REPORT OF THE JOINT WORKING GROUP TO REVIEW CONSULTANT CARDIOLOGY REQUIREMENTS

Department of Health and Children
Comhairle na nOspidéal
Advisory Forum on Cardiovascular Health Strategy
Foreword

On behalf of the Joint Working Group to Review Consultant Cardiology Requirements, I am pleased to submit this report which outlines a strategic approach to the development of consultant-staffed cardiology services nationally.

In pursuance of our task, the Joint Working Group engaged in a wide-ranging information gathering and consultation process, including visits to selected hospitals. We have considered carefully the many submissions and presentations made to us and wish to acknowledge the assistance, expertise and enthusiasm which we received in response to our requests.

It can be noted from the report that there have been considerable achievements in consultant cardiology staffing since the launch of the Report of the Cardiovascular Health Strategy Group in July 1999. Progress has been achieved in a coherent and effective manner. This can be attributed to the quality of the template provided in the Strategy, the many structures established to oversee its implementation, the additional resources provided and the dedication of all involved in its delivery.

At the time of the establishment of the Joint Working Group, there were 29 approved posts of consultant cardiologist / cardiologist and general physician. Since then, 17 new consultant cardiology posts have been funded by the Department of Health and Children / Eastern Regional Health Authority and approved by Comhairle na nOspideal. There are currently 46 posts of consultant cardiologist / consultant cardiologist and general physician approved for public hospitals in Ireland.

We have identified an extensive series of recommendations in the report. In formulating the specific Phase I and Phase II recommendations, the Joint Working Group has recognised the services currently in place and addressed the regional disparities which exist, in order to achieve equity in the availability of services throughout the state, consistent with best medical practice and advice. The Group believes that the filling of the priority consultant posts identified will address the immediate requirements for the development of cardiology services throughout Ireland. This is a vital step in the orderly development of cardiology services nationally.

The Group recognises that implementation of the recommendations set out in the report will take time. It will require the whole-hearted support and engagement of Government. Implementation of the recommendations will require detailed planning by those involved in the management, planning and delivery of cardiology services, as well as commitment on the part of all staff, together with increased or redirected resources. The Group believes that the implementation of the recommendations in this report, in the context of the continued implementation of the Cardiovascular Health Strategy, will have real and tangible benefits for patient care.

As Chair, I would like to pay tribute to the members of the Joint Working Group for their time, expertise and dedication to the task set before them. They have attended many meetings and contributed significantly to the finished document by means of their individual professional expertise and commitment to the sub-committee process. The work of the Group could not have run so smoothly without the excellent service provided to it by the Secretariat and I will take this opportunity to thank Ms Audrey Cunningham, who undertook the research for this report and created the subsequent draft.

The success achieved to date would not have been possible without the input of all concerned. I wish to sincerely thank all involved for their commitment to the completion of the report.

Dr Tom Peirce
Chairman
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Introduction

This report has been produced by the Advisory Forum on Cardiovascular Health Strategy, a Joint Working Group comprising representatives from the Department of Health and Children and Comhairle Na nOspidéal.

1.1 Context of the report

This report has been prepared by the Joint Working Group to Review Consultant Cardiology Requirements. The aim of the Joint Working Group is to provide a framework for the equitable and orderly development of high quality cardiology services in public hospitals in Ireland. The report:

- provides a brief overview of cardiovascular disease in Ireland,
- describes hospital cardiology services in Irish hospitals,
- reviews current and emerging issues relating to the prevention, diagnosis and treatment of cardiac disease in hospitals in Ireland, and
- in the context of best national and international practice and medical advice, makes recommendations on the future distribution and provision of consultant-led cardiology services in Ireland.

The Report of the Joint Working Group is presented in nine sections, as follows:

1. Introduction
2. The establishment, terms of reference and working methods of the Joint Working Group
3. Trends in cardiac disease in Ireland
4. The national Cardiovascular Health Strategy
5. The interim report of the Joint Working Group
6. Hospital Consultant cardiology services in Ireland
7. Recent developments in health policy and in the practice of cardiology in the hospital setting
8. Context for future development of cardiology services
9. Recommendations on future development

1.2 Acknowledgements

The Joint Working Group wishes to thank all those who made submissions and those involved in the consultation process. All information and advice received was taken into account in reaching the conclusions and recommendations set out in Sections 8 and 9 of this report.

1.3 Context vis-à-vis the Government’s Health Service Reform Programme

It should be noted that the content of this report was finalised prior to the government publication of the report of the National Task Force on Medical Staffing. The Report is written and its recommendations are made in the context of the existing hospital medical staffing system and current hospital system.
The Establishment, Terms of Reference and Working Methods of the Joint Working Group

2.1 The policy context

The Cardiovascular Health Strategy Group was established by the former Minister for Health and Children, Mr. Brian Cowen, T.D., in March 1998 to develop a strategic approach to cardiovascular disease in Ireland. The report of the Strategy Group, Building Healthier Hearts, was published in July 1999 and made over 200 recommendations on the prevention and treatment of cardiovascular disease, addressing health promotion, primary care, pre-hospital care, hospital services, cardiac rehabilitation, information systems, audit and research.

The Advisory Forum on Cardiovascular Health was established by the Minister to provide expert advice on the implementation of the Cardiovascular Health Strategy. The Advisory Forum considered that a high priority should be assigned to the expansion of hospital consultant cardiology services in line with the recommendations of the Strategy. The Advisory Forum recommended that a working group be established to prepare a plan for the orderly development of consultant-staffed cardiology services. Accepting this advice, the Department of Health and Children established such a working group in 2001, with representatives from the Advisory Forum on Cardiovascular Health, Comhairle na nOspidéal and the Department of Health and Children, and chaired by a nominee from Comhairle na nOspidéal.

2.2 Terms of reference

In the context of the implementation of the Cardiovascular Health Strategy, the terms of reference given by the Department of Health and Children to the Joint Working Group on Consultant Cardiology Requirements were:-

1. A review of existing service provision and identification of shortfall at national and regional level in total complement of consultant cardiologist posts.
2. Identification of hospitals suitable for designation as regional centres having regard to the relevant Strategy recommendations and taking demographic and geographic considerations and the location of tertiary care centres into account.
3. The development of a national plan outlining formal referral links to regional and tertiary centres from all acute hospitals not providing a specialist service.
4. Recommendations regarding the prioritisation of developments over a 5-year period having regard to the quality standards and issues of regional variations in equity of access to consultant-led services identified in the Strategy document.
5. Arising from the above, the development of a national plan for the orderly development of consultant-led services nationally.

In accepting the terms of reference given to it, the Joint Working Group agreed that an examination of the implications of this review for consultant staffing in cardiothoracic surgery would not be precluded.

2.3 Membership of the Joint Working Group

Comhairle na nOspidéal nominated Dr. T. Peirce as Chairman of the Joint Working Group. The following were nominated to represent their respective bodies on the committee:-

Advisory Forum on Cardiovascular Health:
Professor John Horgan, Consultant Cardiologist, Beaumont Hospital
Mr. Aonghus O'Donnell, Consultant Cardiothoracic Surgeon, Cork University Hospital
Professor Michael Walsh, Consultant Cardiologist, St. James's Hospital

Comhairle na nOspidéal:
Dr. Tom Peirce, Chairman, Consultant Physician, Mid-Western Regional Hospital, Limerick
Mr. Tommie Martin, Chief Officer, Comhairle na nOspidéal
Mr. Maurice Neligan, Consultant Cardiothoracic Surgeon, Mater Hospital and Our Lady's Hospital for Sick Children, Crumlin
2.4 The consultation process

The Joint Working Group held its first meeting on 10th January 2001. In pursuance of its task, the Working Group engaged in a wide-ranging information gathering and consultation process. Requests were made to each health board and relevant public voluntary hospital to make submissions pertaining to the terms of reference. The Joint Working Group met with representatives of the Irish Cardiac Society in March 2001 and August 2002. The Group met with representatives of every health board and relevant voluntary hospitals, the Eastern Regional Health Authority and its three area boards, and the Dublin voluntary hospitals during the period of May to October 2001. Site visits were undertaken at selected hospitals during this period.

The Department of Health and Children asked the Joint Working Group to prepare an interim report, identifying priority service developments to inform service planning for the year 2002. The Interim Report of the Joint Working Group was finalised and submitted to the Department of Health and Children in May 2001 (see Section 5).
3 Trends in Cardiac Disease in Ireland

3.1 Background information on cardiovascular disease and coronary heart disease

The cardiovascular system is comprised of the heart and blood vessels – arteries and veins. By far the most common type of disease in the cardiovascular system occurs as a result of atherosclerosis or hardening of the arteries. Atherosclerosis of the arteries supplying blood and oxygen to the heart muscle results in coronary heart disease (CHD). Similar disease processes can affect the arteries to the brain resulting in stroke (cerebrovascular disease), or the main arteries out of the heart to the lower body, resulting in disease of the aorta or peripheral vascular disease.

CHD is currently the principal condition presenting to consultant cardiologists in Ireland. The symptoms of CHD are usually caused by the gradual and progressive narrowing of the arteries supplying the heart (coronary arteries) by atheromatous plaques. Acute symptoms result from the sudden occlusion of coronary arteries following thrombus formation (blood clots) caused by the rupture of atheromatous plaques.

Inadequate blood supply as a result of narrowing of the arteries to the heart muscle is associated with chest pain and discomfort, leading to a diagnosis of angina pectoris.

CHD can also present as an emergency. The patient has severe, unremitting chest discomfort. The ‘acute coronary syndromes’, namely unstable angina and evolving myocardial infarction, are different clinical presentations resulting from similar underlying disease mechanisms. These patients are at risk of cardiac arrest and sudden death, and of other serious complications. With speedy application of modern treatments there is much that can be done to reduce or prevent further heart muscle damage and the associated short and longer term consequences.

In practice, two categories of acute coronary syndrome patient may be identified. Patients with a presumed acute coronary syndrome have ongoing chest discomfort and specific changes on the electrocardiogram (ECG) (persistent ST-segment elevation or new-onset left bundle branch block). The implication is that heart muscle cells have died in these patients as a result of the reduced blood supply. The objective of treatment is to restore blood flow through the artery either with so-called ‘clot busting’ drugs (fibrinolytic treatment) or with percutaneous coronary intervention. In the latter circumstances, the procedure is referred to as a ‘primary angioplasty’, with or without stenting.

Other patients presenting with chest pain have ECG abnormalities suggesting acute ischaemic heart disease. They do not have persistent ST-segment elevation but may have a number of other ECG abnormalities. These patients are treated to relieve their symptoms and are observed with repeated ECGs and serial measurements of markers of heart muscle cell damage. Many of these patients will go on to have angioplasty and stenting.

With improved survival of people with CHD and with the ageing of the population, increasing numbers of people are developing heart failure. This is a chronic condition, punctuated by acute exacerbations, mainly affecting older people. Heart failure is a serious condition, affecting the patient’s quality of life and carrying a poor prognosis. Much of the care of patients with heart failure is provided in the community. However, increasing numbers of patients with heart failure are referred to acute hospitals for assessment and review of treatment, as well as for the care of acute exacerbations. Modern management of heart failure includes the development of consultant-led multidisciplinary teams with special heart failure clinics.
In 1994, the Task Force of the European Cardiac Society and related organisations divided the factors associated with risk of CHD into three: personal and family characteristics, lifestyle, and biochemical/physiological characteristics. While some characteristics such as age, sex and family history are not modifiable, there is much which can be done nowadays to reduce risk of future disease, through stopping smoking, healthy eating, physical activity, attention to blood pressure and blood cholesterol. In order to reduce risk of recurrence (secondary prevention), lifestyle advice and appropriate medication are now an integral component of the care of patients with atherosclerotic vascular disease, including CHD, and in patients with diabetes mellitus. Cardiac rehabilitation reduces risk of a future event after a heart attack, coronary artery intervention or surgery. Cardiac rehabilitation is provided by a consultant-staffed multidisciplinary team.

Cardiologists also treat a range of other cardiac conditions. In recent years there have been major advances in the range and complexity of treatments for disturbances of heart rhythm. These are described in more detail in Section 7. Cardiologists also assess and treat patients with valvular heart disease, diseases of the heart muscle, including enlargement and infection, and conditions of the outer cover of the heart, the pericardium. In addition, diseases originating in other organs or systems may first present with cardiac signs or symptoms.

Paediatric cardiologists and paediatricians treat children with cardiac disease, including congenital heart disease. Those born with abnormalities of the heart may require complex surgery and ongoing monitoring and care. An increasing number of people are surviving to adulthood having had treatment for congenital heart disease, so-called ‘adult congenital heart disease’ or grown-up congenital heart disease. In addition, heart problems are associated with several genetic conditions. Women with a cardiac condition require monitoring before and during pregnancy.

Recent advances in the treatment of cardiac conditions in the hospital setting are described in Section 7.

3.2 Trends in the epidemiology of CHD in Ireland

The Report of the Cardiovascular Health Strategy Group, Building Healthier Hearts (1999), reviewed the epidemiology of CHD in Ireland. The trends identified have continued, with major implications for the provision of health care.

The total death rates from all causes continue to decrease in Irish men and women (Figure 3.1). Much of this decline is due to ongoing reductions in death rates from the cardiovascular diseases, including coronary heart disease (Figure 3.2). The percentage of all deaths in Ireland attributed to these diseases (heart disease, stroke and diseases of blood vessels) decreased from 51% in 1980 to 46% in 1990, 44% in 1995 and 41% in 2000 (Figure 3.3).

The decrease in death rates should not be interpreted as indicating declining need for services to treat cardiovascular diseases. Some of the decrease in rates has been counterbalanced by the increased numbers of people in the population, particularly of older people. The age standardised death rates from cardiovascular diseases decreased by 30% between 1980 and 1999. The decrease in the actual number of deaths was 23%. During that time CHD death rates decreased by 37% but the actual number of deaths decreased by only 17%, reflecting the high death rate from this cause in the increasing numbers of people who survive into older age (Figure 3.4). Age-standardised death rates from CHD remain high in Ireland compared with other EU countries (Figures 3.5a and 3.5b).
Also important in determining the demand for health care is the changing morbidity pattern of CHD, with older age at presentation and longer survival with the disease. The number of hospital episodes with a diagnosis of CHD increased in all age groups in Ireland between 1994 and 1999 (Table 3.1). The percentage increase was greatest for those aged 85 years and over. The other notable feature of the hospital statistics is the doubling of the number of day cases during that time period. The longer survival of patients with CHD is associated with an increase in the population prevalence of chronic disease, including angina, heart failure and diabetes, especially in older people.

**Fig 3.1 Age-standardised mortality from all causes in Irish men and women, all ages, 1970-1999**

![Graph showing age-standardised mortality from all causes in Irish men and women, 1970-1999](image1)

**Fig 3.2 Age-standardised mortality from CHD in Irish men and women, all ages, 1970-1999**

![Graph showing age-standardised mortality from CHD in Irish men and women, 1970-1999](image2)
Fig 3.3 Principal causes of death at all ages, Ireland, 2000

- Cancer 24.3%
- Respiratory 16.1%
- All Other Diseases 14.6%
- Injury and Poisoning 4.3%
- Heart Disease 21.3%
- Other Cardiovascular Disease 10.5%
- Stroke 8.8%

Fig 3.4 Age-specific mortality rates from CHD in Irish men and women, 1999

Source: Central Statistics Office
Fig 3.5a Age-standardised CHD death rates for men in EU countries aged 0-64 years, 1994 and 1998

Source: WHO Health for All database
* Last available figures for Belgium is for the year 1996

Fig 3.5b Age-standardised CHD death rates for women in EU countries aged 0-64 years, 1994 and 1998

Source: WHO Health for All database
* Last available figures for Belgium is for the year 1996
### Table 3.1 Hospital discharges with a diagnosis of CHD (ICD codes 410 – 414)

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<th>Age group</th>
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<th>Total Cases</th>
<th>In-patients</th>
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<tr>
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<td>3418</td>
<td>8.0</td>
<td>1192</td>
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<td>5967</td>
<td>4242</td>
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<td>725</td>
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<tr>
<td></td>
<td>1999</td>
<td>5920</td>
<td>4516</td>
<td>8.5</td>
<td>1404</td>
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<tr>
<td>65-74</td>
<td>1994</td>
<td>5437</td>
<td>4984</td>
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<td>3096</td>
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<td>17736</td>
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Source: Public Health Information System
The Report of the Cardiovascular Health Strategy Group

4.1. Hospital facilities for the diagnosis and treatment of CHD

The Report of the Cardiovascular Health Strategy Group describes the diagnostic procedures and treatments available for patients with cardiac conditions in 1999. Some diagnostic investigations are non-invasive and therefore low risk, while others require insertion of catheters or other devices into the coronary arteries or into other cardiac tissues and carry a higher risk of a serious adverse event. Many patients are treated with medications, both in the acute situation and on an ongoing basis. Some patients require cardiac intervention, either directly into the coronary arteries or cardiac tissue, or cardiothoracic surgery.

Recognising the scale of the problem of cardiac disease in Ireland and that patients with cardiac disease are treated in all acute hospitals, the Cardiovascular Health Strategy recommended that every acute general hospital should have basic diagnostic and treatment facilities for patients with cardiac problems and a physician with appropriate training in cardiology.

The Strategy recommended that "regional cardiology centres should be developed in view of the desirability of regional self-sufficiency for non-invasive investigations ... We recommend that there should be four or five regional centres with facilities to perform angiograms, insert pacemakers and carry out appropriate non-invasive assessments. Such centres should have at least two cardiologists to allow the optimum use of resources, to maintain continuity of service, to remain within acceptable limits of exposure to radiation and to carry out clinical audit and teaching."

The Cardiovascular Health Strategy Group considered that "the current structure of seven tertiary referral centres should be adequate to meet the need for services as currently estimated. However, existing tertiary centres should have at least five clinical cardiologists working within a structure which enables sub-specialist cardiological expertise to be developed".

The Report of the Cardiovascular Health Strategy Group provided additional information and made specific recommendations on the facilities and staffing at each of these three levels of service.

4.2 Acute general hospitals

The Cardiovascular Health Strategy Group recommended that each hospital providing a service to patients with cardiac problems should be equipped with a cardiac investigation area in addition to a coronary care unit. The cardiac investigation area should be large enough to cater for all non-invasive cardiac investigations, including:

- A room for ECGs, 24-hour blood pressure monitoring and Holter analysis facility;
- An exercise and stress testing area of sufficient size to allow cardiopulmonary resuscitation, if required;
- An area for echocardiographic investigations;
- Adequate space for medical and secretarial staff and a storage area;
- Appropriate technical and secretarial staff.
Cardiovascular Health Strategy Recommendations

R8.14 Each hospital admitting patients with acute cardiac problems should have an appropriately trained physician.

R8.15 Each hospital admitting patients with acute cardiac problems should have a CCU with adequate staff and facilities. Where deficiencies exist in CCUs with regard to number of beds, equipment and staffing, such deficiencies should be remedied. Ongoing staff training should be provided, including secondment to tertiary referral services.

R8.16 Each hospital should establish links between the emergency medical service, the Accident and Emergency Department and the CCU to implement ‘fast track’ policies for thrombolysis to agreed protocols.

R8.17 Health Boards and hospitals should examine the facilities available for the assessment of acute chest pain in order to provide timely access to cardiac assessment for patients with recent onset of chest pain and to avoid unnecessary admission.

R8.18 Each hospital admitting patients with acute cardiac problems should have a Cardiac Investigation Area with appropriate staff and facilities.

R8.19 Each acute hospital should have echocardiography facilities. Each such hospital should have a physician with training to carry out these investigations. Each region should have one cardiologist with special expertise in echocardiography.

R8.21 As new forms of cardiac investigation become standard, they should be added to hospital facilities.

4.3 Regional centres

The Cardiovascular Health Strategy Group considered that there is a need for some new cardiac diagnostic centres at regional level. There is scope for the appointment of cardiologists to acute general hospitals with sessions in nearby regional centres for angiography and some sophisticated tests. It is noted that such arrangements can operate between, as well as within, Health Boards. The report also recommended that regional pacing facilities should be established. The following recommendations on facilities are of particular relevance to regional centres in addition to the facilities provided in acute general hospitals.

Cardiovascular Health Strategy Recommendations

R8.20 Regional cardiology centres should have adequate facilities and staff for non-invasive assessment of patients.

R8.22 Angiographic facilities should be provided as close as possible to the population served. A cardiac catheterisation service should be developed or specific referral arrangements agreed for those health boards in which there is no such service at present.

R8.23 Day case facilities should be made available specifically for angiography and maintained as an essential component of this service.

R8.24 It is recommended that immediate attention be given by hospitals providing an invasive cardiology service to developing ambulatory cardiology care centres which in the future may be extended to provide day case angioplasty and other interventions.

R8.30 It is recommended that a cardiologist be appointed in each region with expertise in cardiac pacing. Regional pacing facilities should be established. Permanent pacing rates should be at the European average and more sophisticated physiological pacemaker units should be used.

R8.39 Regional centres which are performing diagnostic tests, including angiography, and inserting pacemakers should have at least two cardiologists.
4.4 **Tertiary centres**

The Cardiovascular Health Strategy recommended that tertiary cardiology centres should have the appropriate non-invasive and invasive facilities as outlined under acute hospital and regional centres. Developments in interventional cardiology will complement the current enhancement of cardiac surgery facilities in Ireland. For those centres carrying out interventional cardiology the following recommendations are of particular relevance.

**Cardiovascular Health Strategy Recommendations**

**R8.26** Those centres carrying out angioplasty should have appropriate nursing, technical and other staff back-up plus the necessary funding.

**R8.27** A feasibility study should be carried out of the likely number of emergency procedures and the costs of providing an out-of-hours PTCA service.

**R8.28** It is recommended that cardiologists involved in interventional cardiology should perform at least 100 PTCA procedures per annum.

**R8.38** All tertiary referral centres should have a minimum of five consultant cardiologists. Selected centres should have specialists in EPS.

4.5 **Intracardiac electrophysiological studies and complex pacing**

As noted above, the Cardiovascular Health Strategy recommended that pacing facilities should be established in regional cardiology centres. Electrophysiology studies are time consuming and at present (1999) the need for these studies is not being met. These facilities should be concentrated and fully supported in centres with the necessary expertise and consultant manpower to perform the investigations and interventions to a high quality.

**Cardiovascular Health Strategy Recommendations**

**R8.29** It is recommended that an EPS service including ablation be developed in selected tertiary referral centres.

4.6 **Other recommendations**

The following recommendations are relevant to all hospitals providing services for cardiac patients.

**Cardiovascular Health Strategy Recommendations**

**R8.1** A resuscitation training officer should be appointed in each general hospital and at least one whole-time resuscitation training officer per health board area.

**R8.32** National protocols should be developed for the application of evidence-based treatments for cardiac diseases.

**R8.45** Protected time should be made available to cardiologists for clinical audit, research, teaching and continuing education.

**R9.1** Every hospital that treats patients with heart disease should provide a cardiac rehabilitation service.

**R10.1** A cardiovascular disease surveillance system should be established.

**R10.20** Schemes should be established for clinical audit of the care of patients with cardiovascular disease.
5 Interim Report of the Joint Working Group

5.1 Synopsis of The Interim Report of the Joint Working Group

The Interim Report of the Joint Working Group was completed in May 2001. The aim was to identify the priority deficits in consultant cardiology staffing. The Interim Report made the following recommendations:

1. A ratio of 1 consultant cardiologist and general physician per 75,000 people was proposed.

2. This ratio was to be applied equitably throughout the country, with additional posts focusing on specialised areas of cardiology, concentrated in the major regional cardiology centres, in particular those with cardiac surgery on-site.

3. A total of 25 additional posts of consultant cardiologist and general physician. In May 2001, there were 29 permanent posts in existence. The recommendations equated to an increase of 82% in consultant cardiologist & general physician posts in the public sector.

4. As a general policy, the Working Group does not favour the concept of single-handed consultant cardiology / general physician appointments, except in exceptional circumstances such as distance from a major centre and secondly, as an initial step, in the development of a two or more consultant-led unit.

5. A reduction in the current dependence of many patients from neighbouring Health Board areas on Dublin hospitals for general cardiology services consistent with the Building Healthier Hearts recommendation that “each hospital admitting patients with acute cardiac problems should have an appropriately trained physician”.

6. That certain areas of expertise and additional consultant staffing are best centralised in a small number of units, in order to provide a critical mass of workload and expertise, thereby achieving better outcomes for patients.

7. It recognised that, in conjunction with the increase in consultant cardiology staffing, additional consultant cardiac surgeons and consultants in other specialties will be required to enhance the totality of cardiology service provision.

8. Cross Health Board co-operation, where appropriate and possible.

9. It will be essential to introduce audit and provide the necessary resources in order to develop the best possible cardiology services throughout the country.

Table 5.1 shows the distribution of additional priority posts of consultant cardiologist and general physician, by Health Board area, as set out and recommended in the Interim Report of the Joint Working Group to review consultant cardiology requirements (May 2001):
# Table 5.1 Recommendations on priority additional consultant cardiology appointments by Health Board area.

<table>
<thead>
<tr>
<th>Health Boards (Regional Cardiology Centres)</th>
<th>Hospital</th>
<th>Recommendations for additional posts of Consultant Cardiologist &amp; General Physician for 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>EASTERN REGIONAL HEALTH AUTHORITY</td>
<td>St. Vincent’s</td>
<td>1 post</td>
</tr>
<tr>
<td>EAST COAST AREA Health Board (St. Vincent’s Hospital)</td>
<td>Mater</td>
<td>1 post</td>
</tr>
<tr>
<td>NORTHERN AREA HEALTH BOARD (Mater &amp; Beaumont)</td>
<td>Beaumont</td>
<td>1 post</td>
</tr>
<tr>
<td>SOUTH WESTERN AREA HEALTH BOARD (St. James’s &amp; Tallaght)</td>
<td>St. James’s Tallaght Naas / Tallaght</td>
<td>2 posts</td>
</tr>
<tr>
<td>TOTAL ERHA:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIDLAND HEALTH BOARD (Location of Regional Cardiology Centre to be decided)*</td>
<td>2 posts for the MHB shared between the Regional Cardiology Centre and the other hospitals</td>
<td>2 posts</td>
</tr>
<tr>
<td>MID-WESTERN HEALTH BOARD (Limerick)</td>
<td>Nenagh / Limerick Reg. St. John’s / Limerick Reg.</td>
<td>1 post</td>
</tr>
<tr>
<td>NORTH EASTERN HEALTH BOARD (Drogheda)</td>
<td>Drogheda Cavan / Drogheda Dundalk / Drogheda</td>
<td>1 post</td>
</tr>
<tr>
<td>NORTH WESTERN HEALTH BOARD (Sligo)</td>
<td>Sligo Letterkenny / Sligo or Letterkenny / Derry</td>
<td>1 post</td>
</tr>
<tr>
<td>SOUTH EASTERN HEALTH BOARD (Waterford)</td>
<td>Waterford Wexford / Waterford Clonmel / Waterford</td>
<td>2 posts</td>
</tr>
<tr>
<td>SOUTHERN HEALTH BOARD (Cork University Hospital)</td>
<td>Mercy / CUH Tralee / CUH CUH</td>
<td>1 post</td>
</tr>
<tr>
<td>WESTERN HEALTH BOARD (UCH, Galway)</td>
<td>UCH Galway Castletown / UCHG</td>
<td>1 post</td>
</tr>
</tbody>
</table>

Total Recommendations for priority additional Consultant Cardiologists, May 2001: 25 posts

EXISTING CONSULTANT CARDIOLOGISTS: 29 posts

INTERIM TOTAL: 54 posts

(Hospitals in brackets) recommended as Regional Cardiology Centres are identified in bold italics.

* The Midland Health Board subsequently decided that Tallimore General Hospital would serve as the Regional Cardiology Centre.

6 Hospital Consultant Cardiology Services in Ireland

6.1 Background information

The treatment of cardiovascular diseases involves a wide spectrum of health professionals, but for the purposes of this report, and in accordance with its terms of reference, the Joint Working Group focussed on requirements for consultant physicians to provide services for patients with cardiac disease. Such consultants may be appointed to posts of consultant cardiologist, consultant cardiologist & general physician or consultant paediatric cardiologist. In the past a variety of titles was used by Comhairle na nOspideal in regulating consultant cardiology appointments, including the above titles and the title consultant physician with a special interest in cardiology. Some doctors were appointed to posts of general physician without a designated special interest, who also practise a substantial amount of cardiology.

The number and type of consultant posts in publicly funded hospitals in Ireland is regulated by Comhairle na nOspideal. Comhairle is a statutory body established under the Health Act, 1970. Its regulatory functions include, inter alia to:

• regulate the number and type of appointments of consultant medical staffs and such other officers or staffs as may be prescribed in hospitals engaged in the provision of services under this Act,
• specify qualifications for appointment referred to in sub-paragraph (i) subject to any general requirements determined by the Minister,
• advise the Minister or any body established under this Act on matters relating to the organisation and operation of hospital services and
• prepare and publish reports relating to hospital services.

The nomenclature, the required qualifications, training and experience for consultant cardiology posts were revised by Comhairle na nOspideal in December 2002, following receipt of the revised curriculum for Higher Specialist Training in Cardiology, from the Irish Committee on Higher Medical Training and subsequent advice received from the Irish Cardiac Society and this Joint Working Group.

6.2 Higher Specialist Training in cardiology and sub-specialties

A curriculum for Higher Specialist Training in Cardiology has been prepared and revised by the Irish Committee on Higher Medical Training (ICHMT). The revised curriculum envisages two training pathways:

Path 1 will lead to certification in Cardiology with acknowledgement of additional training having been undertaken in a subspecialty of Cardiology which will be identified on the certificate; and

Path 2 will lead to dual accreditation in Cardiology and General (Internal) Medicine.

The ICHMT curriculum envisages that ‘Higher Medical Training (HMT) in cardiovascular medicine will be divided into “core training” (Basic Cardiology – 4 years) and “Specialised Cardiology Training” (Sub-specialty – 2 years) modules. The minimum total duration of HMT in cardiology is 6 years. All trainees will be required to complete core training.

The ICHMT identified four possible main areas of special interest:

• Interventional cardiology
• Non-invasive cardiology
• Electrophysiology and advanced pacing
• Adult congenital heart disease

It will also be possible to follow other subspeciality areas, as identified by the trainee or his/her trainers. Following consultation with the National Specialty Director, a suitable training programme can be devised. The programme must be approved by the Director and the Dean of Higher Medical Training informed in advance of participation.
6.3 Summary of the advice received from ICHMT, representatives of the Irish Cardiac Society and this Joint Working Group resulting in the change of titles and specified qualifications for consultant cardiology posts by Comhairle na nOspidéal, in accordance with its statutory functions

The six years of HMT in Cardiology is intended to produce fully-trained Cardiologists who will follow one of two paths, above (page 17). The decision as to which path to follow will be made after 4 years of Basic Cardiology, which all trainees will complete. All trainees are normally enrolled initially in General (Internal) Medicine as well as in Cardiology. Based on the results of assessments of progress made annually, and particularly on an assessment made early in the 4th year, a decision will be taken, prior to the commencement of the 5th year of training, enabling the General (Internal) Medicine Certificate of Satisfactory Completion of Specialist Training (CSCST) option to be dropped by some trainees who will then concentrate on cardiology (Path I).

For trainees following Path I of the Curriculum, a further term of two years (years 5 & 6) will be spent in gaining clinical cardiology training additional to basic training. This will include advanced training in the cardiology subspecialty of their choice.

Trainees continuing along Path 2 work towards dual accreditation. These 5th & 6th years of training will normally consist of a mixture in equal parts of General (Internal) Medicine and clinical Cardiology.

The curriculum requires that the majority of the training of those enrolled as Specialist Registrars take place in Ireland. Specialist Registrars are encouraged to seek training in quality units abroad. Such training requires the prospective approval of the National Specialty Director and must be certified by an agreed supervisor. This, however is not a requirement in order to obtain the CSCST in cardiology / general medicine or specialist cardiology. Graduates whose training has taken place in its entirety abroad are required to demonstrate the equivalence with the cardiology curriculum approved by the ICHMT. Demonstration of such equivalence admits the applicant to accreditation as a Specialist Cardiologist or Cardiologist/General (Internal Medicine) Physician.

In summary, the Joint Working Group envisages two types of Cardiologist:
- Consultant Cardiologist
- Consultant Cardiologist / General Physician

The Consultant Cardiologist, will be proficient in all aspects of cardiology, as outlined above and will also have training in one or more of the following sub-specialty areas:
- Interventional cardiology (coronary angioplasty and stent implantation, percutaneous balloon valvuloplasty)
- Imaging cardiology (advanced echocardiography, nuclear cardiology, CT and MRI)
- Electrophysiology & advanced pacing
- Adult congenital heart disease.

It is envisaged that the appointees to these posts will be whole-time cardiologists and will not be involved in the general medical on-call rota or undertake general physician duties. It is envisaged by the Joint Working Group that the Consultant Cardiologists will be appointed to the supra-regional cardiology centres / regional cardiology centres with cardiac catheterisation laboratories on site.

The Consultant Cardiologist & General Physician will have undertaken at least six years training in cardiology and general medicine. Those who have completed satisfactory training will be capable of independent practice in cardiology and general (internal) medicine. Consultant Cardiologist & General Physician post holders will have responsibility for the management of patients presenting with cardiovascular disease.

The type of duties may include diagnostic work (e.g. echo, ECGs), in conjunction with a broad range of care associated with primary and secondary prevention of coronary heart disease. Duties may also include diagnostic coronary angiography / cardiac catheterisation if such facilities are available in the institution or as arranged on a sessional basis with the nearest supra-regional centre.
Under the revised ICHMT curriculum, these trainees will not be trained to undertake sub-specialty work such as interventional cardiology. The Consultant Cardiologist / General Physician will be a more appropriate appointment for acute general hospitals throughout the country. It is also envisaged that some posts of Consultant Cardiologist / General Physician may be allocated to some of the regional cardiology centres also. An appropriate balance between the two types is required. It is envisaged that the appointees to this type of post will be on the general internal medical on-call rota.

Based on the above, the following cardiology terminology has been adopted by the Joint Working Group:
As per the revised training curriculum two types of cardiologists are defined, Consultant Cardiologist or Consultant Cardiologist & General Physician. Again, the Consultant Cardiologists may have a specific sub-specialty interest as outlined above.

It is the view of the Joint Working Group that the minimum required expertise envisaged for designated consultant cardiologist and cardiologist / general physician posts, would be expertise in diagnostic cardiology, including coronary angiography, which would form part of their routine training and workload.

Interventional Cardiology:
The term interventional cardiology is used to incorporate both diagnostic and therapeutic cardiology. Interventional cardiological techniques include inter alia:
• coronary angioplasty and stent implantation,
• percutaneous balloon valvuloplasty,
• atrial septal defect closure,
• brachytherapy,
• embolisation techniques, and
• complex electrophysiology studies (EPS) should also be included in this term.

Following receipt and consideration of the above advice from the Joint Working Group, Comhairle na nOspidéal, at its meeting on 20th December 2002, revised the existing qualifications and titles it specifies for consultant cardiology posts. The current titles and qualifications specified by Comhairle na nOspidéal for relevant consultant posts are set out hereunder.

### 6.4 Types of consultant and eligibility criteria

**Consultant Cardiologist**
(a) Full registration in the General Register of Medical Practitioners maintained by the Medical Council in Ireland or entitlement to be so registered
and
(b) The possession of the MRCPI or a qualification in medicine equivalent there to
and
(c) (i) Inclusion on the division of cardiology of the Register of Medical Specialists maintained by the Medical Council in Ireland
or
(ii) Seven years satisfactory postgraduate training and experience in the medical profession including four years in cardiology

**Consultant Cardiologist & General Physician**
(a) Full registration in the General Register of Medical Practitioners maintained by the Medical Council in Ireland or entitlement to be so registered
and
(b) The possession of the MRCPI or a qualification in medicine equivalent thereto
and
(c) (i) Inclusion on the divisions of cardiology and general (internal) medicine of the Register of Medical Specialists maintained by the Medical Council in Ireland or (ii) Seven years satisfactory postgraduate training and experience in the medical profession including three years in cardiology and three years in general (internal) medicine.

**Consultant Paediatric Cardiologist**

(a) Full registration in the General Register of Medical Practitioners maintained by the Medical Council in Ireland or entitlement to be so registered and

(b) The possession of the MRCPI in Paediatrics or a qualification equivalent thereto and

(c) (i) Inclusion on the division of paediatrics of the Register of Medical Specialists maintained by the Medical Council in Ireland or (ii) Seven years satisfactory postgraduate training and experience in the medical profession including four years in paediatrics and one year in neonatology and

(d) including two years in paediatric cardiology.

**Consultant Cardiothoracic Surgeon**

(a) Full registration in the General Register of Medical Practitioners maintained by the Medical Council in Ireland or entitlement to be so registered and

(b) The possession of the FRCSI or a qualification equivalent thereto and

(c) (i) Inclusion on the division of cardio-thoracic surgery of the Register of Medical Specialists maintained by the Medical Council in Ireland or (ii) Eight years satisfactory postgraduate training and experience in the medical profession including six years in cardiothoracic surgery.

### 6.5 Number and location of existing posts of consultant cardiologist and consultant cardiologist & general physician (as at July 2003)

At the time of the publication of The Report of the Cardiovascular Health Strategy Group (July 1999), there were 27 posts of consultant cardiologist / consultant cardiologist & general physician in Ireland. To further the implementation of the recommendations outlined in the report, there has been a steady increase in consultant staffing. The Interim Report of the Joint Working Group was completed in May 2001, at which point the consultant manpower had increased to 29 posts. Funding was allocated under the Cardiovascular Health Strategy in 2002 and 2003 to appoint 17 additional posts, currently in post or being recruited. With these appointments there will be 46 approved permanent posts of consultant cardiologist or consultant cardiologist & general physician in Ireland.

In addition to adult cardiology service provision, there are five posts of consultant paediatric cardiologist in Ireland, including two new posts, all of which are based in Dublin. There are 11 permanent posts of consultant cardiothoracic surgeon; nine of these are based in Dublin and two are based in Cork. The Joint Working Group is aware that there are also an additional number of doctors practising as cardiologists in the private sector.
Distribution of consultant cardiologist, consultant cardiologist & general physician posts*

Figure 6.1 shows the percentage distribution of the population of Ireland by health board area. Figure 6.2 shows the percentage deployment of the consultant (adult) cardiology posts in Ireland by health board area. While the population of the Eastern Regional Health Authority (ERHA) comprises 35.7% of the total population of Ireland (2002 Census), 61.5% of the posts of consultant cardiologist / consultant cardiologist & general physician are located in the ERHA region. The opposite situation pertains in all other health boards, with a lower percentage of consultant cardiology posts compared to the percentage of the national population in the board’s area. It should be noted that the ERHA accepts a substantial number of cardiology referrals from other health board areas in addition to providing a cardiology service for the Eastern Region.

* Note: - It should be noted that in addition to the approved consultant cardiology posts, there are a number of formally designated consultant general physicians, who practise various amounts of cardiology, thereby enhancing cardiology service delivery nationwide.

Fig. 6.1- Distribution of Population by Health Board Area

Fig. 6.2- Distribution of Posts of Consultant Cardiologist & General Physician by Health Board Area
Eastern Regional Health Authority

Population: 1,401,314

Cardiology services, both in-patient and out-patient, are provided by nine acute general hospitals and paediatric cardiology services are provided mainly in one children’s hospital with some services in two other hospitals. Two of the three maternity hospitals also have sessional inputs from consultant cardiologists. There are 24 approved consultant cardiology posts in the region and 5 approved permanent posts of consultant paediatric cardiologist shared between the three children’s hospitals. The sessional breakdown of the permanent approved adult cardiology consultant posts is shown below, for the three health board areas, in the Eastern Region. Paediatric services are described in Section 6.5.

East Coast Area Health Board

Population: 333,458

There are five approved permanent consultant posts in the East Coast Area Health Board with the following sessional distribution.

<table>
<thead>
<tr>
<th>Post</th>
<th>St. Vincent’s</th>
<th>St. Colmcille’s</th>
<th>St. Michael’s</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post 1</td>
<td>3</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 2</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 3</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 4</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 5</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>8</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Northern Area Health Board

Population: 486,305

There are eleven approved permanent consultant posts in the Northern Area Health Board, including one full-time and one part-time academic post, with the following sessional distribution.

<table>
<thead>
<tr>
<th>Post</th>
<th>Mater</th>
<th>JCM, Blanch.</th>
<th>Beaumont</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post 1</td>
<td>3</td>
<td>8</td>
<td></td>
<td>8(RCSI)(Academic)</td>
</tr>
<tr>
<td>Post 2</td>
<td>3</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 3</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Post 4</td>
<td>3</td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Post 5</td>
<td>11</td>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Post 6</td>
<td>8</td>
<td></td>
<td>8</td>
<td>3(RCSI)(Academic)</td>
</tr>
<tr>
<td>Post 7</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 8</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 9</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 10</td>
<td>11</td>
<td></td>
<td></td>
<td>1 (Rotunda)(Maternity)</td>
</tr>
<tr>
<td>Post 11</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>16</td>
<td>41</td>
<td>12</td>
</tr>
</tbody>
</table>
South Western Area Health Board
Population: 581 551
There are eight approved permanent consultant posts in the South Western Area Health Board, with the following sessional distribution:

<table>
<thead>
<tr>
<th></th>
<th>St James's</th>
<th>Tallaght</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post 1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 2</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 3</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 4</td>
<td>2</td>
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</tr>
<tr>
<td>Post 5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 6</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 7</td>
<td>8</td>
<td></td>
<td>1 (Coombe)(Maternity)</td>
</tr>
<tr>
<td>Post 8</td>
<td>3</td>
<td>3</td>
<td>8 (Naas)</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>31</td>
<td>12</td>
</tr>
</tbody>
</table>

Midl and Health Board
Population: 225 588
There are three approved permanent consultant posts in the Midland Health Board. One of the posts is based at The Midland Regional Hospital at Tullamore, with access to cardiac catheterisation facilities at St. James's Hospital (Dublin). A second and third post were approved in July 2003, based at Mullingar and at Portlaoise, (eight sessions each), with a three session commitment to Tullamore.

Mid-Western Health Board
Population: 339 930
There are two approved permanent consultant posts in the Mid-Western Health Board. One of the posts is based wholetime at the Mid-Western Regional Hospital, Limerick, with access to the specialised facilities in Cork University Hospital. The second post is based at Ennis General Hospital, (eight sessions) with a three session commitment to the Mid-Western Regional Hospital, Limerick. A third post is under consideration by Comhairle na nOspidéal.

North Eastern Health Board
Population: 344 926
In addition to the existing consultant general physician post (approved in the 1980s with a special interest in cardiovascular disease), a post of consultant cardiologist & general physician based at Our Lady of Lourdes Hospital Drogheda was approved by Comhairle na nOspidéal in December 2002. There are also two posts of consultant general physician, based at Navan and Monaghan hospitals, that have a substantial cardiological component.

North Western Health Board
Population: 221 376
There are two permanent approved posts in the North Western Health Board. There is one post of consultant general physician, appointed with an interest in cardiology, in the North Western Health Board, based wholetime at Sligo General Hospital. In recent years, the consultant undertakes coronary angiography in Sligo in a mobile catheterisation laboratory. In addition a post of consultant cardiologist & general physician based at Letterkenny General Hospital, was approved by Comhairle na nOspidéal in March 2003.
South Eastern Health Board
Population: 423 540
There are three approved permanent consultant posts in the South Eastern Health Board. One post is based wholetime at St. Luke’s Hospital, Kilkenny, with access to the cardiac catheterisation laboratory in St. James’s Hospital, Dublin. The second and third posts are based at St. Joseph’s Hospital, Clonmel and Wexford General Hospital, respectively, (9 sessions per week), both with a two sessions commitment to Waterford Regional Hospital for access to the planned cardiac cathetrisation laboratories facilities. Funding for these two posts was agreed by the Department of Health and Children in 2002 and approved by Comhairle na nOspidéal in May 2002. The recruitment process is now under way.

Southern Health Board
Population: 580 605
There are six approved permanent posts of consultant cardiologist in the Southern Health Board. Three of the posts are based wholetime in Cork University Hospital. One of these was approved in June 2003. Two posts are based in the South Infirmary – Victoria Hospital, 8 sessions and 9 sessions with 3 sessions and 2 sessions respectively in Cork University Hospital. The sixth post, also approved in June 2003, is based at the Mercy University Hospital (8 sessions per week) with three sessions per week at Cork University Hospital. In addition, there is one post of consultant general physician, based at Mallow General Hospital, with a substantial cardiological component.

Western Health Board
Population: 380 057
There are four approved posts of consultant cardiologist in the Western Health Board. The four posts are based wholetime at University College Hospital, Galway. Two of these posts were approved in June 2003. In addition, there is one post of consultant general physician based at Portiuncula Hospital, Ballinasloe, with a substantial cardiological component to his work. The post holder undertakes cardiac catheterisation procedures at St. James’s. There is also one post of consultant general physician based at Mayo General Hospital, Castlebar, where there is a substantial cardiological component to her work.

6.6 Trends in the provision of interventional cardiology in Ireland

The decrease in mortality from cardiovascular diseases in Ireland described in Section 3.2 has been associated with an increase in hospital discharges of patients with a diagnosis of coronary heart disease (Table 6.1). Between 1996 and 2001 discharges increased and length of stay and mortality rates decreased in men and women, and in all age groups.

There were 9 catheterisation laboratories in publicly funded hospitals in the year 2001. It was reported to the Joint Working Group that these hospitals carried out a total of 12 055 coronary angiograms, and 2 799 angioplasty and related procedures in that year (Table 6.2).

A total of 1 459 coronary artery bypass grafts were carried out in 2001 in hospitals reporting to the Hospital In-Patient Enquiry, (HIPE) up from 1 025 procedures in 1996. There was a reduction in CABG procedures in men and women under the age of 55 but an increase over time in all other age/gender categories.
Table 6.1 Hospital in-patients discharged with a primary diagnosis of coronary heart disease, 1996 and 2001, Hospital In-patient Enquiry (HIPE)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Discharges</th>
<th>Bed Days</th>
<th>Average Length of Stay</th>
<th>Mortality Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>&lt; 55</td>
<td>3359</td>
<td>20103</td>
<td>6.0</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>55 - 64</td>
<td>4025</td>
<td>30813</td>
<td>7.6</td>
<td>1.9</td>
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<tr>
<td></td>
<td>65 - 74</td>
<td>3899</td>
<td>34444</td>
<td>8.8</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>75+</td>
<td>2142</td>
<td>18884</td>
<td>8.8</td>
<td>14.8</td>
</tr>
<tr>
<td>Males</td>
<td>&lt; 55</td>
<td>3894</td>
<td>20381</td>
<td>5.2</td>
<td>0.5</td>
</tr>
<tr>
<td>2001</td>
<td>55 - 64</td>
<td>4883</td>
<td>29854</td>
<td>6.1</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>65 - 74</td>
<td>4814</td>
<td>34075</td>
<td>7.1</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>75+</td>
<td>2681</td>
<td>23246</td>
<td>8.7</td>
<td>10.1</td>
</tr>
<tr>
<td>Females</td>
<td>&lt; 55</td>
<td>780</td>
<td>5176</td>
<td>6.6</td>
<td>1.9</td>
</tr>
<tr>
<td>1996</td>
<td>55 - 64</td>
<td>1455</td>
<td>9975</td>
<td>6.9</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>65 - 74</td>
<td>2361</td>
<td>19508</td>
<td>8.3</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>75+</td>
<td>2142</td>
<td>21461</td>
<td>10.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Females</td>
<td>&lt; 55</td>
<td>1076</td>
<td>5658</td>
<td>5.3</td>
<td>0.6</td>
</tr>
<tr>
<td>2001</td>
<td>55 - 64</td>
<td>1727</td>
<td>10477</td>
<td>6.1</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>65 - 74</td>
<td>2550</td>
<td>18800</td>
<td>7.4</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>75+</td>
<td>2436</td>
<td>22740</td>
<td>9.3</td>
<td>11.6</td>
</tr>
<tr>
<td>Total 1996</td>
<td>20173</td>
<td>160364</td>
<td>7.9</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>24061</td>
<td>165231</td>
<td>6.9</td>
<td>3.7</td>
<td></td>
</tr>
</tbody>
</table>

Source: Information Management Unit, Department of Health and Children
Table 6.2 Cardiac Catheterisation Laboratory Facilities and Activity in Public and Private Hospitals for the year 2001

<table>
<thead>
<tr>
<th>Public Hospitals</th>
<th>Number of Cardiac Cath. Labs:</th>
<th>Number of Angiograms</th>
<th>Number of Angioplasties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaumont</td>
<td>1</td>
<td>1 400</td>
<td>250</td>
</tr>
<tr>
<td>Mater</td>
<td>1</td>
<td>2 180</td>
<td>666</td>
</tr>
<tr>
<td>St. James's</td>
<td>2</td>
<td>2 162</td>
<td>718</td>
</tr>
<tr>
<td>St. Vincent's</td>
<td>1</td>
<td>1 254</td>
<td>190</td>
</tr>
<tr>
<td>Tallaght</td>
<td>1</td>
<td>1 200</td>
<td>157</td>
</tr>
<tr>
<td>Cork University Hospital</td>
<td>1</td>
<td>1 462</td>
<td>400</td>
</tr>
<tr>
<td>Mid-Western Regional Hospital, Limerick</td>
<td>1</td>
<td>1 136</td>
<td>154</td>
</tr>
<tr>
<td>University College Hospital, Galway</td>
<td>1</td>
<td>1 261</td>
<td>264</td>
</tr>
<tr>
<td>TOTAL Public Hospitals</td>
<td>9</td>
<td>12 055</td>
<td>2 799</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Private Hospitals*</th>
<th>Number of Cardiac Cath. Labs:</th>
<th>Number of Angiograms</th>
<th>Number of Angioplasties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mater Private</td>
<td>2</td>
<td>2 215</td>
<td>617</td>
</tr>
<tr>
<td>Blackrock Clinic</td>
<td>1</td>
<td>1 462</td>
<td>245</td>
</tr>
<tr>
<td>Bon Secours Hospital, Cork</td>
<td>1</td>
<td>484</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL Private Hospitals</td>
<td>4</td>
<td>4 161</td>
<td>862</td>
</tr>
</tbody>
</table>

Source: ERHA Cath. Lab. review (in respect of hospitals in ERHA region), Statistics Division CUH, MWRH, UCHG and Cork Bon Secours Private Hospital.

* The majority of these procedures in the private hospitals are undertaken by the consultant cardiologists employed in the public hospitals.

6.7 Cardiac surgery services

Cardiac surgery in public hospitals is provided at the Mater and St. James’s in Dublin, and in Cork University Hospital as well as in Our Lady’s Hospital for Sick Children, Crumlin, in respect of children. Plans are under way to provide adult cardiac adult surgery services in University College Hospital Galway. There are plans to augment cardiothoracic surgery in Cork.

The sessional distribution of the 11 approved permanent posts of consultant cardiothoracic surgeon is set out in table 6.3 and the increase number of CABGs from 1996 to 2001 is set out in table 6.4.
Table 6.3 Sessional distribution of Consultant Cardiothoracic surgeons

<table>
<thead>
<tr>
<th>Post</th>
<th>Mater</th>
<th>St. James's</th>
<th>CUH</th>
<th>Crumlin</th>
<th>St. Vincent's*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
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<tr>
<td>6</td>
<td></td>
<td></td>
<td>11</td>
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<td></td>
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<td>7</td>
<td></td>
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<td>11</td>
<td></td>
<td></td>
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<td>8</td>
<td></td>
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<td>9</td>
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<tr>
<td>11</td>
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<td></td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>29</td>
<td>22</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>

* Thoracic surgery is undertaken by consultant cardiothoracic surgeons at St. Vincent's Hospital Dublin, but cardiac surgery is not done at this site.

Table 6.4 CABGs carried out in hospitals reporting to the Hospital In-Patient Enquiry, 1996 and 2001

<table>
<thead>
<tr>
<th>Age Group</th>
<th>&lt; 55</th>
<th>55-64</th>
<th>65-74</th>
<th>75+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males 1996</td>
<td>227</td>
<td>293</td>
<td>241</td>
<td>26</td>
<td>787</td>
</tr>
<tr>
<td>2001</td>
<td>206</td>
<td>413</td>
<td>406</td>
<td>87</td>
<td>1112</td>
</tr>
<tr>
<td>Females 1996</td>
<td>39</td>
<td>73</td>
<td>108</td>
<td>18</td>
<td>228</td>
</tr>
<tr>
<td>2001</td>
<td>33</td>
<td>88</td>
<td>168</td>
<td>58</td>
<td>374</td>
</tr>
<tr>
<td>Total 1996</td>
<td>266</td>
<td>366</td>
<td>349</td>
<td>44</td>
<td>1025</td>
</tr>
<tr>
<td>2001</td>
<td>239</td>
<td>501</td>
<td>574</td>
<td>145</td>
<td>1459</td>
</tr>
</tbody>
</table>

Source: Information Management Unit, Department of Health and Children

6.8 Paediatric cardiology

Paediatric cardiology services are provided on a national basis mostly via Our Lady’s Hospital for Sick Children, Crumlin, in Dublin. Two of the appointees have sessional commitments to The Children’s Hospital, Temple Street and to the National Children’s Hospital at Tallaght respectively. There are 5 permanent approved posts of consultant paediatric cardiologist. Two of the posts were approved by Comhairle na nOspideal in February 2002. The sessional breakdown of the five posts is as follows:

<table>
<thead>
<tr>
<th>Post</th>
<th>Crumlin</th>
<th>Temple St.</th>
<th>Tallaght</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3*</td>
<td>8</td>
<td></td>
<td></td>
<td>3(Mater)</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>post 5</td>
<td>8</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

* This post has a designated special interest in adult congenital heart disease.

Note: - There is also a post of consultant paediatrician with an interest in cardiology based at Tallaght Hospital with two sessions at Crumlin. The postholder retired in 1999 and an application to replace this post has not been made by the hospitals concerned.
A Review of Recent Developments in Health Policy and in the Practice of Cardiology in the Hospital Setting

7.1 **General principles**

The national health strategy 'Quality and Fairness' set out the underlying principles for health services in Ireland: equity, people-centredness, quality and accountability.

The changing epidemiology of coronary heart disease, described in Section 3.2, is relevant to the planning of services for cardiac patients. Patients with coronary heart disease are presenting at an older age and they live longer with the disease. Ongoing management of patients with chronic disease can be provided in the community. However, consultant staffed hospital services have an important role in secondary prevention and cardiac rehabilitation, to prevent recurrence of acute events and improve quality of life. Consultant staffed hospital services must also be provided for the increasing number of patients in older age groups with heart failure.

In aiming to provide equity of access between people living in different parts of the country, the Joint Working Group was cognisant of the requirement that organisational structures must also support patient safety and quality of care. For complex cardiac interventions, the Joint Working Group recognised the balance to be achieved between reasonable access for patients, and the requirement that the operator carry out a minimum volume of procedures and have the support of colleagues and a multidisciplinary team in order to achieve the best patient outcomes.

Recent developments in the care of patients with cardiac conditions are reviewed below. However, it must be recognised that cardiac treatments and interventions are evolving rapidly. Models of care must therefore be reviewed every two to three years to ensure that patients benefit from technological advances, with appropriate risk management, while making efficient use of available resources.

7.2 **Secondary prevention and cardiac rehabilitation**

There is increasing evidence of the effectiveness of secondary prevention in patients with coronary heart disease, i.e. lifestyle advice and medications to reduce the risk of recurrent events, such as heart attack or exacerbation of symptoms requiring interventions. There have been improvements in the prescription of such medications for patients in Ireland in recent years. Nevertheless, a proportion of patients still do not benefit from the prescription of such medicines. In addition, there is continuing prevalence of smoking, inactivity, and increasing prevalence of overweight and diabetes. Consultant staffed hospital services have an important role in initiating such treatment in hospital in-patients and in those referred for management because of their high-risk status.

There is also evidence that cardiac rehabilitation, incorporating exercise training as appropriate to the patient, improves prognosis and quality of life. Despite considerable expansion of cardiac rehabilitation services in Ireland in recent years, there is evidence of substantial unmet need, particularly among older people. Thus, there is need to further expand consultant staffed cardiac rehabilitation provision so that the service can be offered to all patients who would benefit.

7.3 **Care of patients with heart failure**

The Irish Heart Foundation's Council on Heart Failure has drawn attention to the rapidly increasing prevalence of heart failure among older people in Ireland, as in many other developed countries. This is attributed to the ageing of the population, poor control of conditions such as hypertension and better survival rates from acute coronary events. It is estimated that there are currently 80,000 people with heart failure in Ireland. In addition a further 80,000 have impaired left ventricular dysfunction or impending heart failure. There are more than 10,000 new cases each year and approximately 12,000 emergency hospital admissions each year. These figures are projected to increase rapidly in the coming decade.
The Council on Heart Failure describes the condition as 'deadly and disabling' and draws attention to the high rates of hospital admission and poor prognosis of these patients. Hospital admission is the most reliable indicator of further morbidity and more than 50% of patients are likely to be readmitted within six months. The average length of hospital stay with heart failure in Ireland is 12 days, and 17 days for a re-admission. Patients with heart failure occupy more than a quarter of a million bed days in Irish hospitals each year. The Council acknowledges the evidence that not all patients receive optimum care, including appropriate pharmacological therapy. On a positive note, there is evidence that structured physician directed, multidisciplinary care can substantially reduce readmission rates. Patient and carer education, ensuring that patients meet defined criteria for clinical stability prior to discharge and close follow-up thereafter are important components of structured care.

It is estimated that care of patients with heart failure uses 1-2% of the total health care budget in Ireland. Approximately 75% of hospital costs were associated with ward costs while medications accounted for 3.5% of total costs. The Irish Heart Foundation's Council has calculated that there would be substantial savings in the cost of hospital services for patients with heart failure from the application of structured care, led by a physician in each hospital and supported by a trained nurse specialist. Such structured care should continue for three months, with care then devolving to community services. Given the large numbers of patients requiring hospital care, the needs of heart failure patients must be taken into account in planning hospital cardiology services.

7.4 Recent advances in coronary interventions

7.4.1 Percutaneous coronary interventions

The evidence of benefit and the indications to apply percutaneous coronary interventions (PCI) were reviewed by The American College of Cardiology / American Heart Association (ACC/AHA) Committee to Revise the 1993 Guidelines for percutaneous transluminal coronary angioplasty (2001). The Committee used the term percutaneous transluminal coronary angioplasty (PTCA) to refer to balloon angioplasty. Other techniques to relieve coronary narrowing, including implantation of intracoronary stents, various forms of atherectomy, laser angioplasty, and other catheter devices were included under the broader term of PCI.

The ACC / AHA Committee summarised the evidence on the benefits of PCI as follows: ‘Despite the extension of coronary intervention to higher-risk patients with co-morbid disease and complex coronary anatomy, angiographic and procedural success have increased ... with an associated decrease in the major complications of Q-wave MI and emergency CABG. ... Improvements in balloon technology coupled with the increased use of non-balloon devices, particularly stents (which are effective in treating abrupt vessel closure) and glycoprotein IIb/IIIa platelet receptor antagonists have favorably influenced acute procedural outcome.’

The ACC / AHA Committee acknowledges that available data on long-term outcome relate to patients undergoing PTCA before newer technologies became available. While the acute outcome has improved with recent technologies, including stents and pharmacologic therapy, the long-term impact may be less impressive considering factors such as the advanced age and complex multivessel disease of many patients currently undergoing PCI.

Reviewing the evidence comparing the benefits of PTCA and coronary artery bypass graph surgery (CABG), the ACC / AHA Committee concluded that ‘Both revascularization techniques relieve angina. However, to achieve similar clinical outcomes, patients treated with PTCA are more likely to require further interventions than patients having surgery. Analysis of quality-of-life data from BARI suggests that functional status including activities of daily living improved less in patients assigned to PTCA that in those assigned to CABG (p < 0.05), although patients with initial PTCA returned to work five weeks sooner than did patients undergoing operation (p < 0.001).’
PCI technology continues to be developed, particularly to reduce acute and medium-term restenosis rates. One new technology uses the stent as a carrier to release a drug intended to reduce thickening of the arterial wall and recurrence of the arterial blockage. The first trials of such drug-eluting stents demonstrated marked reduction in restenosis rates compared to conventional stents. Several other trials are underway and it is widely anticipated that drug-eluting stents will be demonstrated to produce better outcomes compared to conventional angioplasty and stent.

The cost-effectiveness analysis of the ACC/AHA Committee concluded that for some patients with single vessel disease and severe symptoms, PTCA and related interventions have a cost per quality-adjusted life year (QALY) (< $20,000) which is very favourable compared to medical therapy. For patients with more complex coronary pathology, the cost per QALY ($20,000 to $60,000) was considered 'reasonably acceptable'. In comparing the costs and benefits of PTCA with those of CABG, the initial cost of angioplasty was 65% that of surgery, but the need for repeat interventions increased medical expenses so that after 5 years the total medical cost of PTCA was 95% that of surgery. 'Compared to CABG, PTCA appeared less costly for patients with 2-vessel disease, but not for patients with 3-vessel disease.' Overall, 'The Committee underscores the need for cost containment and careful decision making regarding the use of PCI strategies'.

7.4.2 Primary PCI

The term 'primary PCI' refers to the use of PCI as a reperfusion therapy for patients with evolving acute myocardial infarction (AMI), restoring blood flow in the blocked artery. An editorial in The Lancet stated that results from many multicentre randomised trials comparing primary angioplasty with thrombolytic (intravenous 'clot-busting' drugs) therapy have 'demonstrated reduced rates of death, reinfarction, recurrent ischaemia, unplanned revascularisation procedures, stroke, intracerebral bleeding, and earlier hospital discharge with the invasive approach.' There have now been 22 such trials in which 6,889 patients were randomised, demonstrating that for every 1,000 patients treated with primary angioplasty rather than thrombolytic therapy, an additional 20 lives are saved, 43 reinfarctions are prevented, 10 less strokes occur, and 13 intracranial haemorrhages are avoided. Further, the editorial recognises that the benefits from primary PCI may be greater than demonstrated in the trials, given the ongoing advances in coronary intervention techniques.

The provision of reperfusion therapy for patients with an AMI is even more challenging for PCI compared with thrombolysis. Thrombolysis can be safely given in the community prior to transfer to hospital, or in the accident and emergency department. PCI requires a hospital unit with the facilities and available trained staff to provide complex coronary interventions. The CAPTIM trial found that it took just 60 minutes longer to 'first balloon inflation' than to provide hospital-based fibrinolytic (thrombolytic) therapy. There was a similar time gap in the DANAMI-2 trial in which patients were randomised to thrombolysis or PCI if they presented within 12 hours of an AMI. A large proportion of patients were transferred, with a transfer time of up to three hours to the intervention hospital. Outcomes were significantly better in patients receiving primary PCI, due to a reduction in reinfarction rates.

The results of the trials led The Lancet editorial writer to conclude that 'the best therapy for most patients with evolving AMI should no longer be debated: administer antiplatelet therapy, ... withhold thrombolytic therapy, and transfer the patient for primary PTCA, regardless of whether the nearest catheterisation suite is three floors or 3 hours away'.

The institutional and operator requirements for the safe delivery of primary PCI are set out in section 7.5.
7.5 **Standards for interventional cardiology**

### 7.5.1 Institutional requirements for Percutaneous Coronary Interventions

The British Cardiac Society (BCS) and British Cardiovascular Intervention Society (BCIS) Joint Working Group on Coronary Angioplasty published guidelines (2000) for good practice and training.\(^\text{12}\) The Working Group acknowledged that previous guidelines placed reliance on the volume of procedures undertaken by operators and institutions as a surrogate for measures of quality. The delivery of a high quality service depends on a range of institutional and operator factors, as well as case selection, audit and training.

The BCS / BCIS Joint Working Group noted the importance of adequate staff and facilities to perform safe and effective procedures.\(^\text{12}\) This includes continuous access to angioplasty hardware and adjunctive medication, and a proactive approach to upgrading equipment.

In relation to service provision the Working Group recommended: 'The angioplasty service should provide a 24 hour service seven days a week, and catheter laboratories should be capable of being fully functional within 60 minutes of being needed.' This recommendation has implications for staffing levels, including for consultant cardiologists. 'To ensure continuity of service provision each centre should have a minimum of three trained operators. An on-call cover of 1:3 in such an acute subspecialty puts unreasonable and unsustainable demands on the participating interventionists; centres with this minimum should make strenuous efforts to increase their number of operators to four and preferably five or six depending on local workload.'

The 1996 recommendation that each centre should perform a minimum of 200 procedures per annum was revised. Centres performing less than 200 procedures are considered low volume centres. All centres, regardless of procedure volume, should participate in peer review. The emphasis should be on concentrating services in centres with high volumes of procedures:

- 'All interventional centres should audit their activity against the standards set out in this paper, present the results of this audit locally, and submit their data to BCIS / CCAD for national statistics to be produced.'
- 'A centre undertaking < 200 procedures annually but demonstrating good practice, as judged by peer review and against the criteria outlined in this document should be supported and encouraged to increase its activity.'
- 'The UK should continue to concentrate interventional cardiology services in centres with relatively high volumes of procedures, using operators who maintain a high level of experience and offer a wide range of interventional techniques.'\(^\text{12}\)

In England the National Service Framework (NSF) for Coronary Heart Disease (2000)\(^\text{13}\) set out facility standards for angiography and PTCA, as follows:

- 'Angiography: in any single institution undertaking coronary angiography, a minimum of 500 cardiac catheterisation procedures per year should be carried out by a minimum of two operators.'
- 'PTCA: in any single institution undertaking coronary angioplasty (PTCA), a minimum of 200 procedures per year should be carried out by a minimum of two trained operators (consultant level).'

The Fifth Report on the Provision of Services for Patients with Coronary Heart Disease (2002)\(^\text{14}\) was prepared by a group representing a large range of organisations in the UK, led by the British Cardiac Society. It is recommended that PCI services should only be developed in District General Hospitals (serving a population of 450 000 to 600 000) if they can satisfy the BCS / BCIS guidelines. 'This requires a high level of facilities, a fully trained team, adequate numbers of operators, and appropriate arrangements for surgical cover.'
The American College of Cardiology / American Heart Association (ACC/AHA) Committee on Revision of the 1993 PTCA Practice Guidelines, (2001) listed the following issues to be considered in the assessment and maintenance of proficiency in coronary interventional procedures.⁸

### Institutions
- Quality assessment monitoring of privileges and risk/stratified outcomes,
- Provide support for a quality assurance staff person (e.g., nurse) to monitor implications,
- Minimal institutional performance activity of 200 interventions per year with the ideal minimum of 400 interventions per year,
- Interventional program director who has a career experience of >500 PCI procedures and is board certified by ABIM in interventional cardiology,
- Facility and equipment requirements to provide high resolution fluoroscopy and digital video processing,
- Experienced support staff to respond to emergencies. (See section IV, C. Need for Surgical Backup for discussion) and
- Establishment of a mentoring program for operators who perform <75 procedures per year by the individuals who perform ≥ 150 procedures per year.

### Physicians
- Procedural volume of ≥ 75 per year,
- Continuation of privileges based on outcome benchmark rates with consideration of not granting privileges to operators who exceed adjusted case mix benchmark complication rates for a 2-year period,
- Ongoing quality assessment comparing results with current benchmarks with risk stratification of complication rates and
- Board certification by ABIM in interventional cardiology.

Source: ABIM = American Board of Internal Medicine:

The Committee emphasised that a safe service requires that the institution meet appropriate standards, with the necessary facilities and equipment, a programme director, experienced support staff and a quality assurance and monitoring programme. The optimal institutional volume is 400 or more procedures per annum.

### 7.5.2 Operator requirements for Percutaneous Coronary Interventions

The BCS/BCIS Joint Working Group on Coronary Angioplasty stated that 'it is obviously essential that those providing such a service to patients are properly trained and maintain their competence by continued practice'.⁵ In this regard, the Working Group recommended that: 'An independent angioplasty operator should undertake a minimum of 75 coronary procedures annually, and those performing close to this minimum should ideally increase their workload to nearer 100 procedures.' The Working Group considered that 'anyone with an annual personal workload close to this recommended minimum should consider undertaking their procedures in a centre where other trained operators are available for help and advice if needed.'

In England the NSF recommendations are as follows:¹³

#### Angiography
- each individual trained operator (consultant level) should perform a minimum of 100 cardiac catheterisations per year.

#### PTCA
- each individual trained operator (consultant level) should perform a minimum of 75 angioplasties per year.
The ACC/AHA Committee considered that an acceptable operator volume to maintain standards is 75 or more interventional procedures annually. Above, it is recommended that, ideally, operators with an annual volume of less than 75 per annum should only work at institutions with an active level of more than 600 procedures per year; this recommendation refers to institutions with on-site cardiac surgery. Such low volume operators should develop a defined mentoring relationship with a highly experienced operator who has an annual procedural volume of 150 or more procedures annually.

7.5.3 Views of the Irish Cardiac Society re institutional and operator volumes for PCI
The Irish Cardiac Society (ICS) in a submission to the Joint Working Group advised that 'a PTCA service should only be provided in units carrying out a minimum of 200 procedures per year. Each unit should have at least two interventional cardiologists as part of the total unit complement with each operator carrying out a minimum of 100 PTCA's per year'. In addition, the ICS advised that 'ideally each unit should have two cardiac catheterization labs to allow rescue angioplasty to be carried out without delay and without interruption of other ongoing diagnostic and therapeutic procedures'.

7.5.4 The availability of on-site cardiac surgery
When PTCA was first developed, it was considered mandatory to have ready access to cardiac surgery facilities to treat serious complications arising from the procedure. With advances in PCI, those setting standards have addressed the issue of whether surgical backup should still be required. The ACC/AHA Committee (2001) noted that 'Cardiac surgical backup for percutaneous coronary interventions has evolved from the formal surgical standby in the 1980s to an informal arrangement of first available operating room and, in some cases, off-site surgical backup. With the advent of intracoronary stenting, there has been a decrease in the need for emergency coronary bypass, ranging between 0.4 and 2%. The Coronary Heart Disease / Stroke Task Force in Scotland notes that in Scotland in 2000 only four patients (out of approximately 3,000) required transfer for emergency cardiac surgery and all survived.

The BCS / BCIS Joint Working Group acknowledged that there are differing opinions on the need for surgical cover. It has been suggested that when groups of patients can be shown to require emergency CABG sufficiently infrequently (<1% of cases) its routine provision should be considered unnecessary; however, others argue that the need for emergency CABG is unpredictable and, even though required rarely, it may still be lifesaving.

The recommendations of the BCS / BCIS Joint Working Group were as follows:
'Surgical cover, whether on-site or off-site, is still recommended for all coronary angioplasty procedures other than those few cases prospectively agreed not to be suitable for emergency CABG. All interventional centres should be able to establish cardiopulmonary bypass within 90 minutes of the decision being made to refer the patient for surgery.'

For those centres with off-site surgical cover the BCS/BCIS Joint Working Group considered that 'The covering surgeon should know in advance that the PTCA procedure is being undertaken and an arrangement must exist with the local ambulance service for the immediate availability of an ambulance, fully equipped with resuscitation facilities, for emergency transfer of the patient when necessary. These arrangements should be explicit and agreed with purchasers and the ambulance service.'

In England the NSF (2000) concurs with the BCS/BCIS Joint Working Group, recommending: 'PTCA should be performed only with pre-arranged cardiac surgical cover and in institutions where emergency cardio-pulmonary bypass can be established within 90 minutes of the decision to refer the patient for emergency CABG. If inter-hospital transfer is required, the journey time between hospitals should not exceed 30 minutes.'
In the USA the ACC / AHA Committee have taken a more conservative view than has been taken in the UK. With regard to elective PCI without on-site surgery the ACC/AHA Committee noted:

- Several centres have reported satisfactory results based on careful case selection with well-defined arrangements for immediate transfer to a surgical program;
- Several outstanding and critically important clinical issues, such as timely management of ischaemic complications, adequacy of specialized post-interventional care, logistics for managing cardiac surgical or vascular complications and operator / laboratory volumes, and accreditation must be addressed.
- At this time, the Committee, therefore, continues to support the recommendation that elective PCI should not be performed in facilities without on-site cardiac surgery.

The performance of primary angioplasty (i.e. as treatment for AMI) in facilities without on-site cardiac surgery was also considered by the ACC/AHA Committee. Details are provided of requirements for facilities and staff and of the procedures to be followed. Recommendations include that:

- Primary intervention must be performed routinely as the treatment of choice around the clock for a large proportion of patients with AMI, to ensure streamlined care paths and increased case volumes;
- Case selection for the performance of primary angioplasty must be rigorous;
- There must be formalized written protocols in place for immediate (within 1 h) and efficient transfer of patients to the nearest cardiac surgical facility which are reviewed / tested on a regular (quarterly) basis.
- The operators must be experienced interventionalists who regularly perform elective intervention at a surgical center (≥ 75 cases/year). The institution must perform a minimum of 36 primary PCI procedures per year.
- The nursing and technical catheterization laboratory staff must be experienced in handling acutely ill patients and comfortable with interventional equipment. They must have acquired experience in dedicated interventional laboratories at a surgical center. They participate in a 24-h, 365-day call schedule.
- The catheterization laboratory itself must be well-equipped, with optimal imaging systems, resuscitative equipment, IABP support, and must be well stocked with a broad array of interventional equipment.
- The cardiac care unit nurse must be adept in hemodynamic monitoring and IABP management.
- The hospital administration must fully support the program and enable the fulfillment of the above institutional requirements.
- There must be formalized written protocols in place for immediate (within 1 h) and efficient transfer of patients to the nearest cardiac surgical facility which are reviewed / tested on a regular (quarterly) basis.
- Primary intervention must be performed routinely as the treatment of choice around the clock for a large proportion of patients with AMI, to ensure streamlined care paths and increased case volumes.
- Case selection for the performance of primary angioplasty must be rigorous.
- There must be an ongoing program of outcomes analysis and formalized periodic case review.
- Institutions should participate in a 3 to 6 month-period of implementation during which time development of a formalized primary PCI program is instituted that includes establishing standards, training staff, detailed logistic development, and creation of a quality assessment and error management system.

AMI = acute myocardial infarction; IABP = intra-aortic balloon pump; PCI = percutaneous coronary intervention.

The Fifth Report on the Provision of Services for Patients with Coronary Heart Disease (UK) (2002) recognised the increasing emphasis on PCI for revascularisation. It is intended to further develop networks of cardiac care which will determine the rollout of PCI to additional sites. This will include a limited number of DGHs provided they fulfill the BCIS institutional and operator requirements.
7.5.5 Views of the Irish Cardiac Society re on-site cardiac surgery.

A submission from the Irish Cardiac Society to the Joint Working Group stated that 'Complications of PTCA that require urgent surgery are now extremely rare (<1 per 1000). The advent of technology such as stenting has rendered PTCA an extremely safe procedure'. The Irish Cardiac Society further stated that 'it has been recognised for many years that on-site surgical backup is not a prerequisite for the performance of percutaneous intervention and hospitals without on-site surgery in cities with adjacent surgical centres routinely undertake PCI. For interventional centres distant from surgical units, formal arrangements, possibly involving air transport, should be in place for those exceptional instances where surgical support is required.'

7.6 Developments in electrophysiology

The following information is drawn from a document written by six cardiologists in Ireland with expertise in Electrophysiology submitted to the Joint Working Group by the Eastern Regional Health Authority.

Clinical Electrophysiology (EP) is the subspecialty within cardiology that deals with the diagnosis and management of cardiac arrhythmias and syncope (fainting). Electrophysiologists commonly perform four types of invasive procedures which are not performed by general cardiologists:

- Electrophysiology studies which are used to assess the risk of sudden cardiac death and the inducibility and mechanisms of supraventricular and ventricular arrhythmias (abnormal rhythms arising from different locations in the heart)
- Radiofrequency ablations which cure and prevent recurrence of arrhythmias
- Implantable cardioverter defibrillator (ICD) implants which are used to prevent sudden cardiac death due to ventricular arrhythmias and
- Biventricular pacemaker implants for the treatment of some patients with drug refractory heart failure.

Electrophysiologists use a range of noninvasive tests to stratify patients with regard to their risk of life threatening cardiac arrhythmias. A diagnostic EP study typically takes 1 to 2 hours. Radiofrequency ablation is the therapeutic component of EP studies. Given that it is preceded by an EP study, the entire procedure takes 2 to 4 hours.

Pacemakers are implanted under the skin and are indicated in patients with symptomatic slow heart rhythms. Synchronised pacing is a new form of pacing indicated for approximately 30% of patients with severe heart failure. Implantable cardioverter defibrillators (ICDs) are used to prevent sudden death due to rapid ventricular arrhythmias. Larger than pacemakers, they are also implanted under the skin but the implant procedure is more complex.

The document provides estimates of the likely number of patients requiring the service. It is estimated that 1,240 patients in Ireland require ablations annually. An additional 1,500 patients require diagnostic electrophysiology studies annually. The authors note that new techniques, such as pulmonary vein isolation procedures for the prevention of atrial fibrillation could see the number of patients with an indication for ablations rising 2-3 fold.

It is estimated that a total of about 1,000 pacemakers are inserted annually in five centres in Dublin (Mater Misericordiae, Beaumont, Tallaght, St. James's and St. Vincent's) and three centres outside Dublin (Cork, Galway and Limerick). Most of any increase in demand is likely to result from the indications for synchronised pacing in heart failure patients, the subject of ongoing clinical trials. Potentially this could increase the volume of pacing by 40%.

The view of consultant cardiologists undertaking EP in Ireland is that all centres providing PCI should also provide some electrophysiology services, involving a consultant with appropriate training. This 'would provide adequate capacity for what is likely to be about 2,000 – 2,500 device implants in five years time (1,200 pacemakers, 800 ICDs and 200 biventricular pacemakers)."
The consultants consider that more complex procedures including catheter ablation will be performed in a smaller number of hospitals. They envisage such services being provided in Galway, Cork and in three Dublin hospitals (Mater, Beaumont and St. James's). The aim should be to provide dedicated EP laboratory facilities on each site. Within Dublin, referral arrangements should be in place, from the Southside to St. James's and on the Northside to Mater and Beaumont hospitals.

It is emphasized by these cardiologists that all hospitals providing this service should work closely together to keep waiting times for procedures to a minimum and to ensure that waiting times in one hospital do not substantially exceed those in the other hospitals.

Finally, the cardiologists with expertise in EP note that the performance of procedures is just one component of an electrophysiology service. Appropriate facilities and staffing are also required, including 'a 'critical mass' of cardiac technicians, nurses and radiographers in the electrophysiology laboratory who are expert in the performance of electrophysiology studies', and access to anaesthesia facilities and services.

## 7.7 Models of care for patients with cardiac disease

Any model for the development of cardiology services must fit with the broader health care system. At the time of writing of this report, the National Task Force on Medical Staffing established by the Minister for Health & Children was, among other issues, considering the proposed development of a consultant-provided public hospital service and addressing the resource and cost implications involved. The Task Force also addressed the reduction in working hours for non-consultant hospital doctors arising from the EU Directive on Working Time and the medical education and training requirements of the hospital medical work force. The Task Force has also addressed the associated medical staffing needs of the Irish hospital system and considered the medical education and training requirements arising from any changes to the current model of delivering services.

The Working Group recognizes that the implementation of the National Task Force Report may have staffing implications which would be additional to its recommendations.

There have been rapid advances in the treatment of cardiac disease in recent years and further advances are anticipated. Some of the challenges arising from these developments have been described above, including:

- providing access to elective PCI while maintaining a safe service
- providing rapid revascularisation (thrombolysis or PCI) for patients with acute coronary syndromes
- the organisation of services requiring a very high level of technological facilities and expertise.

It is timely to examine how other countries have developed or are planning to develop cardiology services, bearing in mind that the organisation of hospital services may be different to that in Ireland. Three recently published reports make proposals on the organisation of services for cardiac patients, one for the UK as a whole, one addressing care for patients with coronary heart disease in Scotland and a third which reviews cardiology services in Northern Ireland.

The 'Fifth Report on the provision of services for patients with heart disease' addresses all aspects of service provision in the UK for patients with heart disease. These include prevention and the organisation of services in primary care. In relation to hospital services, the report describes services in district general hospitals (DGHs) as well as in tertiary cardiac centres.

The DGH provides immediate care for a community, serving a population of 450,000 to 600,000. Many of the services previously provided in tertiary centres are being increasingly provided in DGHs. These include permanent pacing, cardiac catheterisation, nuclear cardiology, and transoesophageal echocardiography. Training of district cardiologists needs to be broad; but as consultant numbers increase in the DGH some degree of sub-specialisation is likely. The aim is to provide a 'next working day' cardiological service for cardiac patients, and work as quickly as possible towards staffing levels which would allow a 24 hours a day, seven days a week, consultant-led cardiology service for acute coronary syndrome and other cardiac conditions. DGHs have a large investigative role, including ECG recording, exercise testing, echocardiography, Holter monitoring, tilt testing and pacemaker (and in future implantable defibrillator) follow-up.
Most large DGHs will have a cardiac catheterisation laboratory, a pacing theatre and access to nuclear cardiology facilities. Elective invasive investigational work (mainly coronary angiography) will be undertaken in many DGHs in the future. However, some will also undertake electrophysiology and radiofrequency ablations and insert ICDs. It is estimated that 'one diagnostic cardiac catheterisation and angiography laboratory would be required per 450,000 to 600,000 population; and one pacemaker and defibrillator implantation laboratory per 1.4 – 1.6 million population; or one combined laboratory per 350,000 – 400,000 population if pacing and cardiac defibrillators are implanted in the same facility as cardiac catheterisations and angiography procedures.'

The Fifth Report notes that PCI services are developing in some DGHs in response to long interhospital transfer times to tertiary centres and because of improvements in technology which have increased safety and reduced the need for emergency CABG. However, the report recommends that PCI services should only be developed in the DGH if they can satisfy the recent BCS/BCIS guidelines.14 ‘This requires a high level of facilities, a fully trained team, adequate numbers of operators, and appropriate arrangements for surgical cover’. Despite this caveat, the report states that ‘It is probable that a significant number of large DGH cardiology units will have PCI facilities in the future, and that operators working in the DGH will also maintain their expertise by performing PCI at their local tertiary centre’. At present, the rollout of PCI services will be to a limited number of DGH sites that can fulfill the BCS/BCIS requirements.

The Joint Report of the Society of Cardiothoracic Surgeons and the British Cardiac Society19 on models of care for the delivery of cardiac surgery also anticipates developments in the services provided at DGHs. A minority of such hospitals will have ‘full cardiac surgery and cardiology facilities’. The remaining DGHs will either provide ‘interventional cardiology where appropriate without surgical cover’ or will be DGHs with non-interventional cardiology only.

Tertiary centres in the UK also provide secondary care for the hospital’s local population.14 In addition, tertiary centres provide more specialised services than are provided in DGHs, accepting patients on referral from several DGHs and serving a population of 1.5 to 2.5 million. Each tertiary center ‘should currently be performing 1,200 – 2,500 open heart operations and a greater number of PCI procedures’.

Tertiary services may include:

- Cardiac surgery,
- Interventional cardiological techniques, including PCI,
- Complex EP,
- Specialised investigative techniques, including positron emission tomography (PET) scanning and echocardiography services to investigate complex cases and
- Highly specialised services, such as transplantation, paediatric cardiology, treatment of adult patients with congenital heart disease.

Similar issues on the organisation of hospital services in Scotland were considered in The Coronary Heart Disease / Stroke Task Force Report.16 Accepting the need to increase access to revascularisation, the Task Force recommends that the additional interventions should be provided through expansion of activity within the existing four cardiac surgery centres and eleven catheterisation laboratories to serve the population of Scotland (5.1 million). This will involve the development of additional catheterisation laboratory facilities at these sites. The report also recommends substantial increases in the numbers of consultant cardiologists in Scotland.
A Review of Cardiology Services in Northern Ireland (1999),\textsuperscript{10} made recommendations on cardiology services including pre-hospital care, hospital care and post-hospital care. In respect of hospital cardiology services, the report outlined that acute services for cardiology have traditionally been delivered by a range of facilities structured in a hierarchical manner. All hospitals providing acute services in Northern Ireland conduct a range of non-invasive cardiology investigations to inform diagnosis and patient management. Referral for diagnostic interventional cardiology is to the Royal Victoria or Belfast City Hospitals.

An alternative to the existing "hub and spoke" model, the hub representing the tertiary level of care and spokes representing primary and secondary care, was proposed. The Report recommended a new integrated model of care - "A Clinical System of Care".

The concept of a clinical system was described as an arrangement of clinical resources organised to provide medical care to a clinical group of patients in a way that represents the best balance between clinical-effectiveness, cost-effectiveness and accessibility. This clinical system would ideally consist of:

- all hospitals providing cardiology services communicating on an ongoing basis with one another
- effective information technology (IT) links between all hospitals
- Clinicians with responsibility to the clinical system of care in addition to the institution with which they hold a contract
- the use of evidence-based clinical guidelines.

Within the clinical system of care, a number of local area networks should be created. Within a local cardiac network, a comprehensive range of non-invasive cardiology services should be available at one designated unit. This should include a comprehensive range of facilities for cardiology investigations, a coronary care unit, a minimum of two consultant cardiologists, IT links with other hospitals and with GPs to support information exchange and a workload base sufficient to justify and support all of the above. A range of possibilities were put forward to achieve this, taking into consideration geographic and demographic factors. One possibility outlined was to have 5 local cardiac networks covering the following areas in Northern Ireland: Belfast, the North, the South, the Northwest and the West. It was proposed that the Royal Victoria Hospital and the Belfast City Hospital cardiology units should act functionally as a single tertiary reference centre for Northern Ireland (population 1.6 million).

In essence, the Report recommended the development of an integrated cardiology service, between primary, secondary and tertiary care, while outlining a useful framework for development. The elements of the clinical system of care highlighted were partnership, achieving an equitable distribution of resources and maximizing benefits for all patients.

7.8 The views of the Irish Cardiac Society on the provision of cardiology services in Ireland – A Model of Cardiology Service Provision

The Irish Cardiac Society (ICS) in a submission\textsuperscript{15} to the Joint Working Group outlined proposals for the provision of cardiac services in Ireland. The document outlined three levels of cardiology service provision:

- Supra-regional Centres,
- Regional Centres and
- Acute General Hospitals,

with the aim of such structures being to deliver prompt, efficient and appropriate care to patients with cardiac conditions through development of a network of co-operating centres throughout the country.

The document stated that (i) acute general hospitals serve as a point of first contact for many patients with cardiac disorders, (ii) properly structured and resourced regional centres should provide timely specialist investigation and (iii) a number of supra-regional centres should be structured as final referral points to provide invasive treatment and subspecialty services.
The Irish Cardiac Society's document proposes the following model for the future development of cardiology services in Ireland:

**Structure of Hospital Services suggested by the Irish Cardiac Society:**

**A. Supra-regional Centres (SRC)**
It is proposed by the Irish Cardiac Society that these centres be based in Dublin, Cork and Galway.
SRCs should include the following:
- Cardiac catheter laboratories (at least two).
- Interventional cardiology programme with 24 hour cover.
- EPS programme.
- Pacemaker service (CICD).
- Adult congenital heart disease service.
- Paediatric screening (Echocardiography).
- Cardiac scanning (Nuclear and MRI).
- Cardiac surgery service.
- Consultant cardiologists (minimum 5 plus 2 Electrophysiologists), and
- Training Programme (SpR).

**Dublin**
- Mater, Beaumont, JCM, Blanchardstown (cardiac surgery at the Mater)
- St. James's, St. Vincent's, Tallaght (cardiac surgery at St. James's)

**Cork**
- Cork University Hospital (including cardiac surgery)

**Galway**
- University College Hospital (including cardiac surgery)

**B. Regional Centres**
Should include the following:
- Cardiac catheter laboratory.
- Cardiologists (2).
- Non-invasive facilities (echo, stress test, holter).
- Pacing services (including ICD implementation), and
- Regional centres should be based at: Limerick, Waterford, Drogheda, Tullamore and Sligo.

**C. Acute General Hospitals**
All of these hospitals should have a coronary care unit, non-invasive cardiology services including echo and stress testing and a cardiologist who is dual accredited in General Internal Medicine and Cardiology.

In addition to the above, the Irish Cardiac Society’s document addressed paediatric cardiology service provision. The following observations and recommendations were made in respect of Paediatric Cardiology:

Paediatric services including surgery for the Republic of Ireland can be provided in one major centre, namely Our Lady’s Hospital for Sick Children in Crumlin. As outlined, adult congenital heart disease clinics should exist in the Supra-regional Centres (probably one on the north side and one of the south side of Dublin, and Cork and Galway).

The ICS also advised that there should be one major adult congenital heart disease centre at the Mater Hospital where staff will include both paediatric and adult cardiologists, have paediatric electrophysiology and interventional services available with appropriate laboratory expertise.
7.9 **Number of consultant cardiologists**

At present the ratio of consultant cardiologists per population in Ireland (1/85 000) is better than the current ratio in the UK (1/100 000). However, it is proposed to double the existing complement of cardiologists in the UK to achieve a target of one consultant per 50 000 population. (Table 7.1)

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<tr>
<th>Table 7.1 Consultant cardiology manpower</th>
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<tr>
<td><strong>Country</strong></td>
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<td>UK in total</td>
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Source: Central Statistics Division - Department of Health - UK. (As at September 2002)

The Fifth Report on cardiac services in the UK estimates that between 30% and 40% of general medical admissions have a 'significant cardiovascular component'. The size of the problem means that there needs to be a substantial increase in the numbers of consultant cardiologists. The target had been set at 1 cardiologist per 80 000 of the population i.e. 830 consultant cardiologists for the UK. While this target ratio has not yet been achieved, the report notes that, 'soon single handed consultant cardiologists in DGHs should be a thing of the past'. 'To cover a full time rota each DGH or group of DGHs will require at least five consultant cardiologists.' This staffing level will be required, 'to allow legal cardiology on-call rotas'.

For tertiary centres the total workload, both secondary (i.e. responsibility for the local population) and tertiary, must be calculated in determining overall consultant staffing levels. 'To fulfil its tertiary responsibilities each centre should have at least 5-6 consultant interventional cardiologists, 2-3 electrophysiologists, and 1-2 consultants with responsibility for non-invasive services.

The Royal College of Physicians and the British Cardiac Society have recommended a staffing level of one whole-time consultant per 50 000 population. The current ratio in the UK is 1 per 100 000.

The Coronary Heart Disease / Stroke Task Force Report in Scotland noted that Scotland had 70 consultants involved in cardiological services, approaching the ratio recommended by the British Cardiac Society of 1 cardiologist per 70 000 population. The Task Force noted that the 70 posts were equivalent to 56.4 whole-time equivalents due to academic appointments or major responsibilities in general medicine. The Task Force recommended that a further 29 cardiologists be appointed. This should include the appointment of a minimum of two consultant cardiologists in each 'Acute Trust' setting.
7.10 Cardiac surgery

In accordance with its terms of reference, the Joint Working Group considered it appropriate to examine recent developments and best practice in cardiothoracic surgery, in the context of cardiology service provision. Recommendations on consultant staffing were also considered by the Group.

The report of the Cardiovascular Health Strategy Group, Building Healthier Hearts, clearly described the extent of CHD in the Irish population. During the same time period that the Cardiovascular Health Strategy Group was working on its final document, the National Service Framework (NSF)\(^1\) for CHD was also being formulated in the United Kingdom. The NSF document clearly laid out the number of coronary artery bypass grafting operations needed for a given population. It was estimated that a national rate equivalent to at least 750 coronary artery bypass operations per million population, depending on the local standardised mortality ratio for coronary artery disease, would be required.

A committee made up of members of the British Cardiac Society and the Society of Cardiothoracic Surgeons of Great Britain and Ireland formulated a report entitled, “Models of Care for the Delivery of Cardiac Surgery”\(^2\) to describe and evaluate potential models of care appropriate for the delivery of the operative treatment of adult patients with coronary artery disease. Many of the principles underlying this document are applicable to the provision of cardiac surgery to the Irish population. The document espoused that certain standards should be mandatory for all cardiac surgery units, including inter alia:

- The unit size must be sufficient to provide 24 hour consultant cover. The minimum staffing level for this would be 6 whole time equivalent consultant cardiac surgeons with 9 consultant cardiac anaesthetists performing 1200 adult cardiac surgery operations a year
- Each unit will serve a population of at least 1.2 million
- Integrated information systems must provide information of real value to patients and clinicians
- Cardiac management should be unified and integrated, incorporating representation from all essential care providers. Responsibility for delivery of the service should rest with this team.

In the opinion of the Society of Cardiothoracic Surgeons of Great Britain and Ireland, these standards (combined with many additional factors) should apply to an “ideal unit”.

As cited in the report, the concentration and consolidation of the existing units has some merit. By definition they will be part of larger major hospitals with all of the supporting staff and clinical disciplines outlined above, either onsite or close by. Such a large unit allows the treatment of patients with the full range of cardiothoracic diseases rather than more routine cases only. It allows the full treatment of the emergency caseload. It allows a proper training structure to be put in place. Units that provide good training for cardiothoracic surgery are also the units that provide the best service. Larger units allow for the development of sub-specialties and the concentration of particular expertise has obvious strengths.

7.11 Implications of recent developments for cardiology services in Ireland

The Joint Working Group reviewed those aspects of cardiac care relevant to the Group’s terms of reference. The conclusions of the review as they relate to the work of the Group are as follows:

- There have been major technological advances in cardiology in recent times and it is expected that these advances will continue on an ongoing basis. There is a substantial evidence base for the benefits of several cardiological treatments and interventions. This is the case for PCI, with stent insertion, as a revascularisation procedure for coronary heart disease. It is likely that evidence of benefit will emerge for recent advances in PCI, including drug-eluting stents. Other advances include more complex pacing devices for patients with heart failure and implantable defibrillators for patients at risk of life threatening arrhythmias.
• There have been changes in the indications for treatments, with major implications for service delivery. PCI has been shown to be a more effective treatment than thrombolysis for acute myocardial infarction, with implications for rapid response services for these patients.

• Other technological advances require a high degree of expertise, with dedicated time and facilities. While some pacing procedures do not require tertiary services, others do, including more complex pacing, electrophysiology studies and interventions. Some developments will require expanded capacity, for example, to provide biventricular pacemakers for the growing numbers of patients with severe heart failure.

• There are major cost implications from emerging treatments. The longer survival of patients with coronary heart disease and the increase in the prevalence of heart failure will increase the numbers of patients for whom these treatments will be indicated.

• The expert reports reviewed emphasise that the expansion of cardiology services and the provision of more complex interventions must be accompanied by peer review and clinical audit to ensure a safe, high quality service for patients. This is in line with the basic tenets of the national health strategy, Quality and Fairness.

• While there are variations in the precise details, there are common features to the recommendations of expert and review groups in the UK and the US on the institutional and operator requirements for safe PCI services. While the recommended ideal minimum number of procedures per annum varies slightly from report to report, there are consistent opinions on the importance of training, adequate facilities, skilled multidisciplinary teams and networking with colleagues.

• The ACC/AHA continues to recommend that PCI (both elective and primary PCI) should only be provided where there is on-site cardiac surgery. Where surgery is not provided on-site, but adjacent, then the UK recommendations are that it should be possible to establish cardiopulmonary bypass within 90 minutes of the decision to refer the patient for emergency CABG to a cardiac surgery unit.

• The Joint Working Group has noted the Irish Cardiac Society's recommendations on this matter which state that
  • complications of PTCA that require urgent surgery are now extremely rare (<1 per 1 000),
  • it has been recognized for sometime that on-site surgical backup is not a prerequisite for the performance of percutaneous intervention and that hospitals without on-site surgery in cities with adjacent surgical centres routinely undertake PCI and
  • for interventional centres distant from surgical units, formal arrangements, possibly involving air transport, should be in place for those exceptional instances where surgical support is required.

• Reports from the UK are consistent in recommending expanded cardiology services to meet the needs of patients. This will require substantial expansion in training, recruitment and retention of skilled nurses, technicians and other personnel. It is proposed that the number of consultant cardiologists in the UK should be increased from 630 at present to between 1200 and 1500 by the year 2010. This will provide as a minimum a ratio of one consultant per 50,000 population.

• The recommendations of the Society of Cardiothoracic Surgery of Great Britain and Ireland that cardiac surgery be carried out in large units are consistent with international recommendations on models of service to deliver high quality care for investigations and procedures in cardiology.

• The Joint Working Group considers that the model of care for cardiology service provision in Ireland proposed by the Irish Cardiac Society, is a useful framework for the development and future structuring of hospital cardiac services, in order to deliver prompt, efficient and appropriate care to patients with cardiac conditions, through development of a network of co-operating centres throughout the country.

The recommendations of the Joint Working Group on the implications of recent developments in cardiology for the provision of services in Ireland are presented in Section 8 and 9 of this report.
8 Context for Future Development of Cardiology Services

Note: (This Report is written and its recommendations are made in the context of the existing hospital medical staffing system. The Joint Working Group is aware that the report of the National Task Force on Medical Staffing, may have an additional, significant impact on hospital medical staffing requirements.)

8.1 Patient perspective

The patient with heart disease has the right to receive a specialist opinion, diagnostic and treatment procedures in an appropriate period of time. These should not be delayed at all if the matter is urgent. High standards of communication are required to discuss the issues so that the patient understands the diagnosis, its effects on his or her future and the treatment needed.

8.2 Consultant cardiology staffing development in Ireland, in the context of recent Health Strategies

Arising from the Report of the Cardiovascular Health Strategy (1999), and the subsequent Interim Report of the Joint Working Group, (2001) there has been a substantial increase in consultant cardiology staffing in Ireland towards the implementation of the recommendations in these reports. At the time of the publication of The Report of the Cardiovascular Health Strategy (July 1999), there were 27 posts of consultant cardiologist & general physician in Ireland. To further the implementation of the recommendations outlined in the Cardiovascular Health Strategy, there has been a steady increase in consultant staffing in this specialty. The Interim Report of the Joint Working Group was completed in May 2001, at which point the consultant workforce had increased to 29 posts. Following the recommendations outlined in the Joint Working Group’s Interim Report, funding has been allocated for an additional 17 posts so that there are 46 Comhairle na nOspideal approved permanent posts of consultant cardiologist / consultant cardiologist & general physician in Ireland.

In addition to adult cardiology service provision, there are five approved permanent posts of consultant paediatric cardiologist in Ireland, all of which are based in Dublin. Two of the five posts received funding and were approved subsequent to the publication of the Report of the Cardiovascular Health Strategy.

8.3 Consultant staffing

The Joint Working Group acknowledges that there is a need for a further increase in the number of consultant cardiology posts in public hospitals in Ireland. The main issue stressed by the health boards, the public voluntary hospitals and the Irish Cardiac Society, was the current understaffing of cardiology at consultant level. Improved survival of patients with cardiac conditions, and the evidence of benefit from a range of treatments and interventions have resulted in widespread acceptance that expansion of hospital cardiology services is required.

In a submission to the Joint Working Group, the Irish Cardiac Society, recommended an appropriate ratio of one consultant cardiologist per 50,000, people “but with the emphasis on five consultant cardiologists, plus one electrophysiologist per Major Unit and following that general cardiologists with dual accreditation in Regional Units. The ICS added that major units should aim to provide a 24 hour service for diagnostic / interventional procedures. Appropriate staffing, both consultant and otherwise, of these units would allow appropriate utilization of expensive facilities and training for all staff.

The Joint Working Group recommends that a ratio of one consultant cardiologist per 75,000 population moving towards one per 50,000 be adopted as a target for the country as whole. While aiming to achieve equity of access to services, the ratio will vary from region to region, depending on population size and distribution, and on the location of regional and supra-regional cardiology centres. The recommended number and location of such services and posts is set out in Section 6. The Joint Working Group recommends that cardiology services continue to be targeted for priority development.
8.4 Levels of cardiology service provision

The Joint Working Group has identified three distinct levels of cardiology service provision, and the services which ought to be available at each level:
- Acute General Hospitals
- Regional Cardiology Centres
- Supra-regional Cardiology Centres

8.4.1 Acute general hospitals:

Each hospital providing a service to patients with cardiac problems should be equipped with a cardiac investigation area in addition to a coronary care unit.
The report of the Cardiovascular Health Strategy Group recommended a number of criteria regarding cardiology service provision in the acute general hospital, which the Joint Working Group supports (see section 4.2).

With optimum facilities, appropriate consultant staff and allied health professionals, a range of diagnostic cardiac investigations should be provided in acute general hospitals. Such services will contribute to the evaluation and management of cardiology patients and enhance the provision of services on the prevention and treatment of cardiovascular disease, addressing health promotion, cardiac rehabilitation and heart failure. The Joint Working Group concurs with the recommendations in the Report of the Cardiovascular Health Strategy Group which state

RB.16 Each Hospital should establish links between the emergency medical service, the Accident and Emergency Department and the CCU to implement 'fast track' policies for thrombolysis to agreed protocols.

RB.21 As new forms of cardiac investigation became standard, they should be added to hospital facilities.

Patients initially presenting at acute general hospitals, who require more intensive cardiology treatment, such as invasive and interventional procedures, should be referred to the next level of service provision - a regional cardiology centre, or to a supra-regional cardiology centre as appropriate. The emphasis on cardiology service provision in acute general hospitals should be on early assessment. The transfer of patients with acute coronary syndromes for diagnostic / interventional procedures should occur within an appropriate timeframe.

8.4.2 Regional cardiology centres

There is a need for cardiology centres at regional level. The Cardiovascular Health Strategy recommended that invasive diagnostic tests (such as coronary angiography) and some treatments (such as insertion of pacemakers) requiring an intermediate level of operator and institutional expertise would be provided in regional cardiology centres. The Joint Working Group concurs with this recommendation.

As a general principle, the Joint Working Group considers that a regional cardiology centre should serve in the region of 300,000 people and have a cardiac catheterization laboratory. In some areas, this catchment population may be less allowing for demographic patterns. Regional cardiology centres should be equipped with an appropriately sized cardiac catheterisation laboratory, to facilitate invasive diagnostic cardiology procedures, such as coronary angiography, to cater for the local and regional hospital. The regional cardiology centre should be staffed by a team of at least two consultant cardiologists / consultant cardiologists & general physicians.

In addition to the services provided at acute general hospitals, the facilities outlined in paragraph 4.3, which were identified in the Cardiovascular Health Strategy recommendations, should also be provided at regional cardiology centres.
The Cardiovascular Health Strategy recommended that each region should be self-sufficient in relation to diagnostic cardiology services. This is relevant to health boards where there are no plans to develop a supra-regional cardiology centre i.e. the Midland, Mid-Western, North Eastern, North Western and South Eastern Health Boards. When consulted, each of these boards considered it would be appropriate to develop a regional cardiology centre, including the provision of a catheterisation laboratory. Progress has been made in some boards towards development of these facilities; including the mid-western and south eastern health boards. A mobile catheterisation laboratory facility is currently available in Sligo in the North Western Health Board, on a contract basis, for 2 days per fortnight.

The development of regional cardiology centres would meet the Health Strategy principle of equity of access, in that patients would no longer have to travel lengthy distances to avail of services such as pacemaker insertion and coronary angiography. Referral arrangements for patients are addressed in paragraph 8.6.

The Joint Working Group recommends the establishment of regional cardiology centres to provide an intermediate level of cardiac diagnostic and treatment services, with appropriate staffing and quality assurance arrangements. Such regional cardiology services are warranted by demographic and geographic considerations. The Joint Working Group recommends hospitals in five Health Boards suitable for designation as Regional Cardiology Centres as follows.

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Regional Cardiology Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midland Health Board;</td>
<td>Tullamore General Hospital</td>
</tr>
<tr>
<td>Mid-Western Health Board;</td>
<td>Mid-Western Regional Hospital, Limerick</td>
</tr>
<tr>
<td>North Eastern Health Board;</td>
<td>Our Lady of Lourdes Hospital, Drogheda</td>
</tr>
<tr>
<td>North Western Health Board;</td>
<td>Sligo General Hospital</td>
</tr>
<tr>
<td>South Eastern Health Board;</td>
<td>Waterford Regional Hospital</td>
</tr>
</tbody>
</table>

Interventional Cardiology in Regional Centres:
The extent to which interventional cardiology should be undertaken in regional cardiology centres was considered at length by the Joint Working Group. The issues are the volume of procedures required to maintain expertise to provide a high quality and safe service; to justify the costs of facilities and skilled support staff and; access “back-up” cardiac surgery should complications arise. (see section 7.5).

The Joint Working Group recommends that when regional cardiology centres are established, the main focus should be on diagnostic cardiology. The emphasis should be on providing access to coronary angiography and to treatments such as the insertion of pacemakers.

In the first instance, the Joint Working Group recommends that regional centres should not provide elective PCI. However, as practice in the area of interventional cardiology is evolving, and as a range of national and international advice has indicated, the Joint Working Group recommends that PCIs should only be undertaken in regional centres in accordance with defined protocols and guidelines.

In line with the recommendations of the Irish Cardiac Society, a PCI service should only be provided in units carrying out a minimum of 200 procedures per year, with each operator doing a minimum of 100 PCIs per year.

The Joint Working Group recommends that practice standards should be reviewed at regular intervals in light of international best medical practice.
8.4.3 Supra-regional cardiology centres

A number of supra-regional centres are required which should be structured as final referral points to provide interventional treatment and subspecialty services. This advice is consistent with recommendations in the Report of the Cardiovascular Health Strategy Group and the Irish Cardiac Society. It is proposed that supra-regional centres be staffed by an appropriate number of consultant cardiologists and that the services available should include the following:

- Cardiac catheter laboratories (at least two),
- Interventional cardiology programme with 24 hour cover,
- EPS programme,
- Pacemaker service (CICD),
- Paediatric screening (echocardiography),
- Cardiac scanning (nuclear and MRI, CT),
- Cardiac surgery service,
- Consultant cardiologists,
- Appropriate support staff,
- Training Programme (including for Specialist Registrars), and
- *Adult congenital heart disease service.

* The joint Working Group recommends that there should be one unit in Ireland to provide the adult congenital heart disease service for the country (see section 8.9).

The joint Working Group recommends that the supra-regional centres provide the spectrum of cardiology services including all complex cardiology services and cardiac surgery. There is evidence that outcomes for patients are best in institutions with a high volume of procedures and where the operator also carries out more than a minimum volume of procedures. In order to achieve an acceptable quality of care for complex cardiology procedures, it is necessary to concentrate services for patients in centres with sufficient volume of procedures to support the maintenance of skills in operators and the appropriate support staff. Acute and regional hospitals must be in a position to refer patients to supra-regional centres when necessary. (Referral arrangements for patients are addressed in Section 8.6).

It is noted that within the ERHA, a number of national specialties are provided at the Mater Hospital—adult congenital heart disease, the cardiac transplantation and lung transplantation programme.

The joint Working Group recommends a North Dublin and a South Dublin axis so that cardiology services are grouped for planning and delivery purposes into two supra-regional services. The supra-regional cardiology grouping in North Dublin would incorporate the Mater and Beaumont hospitals while acknowledging established services at James Connolly Memorial Hospital, Blanchardstown. It is envisaged that this structure should serve as a comprehensive cardiology group, providing all aspects of cardiology services including cardiac surgery at the Mater Hospital. In respect of South Dublin, the supra-regional cardiology grouping providing all aspects of cardiology services would be comprised of St. James’s, St. Vincent’s and Tallaght hospitals, including cardiac surgery at St. James’s Hospital.

The Joint Working Group recommends that the supra-regional services on the Northside and on the Southside should each operate as single units for the purposes of referral arrangements, clinical audit and quality assurance. The fostering of such developments is recommended. The emphasis should be on partnership, equitable distribution of resources, with the use of common protocols to encourage equity of access and quality care for patients. The Joint Working Group proposes that over a period of phased development, these structures develop a North Dublin and a South Dublin shared on-call cardiology rota system, particularly for interventional cardiology.
The Joint Working Group recommends that a supra-regional cardiology centre be located in Cork University Hospital, where cardiac surgery is currently provided. It is noted that preventive cardiology is to be provided in the Mercy Hospital and that EPS is undertaken from the South Infirmary Victoria Hospital.

The Joint Working Group recommends that a supra-regional cardiology centre be located in University College Hospital, Galway where plans are under way to provide cardiac surgery.

**Table 8.3 Recommended location of Supra-Regional Cardiology Centres**

<table>
<thead>
<tr>
<th>Supra-regional Cardiology Centres (hospitals involved)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dublin Mater/ Beaumont</td>
</tr>
<tr>
<td>South Dublin St. James's/ St. Vincent's / Tallaght</td>
</tr>
<tr>
<td>Cork Cork University Hospital</td>
</tr>
<tr>
<td>Galway University College Hospital, Galway</td>
</tr>
</tbody>
</table>

**8.5 Types of consultant cardiology appointment: Single-specialty and dual accreditation cardiologists**

Comhairle na nOspidéil has the statutory responsibility to regulate the number and type of appointments of consultant medical staffs in public hospitals in Ireland and to specify the qualifications for such appointments.

The identification of posts as requiring dual accreditation or single-specialty cardiologists, with or without a designated area of specialist expertise, will depend on whether the post is to provide an acute hospital, regional or supra-regional cardiology service. Service planners and regulators will also take into account any areas of expertise necessary to complement the consultant cardiologists already in post in related cardiology services.

Consultant services in acute general hospitals will provide a general medicine service for the catchment population. The "consultant cardiologist & general physician" will take a lead role in diagnosis and treatment of acute cardiac conditions and in cardiac rehabilitation as well as providing diagnostic tests and treatments, cardiac rehabilitation, a service for patients with heart failure, and preventive cardiology. The care of patients with chronic conditions will be shared with primary care services. The consultant will also contribute to local health promotion and prevention programmes. Consultant posts in acute general hospitals will require dual accreditation in cardiology and in general medicine.

In addition to the basic range of services for the local population provided by acute hospitals, regional cardiology centres will provide invasive diagnostic tests as outlined in section 4.3. It may be necessary for cardiologists in regional cardiology centres to participate in the general medical rota. The Joint Working Group notes that regional centres will require an appropriate balance between single-specialty cardiologists, i.e. "consultant cardiologists" and dual accredited appointments, i.e. "consultant cardiologists & general physicians". Depending on the needs identified, it may be necessary to specify for posts in regional cardiology centres that the ideal candidate will have developed skills in either interventional or diagnostic cardiology during their specialised cardiology training.

Posts based in hospitals providing supra-regional services will be for candidates with accreditation in cardiology. It is envisaged that appointees to such posts will have expertise in the area of interventional cardiology and candidates appointed will participate in a separate on-call cardiology rota.
Following advice received from the Joint Working Group, Comhairle na nOspideal has determined that:

Acute general hospitals will require consultants with dual accreditation in cardiology and in general medicine and will be titled "consultant cardiologist & general physician".

Regional cardiology centres will require an appropriate balance between single-speciality cardiologists, i.e. "consultant cardiologists" and dual accredited appointments, i.e. "consultant cardiologists & general physicians". It may be necessary for those in consultant posts in regional centres to participate in the general medical rota.

Supra-regional cardiology centres will require single-specialty cardiologists who may have developed special interests during their specialised cardiology training in e.g. interventional cardiology or EPS, in addition to some posts of consultant cardiologist & general physician. In the context of recent applications for posts of consultant cardiologist made by the major Dublin hospitals to Comhairle na nOspideal, where the hospitals concerned provided information that a separate on-call cardiology rota exists or is being developed, the Joint Working Group endorses the view taken by Comhairle na nOspideal, that candidates appointed to posts in supra-regional cardiology centres will participate in a separate on-call cardiology rota.

8.6 Referral arrangements

There are a number of reasons to put formal referral arrangements in place for cardiology services. At present, staff in referring hospitals spend substantial amounts of time contacting regional or supra-regional services to arrange for the urgent transfer of patients. These patients frequently remain as in-patients in the referring hospital while awaiting transfer. Expansion of angiography and other services at regional cardiology centres and increases in consultant cardiologists providing specialist services will make it feasible to put formal referral arrangements in place.

In addition to arrangements for patient referral, consultants based in the acute general hospitals may have 'sessional' commitments with a regional or supra-regional centre to use facilities such as cardiac catheterisation laboratories, to carry out procedures on their patients. Consultants in acute hospitals may have sessions in a regional centre to carry out diagnostic tests or treatments on their own patients. This would increase the volume of procedures undertaken in the regional centre and would maintain the skills of the cardiologist / general physician in the acute general hospital. However, the overall aim of the consultant cardiologist & general physician in an acute general hospital is to provide a medical service with a particular emphasis on cardiology services for the local hospital catchment population. A priority in this context will be to provide a rapid assessment service for patients with suspected acute coronary syndromes and to arrange rapid transfer to regional and supra-regional services, where indicated.

It is envisaged that cardiologists in regional hospitals may have sessions in the relevant hospitals providing a supra-regional service. Examples of this arrangement are already in existence. Those consultants with expertise in interventional procedures should be facilitated in maintaining their skills by performing the more complex procedures in the supra-regional setting, with support from experienced colleagues and the skilled multidisciplinary team.

The relationship between referral centres and the receiving services should go beyond referral arrangements for patients. Consultants at acute general hospitals and regional cardiology centres should collaborate in service planning, clinical audit and continuing professional development. Teleconferencing, including simultaneous viewing of angiography recordings is now available. Such case conferences benefit patients but also contribute to staff training and professional development. There are also patient safety and staff development benefits to be gained from collaboration between regional and supra-regional services in quality assurance and clinical audit programmes.

It is recognised that formal referral arrangements take some time to implement as regional services are developed and supra-regional services are expanded. Such arrangements cannot be rigidly applied, and there will need to be contingency plans in place, with the co-operation of all service providers. The development of regional services should reduce the current reliance on supra-regional services for angiography and insertion of pacemakers.
The Joint Working Group recommends that, where referral arrangements are not already in place, the following links should be put in place.

Patients from acute general hospitals should be referred for elective procedures to the regional cardiology centre. Arrangements should be put in place for patients requiring urgent transfer either to a regional centre or a supra-regional centre. Patients requiring urgent transfer should be discussed with a consultant in the regional centre prior to referral to the supra-regional service.

Patients requiring elective transfer from a regional centre should be referred to the supra-regional service with which that regional hospital has a formal referral arrangement. It is recommended that such arrangements be put in place as follows:

- Sligo Regional Hospital to University College Hospital Galway
- Mid-Western Regional Hospital, Limerick to Cork University Hospital
- Waterford Regional Hospital to Cork University Hospital, or Dublin Southside Service
- Our Lady of Lourdes Hospital, Drogheda, to the Dublin Northside Service
- Tallamore General Hospital to the Dublin Southside Service.

The above referral arrangements fit with the ‘strategic radial corridors’ and ‘strategic linking corridors’ of the National Spatial Strategy. Nevertheless, it is recognised that patients in some locations may be referred for elective procedures to a supra-regional centre with more convenient transport links. This could apply for example, from Donegal to Dublin or cross-border (until the linking corridor to Galway is completed), from Clare to University College Hospital Galway, from Carlow and North Kilkenny to Dublin Southside, from South Tipperary to Cork University Hospital, and from parts of Westmeath and Offaly to University College Hospital Galway. Formal arrangements could permit such referrals but the principal referral patterns and professional relationships should be developed as recommended above between regional and supra-regional services.
8.7 **Electrophysiology services (EPS)**

At present there are no official consultant posts of electrophysiologist or cardiologist with a special interest in electrophysiology approved by Comhairle na nOspidéal. However there are a number of doctors who were appointed to consultant cardiologist posts who have expertise in the area of electrophysiology, who provide an EPS. In addition, in June 2003, Comhairle na nOspidéal approved a post of consultant cardiologist to be based at University College Hospital Galway where it was noted that it was the hospital’s wish that the appointee to the post will be involved in the provision of electrophysiology.

As set out in Section 4, the Cardiovascular Health Strategy recommended that facilities for pacing should be provided in regional cardiology centres and that one of the cardiologists appointed to regional centres should have expertise in pacing. The submission from cardiologists EPS in Ireland was consistent with the Cardiovascular Health Strategy which recommended that more complex procedures including catheter ablation should be performed in supra-regional cardiology centres only. The Joint Working Group recommends that complex EPS be done only in supra-regional centres.

Advice received from the Irish Cardiac Society on EPS included the following:
- Given that EPS consumes a substantial amount of catheterisation laboratory time it would be more appropriate to have a complement of two consultants cardiologists for EPS in designated cardiology centres.
- A total of 4 EPS centres would be appropriate for Ireland.

The Joint Working Group recommends that there should be two posts of consultant cardiologist, sub-speciality electrophysiology in each of the four supra-regional centres; i.e. Cork, Galway, North Dublin and South Dublin.

8.8 **Paediatric cardiology**

Paediatric Cardiology is the specialty in pediatrics concerned with diseases of the heart and circulation in the growing and developing individual. The work of the paediatric cardiologist includes investigation and non-surgical treatment of patients with:
- congenital or acquired heart diseases
- disorders of the large intra-thoracic vessels.
- disorders of the cardiac rhythm and conduction and
- primary and secondary disturbances of cardiac function and of the circulatory system.

The paediatric cardiologist is also involved in prevention of cardiac and circulatory disease.

In general, the age of the patients ranges from in utero to the growing adolescent. The paediatric cardiologist is involved in diagnosis and management of congenital heart disease from the antenatal period, throughout childhood and in the follow-up of adolescents and adults, both operated and unoperated. In recent decades the effectiveness of treatment of children suffering from heart diseases has increased enormously, particularly in the field of cardiac surgery. This in turn places high demands on paediatric cardiologists for diagnosis and functional assessment of patients with congenital heart disease.

While paediatric cardiology requires an infrastructure of its own, other specialties in medicine are often involved in the management of patients. The paediatric cardiologist requires collaboration and consultation with other disciplines, including cardiothoracic surgery, cardiology, obstetrics, pathology, radiology, psychology, etc.
Paediatric cardiology services are provided by five permanent posts of consultant paediatric cardiologist, based at Our Lady’s Hospital for Sick Children (OLHSC), Crumlin, Dublin. Two of these posts were approved in February 2002. The posts at OLHSC include sessional commitments to the Children’s Hospital, Temple St. and to the National Children’s Hospital at the Adelaide and Meath Hospitals at Tallaght. Out-patient clinics in paediatric units are being provided or are being developed in Cork, Limerick, Galway, Letterkenny and Waterford. One of the posts has a designated special interest in adult congenital heart disease with formal sessions at the Mater Hospital for this purpose.

8.9 Congenital heart disease in children, adolescents and adults

The population of patients born with heart defects (congenital heart disease) who are surviving into adult life is already large and growing steadily as more patients survive heart surgery in childhood. These patients present particular challenges and need to be looked after by health care professionals with specialist training in this area of cardiology. (The term grown up congenital heart disease, GUCH, has been accepted by the European Society of Cardiology and will be used henceforth in this report.)

Based on the advice received, the Joint Working Group recommends the following in respect of the provision of services:

- it is important that provision is made to allow the smooth transition of the patient from the paediatric to the GUCH clinic,
- services for GUCH must be run by cardiologists who have special training in this complex area of cardiology,
- provision of GUCH care will be an activity provided mainly by supra-regional cardiology centres,
- both adult and paediatric cardiologists can train in this subspecialty,
- units dealing with this patient group are best situated in centres that have both paediatric and adult cardiac surgery, and
- in the context of existing specialist paediatric service provision in Ireland and with regard to adult congenital heart disease services and the location of adult and paediatric cardiac surgery services, the Joint Working Group recommends that the existing links between OLHSC, Crumlin and the Mater hospital are developed and enhanced.

Submissions were received from paediatric cardiologists and from hospital authorities on the development of paediatric cardiology services. Based on the advice received and the literature reviewed, the Joint Working Group recommends the following in respect of paediatric cardiology:

- one specialist paediatric cardiac centre is appropriate for the population of Ireland,
- there should be one paediatric cardiologist per 0.5 million population,
- a total complement of 8 paediatric cardiologists is therefore advised to be based in OLHSC, Crumlin,
- while the posts should be based in OLHSC, Crumlin, the JWG recommends that there should be two posts associated with each of the four supra-regional cardiology centres,
- paediatric cardiology services should continue to be provided and developed further, via out-patient clinics, in relevant hospitals throughout the country,
- there should be sessional commitments to Temple Street Children’s Hospital and formal sessional commitments to each of the maternity hospitals in Dublin,
- a second post of paediatric consultant cardiologist with a designated special interest in adult congenital heart disease should be based at OLHSC, with formal sessions to the Mater Hospital, Dublin, and
- the specialist paediatric cardiac surgery unit at Crumlin unit should have at least two cardiac surgeons with a special interest in paediatric cardiac heart surgery.
8.9.1 Heart disease and pregnancy

Pregnancy in most women with heart disease has a favourable maternal and fetal outcome. However, pregnant women with heart disease do remain at risk for other complications including heart failure, arrhythmia, and stroke. Women with congenital heart disease now comprise the majority of pregnant women with heart disease seen at referral centres.

The Joint Working Group recommends that pregnant women with heart disease who are at intermediate or high risk for complications should be managed by a multidisciplinary team from obstetrics, cardiology, anaesthesia and paediatrics.

8.10 Teaching and research

In June 2001, the Department of Health & Children issued a strategy for health research entitled "Making Knowledge Work for Health”. The strategy provides the framework within which investment in health research will be made. This strategy identifies two distinct streams of health research that it terms “science for health” and “research and development (R & D) for health” respectively. The strategy recognized that one of the most effective ways of promoting good research is to invest in high-quality people and made recommendations concerning the development of career structures for both clinical staff and research scientists. Two distinct areas in which there is a need for a greater research contribution at the level of clinical consultant are identified. Firstly there is a need to improve the potential of clinically oriented science for health research through the appointment of academic consultant posts with a major commitment to research. Secondly, the strategy recommends that for existing clinical staff, protected research time should be afforded to those with an interest in, and capacity for, research as part of the local health research strategies of health boards, voluntary hospitals and other specialist agencies. It is envisaged that this type of protected research time would particularly facilitate the development of strong, local R & D functions.

Major additional funding commitments by the Government in recent years have facilitated and will continue to facilitate expansion in health research. Such programmes include:

- the Matching Fundings Agreement between the Irish Government and the Wellcome Trust, under which an additional 6 million Irish pounds were made available between 1998 - 2000 to support the development of biomedical research in this country,

- the Programme of Research in Third Level Institutions (PRTLI), whereby 550 million Irish pounds were committed under the National Development Plan for the period 2000- 2006 to provide support for research, technology advances and innovation in third level institutions, and

- the establishment of Science Foundation Ireland, responsible for management of the Technology Foresight Programme, under which the Government committed a further 500 million Irish pounds in the National Development Plan for research related to biotechnology and information and communication technologies.

The commitment to enhance and support health research in this country and to establish a research development function within the health services was again reiterated in the recent Health Strategy “Quality and Fairness”, November 2001. It stated that “the implementation of the Strategy must include support for health research, with particular reference to supporting health professionals who wish to carry out research”.

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Many consultant cardiologists are involved in teaching. Cardiologists contribute to teaching nurses, technicians, and a range of health professionals as well as medical students and non-consultant hospital doctors. For many cardiologists, teaching activities are incorporated into their ongoing work. Others have a more formal involvement in teaching, through sessional commitments with a university, third level institution or professional body. A few posts are mainly academic, with a small clinical commitment.

The Joint Working Group concurs with the recent Report by Comhairle na nOspidéal entitled "Report of the Academic / Clinical Research Consultant Committee", which advocates that the development of, and further investment in, posts at consultant level which have protected research sessions will have a major and positive impact on the health services and health research in Ireland. The Report envisages that posts at consultant level with protected time for health research will come into being via three main routes:

• one being the creation of new posts holding the existing “full-time” academic contract, where the academic element of the post shall incorporate protected research sessions,
• the second route being the restructuring of existing standard consultant clinical posts to incorporate protected research sessions within their standard consultant contract, and
• the third being the recognition of fixed-term, fixed-purpose posts, held by individuals who have successfully secured major research funds from a prestigious granting body or agency such as the Wellcome Trust or the HRB, as being of consultant standing by Comhairle na nOspidéal. These doctors will hold contracts issued by the funding agencies rather than the academic or standard consultants’ contract.

The Joint Working Group recommends that cardiology posts at consultant level with protected time for research be developed by the medical schools, hospital authorities and other relevant agencies.

The Joint Working Group recommends that at least one “full-time academic” appointment should be made in each supra-regional cardiology centre. The research / academic posts may be in addition to the service posts outlined in table 9.2

8.11 Audit, clinical governance and continuing professional development

It is essential that cardiovascular care is of high quality. This requires that all health care professionals delivering care have a high level of up-to-date medical education. This can only be achieved if staff undergo continuing education within a programme of continuing professional development. The overall quality of treatment can only be assessed by the accurate collection of information regarding the outcome of treatment. These figures need to be analysed locally and compared against national figures. The process of monitoring every aspect of patient care and assuring that it is of high quality is a very time-consuming process, requiring administrative and substantial consultant input as well as information technology expertise. Nevertheless such clinical audit is essential to support the safe delivery of high quality hospital cardiology services. The Joint Working Group considers that the process of clinical governance is vitally important in the provision of high quality cardiovascular services in hospitals.

The Joint Working Group recommends that appropriate time and resources are allocated for the process of clinical governance and continuing professional development.
8.12 Cardiac surgery

Cardiac surgery is currently undertaken in four public hospitals in Ireland: the Mater Misericordiae Hospital, St. James's Hospital in Dublin, Cork University Hospital and Our Lady's Hospital for Sick Children in Crumlin, Dublin. There are 11 posts of consultant cardiothoracic surgeon.

The theatre and critical care complex, currently under construction as part of the Phase 2 development at University College Hospital Galway, is due for completion in July 2003, and is planned to include provision for cardiac surgery.

Certain other clinical disciplines though are essential for the effective delivery of both cardiac surgery and cardiology; these include anaesthesia, intensive care, radiology, haematology, chemical pathology and microbiology. All cardiac service units must incorporate provision of these disciplines. Increasingly many of these essential support services are being concentrated in larger hospitals.

Cardiothoracic surgery also requires the assistance of other clinical disciplines such as general surgery, teams to manage renal failure, neurological problems, gastro-intestinal problems and diabetes which may be required on occasion to treat complications.

Cardiothoracic surgery requires a wide ranging group of personnel with other skills, including cardiac technicians, perfusionists, and non-consultant medical staff.

Many of the principles underlying the document "Models of Care for the Delivery of Cardiac Surgery" (see section 7), are applicable to the provision of cardiac surgery and cardiothoracic surgery to the Irish population. However, the minimum size of a cardiothoracic surgical unit with its suggested surgical activity and population served, may not apply in the Irish situation because of the geographic location of the cardiac surgical units and the distribution base of the population. Consideration for patient safety and satisfaction should be at the core of any model of service delivery. The delivery of a first rate clinical service orientated toward the patient should be the target.

With changing demography, patient survival and developments in clinical practice, it is difficult to accurately predict demand for cardiothoracic surgery services. Nevertheless, in the context of its terms of reference, the Joint Working Group acknowledges that the increase in the number of consultant cardiology posts nationally will also necessitate an increase in cardiothoracic surgery consultant staffing.

The Joint Working Group recommends that each Supra-Regional Cardiology Centre should have a minimum of three, and ideally four consultant cardiothoracic surgeons. With the change in practice over time, predicting the future demands for cardiothoracic-surgery services is less certain.
Recommendations on Future Development – Consultant Staffing

Note: (1) (This Report is written and its recommendations are made in the context of the existing hospital medical staffing system and current hospital networks. The Joint Working Group is aware that the report of the National Task Force on Medical Staffing may have an additional, significant impact on hospital medical staffing requirements.)

9.1 Recommendations for future development – consultant staffing

In accordance with the principles set out in Section 8 of this report, the Joint Working Group recommends that hospital cardiology services be developed nationally, on the basis of three complementary levels of service provision;

• acute general hospitals
• regional cardiology centres
• supra-regional cardiology centres.

9.2 PHASE I - Prioritisation of consultant cardiology posts

The Joint Working Group considers that the development of cardiology services should occur in a planned and phased fashion, with an initial tranche of posts, (Phase I – priority posts), followed by additional posts to reach an appropriate overall total complement of consultant cardiology posts, to be implemented over the medium-long term (Phase II).

The Joint Working Group believes that the filling of the priority posts, (Phase I), (i.e. implementing the Interim Recommendations, which involves 25 additional posts), will address the immediate requirements for the development of cardiology services throughout Ireland. These priority posts will also help to reduce the current dependence of many patients from neighbouring health board areas on Dublin hospitals for general cardiology services. This is the first vital step in the orderly development of cardiology services nationally.

9.3 PHASE II - Additional consultant cardiology posts

Following the implementation of Phase I, (i.e. the priority posts), the Joint Working Group recommends that the overall medium-long term development (i.e. combined phased I and phase II), be implemented in accordance with the three complementary levels of cardiology service provision recommended in Section 8, acute general hospitals, regional cardiology centres and supra-regional cardiology centres.
### Table 9.1 Phase 1 - Status of Priority Developments

<table>
<thead>
<tr>
<th>Health Boards (Regional Cardiology Centres)</th>
<th>Hospitals</th>
<th>Priority Recommendations for additional posts (INTERIM REPORT)</th>
<th>Current Status of posts recommended (July 2003)</th>
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<td><strong>Northern Area Health Board</strong> (Mater &amp; Beaumont)</td>
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<tr>
<td><strong>South Eastern Health Board</strong> (Waterford Regional)</td>
<td>Waterford Clonmel Wexford</td>
<td>2 1 Clonmel/Waterford 1 Wexford/Waterford</td>
<td>1 funded and under consideration 1 - 2 approved</td>
</tr>
<tr>
<td>Health Board Total</td>
<td></td>
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<td></td>
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<tr>
<td><strong>Southern Health Board</strong> (Cork University Hospital)</td>
<td>CUH Mercy Tralee</td>
<td>1 1 Mercy/CUH 1 Tralee/CUH</td>
<td>1 Post funded &amp; approved 1 Post funded &amp; approved - 2 approved</td>
</tr>
<tr>
<td>Health Board Total</td>
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</tr>
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<td><strong>Western Health Board</strong></td>
<td>UCHG Mayo/UCHG</td>
<td>1 1 Mayo/UCHG</td>
<td>2 Post funded &amp; approved 2 approved</td>
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<td>Health Board Total</td>
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<td>2 recommended</td>
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<td>Overall Recommendations</td>
<td></td>
<td>25 posts recommended</td>
<td>16 posts funded &amp; approved + 1 post funded &amp; under consideration</td>
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Note: The term "funded" refers to the process whereby applications for consultant posts are funded by the Department of Health & Children or the Eastern Regional Health Authority in respect of the hospitals located in the ERHA region.

The term "approved" refers to the process whereby Comhairle na nOspidéal regulates consultant appointments. The term "approved" is used when there is a positive outcome. This process occurs after funding has been allocated by the Department of Health / the ERHA.
Table 9.2 Joint Working Group’s Recommendations - Overall Combination of Phase I and Phase II Development

<table>
<thead>
<tr>
<th>Region</th>
<th>Hospitals</th>
<th>No. of Posts as at Jan 2001</th>
<th>Phase 1 Interim Recommendations May 2001</th>
<th>Phase 2 Recommendations</th>
<th>No. of Posts July 2003</th>
<th>Overall Total Envisaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dublin</td>
<td>Supra-Regional Cardiology Centre (Mater/Beaumont)</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>7</td>
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<td></td>
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<td>2</td>
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<td>Acute General Hospital(s)</td>
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<td>Tullamore (T)</td>
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<td></td>
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<td>Mullingar /T</td>
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58
<table>
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<tr>
<th>Region</th>
<th>Hospitals</th>
<th>No. of Posts as at Jan 2001</th>
<th>Phase 1 Interim Recommendations May 2001</th>
<th>Phase 2 Recommendations</th>
<th>No. of Posts July 2003</th>
<th>Overall Total Envisaged</th>
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</table>

Notes:

a. Both posts based at JCM have a 3 session commitment to the Mater Hospital for cardiac cath. lab. access.
b. The post based at Naas has a 3 session commitment to Tallaght Hospital for cath. lab access.
c. The post based at St. Colmcille's has a 3 session commitment to St. Vincent's for cath. lab. access.
d. The post based at Ennis has a 3 session commitment to MWRH, Limerick for cath. lab. access.
e. The post based in Killkenny has an arrangement with St. James's Hospital for cath. lab. access.
f. The posts based at the Sth. Infirmary have sessions to CUH for cath. lab. access.
9.4 Stages of implementation

Table 9.3 Position from January 2001-July 2003- final recommendations:

- 29 existing posts of Consultant Cardiologist / Cardiologist & General Physician at commencement of Joint Working Group (January 2001)
- 25 additional posts recommended in Interim Report – Priority Posts (Phase I)
- 17 additional posts have been funded and approved since January 2001
- 54 Overall Interim Total Posts envisaged (i.e. Total posts recommended to complete Phase I development)
- A further 27 additional posts recommended in Phase II Development
- A total of 52 additional posts recommended over medium – long term (i.e. combined Phase I + Phase II additional posts)
- 81 Overall TOTAL Posts envisaged (i.e. Total posts envisaged for completion of Phase II development) (i.e. Phase I + Phase II)
- Where are we now?
- 46 approved posts currently (September 2003)

Since the establishment of this Joint Working Group, 17 new posts have been funded by the Department of Health & Children / Eastern Regional Health Authority and approved by Comhairle na nOspidéal. There are currently 46 posts of consultant cardiologist / consultant cardiologist & general physician approved to work in public hospitals in Ireland.

In formulating the foregoing specific Phase I and Phase II recommendations, the Joint Working Group has recognised the services which are in place and addressed the regional disparities which currently exist, in order to achieve equity in the availability of services throughout the state, consistent with best medical practice and advice.

The completion of the combined Phase I and Phase II development will involve a total increase of 52 new posts from January 2001 which will bring a national consultant cardiology staffing of 81 posts. This increase from 29 posts, (at the time of the establishment of the Joint Working Group) to 81, will result in a ratio of 1 consultant cardiologist / cardiologist & general physician per 48 000 population. It should be noted that the current overall ratio in the UK is 1 cardiologist per 100 000, while the target set there is 1 per 50 000.
9.5 Concluding remarks

The Joint Working Group believes that this Review of Consultant Cardiology Requirements, in
• clarifying standards of care in relation to treatment,
• advising on the location of facilities and referral pathways, and
• supporting a maximisation of professional skills, will help shape the strategic direction of future
cardiology services for Ireland and provide a framework for the orderly development of
consultant staffed services nationally.

Allied with the increase in consultant cardiology staffing, the Joint Working Group believes that additional
capital developments and support staff are required in order for the recommendations, as previously
outlined, to be effectively achieved. It is recognised that, in conjunction with the increase in consultant
cardiology staffing, additional consultant cardiac surgeons and consultants in other specialities will be
required to enhance the totality of cardiology service provision.

The Joint Working Group recognises that implementation of the recommendations set out in this report
will take time. Health boards and hospitals should take account of the recommendations of this report in
formulating plans for the development of hospital cardiology services. Implementation of the Joint
Working Group’s recommendations will also require detailed planning by health boards, hospitals and
others involved in the planning and delivery of cardiology services, as well as commitment on the part of
all staff and increased or redirected resources. The implementation of the recommendations of this
review, in the context of the continued implementation of the Cardiovascular Health Strategy, will have
real and tangible benefits for patient care.
References


11. Moon JC, Kalra PR, Coats AJ. DANAMI – 2: is primary angioplasty superior to thrombolysis in acute MI when the patient has to be transferred to an invasive centre. 2002; 85: 199-201.


<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AMI</td>
<td>Acute myocardial infarction</td>
</tr>
<tr>
<td>BMI</td>
<td>Body mass index</td>
</tr>
<tr>
<td>C&amp;AG</td>
<td>Comptroller and Auditor General</td>
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<tr>
<td>CABG</td>
<td>Coronary artery bypass graft</td>
</tr>
<tr>
<td>CCU</td>
<td>Coronary care unit</td>
</tr>
<tr>
<td>CHD</td>
<td>Coronary heart disease</td>
</tr>
<tr>
<td>CHSG</td>
<td>Cardiovascular Health Strategy Group</td>
</tr>
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<td>CPR</td>
<td>Cardiopulmonary resuscitation</td>
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<tr>
<td>CPD</td>
<td>Continuing professional development</td>
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<td>ECG</td>
<td>Electrocardiogram</td>
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<tr>
<td>EMT</td>
<td>Emergency medical technician</td>
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<td>EPS</td>
<td>Electrophysiological studies</td>
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<tr>
<td>HIPE</td>
<td>Hospital In-Patient Enquiry</td>
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<td>HPU</td>
<td>Health Promotion Unit</td>
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<tr>
<td>IABP</td>
<td>Intra-aortic balloon pump</td>
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<td>Irish Cardiac Society</td>
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<td>Intensive care unit</td>
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<td>IHD</td>
<td>Ischaemic heart disease</td>
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<tr>
<td>IMU</td>
<td>Information Management Unit</td>
</tr>
<tr>
<td>MCCU / MICU</td>
<td>Mobile coronary care unit / mobile intensive care unit</td>
</tr>
<tr>
<td>PCI</td>
<td>Percutaneous coronary intervention</td>
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<tr>
<td>PTCA</td>
<td>Percutaneous transluminal coronary angioplasty</td>
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