Provision of services for the diagnosis and treatment of heart disease in England and Wales

Third Report of a Joint Cardiology Committee

ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

SUMMARY The principal conclusions of the report are as follows. (1) Cardiology continues to change rapidly. In the five years since the issue of the Second Report of the Joint Cardiology Committee in 1980 the specialty has been affected principally by the increase in coronary artery surgery and the increasing importance of non-invasive techniques of diagnosis, particularly echocardiography. (2) The burden of heart disease in Britain shows some decline recently, but this falls short of that which has occurred in other countries. The vital role of the initial assessment of patients to ensure the efficient use of limited resources falls upon physicians and paediatricians in district general hospitals. (3) Each district general hospital should have at least one physician, practising general medicine but having a special expertise and training in cardiology. He should undertake echocardiography, stress testing, ambulatory monitoring, emergency pacing, rehabilitation, and cardiac intensive care, with the necessary facilities and staff. He will also play an important part in the follow up of patients assessed and treated at cardiac centres. (4) Paediatricians should continue to evaluate children with heart disease and their training should include periods at cardiac centres. (5) Cardiac centres currently undertaking invasive investigations and cardiac surgery need to expand to cope with demand. A target figure of 750-1000 coronary artery bypass operations annually is suggested. This implies three or four surgeons and six cardiologists per centre. Other staffing should be based on these figures. Smaller centres are not necessarily non-viable but should be encouraged to expand or merge. (6) Funding should be clarified so that regional contributions to regional services are identified and not lost in district budgets. Expensive capital equipment should be regionally funded whether sited in cardiac centres or district general hospitals. (7) Supraregional centres for the cardiac problems of infants under the age of one year have been identified and should receive supraregional funding. Their staffing and equipment should be appropriate to the exceptional demands of this work. If such a centre is sited within an existing cardiac centre the staff will be additional to those needed for the adult work. Facilities for older children should continue to be provided, as at present, at all cardiac centres. (8) Cardiac transplantation should be funded supraregionally. (9) The medical audit of cardiac work should be supported by the Department of Health and Social Security (DHSS). (10) Research remains a high priority, and cardiac centres should be provided with the facilities, and staff with the contracts and time, to undertake it. (11) A revision of this report is recommended within five years.
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In practice, there is a spectrum of roles within cardiology. Some cardiologists working primarily in a cardiac centre will have a limited commitment in general medicine, while others at district general hospitals may spend part of their time in a cardiac centre.

The burden of heart disease

Cardiovascular diseases are by far the most important causes of death, particularly premature death, in Britain. Data from the Office of Population Censuses and Surveys show that coronary heart disease is the dominant cause of death in men after the age of 40. In 1978 it accounted for about 40% of all deaths in men aged between 35 and 64 years. While certification of death may not be accurate, the results of a large scale necropsy study in the United States suggest that conclusions based on clinical data do not markedly overestimate the toll; in Rochester, Minnesota, 40% of all deaths in men over a 10 year period were attributed to coronary disease. In women, the mortality in each age bracket corresponds approximately to that of men 10 years younger. In the United States, Canada, Australia, and Finland, deaths from this cause have fallen and there is some suggestion that a similar trend may be starting in Britain. If this improvement has resulted from primary preventative measures, and this remains to be shown, we in Britain can draw small comfort; and prevention, even if successful, cannot be expected to bear early fruit.

The morbidity of coronary heart disease is considerable. The prevalence of angina has been reported as 4.8% in men aged between 40 and 64 years, a probable underestimate of the true figure in the community since these data were obtained by questionnaire from those still at work. Heart failure, the other principal manifestation, is common. In one study it occurred in 23% of those surviving for one month after myocardial infarction. The economic consequences are serious. The number of work days lost because of coronary heart disease rose between 1969 and 1975; in contrast, in all other conditions it fell. The disease now accounts for over 8% of all certified incapacity in men. A sizeable proportion of hospital resources are committed to its treatment: the most recent report of the Hospital Inpatient Enquiry estimated that it accounted for nearly 150 000 admissions to hospital each year and for the occupancy of 7500 beds at any one time.

Other forms of heart disease remain important causes of death and disability. Though rheumatic heart disease is seen less often, degenerative mitral lesions seem commoner, and calcific aortic valve disease appears as frequently as in the past. Overall, the number of those requiring valve replacement has remained static.

Terminology

A cardiologist is a physician who has received formal training in cardiology, spends the major part of his time practising the specialty, but may also have responsibilities in general medicine. He may work in a district general hospital or in a cardiac centre where invasive investigations and cardiac surgery are carried out.
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Idiopathic conducting system disease, presenting as bradycardia, syncope, or sudden death, is a continuing problem and one probably insufficiently recognised as a cause of otherwise unexplained confusion, dizziness, fits, faints, and trauma, especially in the elderly, as experience with ambulatory monitoring has shown. It is likely that only a minority of those who could benefit receive pacemaker implantation, and the figure for those so treated per million of population in Britain lags behind those in other European countries.

The incidence of congenital heart disease remains at eight in every 1000 liveborn children and another one or more per thousand will have a congenitally determined arrhythmia. While surgery has transformed the management of many of these abnormalities, its very success has created new and particular diagnostic and therapeutic needs, and these are discussed in more detail below.

Similarly, the reduction in hypertensive heart disease which modern drug treatment has achieved has been purchased at the cost of a sizeable investment in specialist supervision.

Requirements for a cardiac department in a district general hospital

Widening appreciation both on the part of doctors and the public of the advances in medical and surgical treatment outlined above has led to increasing demands in the past five years for specialist services to identify those patients likely to benefit, and the task of selection falls first on the district general hospital. It is in this area of the cardiac services where the most serious deficiencies exist and will intensify if current trends continue. A recent survey has shown that, of 215 health districts in England and Wales, only 152 had a member of staff with special expertise in cardiology, though since then the number has increased slightly. This leaves 12 million of the population without a cardiologist or physician with cardiological training in their own district. Yet with resources at cardiac centres limited, the skilled selection of patients locally is vital. It is, furthermore, with new non-invasive methods of diagnosis now a task transformed. To function effectively the committee considers that every district general hospital should have at least one physician with cardiovascular training on its staff, who, by the nature of his appointment, will also undertake general medicine. Some will have sessions in the cardiac centre. There are other arguments in favour of improving and extending the cardiac services available in district general hospitals—the need for patients to be treated whenever possible close to their homes, the relief from the burden of travel for follow up visits, and the raising of clinical standards—but the overriding argument is for the economic use of the high cost special resources of the cardiac centres engaging in cardiac investigation and surgery. Some health districts have accepted the need and pioneered the way; others have done nothing. The manpower to staff district hospitals already exists in the current cohort of well trained senior registrars in cardiovascular medicine currently frustrated from advancing to consultant rank by scarcity of posts. The cost of the extra equipment required, much of it in any case already available, is not prohibitive.

Staffing

The committee recommends, therefore, that each district general hospital should have at least one physician with special training in cardiology; larger hospitals might have two. Supporting staff should include at least one registrar, who will probably be in a rotating post and not committed to cardiology as a career.

Cardiac care unit

A cardiac care unit should be available in all district general hospitals as well as in cardiac centres. The narrow designation of “coronary care units” should be abandoned as these units will admit patients with many different pathologies for monitoring and treatment. The cardiovascular physician should be in administrative charge, but some physician colleagues will wish to manage their own patients, accepting expert help for special procedures such as pacemaker insertion. A unit should contain six or more beds, depending on local circumstances, with a procedures room and the facilities for the implantation of temporary pacemaker wires. Immediate on site access to image intensification is essential. A unit should be adjacent to but not integrated into an acute medical ward. Close proximity to a general intensive care unit is an alternative arrangement which may be convenient for equipment and staff, but cardiac patients should not be nursed in company with those admitted to such units. Many district general hospitals already have cardiac care units run on these lines.

Other facilities

District general hospitals, in addition to routine electrocardiography, should have facilities for exercise testing and for ambulatory monitoring. Echocardiography will be needed. Nuclear cardiology, if available, will increase the diagnostic and research potential. The implantation of permanent pacemakers will usually be undertaken at the nearest cardiac centre but may also be carried out in the district general hospital if the physician concerned has the interest and expertise. Pacemaker follow up clinics, however, should be available in every hospital of this kind. Rehabilitation programmes should be undertaken. All these tasks
Cardiac centres

SIZE
The role and siting of the existing centres which undertake specialist investigation and cardiac surgery were defined in the Second Report and require no restatement. The Second Report also emphasised the importance of size, however, and this aspect merits reassessment. The potential of a centre is usually limited by its surgical throughput, and this in turn determines the population which can be served, once the number of patients likely to need surgery is known. Facilities for cardiac catheterisation rarely limit the output of a centre. The present estimates for coronary artery disease are that 400–500 coronary artery bypass operations or angioplasties per million of the population will be needed per year. The precise role of angioplasty has yet to be defined but appears to be increasing. In addition, it is estimated that 100 per million require valve surgery and 40 per million paediatric surgery. At the same time, staff and facilities have to be economically employed to achieve maximum output with maximum efficiency. In 1980 the recommendation was that, with at least three surgeons in every unit, 600 bypass operations should be performed annually, since surgeons undertaking less than 200 operations a year often had results with higher than average mortalities. In indicating this figure, however, the committee of the time recognised that some centres nevertheless achieved good results with lower numbers and, while urging such centres to expand or merge, did not wish to insist on over-rigid guidelines. This remains its position, but in the past five years most cardiac centres have carried out increasing numbers of operations, much of the increase being coronary artery bypass procedures, though valve surgery still accounts for a significant proportion of the total. Thus, given the prediction that 400–500 bypass operations per million of the population are currently necessary annually for the relief of intractable angina and in response to the accepted prognostic indications, the committee now recommends a target for each centre of 750–1000 operations a year.

STAFFING
It follows from the previous paragraph that each centre should be staffed by three, and preferably four, consultant cardiac surgeons. The Second Report emphasised the need to allow for the demands of emergency work, leave, sickness, teaching, and research, as well as for clinical duties. In some centres, in which thoracic surgery is also undertaken by surgeons primarily involved in cardiac work, an additional surgeon may be necessary. The role of cardiologists has altered to some extent since the previous report, with a greater emphasis on coronary arteriography and, increasingly, on invasive interventions such as angioplasty, balanced by an expansion of non-invasive investigations such as echocardiography. Subspecialisation in such fields as electrophysiology, pacing, and nuclear cardiology continues. The committee repeats its earlier recommendation that the equivalent of six whole time consultant cardiologists is desirable, the exact number depending on the degree of involvement of radiologists in invasive techniques.

The committee remains acutely aware of the conflict of interests inherent in providing both an adequate career structure for junior staff (especially senior registrars and university lecturers with senior registrar contracts) and a satisfactory service to patients. The problem is intensified in cardiology, with its time consuming and unpredictable emergency work as well as the high value it sets on research. Nevertheless, both the surgical and medical sides of a cardiac centre must be supported by at least one senior registrar. Junior staff, medical and surgical, will be completed by an appropriate number of registrars and senior house officers, many of whom will be undergoing general professional training on rotation schemes, which prevents exact figures being specified. As at present, attachment of trainees from overseas should be encouraged. In addition to these, further consultant and junior staff will be needed in centres which also undertake a significant quantity of paediatric, and in particular infant, cardiology (see below).

The committee does not, on this occasion, outline the demands made by such a centre on other specialties, such as anaesthetics, radiology, or pathology, or on nursing and technical services, believing that these can only be decided by local circumstances based upon the framework of cardiological and surgical staffing given above. It reiterates, however, the fact that the burden on these services is very heavy and that staffing must be sufficient to provide 24 hour cover.

Funding for cardiology and cardiac surgery

DISTRICT AND REGIONAL FUNDING
The running costs of cardiology and cardiac surgery are met through the district health authorities in which the units are situated, except in the case of the London postgraduate teaching hospitals, which are managed by special authorities and funded directly by the DHSS. Though detailed policies for revenue funding among regional health authorities vary, cardiology in district general hospitals is usually con-
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siders that the organisation of similar surveys should be undertaken in other areas, particularly those related to the introduction of new and potentially hazardous techniques. Angioplasty and intracoronary thrombolysis would be good examples. The DHSS should be requested to give active support, as it has to the British Pacing Group, in the creation of such registers.

Paediatric cardiology and cardiac surgery

In children, cardiological and cardiac surgical needs are best separated into those of infants (under 1 year), many of whom are seriously ill or emergencies, and those of older children. The special requirements of the former were recognised in the Second Report, which urged the establishment of supraregional centres to deal with the predictable demands in this field. The recommendation has received support elsewhere, and a working party of the Joint Consultants Committee recently formalised this proposal by naming suitable centres for England and Wales.

The DHSS has recently endorsed the establishment of nine such centres to be funded supraregionally (Birmingham, Bristol, the Brompton, Great Ormond Street, Guy's, Leeds, Liverpool, Newcastle, and Southampton). The committee welcomes this development but stresses that as nine centres are an absolute maximum, given the calculations made in the Second Report, no consideration should be given to the establishment of further such centres unless there is a considerable increase in workload which, at present, seems highly unlikely.

Such supraregional centres will, of course, also undertake the care of older children with heart disease, but the committee considers it important that these patients should continue, as at present, to be cared for at all cardiac centres, not just at those which house a supraregional service.

General paediatricians have a vital role, being the first to evaluate virtually all infants and children with heart disease. Paediatric cardiologists, therefore, must maintain the closest liaison with them, both clinically and in an educational capacity. Senior registrars in paediatrics should be given experience of infant cardiology in a supraregional centre and of general paediatric cardiology either there or in a regional cardiac centre. Particular attention should be paid to the dissemination of expertise in cross sectional echocardiography, both to paediatricians in training and those already established, since this should lead to earlier and more accurate diagnosis and referral. The physician in the district general hospital, with his expertise in echocardiography, could have a useful close liaison with the paediatricians in his hospital. In the cardiac centres, contact and collaboration with

SUPRAREGIONAL FUNDING

Infant cardiac surgery, and its associated cardiological service (see below), and cardiac transplantation are carried out in only a few centres in the country and as such should be funded supraregionally.

Research

In the rapidly expanding field of cardiology, advances can only be made against a background of research activity. Some research will be purely clinical, involving for instance the documentation of surgical results, the natural history of disease, or haemodynamic studies. For these, computer facilities for data storage and retrieval are necessary. Much research, however, will be basic experimental work which is of vital importance, and facilities for laboratory and animal work will be needed. Each unit should undertake a programme of research, the nature of which will depend on local circumstances. Contracts for consultant staff should, where appropriate, include research sessions.

Monitoring of results of cardiac investigation and surgical operations

In its previous report, the committee recomended annual reviews of the results of cardiac investigation and surgical operations. In recent years, valuable information has been collected by, for example, the Society of Thoracic and Cardiovascular Surgeons, which now has complete data on all cardiac surgical operations in the United Kingdom and Northern Ireland since 1977, and the British Pacing Group. The reviews of cardical facilities and staffing by the British Cardiac Society and the Royal College of Physicians have been of great importance. The Committee consi-
other paediatric specialties are essential.

The equipment of cardiac regional and supraregional centres must enable them to provide a service free from interruption caused by breakdowns and repairs, and here the importance of each centre having two fully equipped catheterisation laboratories can hardly be overstated. The staff of a supraregional centre must include a minimum of two surgeons to maintain 24 hour, year round cover. In some centres they may also undertake adult work. The number of paediatric cardiologists may vary from two to four, depending on the unit's size; all would normally have general paediatric expertise. Senior registrars in cardiology and cardiac surgery should rotate through these centres, and there will be a number of posts for those wishing to specialise in paediatric work. When a supraregional centre is part of a regional cardiac centre, these staff will be extra to those required for adult work, but in the other cardiac centres the care of older children will be undertaken by members of staff with paediatric training who may, for reasons of numbers, also combine this with adult cardiology.

Future review

As with the Second Report, the committee anticipates that revision of the third will be necessary within the next five years because of developments in cardiology and cardiac surgery.


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