

# Future of cardiothoracic surgery<sup>1</sup>

T A H ENGLISH

Mr President, when you approached me about this presentation I understood that you were concerned by an impression of an increasing desire among some members of the society for the separation of our specialty into the two entities of cardiac and thoracic surgery. Also, you suspected that there was another body of opinion, which, although not actively seeking this, thought that it was an inevitable consequence of the tendency for younger surgeons to engage predominantly in cardiac work.

You mentioned a memorable occasion thirteen years ago, when the future of our specialty was last debated before the society by Philip Allison and Leslie Temple (1966), and you believed that the subject could with profit be discussed again.

With some hesitation, and perhaps because a year seemed a long time ahead, I agreed to put the case for continued integration. Philip Caves was to advance the view for increasing subspecialisation. His tragic and untimely death two months ago was an immeasurable loss to British cardiac surgery, the full extent of which we can barely apprehend at this time. That we are deprived from hearing his views on this subject, which no doubt he would have expressed with that rare combination of clarity of thought, vigour, and forthrightness that characterised the man, is just one small part of our greater loss.

I see the purpose of my presentation as twofold. Firstly, I hope it will serve as a general introduction to the debate that is to follow. Secondly, I cannot, and indeed have no wish to, escape the responsibility of attempting to persuade you to the view that cardiac and thoracic surgery should continue as a single surgical specialty and that very considerable disadvantages would follow its division into separate disciplines.

Such a task demands a brief look at the past, a closer look at the present, and an assessment of the future demands of lung, oesophageal, and cardiovascular surgery.

The era between the first and second world wars saw the emergence of the first generation of

thoracic surgeons. The problems of open pneumothorax and dead space in the chest were largely solved, and a start was made on pulmonary resection for bronchial carcinoma and bronchiectasis. However, by the outbreak of the second world war about 75% of all thoracic surgery in this country was directed towards the care of the tuberculous patient.

The 1940s saw the introduction of closed cardiac operations. British thoracic surgeons such as Brock, Holmes-Sellers, and Tubbs were in the forefront of developments in this new and exciting specialty. Most surgeons in Britain, however, continued to devote a considerable proportion of their time to general thoracic surgery, unlike the United States, where specialisation in cardiac surgery alone started much earlier than in Britain. I think it is fair to conclude that this was a major factor in the early achievements and superiority of open heart surgery in America. It was not until the 1960s that appointments with an exclusive cardiac surgical content first began to appear in Britain, a tendency which, as a result of the expanding interest and demands of cardiac surgery, has accelerated during the past decade.

## Current pattern of cardiothoracic practice in Britain

Before embarking on predictions as to what is likely to be best for the specialty in the future, it seemed necessary to investigate the current pattern of cardiothoracic surgical practice in Britain. A simple questionnaire was therefore sent to all active consultant members of the society, asking them to indicate what proportion of their time was devoted to thoracic and to cardiac surgery.

Altogether 127 of the 145 questionnaires distributed were returned (83%). There were four instances where surgeons engaged in various combinations of cardiac, vascular, thoracic, and general surgery that could not be included in the analysis, and six others were received too late for inclusion.

Table 1 shows that the two commonest categories at present are 100% thoracic surgery and 75% cardiac+25% thoracic surgery.

<sup>1</sup>Based on a presentation to the Society of Thoracic and Cardiovascular Surgeons of Great Britain and Northern Ireland. Leeds 28 September 1978.

Table 1 (See text)

	No	%
100% Thoracic	35	29
75% Thoracic + 25% cardiac	16	14
50% Thoracic + 50% cardiac	16	14
75% Cardiac + 25% thoracic	34	29
100% Cardiac	16	14
Total	117	100

If, however, these results are looked at in a slightly different way, as presented in table 2, it becomes evident that there is already a fairly broad division of interest between surgeons who devote more than 75% of their time to either thoracic or cardiac surgery and that these two groups together account for 86% of all cardiothoracic surgeons.

Table 2 (See text)

	No	%
More than 75% thoracic	51	43
50% Thoracic + 50% cardiac	16	14
More than 75% cardiac	50	43
Total	117	100

We must now consider whether this distribution of interests is the most appropriate for present and future needs, or whether we should be preparing for increasing subspecialisation, leading perhaps to the ultimate separation of the two specialties. Clearly there must be many possible solutions, and I can only bring to your attention some of the factors which I believe are most worthy of consideration, and consider the advantages and disadvantages that might result from further subspecialisation.

### Size and population distribution of Britain

With a total consultant membership of about 140, our specialty is numerically one of the smallest in Britain. As the Specialist Advisory Committee knows only too well, this already presents a difficult problem in matching the output of senior registrars to the number of consultant posts becoming available. At times this has meant that a surgeon whose training had a distinct bias towards cardiac surgery has ended up in a thoracic appointment. However, I ask you to consider how much more difficult it would be to provide the appropriate number of new consultants if these had to be drawn from two entirely separate training programmes.

Then there is the question of the regional distribution of specialist services in Britain. Some regions have an intense concentration of their population in large urban conurbations; others have smaller populations distributed geographically over a wide area. I believe that for a regional unit serving a population of more than three million, it is perfectly reasonable, and may indeed be preferable on both economic and medical grounds, for separate cardiac and thoracic surgical services to be provided by different surgical teams sharing the same facilities.

However, this is not feasible in regional units with smaller populations that are served by only two, or at most three, consultant surgeons. Here, although individual consultants may have a special interest in either cardiac or thoracic surgery, it is important that they should continue to practise both branches of the specialty. Such an arrangement allows a more flexible and economic use of time and resources and ideally should contribute to the continuing education of the surgeons concerned.

### Flexibility of cardiothoracic surgical training programmes

Perhaps the most important implication of the issues just examined is that senior registrar posts should continue to have both a cardiac and general thoracic content.

Inevitably some programmes will be more or less balanced than others, and this is recognised by the current regulations of the Specialist Advisory Committee which require that the equivalent of only one of the four statutory years needed for certification be spent in either thoracic or cardiac training. There is no harm in this unless a disproportionate number of posts became too heavily weighted towards cardiac surgical training, in which case the practice of pulmonary and oesophageal surgery will suffer.

There are good practical and academic reasons for preserving the close association of pulmonary and cardiac surgery during the formative years of a surgeon's training. The two great systems of the body contained within the thorax are in many respects interdependent, and disease affecting one often causes dysfunction of the other. Accordingly, the study of one system is enriched by knowledge of the structural and functional changes that occur in the other.

It is also desirable that the trainee in cardiothoracic surgery should be exposed to as wide a variety of surgical procedures as possible. At the practical level, the aspiring cardiac surgeon can

gain valuable experience in techniques of dissection during pulmonary resections, while the oesophageal or pulmonary surgeon can become more expert in the control of haemorrhage and in the postoperative care of the cardiovascular system through his involvement in cardiac surgery.

### **Uncertain future of pulmonary surgery**

With the virtual elimination of tuberculosis surgery in Britain, resection for bronchial carcinoma now occupies most of the pulmonary surgeon's time, while operations for empyema, chest trauma, and pneumothorax constitute the bulk of the remainder.

With the rapid expansion in the specialty of oncology, I think it is reasonable to anticipate that selection criteria for operative treatment of cancer of the lung will become more stringent. Certainly the establishment of a professorial unit in oncology in our own region is having an effect on referral patterns.

Even apart from the possibility of a decline in the incidence of bronchial carcinoma, further contraction in the number of cases referred for surgery is likely. If this does happen fewer pulmonary surgeons will be required in the future.

### **Requirements of oesophageal surgery**

Surgery of the oesophagus is always in danger of being neglected, falling as it does between the province of the general surgeon as part of the alimentary tract, and the thoracic surgeon because of its anatomical situation. I believe oesophageal surgery is generally done better by a thoracic surgeon with an interest in the oesophagus than by a general surgeon who is similarly interested. What does seem certain is that only if surgeons, be they "general" or "thoracic," continue to take a special interest in oesophageal surgery will its proper future be assured.

In the recent past British thoracic surgeons earned a pre-eminent reputation in oesophageal surgery and names such as Allison, Barrett, Belsey, and Collis have rightly become part of the international literature on the subject. The tradition they established is being perpetuated by a new generation of young thoracic surgeons working in such places as Birmingham, Bristol, Exeter, and Southampton. These men continue to attract regular rotations of American surgical residents as proof of what they have to offer in oesophageal and pulmonary training.

However, gaps in the provision of oesophageal

services in Britain remain, particularly in the London metropolitan regions. These need to be filled by properly trained men of the highest calibre, and I believe the best way of ensuring this is that they should continue to be drawn from the wider pool of trainees entering cardiothoracic surgery.

### **Future trends in cardiac surgery**

Concerning future trends in cardiac surgery, I shall consider only a few of the more important areas of current advances.

The attainment of more physiological conditions during cardiopulmonary bypass than those achieved by our present rather crude methods is a reasonable expectation. I believe that the involvement of specialists in other disciplines such as biomedical engineering will result in important advances in perfusion technology and in the design and durability of cardiac valve substitutes. The widespread introduction of a cheap and effective membrane oxygenator and a simple system for providing pulsatile flow during bypass are but two possibilities that are likely to be realised within the next few years.

Because of the extraordinary reserves of the human myocardium, it has taken surgeons a long time to appreciate that patients can survive operation and gain reasonable symptomatic improvement from it, and yet have suffered a significant degree of irreversible damage to the myocardium during the surgical procedure. With current knowledge, continuing refinements in our methods of myocardial protection are likely. Biochemists and cardiac physiologists have already made valuable contributions to the subject and, through their involvement with it, have made life more stimulating for the cardiac surgeon.

Most are agreed that there is likely to be a significant increase in coronary surgery during the foreseeable future. Here the problem seems to be largely a logistic one. The extent of the demands made could be very considerable if, for example, it were to become clearly established that patients with triple vessel disease had a better prognosis with surgical than with medical treatment.

Finally, I believe that the results of clinical cardiac transplantation as practised in the best centres are now so good that there ought to be at least one or two units in Britain where this work is responsibly pursued. Here again the necessary and intimate involvement of specialists from other branches of medicine must add immeasurably to the interest of the work.

### Paediatric cardiac surgery

The special requirements of paediatric cardiac surgery merit separate consideration. Here I think there is a potential conflict between the desirability of the "general" cardiac surgeon continuing to deal expertly with the simpler congenital defects, and the obvious need for the provision of supraregional centres that are specially staffed and equipped to deal with the more complex conditions, particularly those presenting in the first few weeks and months of life.

I believe that, apart from economic considerations, this sort of subspecialisation is essential if British cardiac surgery is to retain the high reputation it has already established. The problem therefore devolves on how best to organise the training of the limited number of surgeons required for this work; and also how to ensure that all senior registrars who opt for a predominantly cardiac surgical future receive adequate experience in congenital heart disease before embarking on consultant practice.

### Conclusion

These are difficult matters but, as with most of

the issues we have examined, I believe they are best approached by preserving a flexible training programme that can be adjusted to meet the needs of subspecialisation as these arise, rather than by a more rigid division of specialist interests that would follow the formal separation of cardiac surgery from the rest of thoracic surgery. If indeed this were to occur I believe that both would suffer, but that the effects on the standard of pulmonary and oesophageal surgery would be particularly damaging.

For these reasons, I hope very much that, although our various interests may become more specialised in the future, this society will continue to provide a forum for sharing these interests with others engaged in cardiothoracic practice and that the speciality as such will remain firmly integrated.

### Reference

Allison, P R, and Temple, L J (1966). The future of thoracic surgery. *Thorax*, **21**, 99-103.

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