienced by good clinicians. Finding ways of assisting clinicians to do this should be the basis of educational development for clinical teaching.

References

- 1 Skeff K, Bowen J, Irby D. Protecting time for teaching in the ambulatory care setting. *Acad Med* 1997;72:694–7.
- 2 Iglehart J. Forum on the future of academic medicine: Session 1 – setting the stage. *Acad Med* 1999;72:595–9.
- 3 Snell L, Tallet S, Haist S, Hays R, Norcini J, Prince K, Rothman A, Rowe R. A review of the evaluation of clinical teaching: new perspectives and challenges. *Med Educ* 2000;34:862–870.
- 4 Royal College of Physicians & Surgeons of Canada. *Skills for the New Millennium. Report of the Societal Needs Working Group. CanMEDS. 2000 Project.* Ottawa: The College; 1997.
- 5 General Medical Council UK. *Good Medical Practice.* London: The Council; 1998.
- 6 Kilminster S, Jolly B. Effective supervision in practice settings: a literature review. Unpublished paper prepared for the 10th Cambridge Conference, Townsville (Aust). 1999.
- 7 Calman K. The profession of medicine. *BMJ* 1994;309:1140–3.
- 8 Irby D, Ramsey D, Gillmore G, Schaad D. Characteristics of effective clinical teachers of ambulatory care. *Acad Med* 1991;66:54–5.
- 9 Calkins E, Arnold L, Willoughby T, Hamburg S. Docents' and students' perceptions of the idea and actual role of the docent. *J Med Educ* 1986;61:743–8.
- 10 Hewson M, Jensen N. An inventory to improve clinical teaching in the general medicine clinic. *Med Educ* 1990;24:518–27.
- 11 Ullian J, Bland C, Simpson D. An alternative to defining the role of the clinical teacher. *Acad Med* 1994;10:832–8.
- 12 Roter D, Stewart M, Putnam S, Lipkin M, Stiles W, Inui T. Communication patterns of primary care physicians. *JAMA* 1997;277:350–6.
- 13 Stewart M, Brown J, Boon H, Galajda J, Meredith L, Sangster M. Evidence on patient-doctor communication. *Cancer Prev Control* 1999;31:25–30.
- 14 The Standing Committee on Postgraduate Medical, Dental Education (SCOPME). *Multiprofessional Working and Learning: Sharing the Education Challenge.* London: The Standing Committee; 1997.
- 15 Green R, Cavell G, Jackson S. Interprofessional clinical education of medical and pharmacy students. *Med Educ* 1996;30:129–33.
- 16 Szasz G. Interprofessional education in the health sciences. *Millbank Memorial Fund Q* 1969;47:449–75.
- 17 Leatt P. Physicians in health care management: 1. Physicians as managers: roles and future challenges. *Can Med Assoc J* 1994;150:171–6.
- 18 General Medical Council (UK). *Management in Health Care. The Role of Doctors.* London: The Council; 1999.
- 19 Stritter FT, Bowles L. The teacher as manager: a strategy for medical education. *J Med Educ* 1972;47:93–101.
- 20 Baldwin PJ, Newton RW, Buckley G, Roberts MA, Dodd M. Senior house officers in medicine: postal survey of training and work experience. *BMJ* 1997;314:740–3.
- 21 Finocchio L, Bailiff P, Grant R, O'Neil E. Professional competencies in the changing health care system: physicians' views on the importance and adequacy of formal training in medical school. *Acad Med* 1995;70:1023–8.
- 22 Evans J. The 'health of the public' approach to medical education. *Acad Med* 1992;67:719–23.
- 23 Jobe A, Coale M, Colasa K, Willis I, Irons T. Leadership development for medical students – beyond the prescription pad. *Family Med* 1993;25:179–81.
- 24 Paine R, Sachs R, Krause T, Braeske M, Meyer W, Andrea W. Educating medical students and residents as health protectors and patient advocates. *Am J Prev Med* 1993;9:117–21.
- 25 Lozano P, Biggs V, Sibley B, Smith T, Macuse E, Bergman A. Advocacy training during paediatrics residency. *Paediatrics* 1994;94:532–6.
- 26 Berwick D, Nolan T. Physicians as leaders in improving health care: a new series in *Annals of Internal Medicine.* *Ann Intern Med* 1998;128:289–92.
- 27 Irby D. Teaching and learning in ambulatory settings: a thematic review of the literature. *Acad Med* 1995;70:898–931.

Received 11 April 2000; editorial comments to authors 5 May 2000; accepted for publication 7 June 2000