

The world turned upside down: proposals for community-based undergraduate medical education

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Introduction

TWENTY-FIVE years ago George Swift started the first vocational training scheme for general practice in the British Isles, probably the first in the world. I qualified in 1952. To later generations, it is difficult to convey the sense of catastrophe in general practice at that time. Leisured fee-earning and cottage-hospital surgery by general practitioners, thought to be the growing points of peripheral excellence, had been beheaded by the National Health Service (NHS) Act of 1948. Few medical leaders at that time understood that a decommercialized, universally available service marked not the end, but a new beginning. Were it not for George, and others like him in the early years of the Royal College of General Practitioners, British general practice would still be turned peevishly toward a sentimentalized past, rather than actively engaged in developing its own future. We would still be in a reasonably comfortable dustbin at the bottom of a lengthening specialist ladder. Now British general

practice is heading once again for a crisis of structure. As in 1948, it is a crisis of growth, though perceived by some as a crisis of decline. In this lecture I want to deal with the part of undergraduate medical education, both as a contributor and a potential solution to that crisis.

The people we have

Britain's doctors, or at least the medical students who give them birth, are the cream of the cream. Competition to enter medicine is greater than for any other profession. This has permitted our deans to raise A level requirements each year, while continuing on ceremonial occasions to deplore the apparently irresistible trend to bigger brains and smaller imaginations. In 1983 62 per cent of medical school applicants had two or more A levels at A grade, compared with 28 per cent of applicants for university places generally. Medical students are also younger than those entering other faculties, with an average age of 18.9 years at entry, compared with 19.1 years. They are also the cream of society. Social Class I (2.8 per cent of our general population) provides 40 per cent of our medical students. Though only 29 per cent of school leavers with three or more A level passes have been educated privately, they get 57 per cent of medical school places.^{1,2} The propensity of medical students to pass examinations continues through their university education; only 10 per cent of entrants fail to qualify. If there is anything wrong with medical performance, it cannot be blamed on the raw material.

Though no one denies there is still some room for improvement, our medical schools teach and our students learn better than ever before. Our graduates, looking at medical education any decade later, must surely agree that their schools are better organized, more humane, and more conscious of the society they serve, than they were. Steadily more critical within their own paradigm, our medical schools, like the students who enter them, are reaching a state of asymptotic excellence.

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If we accept, as Society and our profession generally does, that hospital-based specialist physicians and surgeons face the most complex, arduous, and prolonged training of all doctors, production of these in sufficient numbers should be a reasonable test of the success of medical education generally. The one-third of all medical graduates who become hospital specialists are sufficient to meet all our needs, and there is no shortage of trained people for any necessary expansion of the consultant grade. No one, so far as I know, has suggested there is any general failure of consultants to perform satisfactorily the work for which they have been trained. The only perceived limits to specialist excellence are its shrinking resources, relative to North America and Europe; dwindling ancillary man- and woman-power, decaying buildings, and obsolete equipment. Although I believe the established model of specialist excellence will have to be revised when we have settled the more fundamental problem of inadequate primary care, in terms of current thinking, all the problems of specialist training are either solved, or on the way to solution.

But what about general practice, which still accounts for 57 per cent of all our medical graduates? By looking at the state of primary care abroad, we can reassure ourselves that we are not doing too badly; but in absolute rather than relative terms, general practice is a disaster area.

How else can we explain that a retiring professor of family medicine, an active and universally respected architect of the renaissance of British general practice which began so promisingly in the 1960s, is in 1984 forced to ask the question, 'Is good general practice possible in the average circumstances of urban Britain?'³ After all we have done by establishing departments of general practice, by encouraging elective periods in the community, by introducing population medicine into the undergraduate curriculum, above all by establishing mandatory postgraduate training for general practice as a specialty, Wilkes reaches conclusions with which most of us must reluctantly agree:

'The pace of change is very fast and one can be as out of date at 40 as at 65.

One has to accept the failure, so far, of the vocational training schemes to instil any pattern of genuine continuing education. The national figures of attendance by general practitioners at approved educational sessions are pathetic. It has been said that the only achievement of vocational training is to have made some good practices rather better. The harassed and isolated majority remain untouched. Not for them the age-sex registers, case finding, or high quality surveillance of chronic disease. No teachers' workshops for them, but just the busy surgery sessions for which they feel already grossly overtrained. . . . One remembers the description of the French military brothel as sacrificing quality to speed of throughput. This, more than Balint, is our sort of world!

All of us in areas of industrial decline and social dereliction feel we have failed some of the time, and some feel they have failed all of the time. If we are indeed 'already

grossly overtrained' for what we do, is it surprising that so many fail to seek further training? They have already discovered that the definition of good doctoring they learned in their teaching hospitals was inappropriate to the work that they do. Perhaps with relief, they abandon the long, competitive struggle that began at school with ruthless pursuit of A levels, and they slide down to rejoin the human race, with a guaranteed income which will be neither improved by excellent doctoring nor impaired by abdication from serious clinical responsibility.

The definition of what good doctoring is remains in the hands of hospital-based specialists. In one large and apparently typical British medical school for which I have figures, 29 per cent of undergraduate teaching time is in the hands of non-clinical basic scientists, 68 per cent is in the hands of hospital specialists, and 3 per cent is in the hands of departments of community medicine and general practice. Medical students, more than half of whom have been isolated from ordinary social experience by private secondary schooling, are further estranged from the society they are to serve by three years of academic medical sciences, possibly including a little book learning about human behaviour, and finally subjected to five or six years of total immersion in hospital clinical medicine, virtually excluding contact with the outer world. Finally, the 50 per cent or so of all students who are to become general practitioners are given one year's remedial apprenticeship with a working general practitioner and one session a week on a day release course, hopefully to glimpse alternative definitions of good doctoring, appropriate to the community primary generalist. They may then come to realize, perhaps for the first time, that the preconditions for the practice of scientific medicine generally do not exist in the community, but have to be created by young doctors themselves, in violation of most of what they were taught, and often in opposition to established practitioners who have capitulated to their world as it is. Those who succeed do so despite their undergraduate training, not because of it. Without adult social experience, they are schooled in imitation rather than innovation, as personal adventurers rather than as team workers, and as secondary omnispecialists on the edge of the community, rather than primary generalists within it. Medical students with a capacity for autonomous innovation in real communities should be adults, preferably with other work experience,⁴ as 40 per cent now are in Denmark and Sweden,⁵ an experience our medical schools have ignored.

Our system of medical education is still designed to produce community clinicians only as a byproduct, an afterthought following a core curriculum designed by and for specialists. Its central aim remains the production of specialist excellence, unsullied by prior contact with the society it serves. It is training the wrong people, at the wrong time, in the wrong skills, and in the wrong place. The core curriculum for all doctors should be primary care: this should be taught where it is actually carried out,

within communities; and the primary generalists produced in this way require not a year or two of rehabilitation in specialized vocational training, but a lifetime of in-service postgraduate study. I must emphasize this last point, because I do not have time in this paper to develop it. Undergraduate medical training can only be shortened and simplified, if there is a truly revolutionary expansion of in-service postgraduate training available to and used by all members of the primary care team throughout their working lives.

The people we need

Perhaps you think I exaggerate in speaking of general practice as a 'disaster area'. Whatever its faults, general practice, quantitatively and qualitatively, is better now than it was. It is better where it has always been good, in the country towns and commuter villages; and better where it has always been bad, in migrant slums, industrial areas, and their genteel suburbs. Most of all, we are beginning to stop pretending that things are better than they are; we are beginning to measure what we know is important in our work, and to measure our omissions as well as our acts.⁶

What do we find when we make these measurements on whole populations, on variables which lie at the very heart of clinical responsibility, such as the management of diabetes, high blood pressure, or asthma? These are conditions in which control is usually possible and worthwhile, and they can be regarded as reasonable indicators of the quality of care.

In a randomized study comparing care of diabetics by general practitioners and hospital specialists over a period of five years, Hayes and Harries⁷ found only 14 per cent of patients were reviewed annually by general practitioners, compared with 100 per cent by specialists, and death rates were three times higher in the GP group. This confirms the findings of other studies. For hypertension, random samples of men over 20 in London have shown that in 1982 between one-half and one-third had had no blood pressure recorded by their general practitioners over 10 years, nearly half of all treated hypertensives had been started on drugs after only one reading of this very unstable measurement, and over two-thirds of them had had no investigations of any kind.^{8,9} Again, these results have been confirmed by other studies. Of 38 Birmingham patients who died from asthma outside hospital, not one had ever had any measurement of airways obstruction, despite an average duration of illness of about 15 years.¹⁰ The normal population distribution of peak expiratory flow rate (PEFR) was first defined by a general practitioner,¹¹ the possession of a peak flow meter has been an elementary requirement of responsible general practice for at least 10 years, innovative general practitioners have shown that regular measurements of PEFR give warnings of serious attacks,¹² and early use of nebulizers and steroids can make hospital admission unnecessary;^{13,14}

but these methods developed by progressive general practitioners have not become the norm.

Innovative practices long ago proved that control of hypertension¹⁵ and diabetes¹⁶ by general practitioner teams can be as good as or better than in any hospital clinic, and general practitioners with an energetic approach to childhood asthma find a dramatic fall in the need for hospital admissions; but the methods developed in these practices have not become general, and in areas of greatest need they are still almost unknown.

As earlier, simpler, and more effective interventions become possible for an ever wider range of diseases, customs and institutions evolved to maximize placebo effect are becoming obviously inadequate. Science is no longer an optional weapon for occasional use in major disease. We are into a new era of effective, and therefore potentially dangerous, therapeutic weapons. They must be used accurately, with discrimination, and on the whole appropriate population at risk, for their full benefit to be realized in practice. The doctor's sick shop, relying on episodic presentation of symptomatic illness, is inadequate for conservation of community health or the effective application of medical science.

The rectangular wheel

The social philosophy underlying existing undergraduate medical education resembles a bicycle wheel. The teaching hospital is in the hub of this universe. The periphery, though essential to the function of the whole, is inch for inch less important than the quality of the centre. Action and direction are transmitted from the centre to a passive periphery, whose principal quality is ability to connect with an irregular, unpredictable, and apparently irrational world, without buckling or transmitting too many knocks to the centre.

As the hub becomes more excellent, complex, and delicate, it becomes less tolerant of leaks at the periphery. If, on a mass scale, general practitioners fail to apply simple but effective measures for detection and anticipatory care of (for example) diabetes, high blood pressure, and asthma, one solution is to extend the qualities of the centre to the periphery. This starts with ad hoc community extensions from single departments, and logically ends with a solid wheel, all centre and no periphery, immensely expensive, and poorly adapted to the irregularities of the real world of multiple rather than single pathologies.

This process has already begun. Where general practitioners fail to occupy and develop areas of clinical responsibility they have hitherto claimed as their own, hospital departments have improved and expanded outpatient care of type II diabetes, reached out into the community to screen for hypertension,¹⁷ and organized direct access to hospital for childhood asthma, with a fivefold increase in self-referrals in one region between 1970 and 1978.¹⁸ If these developments prevent blindness, strokes, and

childhood deaths otherwise not prevented, they are morally irresistible, and will be restrained only by cost.

For some time to come, that immoral restraint will hold. We have that time to solve a real but paradoxical problem; how can we re-educate and remotivate general practitioners who entered medical schools as highest possible achievers, were then educated in the basics of all major specialties and gained practical experience of hospital medicine over two or three years, but when dumped into the real world apparently lost the ability or the will to organize simple but necessary monitoring of chronic disease for their whole registered populations?

Part of the answer is simply to recognize that this failure has less to do with the skills of doctors, than with the organization of their work and the way they see their responsibilities. Hospital specialists take for granted a clinical team backed by office staff and equipment, able to plan their work sessionally, identify defaulters, and delegate tasks to a variety of staff. All these procedures, and the staff necessary to operate them, remain exceptional in general practice. No amount of re-education of general practitioners in hospital specialism will make it possible for one man to combine in himself all the skills, and the time required to exert them, of hospital outpatient teams. Our hospital-based teachers create students in their own image, but are unable to teach the creation of teams in the community where none has existed before. They are able to reproduce the hub of the wheel, and some spokes, but they leave the production of rims and tyres to chance, or to vocational training schemes, which sometimes are almost the same thing.

Divisions of labour

General practitioners who organize seriously for anticipatory care have learned to delegate responsibility to practice nurses. From the Burlington randomized controlled trial of nurse practitioners in Canada,¹⁹ we already know that nurses trained in primary care skills, and given twice as much time for each consultation, perform just as well as family doctors with a conventional hospital training, over defined but wide areas of responsibility. When I visited the United States in 1975 and 1982, I found that in many ways my work resembled that of a nurse-practitioner more closely than that of an American family physician. I did house calls and night calls, he did not; he did hospital rounds each morning, I did not; he earned at least \$30,000 a year, the nurse practitioners and I earned about \$15,000.

Encouraged to act autonomously, nurses become excellent clinicians. Of course, they have limited competence; but so have we all. The age of the omniscient doctor ended when medicine began to be more real than illusory. All of us have to learn both our limitations and how, if necessary, our limits can be extended. Practice nurses are coming closer to us as autonomous clinical colleagues, and we are coming closer to them in appreciating the im-

portance of teamwork and organization.

Future undergraduate medical education should merge part of the training of doctors with the training of nurses, more of whom, like doctors, will in future work in the community rather than in hospitals. What is the critical difference between the nature of doctoring and the nature of nursing? The question has become real ever since the United States, transiently unable to provide doctors for unprofitable populations, encouraged the emergence of nurse-practitioners,^{20,21} I suggest that the fundamental difference has lain in the autonomy of doctors and the subordination of nurses. Historically, nurses were schooled in blind obedience, enslaved to routines rooted in dogma as much as in science. The nursing profession has now emancipated itself, modelling on our already obsolete professionalism. Nurses can no longer be subordinate to doctors, but since it is still assumed that they must be obedient to someone, they are now subordinate to nursing officers, many of whom no longer have personal responsibility for patient care. I think most general practitioners with experience of working in a real primary care team suspect that nurses, with appropriate in-service postgraduate training and having escaped from their servile traditions, are just as capable as doctors of acting autonomously. They have the same difficulty as we do in accepting clinical decisions made by superiors without recent experience of carrying them out. Effective primary health workers in the future will combine features of both medicine and nursing, all community health workers will share a common core curriculum, and the curiously egalitarian British medical tradition, in which respect for authority depends on its continuing clinical responsibility, may extend to all health workers.

Rebirth or senescence?

Even if we accept the aim of reversing the proportions of undergraduate clinical teaching time from 96 per cent in hospital and 4 per cent in or about the community, to 4 per cent in hospital and 96 per cent in the community, the obstacles are at first sight insuperable. Even 1 or 2 per cent shifts in curriculum require lifetimes to achieve. One moribund professor of any basic medical science can be impregnable, if supported by allies in clinical departments with their own reasons for agreeing with him. This entrenched resistance will be compounded by the fear of virtually all general practitioners of what they must at first see as downgrading to nurse/practitioner status, and the creation of a two-tier profession. Although training in the skills of secondary and tertiary care is almost entirely unnecessary in all but the most isolated British general practice, it is a powerful reinforcement of status. Finally, even an undergraduate qualification in medicine is still to some extent an international commodity. Undergraduate clinical training in the community would have immense difficulty in securing equal standing with traditional hospital training, nationally or internationally.

It is therefore not difficult to reassure ourselves that such a change, however rational or desirable, is impossible. It certainly will be, if we go about it by frontal attack, for example by utopian schemes for creating an Open University medical school with distance-learning projected by central theoreticians to some hypothetical network of peripheral learning groups, or if we base our strategy on appeals to egalitarianism, fashionable anti-science, or sentimental conceptions of pastoral care.

On the other hand, it is clearly intolerable that as a nation we should continue at huge expense to train all doctors to be nascent specialists, and then retrain about half of them to be community generalists, only to find a gross shortfall in their performance of elementary clinical tasks whenever these are measured against whole populations at risk. The inappropriate undergraduate training of general practitioners means that even after vocational training, many are unable to organize health maintenance in the community, and are at the same time frustrated by withering of the hospital skills they so painfully acquired, and on which they think their status depends. The incomplete undertaking of generalist responsibilities means that specialists still have to carry out generalist tasks in hospital outpatient departments and even in wards, which they are not fitted for because they have virtually no in-community training. They are therefore unable to concentrate on their specialist functions, and unable clearly to define a cooperative interface between primary and secondary levels of care.

Undergraduate education is not even based on secondary care in district hospitals, but on tertiary care at centres of excellence. Are super-specialists really helped in their work by having responsibility for undergraduate teaching? Greater concentration of high technology and postgraduate specialist training at tertiary centres is necessary for a planned and cost-effective NHS. In return, super-specialists might be willing to loosen their hold on undergraduate training. Our centres could thus become more excellent, and we might at last be able to start improving the periphery by investing in it directly, rather than by creating so great a surfeit of excellence in teaching hospitals that a little may trickle down to the bottom; a familiar relationship between rich and poor.

As medicine becomes scientific and real rather than scientific and illusory, teaching at all levels has to come to terms with the fact that excellence in science lies in the integrity and imagination of its practitioners, not in the nature of its tools or its substrate. The technical advances of the past 20 years, particularly in information technology, favour the periphery more than the centre. It is becoming increasingly difficult to make real and relevant advances in human biology by dealing with selected rare or exceptionally serious pathologies in hospitals. Of course, salvaging advanced disease is one growing point in medicine and always will be, but the most rapid and cost-effective innovation now can and should be at the other end, arresting or reversing early pathology as it

occurs in the general population where it actually lives and works. Medicine exists to change natural courses of events, to change bad practices for better. Where better to teach about change than at the grossly imperfect periphery, where the need for change of every kind is so obvious? Centres of excellence only invite imitation, and can only show change as marginal and incremental. Teaching in and by community-based teams, on the other hand, could introduce a dynamism long absent from our hospitals. The logic of real human needs will, despite all opposition, eventually gain the support of doctors with real respect for medical science, at whatever level they work.

Changes on these lines have already begun in many countries: at the Suez Canal Medical School, Ismailia; at Maastricht and Limburg in the Netherlands; at Liaköping in Sweden; and at the University of New Mexico school of Medicine at Albuquerque.²² Even in Britain, some departments of general practice are beginning to improve the quality of primary care on their doorsteps,²³ rather than lay them waste as they have done in the past. General practice has no more than a toehold in British medical schools, and we are far behind countries like the Netherlands where reorientation toward primary care in the community has had material government support, not just verbal blessing; but our departments of general practice and community medicine could rapidly become growing points for an extended network of undergraduate teaching, if we had a government that did not just talk about preventive and anticipatory care, but was prepared to pay for more people and new people to do it. Most of all, if our postgraduate centres were guaranteed the medical and lay staff they need to organize lifelong in-service education for all doctors, nurses, and other community health workers, and if we reverted to a general practitioner contract that actively encouraged such education, we would have the beginnings of the peripheral educational network required for undergraduate teaching in the community on a mass scale.

Practice determines education

In apparent contradiction with all this, George Silver has written that 'Medical education is a reflection of medical practice; it is not the education that will change the practitioners, but reformed practice that will redesign medical education'.²⁴

Exactly so. For many reasons I do not envy my colleagues who shoulder the burdens of our underthanked, understaffed, underfunded, and often undermined academic departments of general practice; but the biggest reason of all is that they are generally not where most of the action is going to be. In a truly civilized society, medical care is a public service, and medical education is a public concern. The people must ultimately decide what kinds of doctor they want. Just as we have in the past underestimated the wisdom and intelligence of our

patients, so have we also underestimated the wisdom and intelligence of the people. In a Gallup poll in 1983, 71 per cent of respondents thought the Government spent too little on the NHS, and 49 per cent thought the Government spent too much on armaments.²⁵ There is a mandate now, there has always been a mandate, for any political leader courageous enough to admit that Britain's real reputation in the world has gained more from its humane and decommercialized health service available to every citizen, than from its ability to sink obsolete battle-ships or to contribute to the final destruction of our planet.

We are on the eve of immense social changes, which will move further and more rapidly than we can now conceive, in directions scarcely foreseeable by any of us. We can be certain only that irrevocable social shifts have already begun, which will change the structure of the NHS, particularly at its foundation in primary care. The social structure of medical practice, and therefore of medical education, was developed when medical care merely flirted with science, but was married to the cockshure certainties necessary for the placebo effect. These structures are inappropriate and limiting now that medical care, like other sciences, can actually change outcomes, and depends on measurement and doubt. Through our own efforts, practice is already changing, and this puts some pressure on undergraduate training for changes in the same direction. But these will not attain a mass scale until a large majority of our entire society becomes as convinced as it was in 1945, the true year of birth of the NHS, that all of us will have to live, work and learn in a new way.

In the storms to come we shall need a compass which points in the direction of care in, by and for communities; not abstractions, but real places in which people actually live and work, in which doctors will be trained as effective participants, not shopkeepers, handers-down of threadbare charity or sterile emissaries of a medical science still remote from the people. I hope George will approve.

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Theophylline and airway obstruction

The authors studied the effects of theophylline on diaphragmatic strength and fatigue in 15 patients with severe chronic obstructive pulmonary disease. Diaphragmatic strength was assessed by measurement of the transdiaphragmatic pressure generated at functional residual capacity during a maximal inspiratory effort against closed airways. Diaphragmatic fatigue was induced by resistive loaded breathing. The electrical activity of the diaphragm was recorded with an esophageal electrode during the fatigue runs, and the high-low ratio of the electrical signal was analysed to assess diaphragmatic fatigue. Studies were performed before and after 7 and 30 days of theophylline administration (mean plasma level, 13 ± 2 mg l⁻¹). A control group received a placebo instead of theophylline. Theophylline increased maximal transdiaphragmatic pressure by 16 per cent after 7 days of administration ($P < 0.01$), and this increase persisted after 30 days. No significant change in maximal transdiaphragmatic pressure was observed in the group given the placebo. Theophylline also suppressed diaphragmatic fatigue in all patients who received it. The authors concluded that theophylline has a potent and long-lasting effect on diaphragmatic strength and fatigue in patients with fixed airway obstruction.

Source: Murciano D, Aubier M, Lecocguic Y, et al. Effects of theophylline on diaphragmatic strength and fatigue in patients with chronic obstructive pulmonary disease. *N Engl J Med* 1984; **311**: 349-353.