Is Increasing Specialisation Counterproductive?

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Background

All healthcare systems in the developed world face an increasing demand for healthcare and budgets that are finite. The grim reality is that there is little supportive evidence for many widely-used interventions. It is easier for the time-pressured doctor to write a prescription or defer to an investigation than take a full history, conduct an examination and make the best opportunity of the consultation to get to the root of the patient's problem. As many diseases are self-limiting, patients managed by this process do not automatically come to harm, but precious resource is wasted either on medication or investigation when a better-trained doctor, able to make a diagnosis and offer an informed explanation at the initial consultation, would be far superior.

Traditional Practice

My experience in trauma and orthopaedic surgery will be similar to those in all branches of medicine. I started consultant practice a quarter of a century ago. There was one consultant per 70,000 population and seven registrars to meet the needs of a city of 700,000. Many of us developed a special interest and cross-referral was common. The consultant staff in all specialities met weekly to discuss difficult cases and daily over the lunch table in the doctors' dining room to share and resolve patients' problems and the business of the hospital. Lines of communication were short and the cost of running the service manageable. Those times should not be viewed entirely through rose-tinted spectacles. These were not halcyon days for some patients. Those with a fractured hip waited days for surgery, and arthritic hips, years. There were not enough of us to deliver the service we would have wished for our own relatives and expansion was necessary.

Medical Manpower

Accordingly, the medical schools expanded exponentially from 1969. It became apparent that the additional students were either females or postgraduates. My own medical school has since quadrupled the number of undergraduates and the undergraduate intake of my adopted medical school is 70 % female, and fewer males graduate than 25 years ago. After registering, a high proportion of the females elect for part-time work. If medical graduates work half-time, the cost to the state of their training doubles, the experience they acquire is diluted, more doctors work fewer hours, and they gain less experience. Less experience means less well-informed decisions and greater reliance on investigations. More doctors have not solved the medical manpower problem and less experience has reduced its versatility.

Experience of Medical Manpower

Limited working hours result in specialists who are perilously short of general clinical experience on completing higher training.

The current requirement is that an orthopaedic specialist registrar be involved in 1800 operations over the six-year training programme. One-third of these will actually be performed personally. A dextrous trainee 30 years ago would have performed 600 cases in a year. The fate of the current specialist registrar is super-specialisation manqué. The final two years of training are spent honing super-specialist expertise on fellowships at the expense of general skills. This means that general skills are further compromised on taking up a consultant post. Super-specialisation is quite appropriate if patients' diagnoses are straightforward and fall neatly into an approved care pathway. However, sick patients present as emergencies 138 hours of the week outside normal working hours, and need to be assessed by doctors with the general skills needed to diagnose and treat their problems.

The standard of the old FRCS was set to a level at which the successful diplomate could be expected to provide emergency care in all surgical disciplines. This has long ceased to be the case. The surgeon responsible for general emergencies must be proficient in performing a laparotomy. However, laparotomy is not routinely practised by those whose days are spent in breast surgery, reducing the numbers of consultants capable of staffing an emergency take.

Productivity and Development of the Workforce

The consultant workforce has rapidly expanded, but output has not increased proportionately. The orthopaedic consultant workforce has trebled over the last ten years but output has actually fallen over the last two. Straightforward operations have been diverted from the teaching hospital to independent treatment centres or the private sector. There are fewer cases on which to train the next generation of surgeons. List utilisation falls when consultants are away, as the registrars lack the experience to perform standard operations effectively.

The European Working Time Directive (EWTD) enjoys a mixed reception amongst junior doctors. Trainee surgeons are conscious that it reduces their experience and compromises their ability to succeed in their chosen speciality. In other specialities, fewer hours are seen to improve the work/life balance. Continuity of patient care has long been abandoned and even ceased to be a consideration. It is extremely difficult to recruit a full partner in general practice in the plusher areas of Bristol as salaried partnership or locum work affords sufficient remuneration and saves the time and responsibility of running a practice.

Medical School

The consequence of this is entirely predictable. Less medical manpower means more students to train more doctors. More students mean dilution of tuition at medical school. The newly-qualified doctors have less experience and fewer practical skills than their predecessors. Their clinical contribution is restricted by the skill set with which they graduate. Medical schools need to target their resources at the students and course content that will produce good doctors capable of providing a service to the nation that educated and trained them.

Selection

Selection to medical school is based on predicting how likely the candidate is to complete the course. A-level Chemistry seems the closest correlate, although longitudinal data from graduation becomes sketchy after the first higher diploma e.g. MRCP. The best and brightest apply, but is there any consideration of the likelihood that these lively 18-year-olds will give 35 years' service to the nation that is paying for their tuition? If positive discrimination can be applied to those from deprived secondary schools, why not to expensive places at medical school? Medical school trains rather than educates. There is little time on the curriculum for intellectual development. The medical course favours the student who can retain information rather than understand it and, if the doctor is not going to practise, she or he would obtain a far rounder education reading another subject.

Preclinical Content

The medical course is a crowded mix of competing interests. The undergraduate's brain is treated as an unlimited sponge designed to absorb infinite items of information. The volume is so overwhelming that the average undergraduate cannot retain it all and, in despair, rote-learns the anticipated content of forthcoming examinations. Anatomy is one of the bases of medicine. In an abbreviated anatomy course at one of the new medical schools, students are still required to learn the branches of the facial nerve. The clinical condition of the facial nerve that doctors are most likely to encounter is Bell's palsy. In Bell's palsy, the nerve is compressed in the facial canal, not in the branches that pass through the parotid. Knowledge of these branches is essential to the surgeon performing a parotidectomy, but only a few head and neck surgeons will ever perform this procedure and this anatomy could reasonably be learned as part of postgraduate training. Notwithstanding, a time-honoured mnemonic is committed to memory for no useful reason other than precedent. It could be argued that precedent is an adequate reason but, when my rheumatology colleague complains that some of his undergraduates are unable to identify the femur, the gratuitous detail of the anatomy course has obscured its relevance to basic clinical practice.

Clinical Content

The clinical course needs to teach not only the subject, but the ethos of medicine. The traditional attachment to a 'firm' gave the medical student the opportunity to be involved in the teamwork of patient care from an early stage, performing venepuncture, clerking on take and assisting in theatre. Their contribution was rewarded with additional teaching and the opportunity to undertake minor procedures. The 'firm' no longer exists as the EWTD channels the junior staff to shift-work. Recovery time after nights and absence during the working week conspire to dilute their experience and retard their training. Students learn by example. They accept what they see. They cannot appreciate the importance of continuity of care if they do not observe it and, instead of serving a rewarding apprenticeship, they are dispatched with a checklist of clinics, theatre

sessions and classes to attend, at which they are largely spectators. They see their consultants once or twice. The consultants provide the only continuity of care, work excessive hours to maintain a service, and offer such training as they can. The students are not present so are not exposed to this vital ethos of medical practice. Students perceive that their absence from clinical sessions will not be noticed and, suitably uninspired, skip classes. The outcome of all this is that students approach finals with a flimsy knowledge of medicine, little capacity to relate to patients, and almost none of the exposure to the teamwork necessary to run a coherent practice. The clinical years have become a version of preclinical with different textbooks, little experience of relevant medicine, and more of the same old commitment of gratuitous detail to short-term memory and examination of the same.

Overview of the Undergraduate Course

It should be possible to define, teach and examine a curriculum that covers the clinically relevant basic science and conditions that kill or cripple or are common. Attempts to teach everything mean that the undergraduate remembers little. The attempt to teach everything results in short-term retention of exhaustive lists of conditions of which few are serious contenders in a sensible differential diagnosis. There is little point teaching primary bone tumours, as approximately one case will ever be encountered by two entire years of undergraduates if they all work full-time until retirement. Rather, the student should be taught to recognise the common and seek advice when a different pattern of disease presents. This can only be acquired by bedside experience. Computer simulation is a poor substitute for this, and politically correct psychologists for seeing a really good clinician relate to a sick patient. The clinical undergraduate becomes dispirited by examinations that are unrealistic and fail to reward diligent preparation. Intelligent 18-year-olds emerge as defensive victims of their medical course, afraid to answer a question in case they get it wrong, rather than energetic young doctors anxious to learn, and learn from their mistakes.

Postgraduate Training

Having graduated, the young doctor is on acute take once a week if lucky. Foundation programmes have insufficient places in the acute specialities to accommodate their trainees. The doctor emerges after two years with less experience than his forbears did after one. Attending the operating theatre is a rarity, and there is a delay in the acquisition of basic surgical skills often until the fourth decade when the art of finding a tissue plane should have been acquired ten years earlier in the dissecting room.

Of course there are skills training courses, but the delegate at these dutifully makes an incision in pig or turkey skin, sutures it up and then fails to reinforce the learning by applying the skill in clinical practice. Minor suturing in emergency departments is now the province of the nursing staff.

The art of diagnosis has become suborned to investigation in lieu of clinical assessment. The accurate investigation of deep venous thrombosis is radiological, but that is an exception. In musculoskeletal disease, radiographs of the wrong joint of a patient who has never been examined are routine. They expose the patient to avoidable radiation, incur unnecessary costs, and delay the true diagnosis with false reassurance. The patient is not examined because the attending doctor is uncomfortable with musculoskeletal assessment, and has reinforced this knowledge gap by avoiding the history and examination that are the basis of all clinical practice.

The problem emerges of a relatively well-paid workforce that lacks the experience and exposure to be able to assess the general wellbeing of the patient, is comfortable within a small range of disease, and relies on investigation instead of clinical acumen. The outcome is delayed diagnosis, yo-yo referrals to the wrong specialist, excessive investigation and a worse outcome at excessive cost to the service.

This is not a sudden response to the European Working Time Directive. Asher[1], in 1959, cited the case of a dull child with retinitis pigmentosa who was seen by an ophthalmologist. The latter suspected Lawrence-Moon-Biedl Syndrome (low intelligence, retinitis pigmentosa and polydactyly) and suggested referral to an orthopaedic surgeon to confirm the last of this triad by counting the fingers. Mayou[2] in 1994 noted the poor outcome of patients with non-cardiac chest pain who were dismissed to the care of their GPs by cardiologists. The GPs had already played their diagnostic hand so the patient was left in limbo with a diagnosis of 'not my patch, guv' from the long-awaited consultation. This was not just poor communication skills but inadequate general medical knowledge.

Calman (2007)[3] calls the general practitioner the 'new general physician'. The few who did long hours of emergency takes on rotations leading to MRCP and did so 20 years ago indeed fulfil that role. Sadly such doctors are the rare exception. More likely is the career GP who may have done a year of medicine on reduced rotas and simply has not had the exposure to make good the weaknesses of general skills in secondary care. For the general practice to be an effective gatekeeper, there must be prompt, accessible and informed support from secondary care. In my own city, GPs are virtually prevented from referring to orthopaedic surgeons and are obliged to channel patients with musculoskeletal disease to community physiotherapists with no ties to or support from secondary care.

Thus subacromial impingement is diagnosed as 'diffuse upper limb dysfunction'. Secondary adhesive capsulitis develops in response to the chronic pain. Pain radiates down the upper limb as the brachial plexus is stretched by trick scapulothoracic movements. Radiological investigations and nerve conduction studies are ordered with the attendant delay. They are not diagnostic so the patient is told that there is nothing wrong with them. The patient becomes miserable with the pain, loss of sleep and functional limitation, antidepressants are suggested, and this expensive and ineffective apology for clinical medicine becomes the accepted norm. The GP is discouraged from taking matters further by commissioning bodies and becomes resigned to the status quo. The patient's quality of life stays avoidably diminished and the service has paid out for management that was ever likely to fail because the clinical input was ineffective.

Potential Improvements

Selection of Medical Students

The definition of a good doctor is difficult but, no matter the academic brilliance, the first requirement is that the doctor turns up, empathises with the patient and is competent at clinical assessment. I have found no literature that explores this outcome measure except part-time work. Within 10 years of graduation, 9 % of males and 50 % of females work part-time. This increases by another 5 % in both genders by 15 years[4]. Academic ability at 18 years of age is an incomplete predictor of performance at medical school and the early postgraduate years, and certainly of output as a doctor. If half our graduates are working part-time after 10 years, there is a pressing need to identify those with the potential for full-time commitment.

The Undergraduate Curriculum

The whole process of training doctors needs to be revisited. Medical school manages to demotivate more of its students than it enthuses. This commences with the gratuitous detail of the anatomy course. Revisiting the anatomy texts reveals noble attempts to bring clinical relevance to the material, but they suffer from inadequate clinical input. Anatomy and the basic sciences may be taught by inspirational scientists capable of conveying the excitement of their subject. Sadly, they are generally the remit of the PhD in medical sciences, whose flame of original thought has long since been extinguished, so is relegated from the laboratory to the lecture theatre. Such personnel cannot design the material needed by nascent clinicians and the course needs to be redefined by practising clinicians in the appropriate speciality. Not a single well-known anatomy text covers the dynamic action of muscles on joints.

Clinical Course

The need to train generalists is compromised by the super-specialisation of hospital consultants. It is quite clear to the examiners of our orthopaedic undergraduates if they have been tutored by a knee surgeon. They are great on the knee but cannot examine a hip. The demise of the senior registrar has been highly destructive to the general training of specialists, the treatment of emergencies and the education of undergraduates. Such trainees had general skills and were adept at passing them to the next generation. The reintroduction of the grade should obviate the need for 'junior' consultants and turn out a much rounder clinician at consultant level. The 'firm' should be reestablished and the apprenticeship restored. Some 50 % of UK graduates feel unprepared for pre-registration house officer duties, and this is a potent reflection of the poverty of the current course[5]. My own students were required to be able to recognise a fractured triquetral radiographically before finals. They might have grimly recited the carpal bones with difficulty, but would not have recognised that an old lady who had fallen and was unable to bear weight had probably broken her hip unless it was shortened and externally rotated. This gratuitous detail just clutters the mind of our undergraduates.

A new realism is required in the undergraduate course, and each speciality should define a minimal curriculum of the critical conditions with which a doctor must be familiar to ensure patients do not come to avoidable harm for want of adequately trained medical staff.

Postgraduate Training

The essence of medicine is the general approach. A much more stringent training in the subject in general must be undertaken before developing a special interest.

The general skills needed to treat the sick and the idea that the profession is a way of life instead of a rather well-paid and secure job need to be restored. These are the qualities that inspire our students and trainees. If the profession is to meet the needs of the patients who will present to them in their hour of need, there needs to be a revision of its recruitment, training and ethos.

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