THE CLINICAL TRAINING OF A SURGEON*

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The Golden Jubilee of the Medical School of the University of Cape Town is a memorable occasion for medicine in South Africa, and all of us are very proud indeed that our old training school has reached this important milestone. Those of us who had the privilege of training here owe a great deal to the past teachers who laid the foundations of this School, and we sincerely admire those of the present generation who are building so impressively on this wonderful beginning.

It is a privilege for me to be invited to address this gathering and I am grateful to the Faculty for granting me the honour, but I feel that it is somewhat presumptuous of me to come here to talk on the clinical training of a surgeon when it is in fact this School that has produced four of the five present professors of surgery in the Republic of South Africa, and quite a few elsewhere. It is therefore not my intention to go into any detail about the training of a surgeon, because that will merely be repeating what is already so well known and well practised in Cape Town; all I intend to do in the time allotted to me is to make a few observations on certain aspects of this training.

Medical education has always been a complex and controversial subject, and the training of a surgeon in particular has received more attention than that of any other branch of medicine. The International Federation of Surgical Colleges met in London in 1960 to discuss surgical training and appointed a working party to continue investigating the matter.[1] More recently an excellent book, by the late Prof. Ian Aird, has appeared on the subject,[2] and it is also noteworthy that this symposium on surgical training is the only one concerned with medical education during this week.

Why is there this pre-occupation with surgical training? There must obviously be some aspects which are causing concern to those interested in the problem, and this is not surprising because surgical training is very different from that of any other specialty in medicine. *The unique difficulty inherent in surgical training is to reconcile the necessity for learning the technique of operative surgery with modern standards of scholarship and research.* Herein lies the dilemma facing everyone concerned with the training of surgeons.

OPERATIVE TECHNIQUE

The young surgical trainee must learn to operate and must master, not only the actual technique, but also how to deal with all the possible eventualities which may be encountered unexpectedly during any operation. This knowledge and

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ability comes only after a prolonged apprenticeship to able and experienced surgeons. It is my belief that an apprenticeship served with only one surgeon might tend to cramp the independence of thought and outlook of the trainee and so yield an unimaginative and stultified product. Preferably the trainee should rotate between several surgeons, and possibly it is even desirable that he should rotate between different hospitals to give him the wide experience and tolerant view so necessary to dispel any parochial feeling of superiority.

This surgical apprenticeship should be a lengthy one, and I consider that a period of six years is the ideal to aim at. Such an extension of the period of apprenticeship may produce some difficulty by creating a shortage of suitable posts in teaching hospitals, but I do not think that the whole of the six years need necessarily be spent in an undergraduate teaching hospital. A maximum of two years could be spent in a postgraduate teaching hospital, because it is preferable to increase the number of postgraduate training hospitals rather than to reduce the time for training, which must be long enough to ensure a thorough grounding in all the major branches of surgery. Before a hospital could be approved in this manner as a postgraduate teaching hospital, it would have to comply with certain modern standards of efficiency, supervision and academic interest, but if these standards are sufficiently high such a plan could create good training facilities and would also quite incidentally result in an improvement in the work done in such hospitals.

There is a tendency in some teaching hospitals to grant a training post only until the person holding it is eligible for registration as a specialist, after which he is no longer reappointed. The requirements for registration comprise the bare minimum of training and this should not be accepted as implying that the person is completely trained, because in that case we shall create a whole host of inadequately trained surgeons.

The surgical apprenticeship must be based on assisting a competent chief, and major surgery should be started very gradually under strict supervision. Only in this way can the trainee be sure that his own operative technique and judgement start to develop at the level attained by the chief himself. To start major surgery too soon has the effect of setting a low ceiling on the ultimate potentiality of the trainee as an operator, and therefore it is essential to appreciate that it is preferable to serve a prolonged assistantship which brings the trainee up to the level of the chief in the shortest possible time. This philosophy is unfortunately not always appreciated by the trainee, and it is important for his own good that he should be convinced that too early a start with major surgery sets a limit to the speed of evolution of his own technique.

This apprenticeship, so necessary in surgical training, brings with it a few special problems that are unique in medical education.

Availability of Clinical Material

The one absolute requirement is that there must be an adequate number of surgical patients available for the purpose of this apprenticeship. Up to the present in most centres in this country there has been no difficulty with this, and in Great Britain, owing to the National Health Service, there is also no problem. However, the development of the medical aid society movement in South Africa is rapidly creating a state where there is a very distinct shortage of clinical material, although at present largely felt in Johannesburg only. Now more recently there is this new development aimed at making all White people members of some medical aid society. These patients will then be private patients, and although they may be prepared to submit to clinical teaching they will certainly not agree to be operated upon by trainees, even if this is done under close supervision; so whereas such a scheme may be satisfactory for the teaching of undergraduate surgery, it will create a very serious problem in postgraduate training.

It is my belief that this problem can easily be avoided by creating medical aid societies only for that portion of the population earning more than a certain income. These people are able to make a fairly large contribution to the medical aid society, which will in turn ensure an adequate remuneration for the doctor. The remainder of the population, below such an income level (including those covered by the large benefit societies) should become the responsibility of the state in public hospitals, and they will then constitute the hospital class of patient who will fill the medical school hospitals.

One appreciates that there will be many objections to such a scheme, but I think an urgent approach to the problem is necessary, because if the new plan is brought into operation I foresee very significant trouble in teaching clinical surgery to postgraduates. In such a case the only alternative will be to use non-White patients only, and that will be most undesirable, since the experience gained will be limited by the fact that our African people seem to escape many of the surgical diseases encountered in White people.

Time Spent in Operating Theatres

Another problem created by the necessity to learn the technique of surgery is that the surgical postgraduate student spends a considerable time in the operating theatre. His counterpart in every other discipline is free to spend this time in laboratories and libraries, and at the end of the training period he may have many admirable publications to his credit, whereas the surgical trainee has only learnt to operate. When these two now compete for a scholarship, the surgical applicant is at a very grave disadvantage. It is not sufficiently realized by selection committees that the surgical postgraduate student has in fact been through a very rigid discipline, in every way equivalent to that required for a modest research project. If this is not kept in mind the surgical trainee will never be granted a scholarship, with a consequent depressing effect on the development of surgery in this country.

Non-operative Management

But apart from the ability to operate and the judgement required in the operating theatre, the trained surgeon must also have a wide knowledge of the practice of surgery in relation to diagnosis and pre- and postoperative management. This also requires a prolonged apprenticeship, during which time the postgraduate student studies the subject around the cases he encounters in the wards. I am convinced that this cannot be learnt by full-time study or attending courses, and that it can only be done effectively by studying during an apprenticeship. Surgeons cannot be created in classrooms, but only in the wards, theatres and the outpatient department, and consequently there is no place for full-time courses of instruction. The trainee must serve an apprenticeship during which time he should be given some guidance to assist him in his studies.

EXAMINATIONS

The question now arises whether such a prolonged apprenticeship is sufficient proof of an adequate training or whether a special examination should be written at some stage to confirm that the candidate has in fact acquired the necessary knowledge. Here there is considerable difference of opinion, and many countries, such as Switzerland, Holland, Austria and West Germany, have no postgraduate examinations, an adequate apprenticeship being accepted as sufficient proof of efficiency. We in South Africa, in common with the other English-speaking countries, favour an examination to prove a satisfactory level of knowledge, and personally, although I am not very enthusiastic about examinations, I appreciate that it has many advantages and very few disadvantages, provided it is kept in its proper perspective.

Unfortunately I find that the candidate frequently lacks this correct approach to the examination. So often the trainee keeps the examination as his aim and becomes so engrossed and obsessed with it that he spends his time preparing for the examination instead of serving his apprenticeship. The trainee should remember that his primary object is to become a well-trained and accomplished surgeon: the examination is merely an incident during this training period and of very little true importance. If the apprenticeship is adequate there should be no difficulty with the examination, which is merely an irksome necessity and by no means a worthy objective in its own right.

Another controversial problem which arises in connection with the examination is to decide when it should be written. Should it be written early in the postgraduate training period

and used as a method for the selection of candidates for advanced surgical training, as is the case with the F.R.C.S. examinations of England, Edinburgh and Australia (where it merely indicates that a candidate possesses the knowledge and ability to be appointed as a senior registrar), or should the examination be written later in the training period as in Canada, where it is used as a licence to practise surgery?

Superficially it seems obvious that the best method is to write the examination late so as to ensure that the candidate has a comprehensive knowledge of all aspects of surgery and that he is suited to commence surgical practice safely and efficiently. But the purpose of surgical training should be more than merely making the person fit to practise surgery at the time of qualification. It is more important that he should have the desire and ability to continue with his studies and keep up with modern thought and development. For this the future surgeon will not only have to know how to study, but what is more important, he should have developed the ability to evaluate new and different views and he should have the humility to appreciate the importance of the opinion and experience of others.

Such an approach is not encouraged by a terminal examination, for which a good memory is more important than originality of thought, and reading of basic books more necessary than a studious pursuit after the details of knowledge. We must ensure that the future surgeon will not be content with continuing to practise at the level of knowledge he possessed on leaving the medical school, but that he will continue to recognize problems and have the desire and ability to solve them. This, however, can only come after the mental humiliation and rigid discipline of a study in depth of a chosen subject related to surgery. This type of study should ideally be of such a nature that it leads to a Master of Surgery degree, which I regard as the hallmark of the complete surgeon and which I consider essential for anyone who is to follow an academic career in surgery.

But allowance must be made for differences in temperament, interest and ability, and a rigid pattern of training should therefore be avoided. Whereas I agree that fundamental and original research should be encouraged as much as possible, we should keep in mind that some extremely good surgeons and outstanding teachers have done no such work, but have still made a major contribution to surgery and to the community. Similarly, many surgeons possess a flair for laboratory and experimental work, but are extremely indifferent clinicians. While one thus unreservedly agrees that research is most desirable, I do not think it is essential, and all we should do is to create the facilities for research to be done by whoever wishes to make use of them. Encouragement by example can be most valuable, but enforcement of a period of basic research may cause great distress and frustration to some trainees.

Nevertheless, an intensive study of a given subject, perhaps suitable for a good review article, is required to ensure that the future surgeon's mind is alert and capable of responding to the new and original problems which crop up so regularly in modern surgical practice. If such a study of some subject in depth is to be possible, the trainee should have a year or two at the end of his training period free from the anxieties of a coming examination. The fear of a forthcoming examination has in my experience consistently inhibited the postgraduate student's interest in original thought and work, and many of our candidates have only done their best work and thinking after completion of their postgraduate examinations. To make this possible, therefore, the examination should not be at the end of the training period. But we now have a contradiction, because a late examination is required to ensure the candidate's fitness to practise surgery, and an early one is necessary to leave time for a study in depth, which is a broadening experience so very necessary for a critical approach to future developments.

As in so many other similar circumstances, a compromise is required, and with the long period of apprenticeship mentioned above the examination can readily be placed after four years of surgical apprenticeship to ensure fitness to practise, but still leaving time for the liberalizing study of some special facet of knowledge.

SURGICAL SPECIALTIES

Once we accept that an examination is necessary to assess the trainee's fitness to practise his specialty, we immediately come up against the problem presented by the person who wishes to specialize in one of the so-called super-specialties such as orthopaedics, urology, thoracic and neuro-surgery. There is a very strong view held, especially by British educationists, that the future super-specialist should first qualify in general surgery, after which he should confine himself to the practice of his chosen field.

There is certainly much to be said for this plan, because it ensures a broad background which is so essential for all these specialists. But in this method there is no examination written in the specialty which is to be practised, and therefore there is no guarantee that the period spent in apprenticeship in the specialty is in fact combined with a detailed study of this subject. Only too often this period of apprenticeship is spent in mastering the technical aspects of the subject and not its theory and science. In this way both the individual and the specialty suffer, because many of those who practise it have not in fact studied it with any vigour, and are therefore never able to advance the subject in any way.

It is my belief that there should be examinations in these special subjects. A good knowledge and experience of general surgery must of course be ensured, and this can easily be done by insisting on adequate general surgical experience before registration in the specialty and by entrenching the principles of general surgery firmly in the examination itself. It is even possible that the general surgical part of the examination could be written as a separate intermediate examination after the general surgical training has been completed, but before the apprenticeship in the special subject has begun. In this way we shall then create a new band of super-specialists who have made a careful study of the special branches of surgery and are at the frontiers of knowledge in those particular subjects, ready to make further contributions and advances.

Such examinations in the special surgical subjects are held in Australia, Canada and the United States of America, and in some of the medical schools in this country. The South African College of Physicians, Surgeons and Gynaecologists adheres to the policy of the British surgical colleges and does not provide such diplomas, but I think it is important that it should introduce such examinations in the major surgical specialties.

We in South Africa must not feel that we should adhere completely to the British system, because in Great Britain the National Health Service provides a perfect safeguard against inadequately trained people. Under that system it is impossible to practise as a specialist without a consultant appointment in a hospital and this distinction is only attained once it is generally recognized that the candidate is ready for such a position. There is therefore no need for examinations to assess the fitness to practise, because the various Appointment Committees will fulfil that function. Here in South Africa, however, the surgeon is free to practise once he has complied with the very minimal requirements of the South African Medical and Dental Council, and we must therefore create our own safeguards to ensure a high standard of training.

Furthermore in Britain the F.R.C.S. is intended to be taken by the trainee early in his training period before he becomes a senior registrar, and he therefore can commence the apprenticeship in his chosen subject fairly soon. But if we are to use our examinations to determine fitness to practise, then a prolonged period of training in general surgery will be necessary and this will considerably delay the training in the special subject. Admittedly this can only be of benefit, but the requirements of surgery in these times are so stringent that that extra time could be more beneficially spent in the special subject after a basic period in general surgery.

SELECTION OF CANDIDATES FOR TRAINING

Training alone, however, is not enough — we must ensure that an adequate training is given to *properly selected young men.* But who will venture to say how this selection is to be made? Here is a problem which should be investigated further,

because a successful method would save much needless distress and waste of human endeavour.

In this connection I wish to point out, however, that in my experience a prolonged period spent in general practice constitutes a very serious disadvantage to anyone wishing to train as a surgeon. I readily acknowledge that a year or two spent in general practice will provide the young graduate with an understanding of human nature and an appreciation of the requirements of practice, and in this way will be of some value to him in future surgical practice. But after that the time spent in general practice is not only wasted, but is actually a disadvantage, because studying becomes more difficult with advancing age, the discipline becomes more irksome and the increasing responsibilities of a growing family make the comparatively small remuneration of a trainee quite inadequate. This often results in a training which is as short as possible, done under unfavourable conditions and lacking that refinement which is so necessary today.

I accept that some exceptions to this generalization can be found, but for each one there are many stories of hardship and frustration which come to mind, and I have no hesitation in saying that surgical training should be begun soon after graduation if maximum efficiency is to be achieved.

At the University of the Witwatersrand we have for some years now been practising some sort of selection by requiring the candidate to have the primary part of the F.C.S. examination before he is accepted as a surgical registrar. In effect this means that he is not acceptable as a suitable candidate for surgical apprenticeship until he has passed this preliminary examination in the basic medical sciences, which is so necessary to ensure that the surgeon is a thinking scientific person and not merely a surgical technician. While preparing for this examination the candidate is encouraged to spend a year as junior lecturer in some appropriate university department, or, if he is more clinically minded. as a casualty officer or a senior house surgeon in the different major surgical specialties.

This system has many very distinct advantages. It ensures that the candidate has a certain ability and that he should thus have no difficulty with the final examination if given satisfactory opportunities to learn and study. It also gives the young trainee sufficient time to study for the primary examination, which he certainly would not have while working as a registrar. Furthermore this system has the advantage that, when accepted as a registrar, he is free to study the principles and practice of surgery round the cases encountered in his everyday routine work. This I believe is the only correct way of studying surgery, and to study the basic sciences while working in the ward as a registrar is a sad waste of precious time and opportunity.

This system is working well and is having most satisfactory results. Unfortunately not everyone agrees with the principle; so we are occasionally having some difficulty in implementing the plan, but thus far we have succeeded, and gradually the opponents of the scheme are beginning to realize that it has distinct merit. I hope in due course that it will, as far as we are concerned at least, become an accepted fact. In this way our whole period of surgical apprenticeship is in fact just that, and our postgraduate students derive the maximal benefit from this important phase of their training.

OVERSEAS TRAINING

Adequate facilities for postgraduate surgical training in this country have only been in existence since World War II — until that time it was necessary for the trainee to go overseas for this training. Although of such recent origin, our postgraduate opportunities are excellent and I am sure that they are far better than those available to most of our graduates who go overseas where, on the whole, the teaching institutions are concerned with their own graduates. But old customs die hard and one still finds only too often that our postgraduate students go overseas soon after completing their internships and then spend a long time there, often under most unfavourable conditions. It is time that it is generally appreciated that the facilities in this country are better than those usually available to *our* postgraduate students overseas, and that it is far more satisfactory for them to train in South Africa.

In spite of the fact that I think our surgical training in this country is first-rate, it is nevertheless essential that the postgraduate should go overseas to prevent the parochial outlook and feeling of superiority which arises out of ignorance of the work done elsewhere. Preferably this visit overseas should take place towards the end of the training period and should last at least one year. Most of this time should be spent in one centre, which should be carefully selected to coincide with the postgraduate's interests. Preferably this year should be spent not only in clinical surgery, but also in research, and it may be an extremely valuable opportunity to acquire special knowledge and techniques which can be brought back to this country to become a hobby for the rest of the surgeon's life.

THE TEACHERS

Postgraduate training in surgery aims at producing a surgeon capable of critical judgement, with technical skill, rich clinical experience, mature wisdom, an original mind and independence of thought. The degree of success achieved depends on the facilities available and the ability of the candidates, but in the final analysis the adequacy of surgical training will depend on the calibre of the teachers. In this regard South Africa is most fortunate in having the high traditions of service and teaching started by the founders of the University of Cape Town Medical School, which has set the high standards now so successfully followed by others.

REFERENCES

1. International Federation of Surgical Colleges (1961): Ann. Roy. Coll. Surg. Engl., **28**, 267.
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