

Changing Cardiovascular Health

National Cardiovascular Health Policy

2010 – 2019

MAY 2010

DEPARTMENT OF HEALTH AND CHILDREN

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MINISTER'S FOREWORD

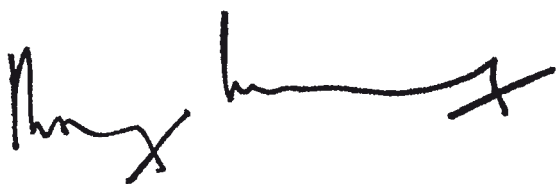
I am pleased to introduce this new policy framework covering all aspects of cardiovascular health, including stroke. It is now a decade since the first National Cardiovascular Health Strategy, *Building Healthier Hearts* (1999), was launched. It introduced a wide range of new services and initiatives, which have had a positive impact on reducing the burden of cardiovascular disease through prevention, better diagnosis and treatment. However, given the pace of change in scientific development and medical practices in this area during the last decade, an updated policy was required. Furthermore, any policy on cardiovascular care would be incomplete unless it includes a strategy on stroke.

This new policy, *Changing Cardiovascular Health*, covering the period 2010-2019, addresses the spectrum of cardiovascular disease and stroke, including prevention and management and how these are integrated to reduce the burden of these conditions. It covers the whole area of prevention, including measures that individuals can take as well as population interventions, and areas in which intersectoral action is necessary. It deals with the clinical management of cardiovascular disease and stroke, and covers all aspects of healthcare – from childhood through old age, from pre-hospital emergency care to rehabilitation and palliative care.

The policy is being launched in a challenging economic climate with little prospect of additional resources. However, the policy covers the period 2010-2019 and much can be done to advance it in tandem with other national strategies and the reorganisation of current resources. The Health Service Executive has been tasked with developing an implementation plan detailing how it intends to arrange services to support the delivery of care.

This policy represents a significant development coming after previous policies on cancer and diabetes, which together will account for the majority of healthcare in this country. The policy will operate alongside and complement existing policies on obesity, alcohol and chronic disease. The review is timely given the considerable changes in health services, the impact of unhealthy lifestyles, the future demand on health services and the scope for substantial improvements in cardiovascular mortality in the years to come. I am confident that this policy paves the way for enhanced prevention and care of cardiovascular disease and stroke in the next decade and will mark a new chapter for service delivery in this area.

I would like to take this opportunity to thank the members of the Cardiovascular Health Policy Group, who gave freely of their time and expertise in order to develop this framework, and especially Professor Hannah McGee, Professor of Health Psychology at the Royal College of Surgeons in Ireland, who worked tirelessly on this project.



Mary Harney, TD

Minister for Health and Children

ACKNOWLEDGEMENTS

This National Cardiovascular Health Policy was commissioned by the Minister for Health and Children. Its aim is to provide an integrated and quality-assured policy framework for the prevention, detection and treatment of cardiovascular disease, including stroke and peripheral arterial disease. The policy comes a decade after the important first National Cardiovascular Health Strategy in Ireland (*Building Healthier Hearts*, 1999) and is a timely successor. Since *Building Healthier Hearts*, we as a country have improved our evidence base on population health and on service delivery and cardiovascular outcomes, although there is much still to do to ensure our information collection methods are systematised to deliver evidence in a dependable periodic manner.

I am very grateful to the hard-working and enthusiastic Working Group who developed this policy. The similarity of the professional challenges of working in the traditionally separate areas of cardiac and stroke care, and the opportunity to work together to develop a common approach to the variety of presentations of cardiovascular disease (from prevention through emergency care to early rehabilitation and lifelong chronic disease management), was an important stimulus to work to achieve an integrated vision for the coming decade in the management of cardiovascular disease. While all of the Working Group provided their unique perspectives to make a comprehensive final product, I know that members will concur with me in particularly thanking Dr. Brian Maurer who combined his lifelong career expertise from cardiology and his advocacy role from the Irish Heart Foundation to bring wisdom and a sense of responsibility to our deliberations. It was a pleasure to be part of the developmental processes of the Working Group.

Thanks are extended to many people outside of the core Working Group for their support. It is not possible to individually list all who provided some assistance. We thank Dr. Kathleen Bennett and Dr. Tom O'Hara, Department of Pharmacology & Therapeutics, Trinity College Dublin, for biostatistical support, and we acknowledge their Department head and mentor – Professor John Feely, Chair of the HeartWatch Implementation Committee, whose untimely death during this period deprived the academic and clinical cardiovascular community in Ireland of one of its inspiring contributors. We thank the HSE staff for data and advice (Professor Joe Barry, Ms. Deirdre Carey, Dr. Nazih Eldin, Dr. Catherine Hayes, Dr. Fenton Howell, Dr. Maria Lordan-Dunphy and Ms. Fionnuala O'Brien); and Royal College of Surgeons in Ireland staff for research and administrative support (Dr. Karen Morgan, Dr. Anne Hickey, Mr. Mark Ward, Ms. Deirdre Holly, Ms. Helen Burke, Ms. Carole Caetano and Ms. Shani Rushin). Thanks also to Dr. John Billings, Health Information and Quality Authority; Mr. Martin Feeley, Irish Association of Vascular Surgeons; Mr. Tom Horton and Mr. Aonghas Horgan, Office of Social Inclusion; and staff at the Grown Up Congenital Heart Services, Mater Misericordiae University Hospital Dublin; the Food Safety Authority of Ireland; and the National Treatment Purchase Fund. Thanks to the many staff in the Department of Health and Children who provided support throughout the work of the Group – in particular Dr. John Devlin, Deputy Chief Medical Officer, who was the ongoing contact for the Group.

All of these efforts have been towards delivering a new policy for a new era in cardiovascular care – where the goal will be to prevent, to treat and to manage in an environment that is both more challenged economically, but also more enabled by the many scientific, professional and societal achievements of the last decade in this area. The title of the new policy conveys the impetus – *Changing Cardiovascular Health*: the challenge is to make change rather than to observe change. We trust this policy will empower policy-makers, service providers and service users to work to change our cardiovascular health in the coming decade.

Professor Hannah McGee, FEHPS, FESC
Chair, Cardiovascular Health Policy Group

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION TO THE CARDIOVASCULAR HEALTH POLICY (CHAPTER 1)

The Cardiovascular Health Policy Group was established with the following terms of reference:

Having regard to the audit of the implementation of the cardiovascular health strategy, *Building Healthier Hearts*, and the audit of stroke services, *Irish National Audit of Stroke Care*, and consistent with developments in relation to the management of chronic diseases and the Primary Care Strategy, to develop a policy framework for the prevention, detection and treatment of cardiovascular disease, including stroke and peripheral arterial disease, which will ensure an integrated and quality-assured approach in their management.

This new cardiovascular policy, *Changing Cardiovascular Health* covering the period 2010-2019, comes a decade after the first national cardiovascular health strategy, entitled *Building Healthier Hearts*, was published by the Department of Health in 1999. The new policy is timely given the pace of scientific discovery and related changes in medical practice, changes in health service structures, and patterns and influences on population health behaviours in Ireland over the decade. Cardiovascular health and its maintenance is a microcosm of health more generally. A policy that can improve cardiovascular health and cardiovascular disease management will have beneficial effects for the whole healthcare system and population.

CARDIOVASCULAR DISEASE – TRENDS IN IRELAND (CHAPTER 2)

Cardiovascular disease remains the most common cause of death in Ireland, currently accounting for one-third of all deaths and one in five premature deaths. However, there has been substantial progress. Age-standardised death rates from cardiovascular disease have decreased by two-thirds over the past 30 years. Despite improvements, Ireland still ranks below the EU15 average for life expectancy for both men and women. As mortality rates have reduced, demand on health services has intensified.

Without changes in prevalence and practice, hospital bed use can be expected to increase substantially over the next decade as the number of people aged over 65 in Ireland is predicted to increase by 41%. In primary care, prescriptions for cardiovascular medication have increased two- to four-fold. At population level, the current lifestyle-related risk factor profile of the Irish population is a major concern: levels of smoking have not changed in the last 5 years, while levels of obesity and physical inactivity have increased (*see Chapter 3*). If these patterns continue, they threaten to reverse the declining trend in cardiovascular disease mortality of recent decades. There is thus considerable scope for improvement. This challenge is an intersectoral one – involving and being driven by those responsible for health and healthcare, but supported and enabled by sectors such as education, transport and agriculture.

Apart from the human cost, the cost of cardiovascular disease to the Irish economy – which includes the costs of healthcare, loss in productivity and informal care – is a significant burden. Spending on cardiovascular health, while substantial, accounts for only 6% of the Irish healthcare budget – lower than the EU27 average of 10%. A much greater level of analysis of the costs of cardiovascular disease is needed to inform discussions about service investments and value for investment over the 10-year timeframe of this new policy.

PREVENTION AND HEALTH PROMOTION (CHAPTER 3)

Cardiovascular disease must be addressed through a combination of *population-based approaches*, which target the entire population, and *high-risk approaches*, which focus on individuals in contact with health services. The burden of cardiovascular diseases and the lifestyle factors that contribute to them is borne disproportionately by those in lower socio-economic groups. Evidence suggests these differentials may be increasing. Given the documented inequity in cardiovascular health and risk factor profiles, measures to increase population health must permeate across all socio-economic groups, but with a specific focus on reducing inequity.

The individual determinants of cardiovascular health and disease are similar to those relating to overall disease burden – smoking, raised blood pressure, raised blood cholesterol, physical inactivity, obesity and diabetes mellitus. The current health behaviour profile of the Irish population, and resultant cardiovascular risk, means that a major effort is needed to change these patterns.

This policy proposes a series of 10-year targets for health behaviours influencing cardiovascular-related population health (see *Recommendation 3.1*).

RECOMMENDATION 3.1

The Department of Health and Children should prioritise actions that promote the health behaviour profiles underpinning cardiovascular health, with specific targets to actively pursue and achieve within a 10-year period.

The prioritised areas are:

- maintaining a healthy body weight;
- healthy eating and physical activity;
- reducing salt intake;
- refraining from or quitting smoking;
- consuming alcohol responsibly.

Actions will include fostering intersectoral support for initiation of activities promoting health and prohibition of activities that will maintain or foster unhealthy behaviours. Details on how to achieve these targets are contained in a range of recent Government policies. Reductions in inequalities in cardiovascular health across society must be an underlying principle in achieving improvements in health behaviour.

Lead organisation: Department of Health and Children

Health behaviour profiles in Ireland: Current status and 10-year targets

Body weight: The prevalence of overweight and obesity is high and increasing in Ireland. Research shows that 38% of the adult population are overweight and 23% obese. By 7 years of age, 26% of girls and 18% of boys are overweight or obese.

HEALTHY BODY WEIGHT – TARGETS

Restore the BMI distribution of adults to levels as assessed 10 years ago (in 1999, 43% healthy weight; 39% overweight; 18% obese). This is to be achieved by:

- halting the current annual increase in the prevalence of overweight and obesity in the medium term (by 2014);
- achieving a modest reduction in prevalence of obesity within 10 years (by 2019).

Targets for adults over 10-year timeframe:

- Healthy weight: increase from 38% to 43%
- Overweight: maintain overall levels at 38%
- Obesity: decrease from 23% to 18%

Targets for children over 10-year timeframe:

- Healthy weight: increase from 78% to 84%
- Overweight: decrease from 11% to 7%
- Obesity: decrease from 11% to 9%

Nutrition/healthy eating: The national dietary profile is challenging. While there has been an increase in the recommended consumption of 5 portions of fruit and vegetables by adults daily (to 65%), 86% report that they consume more than the recommended daily servings of foods high in fats, sugar and salt.

HEALTHY EATING – TARGETS

- Increase by 20% the proportion of adults consuming the recommended 5 or more daily servings of fruit and vegetables (from 65% to 78%) by 2014.
- Ensure total fat provides less than 35% of dietary energy requirements. This is a 'short-to medium-term' goal, to be achieved by 2012. After 2012, the medium to long-term goal is less than 30% of dietary energy from fat by 10 years (2019).
- Reduce to less than 10% the dietary intake from saturated fats and trans-fatty acids.
- Reduce to less than 2% the dietary energy intake from trans-fatty acids.
- Reduce to less than 10% the dietary energy intake from foods with added sugars.
- Reduce to less than 3 daily servings those foods high in fats, salt and sugar from the 'top shelf' of the Food Pyramid (e.g. oils, butter, cakes, soft drinks).

Note: Dietary energy does not include energy from alcohol.

Physical activity: Levels of physical activity among the population are inadequate. Over one-fifth of Irish adults (22%) reported being completely physically inactive, with lack of interest or 'no time' given as the main reasons. For children, slightly less than half exercise at least 4 times a week, with striking gender differences – 41% of adolescent boys and 28% of girls exercise 4 or more times a week.

PHYSICAL ACTIVITY – TARGETS

- Increase by 20% the proportion of the population undertaking regular physical activity, i.e. increase proportion of physically active adults from 55% to 66% and children from 41% to 49% by 2019.

Salt consumption: Average daily salt intake is significantly above the recommended amount, men currently consuming 10g/day of salt and women 9g/day. Most dietary salt comes from foods as purchased (e.g. take-aways, processed 'ready-make' meals) rather than from adding salt in cooking or at the table.

SALT CONSUMPTION – TARGETS

- Reduce salt consumption as set out in the EU Salt Reduction Initiative, i.e. reduction by 16% in 4 years (2008-2012).
- Achieve reduction to a target of no greater than 6g/day salt for adults within the lifetime of this policy.
- Particular attention to be given to salt reduction in children, with target setting as appropriate.

Smoking cessation: Smoking is the leading cause of preventable mortality, with Ireland ranking 2nd highest for smoking-related causes of death in the EU15. While the smoking ban in the workplace introduced in 2005 has significantly reduced exposure to secondary smoke, smoking rates for adults are still high – at 29% (31% of men and 27% of women).

SMOKING REDUCTION – TARGETS

- Reduce overall population prevalence of smoking by 1% per annum (from 29% to 19% by 2019).
- Reduce the smoking initiation rates by 1% per annum (from 31% to 21% by 2019).

Alcohol consumption: Alcohol consumption in Ireland – especially relevant to population blood pressure and overweight/obesity – is unacceptably high. Alcohol consumption is over 40% higher than the EU average, with substantial numbers reporting excessive or risky drinking, or both. Levels of drinking in adolescence are among the highest in Europe.

ALCOHOL CONSUMPTION – TARGETS

Reinforce the Strategic Task Force on Alcohol (2004) consumption targets by:

- reducing the total per capita consumption of alcohol to 9 litres per annum (the EU average);
- reducing the harmful individual consumption of alcohol, especially related to risky and excessive drinking.

Blood pressure and cholesterol: In recent research, 60% of middle-aged and older Irish adults had high blood pressure and 82% had raised cholesterol. Most were either not on medication or had uncontrolled blood pressure and cholesterol on medication. Almost two-thirds had at least two of four key risk factors for cardiovascular disease – raised blood pressure, raised cholesterol, obesity and smoking. Management of blood pressure and cholesterol will in part be addressed by targeting the health behaviour profiles as outlined above and also by improving management in primary care (*see Chapter 4*).

Intersectoral work

There are broad social, economic, cultural and environmental determinants of health and well-being. The challenge for the health sector is the imperative to have *action across multiple sectors* of society (*see Recommendation 3.2*). Important partners include the education sector, the sports and leisure sector, urban planning and construction, transport, agriculture, the private sector, the food industry and the media.

RECOMMENDATION 3.2

Intersectoral work should be given the priority it needs to deliver health-related benefit.

To achieve real change, actions should be led by the Department of Health and Children, reporting to Government on a regular basis through the Cabinet Committee on Health.

A key deliverable in evaluating the success of this work will be reductions in inequality in cardiovascular health targets.

Lead organisation: Department of Health and Children

PRIMARY CARE (CHAPTER 4)

Primary care has a vital role to play in raising awareness of cardiovascular disease, prevention, early detection, emergency response, risk assessment and management. The full potential of primary care to contribute to the containment of cardiovascular disease has yet to be realised.

Promoting awareness

There is a need to promote awareness in the population of the need for regular monitoring of blood pressure and cholesterol levels, as well as the symptoms of diabetes (*see Recommendation 4.1*). In parallel, awareness of the early symptoms and appropriate emergency responses to cardiovascular signs is necessary in order to ensure effective interventions can be administered in a timely fashion.

RECOMMENDATION 4.1

Media and education campaigns should be undertaken to increase awareness by the general public of cardiovascular risk factors and levels of risk associated with them. This awareness should be reinforced in primary care settings, such as GP practices and pharmacies, by the HSE in partnership with voluntary agencies.

Such campaigns should include raising awareness of risk factors, symptoms and appropriate responses to heart attack, stroke, trans-ischemic attack, heart failure, peripheral arterial disease and other vascular conditions. Given the primacy of awareness to attitude and behaviour change, a series of campaigns needs to commence immediately and in a phased manner, with interim evaluations guiding the next educational phase.

Lead organisation: HSE, in partnership with voluntary agencies

Clinical practice

Beyond prescribing cardiovascular medications in accordance with international guidelines, there is ample evidence that multidisciplinary input into preventive cardiovascular disease programmes in high-risk individuals can benefit lifestyle-related risk factor changes. As multidisciplinary primary care teams are established in Ireland, they must be empowered to support cardiovascular prevention.

An effective programme of chronic disease management is deliverable through a shared care model facilitated by multidisciplinary teams with designated care pathways. Shared care models need to be expanded and developed in order to achieve optimum chronic disease management for patients with cardiovascular disease. Strategies need to be developed and implemented to support a multidisciplinary team approach that promotes continuity of care. This includes the provision of self-management education programmes. The role of general practices, pharmacies and other centres in supporting chronic disease management needs to be examined.

High-risk patients: The definition of 'high risk' needs to be extended to include all patients in the priority groups as identified by the current *ESC Clinical Practice Guidelines* – by the Fourth Joint Task Force of the European Society of Cardiology [ESC] and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (Graham *et al*, 2007). This includes patients who have had an event and/or a revascularisation procedure, patients with established disease, close relatives of people with premature atherosclerotic disorders, as well as individuals with multiple risk factors.

Recommendations 4.2-4.4 relate to the prevention of cardiovascular disease in clinical practice.

RECOMMENDATION 4.2

Professional standards: The 2007 ESC Clinical Practice Guidelines should be adopted and a care protocol for primary care based on these guidelines should be developed. Protocols on best practice in cardiovascular clinical care should be agreed.

This extends the group of individuals considered at high risk and includes patients with established disease, close relatives of people with premature atherosclerotic disorders and individuals with multiple risk factors.

Lead organisation: HSE, in partnership with Irish Heart Foundation, Irish Cardiac Society, Irish College of General Practitioners, Department of Health and Children, and HIQA

RECOMMENDATION 4.3

Structured clinical care: Develop structured clinical care, which includes prevention of cardiovascular disease, in clinical practice.

This will provide targeted individualised assessment and management of cardiovascular disease in primary care, in accordance with the 2007 *ESC Clinical Practice Guidelines*, i.e. those at risk, those with established cardiovascular disease and selected family members. Structured clinical care is considered a key requirement to future general practitioner contract agreements.

Lead organisation: HSE, in conjunction with Irish College of General Practitioners

A risk assessment programme – similar to the HeartWatch Programme, but incorporating the above definition of ‘high-risk’ individuals – should be piloted and implemented, taking into consideration the implications of this extended high-risk group (*see Recommendation 4.4*). It is proposed that a structured programme for cardiovascular risk ascertainment in primary care, with opportunistic recruitment of patients, be considered within the context of a rigorous scientific study to inform these developments. A health technology assessment, provided through the HIQA, will inform the scope of the clinical studies.

RECOMMENDATION 4.4

Population approach: Evaluation of a structured programme for cardiovascular risk ascertainment and management in the primary care setting is required to inform the development of a model for the delivery of care.

A health technology assessment and clinical study will determine the health and economic benefits of such systematic risk ascertainment for different population groups (compared to usual care). As clinical and cost-effectiveness benefits become clear, implications for service development must be agreed and interventions targeted at relevant population groups implemented. The evaluation should be completed and recommendations delivered in the first half of the lifetime of this policy (2010-2014).

Lead organisation: Department of Health and Children, in association with HSE, HIQA and Health Research Board

Diabetes mellitus

Those with Type 2 diabetes and those with Type 1 diabetes who have microalbuminuria are priority groups for the prevention, early detection and management of cardiovascular risk (*see Recommendation 4.5*). This policy supports the recent HSE integrated model for service delivery for these patients.

RECOMMENDATION 4.5

A protocol for the early detection and structured cardiovascular care of patients with diabetes should be agreed in order to manage this high-risk group.

Lead organisations: HSE and Irish Heart Foundation, in partnership with Irish Cardiac Society, Irish College of General Practitioners and Irish Endocrine Society

Prevention of stroke in primary care

In addition to the 2007 *ESC Clinical Practice Guidelines* on the prevention of cardiovascular disease, which address common challenges for all cardiovascular patients, the detection and management of raised blood pressure (hypertension) and anti-thrombotic therapy for those with atrial fibrillation are of particular relevance in the prevention of stroke (*see Recommendations 4.6 and 4.7*). Elevated blood pressure has been considered the most important determinant of the risk of stroke due to cerebral infarction or haemorrhage and thus warrants particular attention.

Atrial fibrillation is a potent risk factor for stroke, increasing the risk five-fold. The risk of thrombotic complications, such as stroke, in patients diagnosed with atrial fibrillation can be dramatically reduced by treatment with anticoagulants. Despite the well-recognised benefits of anticoagulation therapy, many patients with atrial fibrillation remain undetected or untreated. Improved detection of atrial fibrillation and anticoagulation can be achieved by developing structured systems between primary care and the hospital setting.

RECOMMENDATION 4.6

Effective management of hypertension should be prioritised in primary care.

Guidelines are needed on standards of assessment, management and review of patients in primary care based on best practice and health technology. In addition, general practices need to be supported to establish rigorous systems for blood pressure assessment, management and review for their population of patients. This requirement should be considered in the context of future arrangements pertaining to the general practitioner contract.

Lead organisation: Department of Health and Children, in partnership with Irish College of General Practitioners

RECOMMENDATION 4.7

Anticoagulation service management should be formalised, including:

- **Clinical leadership of integrated anticoagulation services:** This must be established within service networks so that GPs and hospital staff (including stroke specialist consultants, consultant haematologists and nurse specialists) achieve and assure optimal care for all.
- **Structured anticoagulation services:** These will have to be developed between and within primary care services and hospital anticoagulation clinics. This will necessitate appropriate resourcing being provided to participating practices (e.g. IT linkages to hospital/GP/pharmacy anticoagulation services, 'near-patient' anticoagulation testing, practice nurse appointments).
- **A screening programme for atrial fibrillation:** This should be established, with formal evaluation, to ensure an effective means of implementation for people aged 65 and over.

Lead organisation: HSE

Heart failure

There is a potential epidemic of heart failure in Ireland over the next 10 years, arising from increasingly successful therapies to reduce early morbidity and mortality, and given the rise in the number of older people during this time. To address this scenario, heart failure management requires an integrated community-based approach, led by primary care teams, with the focus on keeping affected people out of the hospital setting (*see Recommendation 4.8*). This is paramount if the hospital system is to address acute care needs adequately.

RECOMMENDATION 4.8

A programme should be developed to increase and support the capacity of primary care to detect heart failure at an early stage and to provide proactive care, including:

- **Education of the primary care team**, particularly GPs and practice nurses, in accordance with agreed national guidelines across primary and secondary care providers.
- **Agreement on and introduction of models of shared care**, supporting the key role of the GP and primary care team (*see Chapter 5, Hospital section*).
- **Deployment of specialist heart failure nurses** within an integrated system to maximise the value of these nurses to work with GPs and primary care teams.
- **Deployment of other staff to increase the capacity of primary care teams** to support the community-based management of patients with heart failure, including specialist palliative care.
- **Staffing arrangements to provide 7-day access** for heart failure patients with clinical deterioration.
- **IT capacity to facilitate communication** between primary and secondary care, including the establishment of heart failure registers and audits.
- **Tele-monitoring to support patients in adopting and maintaining self-care**. This will involve the adoption of agreed national guidelines across primary and secondary care providers.
- **Specialist palliative care** for heart failure patients.

Lead organisation: HSE

Peripheral arterial disease

Patients with peripheral arterial disease (PAD) have a very substantial risk of other cardiovascular diseases. Many patients with symptoms fail to present because they may attribute symptoms to the normal effects of ageing or physical inactivity. Greater public awareness is needed about this disorder (*see Recommendation 4.9*).

RECOMMENDATION 4.9

A protocol for risk assessment and management of patients with suspected peripheral arterial disease (PAD) should be developed and evaluated in primary care.

Lead organisation: HSE, in partnership with Irish College of General Practitioners and Royal College of Physicians in Ireland

HOSPITAL AND EMERGENCY CARE SERVICES (CHAPTER 5)

Hospital and acute care services for cardiovascular conditions include emergency and acute cardiac and stroke care and related pre-hospital emergency services. They also include non-emergency care concerning surgery and management of heart failure, peripheral arterial disease (PAD) and grown-up congenital heart (GUCH) disease.

General clinical care pathways

While the focus here is on cardiac-specific and stroke-specific aspects of acute care pathways, clinical pathways also relate to how cardiovascular disease is prevented, its early detection, ongoing treatment and rehabilitation, and palliative care. Within the current resource framework, there is much that can be done to improve clinical care and outcomes, particularly for emergency patients, as well as to reduce costs while maintaining quality. There is much that can be put in place to improve clinical effectiveness and efficiency by way of organisational change, applying best practice procedures, developing new cardiovascular models of care and the introduction of clinical pathways that highlight improvement of clinical processes in cardiovascular care to enhance clinical effectiveness and efficiency. The introduction of these clinical pathways and cardiovascular models of care will provide an effective strategy to reduce clinical performance variations across the system.

Establishing care pathways means that those in hospital-based specialist services will need to adapt and provide more support to primary healthcare providers. These changes are already underway in some hospitals and regions throughout the country. In the current economic climate, it is envisaged that the development of new emergency models of care and new clinical networks will have to take place within current resources.

ACUTE CARDIAC CARE

Acute cardiac care pathways

Survival followed by speedy reperfusion is the goal of emergency care for patients with myocardial infarction. Reperfusion through primary percutaneous intervention (PCI) has major advantages over thrombolytic therapy, but must be delivered in accordance with international safety standards. A system of delivering early PCI reperfusion will be provided by building up services that have well-resourced and trained pre-hospital emergency facilities and staff. Where patients cannot reach PCI services within the time specified for safe and effective care, they will avail of emergency services developed to give timely access to centres providing thrombolysis. In each case, the aim will be to get the patient treated as rapidly and effectively as possible within the available reperfusion options. This service mix will provide the widest and most equitable coverage of acute cardiac services to the Irish public (see *Recommendations 5.1-5.5*).

RECOMMENDATION 5.1

Patients with ST elevation myocardial infarction should be treated with primary percutaneous intervention (PCI) as first-line therapy, in accordance with the 2007 ESC Clinical Practice Guidelines, if the time from first medical contact to primary PCI can be achieved within 120 minutes.

Optimal treatment under this development will require an emergency medical system to link a network of hospitals having cardiac facilities, with a clear designation of geographic coverage, shared risk stratification protocols for pre-hospital diagnosis and triage, and fast transport in appropriately equipped ambulances or helicopters.

Lead organisation: HSE

RECOMMENDATION 5.2

If PCI cannot be provided within 120 minutes of first patient contact, the patient should be assessed for thrombolysis as soon as possible. Treatment options should include pre-hospital thrombolysis in addition to the in-hospital service, depending on patient presentation.

Protocol-driven emergency thrombolysis should be provided in either pre-hospital or hospital settings. The priority in service development will be to deliver the fastest service to the widest range of patients and this should be reflected in future service plans. Pre-hospital thrombolysis has been incorporated in the advanced paramedic scope of practice by the Pre-Hospital Emergency Care Council and a supporting clinical practice guideline has been published. A programme to train GPs for appropriate roles in pre-hospital emergency care, including thrombolysis in certain rural areas, is also underway.

Lead organisation: HSE

continued

RECOMMENDATION 5.3

Emergency PCI services should be delivered on a 24-hour 7-day basis in a small number of centres, sited to maximise patient access and workforce expertise and coverage.

Some centres which do not provide emergency services may be able to provide PCI for patients presenting directly to them during restricted hours, provided that there is a sufficient throughput to maintain expertise.

Lead organisation: HSE

RECOMMENDATION 5.4

Patients assessed as having forms of acute myocardial ischemia other than ST elevation myocardial infarction should be taken to the nearest acute medical facility, triaged at the emergency department, treated and stabilised, moved to the nearest acute coronary care setting and then transferred within 24 hours to the nearest comprehensive cardiac centre.

Most of these patients will require diagnostic angiography and some will require early intervention. These recommendations refer to patients transferred to hospital by ambulance. The same diagnostic and treatment protocol applies for those patients (currently approximately 50%-55%) who arrive at hospital independently of the emergency services.

Lead organisation: HSE

RECOMMENDATION 5.5

Designation of cardiac networks providing diagnostic and interventional services should include non-invasive diagnostic imaging facilities, in addition to echocardiography, catheterisation and angiography.

Pragmatically, a minimum of two investigative/angiographic laboratories are needed in each centre providing the service to deliver on a timely basis. Furthermore, the period of changeover from a largely thrombolysis-based reperfusion service to a primary PCI needs to be carefully monitored to ensure that standards of patient care are maintained in the transition period. Network development is a core first step in the implementation of this policy.

Lead organisation: HSE

Intensive cardiac care

Reflecting changing practices and population profiles, the current Coronary Care Unit needs to evolve into an Intensive Cardiac Care Unit (ICCU), functioning in close liaison with the emergency department while remaining under the control of the cardiology service. Protocols must ensure that individualised patient treatment plans, including adequate patient education, are formulated and put in place before discharge. This is essentially Phase I of an integrated rehabilitation programme (see *Recommendations 5.6 and 5.7*).

RECOMMENDATION 5.6

The current Coronary Care Unit should be substantially reconfigured, following needs assessment, to become an Intensive Cardiac Care Unit (ICCU), meeting the changing clinical profile of the patients now encountered.

A review of the changing pattern of need and supply for acute cardiac care is required to underpin this reconfiguration.

Lead organisation: HSE

RECOMMENDATION 5.7

Protocols need to be developed to ensure provision of individualised patient treatment plans in Intensive Cardiac Care Units, incorporating education of patients within a tailored, phased rehabilitation framework.

It is acknowledged that new procedures and increased efficiency, resulting in shorter stays in hospital, challenge the traditional model of patient education and early rehabilitation at this point. New ways to achieve the same effects are needed.

Lead organisation: HSE

Emergency care for chest pain

In the acute setting, the goal will be to triage the high-risk patient for urgent treatment of acute coronary syndrome; in the sub-acute setting, there is a requirement to address the needs of patients referred by their GP where there is a pressing concern about emerging ischaemic heart disease (see *Recommendation 5.8*). Same-day specialist expertise and relevant diagnostic services are needed.

RECOMMENDATION 5.8

Hospitals admitting patients with acute cardiac conditions should have a protocol-driven assessment of patients with lower-risk chest pain to maximise detection of those with acute ischaemia and to minimise inappropriate admissions.

In tandem, priority ambulatory care must be formulated to deliver specialist expertise, ideally by the next working day or within 72 hours at the latest for GP-referred patients with acute or suspicious presentations. In addition, a specialist ambulatory focus for a number of clinical presentations should be considered so that appropriate expertise and techniques can be made available and used to maximum effect in the context of a rapidly changing clinical evidence base.

Lead organisation: HSE

Heart failure care

This policy proposes a move from emergency in-hospital care to accessible ambulatory specialist care that supports proactive care by GPs and primary care teams (see *Recommendations 5.9-5.11*).

RECOMMENDATION 5.9

All hospitals evaluating patients with heart failure should restructure in-hospital and out-patient cardiac care to allow for specialist heart failure ambulatory services that support the key role of the GP and primary care team.

Lead organisation: HSE

RECOMMENDATION 5.10

Models of shared care of patients with heart failure should be established, based on agreed national guidelines and on models currently being elaborated in Ireland and internationally.

Lead organisation: HSE, in association with Irish College of General Practitioners and Irish Heart Foundation

RECOMMENDATION 5.11

ICT-enabled communication between hospitals and GPs or primary care teams should be actively used to support shared heart failure care.

Lead organisations: HSE and Department of Health and Children

Organisation of cardiac services into networks

Specialist cardiac services should be organised into population-based regional networks, as envisaged in the recent ESC STEMI Guidelines (Van de Werf *et al*, 2008), in order to deliver a full range of cardiac services (see *Recommendation 5.12*). Central to the network concept is the principle that every hospital delivers a full range of cardiac services either on-site (comprehensive centres) or in formal partnership with others (general centres); acute and national specialty services are provided in a smaller number of comprehensive centres. Ongoing care and rehabilitation and liaison with primary care are recognised as important components of these services.

RECOMMENDATION 5.12

Specialist cardiac services should be organised into population-based cardiac networks, with network hospitals designated as (i) General Cardiac Centres or (ii) Comprehensive Cardiac Centres.

A broad plan for service reconfiguration needs to be developed. This should identify general and comprehensive cardiac centres and allow service planning – involving workforce and emergency service development in particular – to evolve within the new network structure.

Lead organisation: HSE

Cardiac surgery and transplantation

Recent changes in medical practice and patient demographic profiles have had a major impact on cardiac surgical practice. Patients now present with more complex conditions. There is very little spare capacity in the operating time currently available for cardiac surgery in Ireland. Numbers of existing and approved consultant surgeon posts are adequate, but availability of dedicated cardiac surgical intensive care beds represents a serious challenge to effective cardiac surgery activity (see *Recommendations 5.13 and 5.14*). In addition, the main barrier to thoracic organ transplantation in Ireland is availability of donor organs (see *Recommendation 5.15*).

RECOMMENDATION 5.13

Cardiac surgical units should have a dedicated Intensive Cardiac Care Unit, with adequate numbers of beds (the majority to be provided in single rooms).

Lead organisation: HSE

RECOMMENDATION 5.14

All consultant anaesthetists and intensivists providing care to cardiac surgery patients should have specialist training.

All anaesthetists providing cardiac anaesthesia should carry out at least one cardiac surgery list per week. A dedicated cardiac anaesthetic on-call rota should be established in each hospital providing cardiac surgery.

Lead organisations: HSE and relevant postgraduate training bodies

RECOMMENDATION 5.15

Solutions to maximise access to donor organs for transplantation should be explored.

Specific initiatives will be informed by the work of the Organ Donation and Transplantation Unit, to be established within the HSE's existing national structures and resources.

Lead organisations: Department of Health and Children and HSE

Congenital heart disease

While figures for surgical and waiting lists are adequate, access to operating theatre time, together with insufficient ICU beds, means that approximately one-third of surgical procedures for congenital heart disease take place outside of normal working hours, with resultant impact on staff, patients (mostly children) and their families (see *Recommendation 5.16*).

RECOMMENDATION 5.16

A review of service needs and availability for GUCH patients (Grown-up Congenital Heart disease) should be carried out in the context of international trends, followed by a service development plan for this expanding population of patients.

Lead organisation: HSE

ACUTE STROKE CARE

Acute stroke care pathway

Stroke services are much less developed than cardiac services in Ireland. The first *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, found that there were less developed acute services across 12 identified markers of quality care compared to those in the UK (Horgan *et al*, 2008).

Stroke units

Stroke units are the foundation of timely and comprehensive stroke care in hospital and are a minimum standard internationally for audit and accreditation of stroke services. Many acute hospitals in Ireland already have several elements of the staffing and infrastructure required to create a stroke unit. Thus, it is expected that implementation of stroke unit care can be substantially achieved even in economically challenging times (*see Recommendations 5.17 and 5.18*).

RECOMMENDATION 5.17

All hospitals admitting patients with acute stroke should have a stroke unit, as defined by the European Stroke Organisation.

Each stroke unit should have sufficient capacity to admit patients directly from the emergency department and the rapid access TIA clinic, to accept transfers from other hospitals within the stroke network when required, and to provide care for all stroke/TIA patients for their hospital stay. This should be a key priority for the hospital reconfiguration programme.

Lead organisation: HSE

RECOMMENDATION 5.18

Stroke units should have adequate and appropriate staffing.

This includes a designated lead consultant stroke physician working within a stroke network group. In addition, stroke units should have adequate multidisciplinary teams of staff to cater for the complex needs of patients with stroke, many of whom will have high levels of dependency. Such teams should include physiotherapy, occupational therapy, speech and language therapy, social work, clinical nutrition and dietetics, clinical psychology/neuropsychology, and specialist nursing.

Lead organisation: HSE

Emergency care, including thrombolysis

Stroke thrombolysis confers substantial benefits in terms of survival and disability. Providing emergency stroke evaluation, followed by thrombolysis within 180 minutes of stroke onset as the standard of care for eligible patients will require reconfiguration to provide access to brain imaging and a consultant stroke physician on a 24-hour 7-day basis (*see Recommendations 5.19 and 5.20*).

RECOMMENDATION 5.19

Emergency stroke treatment by a consultant stroke physician should be available on a 24-hour, 7-day basis to all acute stroke patients within each stroke network.

When it is not feasible to transport the patient within the timeframe for emergency evaluation and treatment with thrombolysis, tele-medicine supported by an on-call consultant stroke physician should be available. This emergency treatment will be developed on an incremental basis.

Lead organisation: HSE

RECOMMENDATION 5.20

Each stroke network should agree a model of service delivery to meet the need for a 24-hour 7-day thrombolysis service.

Clear protocols and patient pathways should be identified, implemented and reviewed on a regular basis.

Lead organisation: HSE

Hospital in-patient stroke rehabilitation

Stroke rehabilitation starts soon after admission and should occur in a stroke unit as an integrated component of the work of the unit (*see Recommendation 5.21*). This permits the multidisciplinary team to care efficiently for patients across the spectrum – from emergency assessment to discharge from hospital.

RECOMMENDATION 5.21

Evidence-based guidelines and protocols of care should be developed and adopted for acute and rehabilitation management of stroke patients.

Lead organisation: Irish Heart Foundation, in association with Department of Health and Children, HSE and HIQA

Discharge from the acute hospital

For stroke patients, the timing of discharge from hospital and requirements for continuing care are closely related to functional recovery and residual impairment and independence, or potential to regain independence, in activities of daily living (*see Recommendation 5.22*).

RECOMMENDATION 5.22

Patients should have a full needs assessment prior to admission to hospital, aiming to support discharge home or to their place of residence.

Placement in long-term care should only be considered on the basis of medical or social need, rather than as a result of inadequate community services and facilities.

Lead organisation: HSE

Transient ischaemic attacks

Transient ischaemic attacks (TIAs) are an important warning symptom of stroke and an opportunity to intervene to prevent the condition developing into a full stroke. Same-day assessment and treatment by a consultant stroke physician-led team can prevent a subsequent stroke (*see Recommendation 5.23*).

RECOMMENDATION 5.23

Patients experiencing transient ischaemic attacks (TIAs) should be referred to consultant-led, same-day, rapid-access TIA/stroke prevention clinics with appropriate diagnostic and management facilities, including secondary prevention advice, pharmacological management and access to vascular surgery, where needed, within 2 weeks.

Clear pathways of referral and use of risk stratification are needed to identify high-risk patients and aid 'immediate admission' decisions to be made in primary care and in emergency departments.

Lead organisation: HSE

Carotid stenosis and carotid endarterectomy

Research evidence strongly supports the benefits of surgery over medical management alone in symptomatic moderate-to-severe carotid stenosis in order to reduce the incidence of recurrent neurovascular events (TIA and stroke). Asymptomatic carotid artery disease is also a risk factor for stroke. Selection of high-risk patients will ensure most benefit from surgical intervention (see *Recommendation 5.24*).

RECOMMENDATION 5.24

Clinical management of carotid disease should involve the following:

- All patients with recent TIA or non-disabling stroke should have urgent ipsilateral carotid assessment by Doppler ultrasound or CTA/MRA. Carotid endarterectomy should be offered to all patients with symptomatic moderate-to-severe (70%-99%) carotid stenosis and performed within 2 weeks of symptoms.
- Patients with asymptomatic moderate-to-severe carotid stenosis should be considered for carotid endarterectomy on a case-by-case basis and have a full risk assessment, including TCD monitoring/intima medial thickness measurement.

Organisational management at stroke network level should involve the following:

- Defined care pathways with vascular surgery units experienced in performing carotid endarterectomy.
- Access to expertise in carotid imaging and vascular surgery.
- Decision-making forum about surgical intervention to incorporate multidisciplinary neurovascular meetings involving geriatricians/stroke physicians, neurologists, vascular technicians, neuroradiology and vascular surgeons.
- Regular audit of carotid interventions to ensure high standards; this could contribute to a national register of carotid surgery.

Lead organisation: HSE, in collaboration with Irish Association of Vascular Surgeons and other relevant professional organisations

Organisation of stroke services into networks

Stroke services will be configured into stroke networks, with a number of hospitals working together to provide the comprehensive range of services needed for optimal stroke care and working closely with community services (see *Recommendation 5.25*). The stroke network will comprise a series of General Stroke Centres with associated Comprehensive Stroke Centres. One or more hospitals (comprehensive centres) within the partnership will provide acute services for the network, i.e. services that are not expected to be available at all hospitals.

Services provided on a network basis will include a stroke prevention service and a same-day TIA service, thrombolysis, advanced diagnostics, vascular surgery and comprehensive rehabilitation. Networks may involve tele-medicine support for hospitals serving remote areas and off-site rehabilitation. Certain services will be provided on a national or regional level, such as vascular neurosurgery, interventional radiology, neuropathology and the services of the National Rehabilitation Hospital.

RECOMMENDATION 5.25

Specialist stroke services should be organised into population-based stroke networks, with network hospitals designated as (i) General Stroke Centres or (ii) Comprehensive Stroke Centres.

A broad plan for service reconfiguration needs to be developed. This will identify general and comprehensive stroke centres and allow service planning – involving workforce and emergency service development in particular – to evolve within the new network structure.

Lead organisations: HSE and Department of Health and Children

Emergency response services

The importance of transfer to specialist services and rapid onset of treatment in acute cardiac and stroke settings (in particular concerning thrombolysis and primary PCI) cannot be overstated. Much progress has been made on reconfiguration of services and training in emergency medical response since the 2006 report by the Task Force on Sudden Cardiac Death (Department of Health and Children, 2006). Although strategic deployment of advanced paramedics, pre-hospital thrombolysis and information systems to capture pre-hospital demands has been developed regionally, such resources are not yet deployed nationally (*see Recommendation 5.26*).

RECOMMENDATION 5.26

This policy endorses the recommendations of the Task Force on Sudden Cardiac Death (2006) for the development of emergency medical service capacity to respond and deliver timely acute cardiovascular care.

The following initiatives are seen as having the highest priority within the new network structures:

- Strategic deployment of advanced paramedics and implementation of pre-hospital triage and cardiac thrombolysis nationally.
- Prioritised national roll-out of the electronic patient-care record in order to guide emergency medical services in the collection, collation and analysis of pre-hospital data.
- National roll-out of information systems, including the out-of-hospital cardiac arrest register, the register of sudden cardiac deaths in young people, and the general patient electronic patient-care record.
- Integration of emergency medical service activities through coordinated approach to the participation of auxiliary and voluntary services, Gardaí and retained fire services.
- Improved first response and therefore survival from cardiac arrest through development, coordination and integration of the emergency medical service with co-responder networks (auxiliary and voluntary services, Gardaí and retained fire services) and community first-responder programmes across the country.

Lead organisation: HSE, in association with Irish Heart Foundation

Public awareness and response

The public are an unrealised asset in acute cardiovascular care. Greater public awareness is needed about the warning signs of cardiovascular emergencies. In tandem, current training activities need to be extended in the skills of basic life support, first-responder programmes and use of automated external defibrillators (see *Recommendation 5.27*).

RECOMMENDATION 5.27

Increase the proportion of the public who are aware of the major signs and symptoms of acute cardiovascular events (e.g. ACS, TIA and stroke), who know the importance of immediately contacting ambulance services and who are skilled in basic life support.

A public education campaign should be undertaken to raise awareness of the symptoms of acute cardiovascular events and of the need to take urgent and appropriate action. In parallel, basic life support training in schools could help develop an upcoming generation with greater awareness and skills in this area.

Lead organisation: HSE, in association with Irish Heart Foundation

CARDIAC AND STROKE REHABILITATION AND CONTINUING CARE (CHAPTER 6)

Cardiac and stroke rehabilitation services are delivered within both hospital and community settings. The purpose of all rehabilitation is to help the individual and their families return to as good a quality of life as possible by addressing deficits promptly and thoroughly. This can be achieved by establishing patterns of care, including self-care, that will delay or prevent further cardiovascular events.

Cardiac rehabilitation

The effectiveness of cardiac rehabilitation programmes is well established in clinical trials. Cardiac rehabilitation was addressed in the first national cardiovascular strategy, *Building Healthier Hearts* (1999), with substantial growth achieved during the past decade in the availability of rehabilitation programmes, to a point where all relevant public hospitals now have access to such a service. Further improvements can, however, be made (see *Recommendations 6.1 and 6.2*).

RECOMMENDATION 6.1

Ensure adequate and equitable coverage of cardiac rehabilitation for all eligible patients through investment in staffing and facilities in all relevant hospitals.

Eligible patients (i.e. ACS or coronary intervention patients and patients with heart failure and peripheral arterial disease) should be offered cardiovascular rehabilitation services. All programmes should have adequate facilities and be delivered by a multidisciplinary team, in accordance with agreed national standards.

Lead organisation: HSE

continued

RECOMMENDATION 6.2**Cardiac rehabilitation should be an integral part of the spectrum of cardiac services in public and private healthcare settings.**

Cardiovascular rehabilitation services are not routinely provided in private hospitals or reimbursed for private patients in public hospitals. This has significant implications for capacity and for access of patients in private hospitals to evidence-based care. A requirement for rehabilitation service provision, as a core component of evidence-based care, should be included in the HIQA-managed licensing requirements for acute hospitals.

Lead organisation: HIQA

Demand for cardiac rehabilitation services has increased since services were first developed. Thus services are overstretched and many eligible patients cannot avail of rehabilitation, while others wait longer than desirable to commence out-patient programmes after hospital discharge. In addition, cardiac rehabilitation programmes now need to accommodate increasing numbers of patients with heart failure or peripheral arterial disease, in addition to post-myocardial infarction, revascularisation and surgical patients (*see Recommendation 6.3*).

RECOMMENDATION 6.3**Cardiac patients should have timely access to cardiac rehabilitation services.**

Active early rehabilitation should commence in line with international professional guidelines. The early rehabilitation challenge is to deliver appropriate and adequate rehabilitation advice and support in the ever-shortening phase before hospital discharge of cardiac patients. The next main challenge is to commence Phase III cardiac rehabilitation as soon as possible – approximately one month post-discharge to optimise benefits. All cardiac patients should leave hospital with a formal plan for subsequent rehabilitation activities.

Lead organisation: HSE

Coordinated community-based lifestyle and risk factor management is highly desirable. The ongoing support needs of the hospital-treated cardiovascular patient fit well with the support needs of the high-risk cardiovascular patient identified through primary care. The concept of prevention services in the community, to promote and maintain cardiovascular health, would serve the needs of both established and high-risk patients, and would provide hospital and primary care staff with a common focus for community support.

At present, there are a number of models of service delivery. A common programme of audit would assess whether all eligible patients have access to services and would identify gaps in service provision to inform planning, but also to evaluate the achievement of key secondary prevention outcomes by different models of service provision (*see Recommendations 6.4-6.6*).

RECOMMENDATION 6.4

Equity of access to services and models of care: A menu-driven system of delivering rehabilitation should be established to support equitable access for groups vulnerable to exclusion from traditional programmes.

Age, gender, education, income, distance from specialist services and transport availability, all mitigate against equitable access to cardiac rehabilitation programmes. Rehabilitation services must ensure that the particular physical, psychological, vocational and social needs of differing groups of patients are addressed.

Lead organisation: HSE

RECOMMENDATION 6.5

Models of care and patient preferences: Criteria should be established for the endorsement of different models of programme delivery, based on delivery of agreed cardiovascular targets.

A number of models of programme delivery exist, with variations on programme duration and emphasis. This is an area of ongoing debate and innovation. From a service perspective, all models of programme delivery should audit their output against agreed short-term targets (programme end) and long-term targets (one year).

Lead organisations: HSE and Irish Association of Cardiac Rehabilitation

RECOMMENDATION 6.6

Ensure that cardiac rehabilitation services are effective and efficient through regular evaluation, with robust ICT systems and appropriate governance.

Eligible patients (i.e. ACS or coronary intervention patients and patients with heart failure and peripheral arterial disease) should be offered cardiovascular rehabilitation services. All programmes should have adequate facilities and be delivered by a multidisciplinary team, in accordance with agreed national standards.

Lead organisation: HSE, in association with Irish Association of Cardiac Rehabilitation

Stroke rehabilitation

Multidisciplinary rehabilitation can benefit all who experience a stroke. The multidisciplinary nature of stroke rehabilitation includes numerous specialties, primarily neurological and geriatric, and rehabilitation medicine specialists in hospital, with GP support in the community. The essential allied health professional staffing for hospital and community services includes nursing, physiotherapy, occupational therapy, speech and language therapy, neuropsychology, dietetics and medical social work.

The first *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, documented major inadequacies in the provision of stroke rehabilitation services (Horgan *et al*, 2008). The stroke unit is the starting point for delivery of organised stroke rehabilitation services (*see Recommendation 6.7*).

RECOMMENDATION 6.7

A multidisciplinary assessment of rehabilitation needs, using a formal procedure or protocol, should be completed within 5 working days of admission for stroke. An appropriate service plan should then be commenced.

Lead organisation: HSE

Early Supported Discharge (ESD) seeks to facilitate successful discharge from the acute stroke service. Successful ESD needs high-intensity inputs from community nursing and multidisciplinary teams. Guaranteeing rapid access to high-quality multidisciplinary stroke rehabilitation in the community pays dividends for the person with stroke and facilitates early supported discharge (*see Recommendation 6.8*).

RECOMMENDATION 6.8

For patients with stroke who are suitable for early supported discharge, resources and systems should be in place to facilitate early rehabilitation in a community setting, delivered by a multidisciplinary team with input from rehabilitation and geriatric medicine. This should begin with a full needs assessment.

Lead organisation: HSE

People with less severe stroke who rapidly exit the hospital service can be lost to rehabilitation support because most community services have limited capacity. In addition, people with severe disability currently experience delay accessing specialist in-patient and out-patient programmes. Frequently there are unacceptable delays in transfer from an acute hospital bed to the acute and secondary rehabilitation phases, and long delays in accessing residential care. In the community, the major rehabilitation resource for older people is through Day Hospital services, which are widely available. Services are needed that are accessible to younger people, to those with mobility impairments and to those with transport problems.

The forthcoming *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*, to be published in 2010 by the Department of Health and Children/HSE, will address the complex neuro-rehabilitation needs of patients who require these services and provide guidance on how they should be integrated.

Enhancing quality of life in the community after a disabling stroke remains a challenge (*see Recommendations 6.9-6.11*). Services such as the Volunteer Stroke Service (VSS) have considerable experience in this area and a major expansion of this organisation would facilitate greater community integration for people with stroke. Vocational rehabilitation for people with stroke is still very limited.

RECOMMENDATION 6.9

A partnership framework should be developed between the HSE and the voluntary sector to enable expansion of stroke rehabilitation support services and the provision of services, such as transport, where needed.

Lead organisations: HSE and Local Authorities

continued

RECOMMENDATION 6.10

All stroke patients should have access to appropriate levels of rehabilitation, regardless of age or residential location.

Lead organisation: HSE

RECOMMENDATION 6.11

Stroke rehabilitation services should be patient-centred, to include individual assessment of need and ongoing review, and coordinated by a key worker to ensure that rehabilitation is available as required on an ongoing basis. There needs to be a continuum of care from hospital to community. Stroke rehabilitation services should be consistent with the broader neuro-rehabilitation service requirements as identified in the forthcoming *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*.

Lead organisation: HSE

Successful integration of acute hospital and community services for cardiac and stroke rehabilitation (i.e. cardiovascular rehabilitation) is needed in the medium term if best use is to be made of personnel, expertise and facilities. Development of senior posts with responsibility for clinical services across community and hospital, and across cardiac and stroke is recommended as a mechanism to foster more successful integration across these services (*see Recommendations 6.12-6.14*). Integrated education will further support this initiative.

RECOMMENDATION 6.12

There is a need to establish or redirect services to address effectively the common rehabilitation goals of all cardiovascular patients.

Lead organisation: HSE

RECOMMENDATION 6.13

There is a need to deliver a structured training and leadership system for professionals involved in cardiovascular rehabilitation.

Lead organisations: Irish Heart Foundation (IHF), Irish Association of Cardiac Rehabilitation and IHF Stroke Council, in association with professional and educational bodies

RECOMMENDATION 6.14

Primary care teams and cardiac and stroke rehabilitation services need to be developed to deliver integrated, shared care between hospitals and the community.

Lead organisation: HSE

Support for patients following stroke and their families starts in the acute setting, with an urgent need for clear and accessible information. In addition, psychosocial support for patients and carers is also needed across the continuum of care (*see Recommendations 6.15-6.18*).

RECOMMENDATION 6.15

Information and education should be provided for patients, their families and caregivers. Information should be timely, up to date, accessible and responsive to the needs of the particular patient and family.

Lead organisation: HSE, in partnership with Irish Heart Foundation and other voluntary agencies

RECOMMENDATION 6.16

Access should be provided to comprehensive psychosocial support, including management of depression, for cardiovascular patients and their families.

Lead organisation: HSE

RECOMMENDATION 6.17

Families and carers should be provided with the appropriate information, support, training, appliances and facilities, including respite care, to enable them to contribute to their relative's care in a way that optimises quality of life and supports independent living for relative and family.

Lead organisation: HSE

RECOMMENDATION 6.18

Each cardiac and stroke network should have access to a comprehensive specialist palliative care service and should actively seek to incorporate hospice and end-of-life care principles into its routine practice.

A proportion of cardiovascular patients will need palliative care services. Palliative care should be incorporated into care pathways and protocols for all patients with end-stage cardiovascular disease. Many patients with heart failure, for example, will have a palliative care phase, with disimproving health and risk of death, during which patients and carers will need to be supported. Care structures, processes and services need to be put in place, or be adapted, to meet these needs.

Lead organisation: HSE

WORKFORCE PLANNING (CHAPTER 7)

This national cardiovascular health policy envisages new or adapted roles within existing services as the basis for its delivery. Additional capacity will be needed to deliver on duty of care commitments to best practice. Workforce planning to achieve this capacity will require several measures including complete and updated documentation on the cardiovascular health workforce and on staffing needs by discipline and location within each network. It will also require measures to support continuing professional development for cardiovascular health professionals (*see Recommendation 7.1*).

RECOMMENDATION 7.1

Workforce planning for cardiovascular services needs to be integrated effectively with service planning, liaising closely with education and training bodies.

Training and development must be considered a continual process, encompassing continuing professional education, personal development planning and management development. An annual audit of cardiovascular services should include information on workforce needs, in line with the current national cardiovascular health policy, and on training and continuing professional development needs in order to deliver an integrated cardiovascular service.

Lead organisations: Department of Health and Children and HSE

Cardiology – Hospital consultants

The final report of the Joint Working Group to review consultant cardiology requirements in 2004 recommended a consultant cardiology ratio of 1 per 48,000 population, giving a total complement of 81 posts at that time. In 2008, there were 56 established consultant posts, not including those working in the private system. In tandem, there are specialist needs in paediatric, congenital heart disease, hypertension, preventive cardiology and rehabilitation, heart failure and peripheral arterial disease (*see Recommendation 7.2*). Numbers of cardiac surgeons in post or approved are deemed adequate to meet current cardiac surgical demand.

RECOMMENDATION 7.2

The Joint Working Group on consultant cardiology requirements (2004) should be used as a guide to consultant cardiology workforce planning in future national service plans.

Decisions on the appropriate level of consultant cardiology staff to deliver the expanded emergency PCI and other cardiac services as set out in Chapter 5 of this policy should involve a gap analysis at each cardiac network level with reference to the above guidelines and taking into consideration any effective developments in medical technology and good practice in this and related areas since 2004.

Lead organisation: HSE

Stroke – Hospital consultants

The majority of stroke patients have substantial medical co-morbidities. Co-morbidities and complications of stroke require consultant/specialist input throughout the care pathway. There is a requirement to provide acute stroke care as well as ongoing care provided in the community. Stroke positions with specific expertise in cerebral vascular disease come from a variety of backgrounds, including consultant geriatricians, neurologists, pharmacologists and rehabilitation medicine specialists.

Total stroke consultant requirements

It is difficult to plan future workforce requirements given the changing nature of stroke care. The British Association of Stroke Physicians estimate that a typical hospital serving a population of 350,000 and admitting approximately 600 acute stroke patients per year would require 3.3 consultants with a sub-specialty stroke interest. This equates to 5 consultants in a network serving a population of 500,000. The additional service requirements identified in this policy (such as rapid access TIA clinics, atrial fibrillation management and other aspects of stroke care) would include an additional 2 or 3 consultants per network and additional rehabilitation physician expertise to meet the ongoing stroke care needs (see *Recommendation 7.3*).

Several existing consultant appointments where stroke expertise and partial stroke service delivery exist may be reconfigured to create full-time stroke specialist posts, with the non-stroke duties of these existing consultants being assigned to additional incoming consultant staff. Some posts should be reserved to boost the number of consultants in centres providing a tele-medicine support service.

It is expected that stroke consultants will engage in dual/sub-roles: two to act as network clinical co-directors and one to have a role as director for each of the following areas – the stroke unit in the comprehensive centre, community liaison/integration, tele-medicine, preventive medicine including management of atrial fibrillation and TIA, and education within the network. To ensure an appropriate mix of skills within each stroke network, appointments should be balanced between geriatric medicine and neurology with a special interest in stroke. The consultant neurologist appointments are additional to those recommended previously by Comhairle and others since stroke services were specifically excluded from the terms of reference of these reports.

RECOMMENDATION 7.3

The staffing ratios and roles outlined in this policy should be used as a guide to consultant appointments and workforce planning in formulating future national service plans.

This will require an appropriate level of consultant neurologists, geriatricians and rehabilitation medicine specialist stroke staff to meet the need for stroke units, emergency thrombolysis, rapid access TIA clinics and other elements of stroke care as set out in Chapters 5 and 6 of this policy. This should involve a gap analysis at the stroke network level so that staffing levels are compatible with the comprehensive range of stroke services outlined previously. Consultant workforce for stroke services should be reviewed midway through implementation of this policy.

Lead organisation: HSE

Non-consultant Hospital doctors

An adequate supply of dedicated non-consultant hospital doctors is essential to support the consultant-provided services in an expanding scheme of consultant appointments and to build capacity for the next generation's consultant workforce in cardiovascular disease.

Nursing roles

The development of nursing roles will enable further specialisation in cardiovascular services, including more integration of skills across previously separate roles in cardiac and stroke care (see *Recommendation 7.4*). A clinical nurse specialist should form part of every specialist cardiac and stroke multidisciplinary team, with a view to expansion to advanced nurse practitioner level. Other nursing roles will also evolve in line with implementation of this policy, including practice nurses, community and public health nurses, and nursing roles across the cardiovascular rehabilitation spectrum.

RECOMMENDATION 7.4

Workforce planning is needed to ensure adequate development and provision of cardiovascular clinical nurse specialists and other specialist cardiovascular nursing roles to ensure adequate provision of personnel in line with best practice guidelines.

Development of a group of cardiovascular clinical nurse specialists will be an important resource in delivering on this policy. Training and recruitment should prioritise a community liaison role for some of this expanding group of specialists.

Lead organisation: HSE, in association with nursing training organisations

Multidisciplinary teams and technical support staff

Input from a multidisciplinary team is a basic requirement to provide quality care. Management of cardiac and stroke patients requires specialist teams led by clinicians with differing relevant expertise (see *Recommendation 7.5*). The core cardiovascular multidisciplinary team should include consultant cardiovascular-related physicians, non-consultant hospital doctors, clinical nurse specialists and technical support staff (including a database manager), as well as access to a range of therapy services (e.g. speech and language therapist, physiotherapist, occupational therapist) and the expertise of dietitians, pharmacists, psychologists/neuropsychologists and social workers. Each team should also have a community liaison coordinator. Technical support staff for existing and emerging diagnostic and procedural work must also be factored into workforce planning if services are to be delivered to the maximum potential of other medical and nursing team members.

RECOMMENDATION 7.5

Workforce planning is needed to ensure adequate development and provision of cardiovascular nursing, health and social care professionals, and related clerical and technical support personnel in line with best practice guidelines.

Appropriate representation is needed within multidisciplinary teams, covering a range of nursing, health and social care professionals, and clerical and technical support staff. Assistant or support grades of health and social care professionals are also needed to help increase efficiency of service provision. An annual review of workforce issues will assist in planning.

Lead organisation: HSE, in association with Department of Health and Children

Primary care teams

The development of primary care teams can become a major driver of this national cardiovascular health policy. Support for primary care team members will be required to enable effective management of patients with chronic cardiovascular disease and high cardiovascular risk. Structured care services, such as heart failure services, will require re-organisation in conjunction with hospital services and development of specialist nursing and multidisciplinary care roles. Current roles may need to be reconfigured to support cardiovascular prevention activities, including the development of prevention services in community settings (*see Recommendation 7.6*).

RECOMMENDATION 7.6

Planning and coordination is needed to ensure that the community healthcare workforce addresses the cardiovascular prevention and rehabilitation recommendations of this policy.

Lead organisation: HSE

Voluntary bodies

Voluntary sector involvement must be considered within the overall context of cardiovascular care delivery. Formal voluntary sector organisations, such as the Irish Heart Foundation, play a pivotal role in patient support, advocacy and empowerment.

NATIONAL FRAMEWORK FOR QUALITY IN CARDIOVASCULAR HEALTH (CHAPTER 8)

A national framework for the delivery of high-quality care in cardiovascular services is outlined here. Requirements include information and communications technology (ICT), workforce planning and investment, alongside a programme of continuing professional development. Staff will need support to integrate rapidly changing evidence-based practices and methods of team-working into everyday practice.

Policy on cardiovascular health is developed by the Department of Health and Children and delivered through a range of agencies, primarily the Health Service Executive (HSE) and the Health Information and Quality Authority (HIQA). Mechanisms include the annual National Service Plan between the Department of Health and Children and the HSE. Evaluation is an integral component of this national cardiovascular health policy and a Cardiovascular Policy Monitoring Group will be set up, to meet twice a year to review progress and advise the Department of Health and Children on the achievement and implementation of policy objectives. A major mid-term review of progress will be completed in Year 5 of the policy (2014).

Key components of delivering high-quality healthcare are effectiveness, patient-centeredness, timeliness, safety, efficiency and equitable access. To ensure a whole-systems approach in delivering these components, committed governance and clinical leadership are necessary.

National standards of cardiovascular health services

Cardiovascular health services in Ireland should be based on international best practice and deliver the best possible health return on investment. Plans for systematic development of cardiovascular health services need to be developed and delivered in a quality framework, with guidance and accountability. This will involve development of evidence-based guidance, performance indicators relating to guidance and national standards for quality and safety, and information and data requirements (*see Recommendation 8.1*).

The HSE, through the National Directorate of Quality and Clinical Care, is responsible for oversight of the disease management programmes within the HSE, for developing clinical guidelines and for providing clinical leadership in this area.

RECOMMENDATION 8.1

Evidence-based guidelines and standards should be agreed, with appropriate performance indicators identified and reporting structures established.

Lead organisations: Department of Health and Children, HIQA and HSE

Cardiovascular health surveillance

A systematic surveillance approach needs to be implemented as a matter of urgency to facilitate the collection and use of patient-based data for surveillance, audit and research (*see Recommendation 8.2*). Development and implementation of common data standards and a unique patient identifier are essential to surveillance. A comprehensive system should also deliver information on equity regarding access to services and on disease prevalence.

RECOMMENDATION 8.2

A comprehensive cardiovascular health services information system should be developed as a priority to enable the implementation of this policy.

This will entail agreement on systematic data collection methods and analytic standards across healthcare pathways nationally to ensure coordinated collation, analysis and evaluation of data.

Lead organisation: HSE

Registers, information systems and data standards

Comprehensive and interpretable data on service provision and information on patient care pathways cannot be achieved without the development of nationally comprehensive and compatible cardiovascular information systems, including patient registers (*see Recommendation 8.3*). There is a need to develop a comprehensive Cardiovascular Disease Registry, similar to the National Cancer Registry model.

RECOMMENDATION 8.3

Minimum cardiovascular-specific datasets should be agreed and mechanisms established for collection of this information as part of routine care and in a manner that enables ready collation of national profiles.

Lead organisations: Department of Health and Children, HIQA (standards) and HSE (audit system)

Population health surveys

Population health data on cardiovascular targets, such as lifestyle, can be achieved through regular national health surveys. Over the 10-year lifetime of this national cardiovascular health policy, high-quality population-based data will be essential in measuring its challenges and achievements, and in directing resources to best realise improvements (*see Recommendation 8.4*).

RECOMMENDATION 8.4

Regular population-based surveys should be conducted to establish health profiles in adults and children.

Challenges in delivering such surveys need to be addressed promptly to enable ongoing delivery of high-quality and robust data for service planning. At least two national adult and child surveys are needed during the 10-year lifetime of this policy.

Lead organisations: Department of Health and Children and HSE

Audit

Clinical audit involves structured review against agreed standards in order to promote improvements in healthcare and public health. A routine national audit system for all aspects of cardiovascular care is needed (*see Recommendation 8.5*). Since this will take time to establish, it is important that plans commence from the start of this policy (2010).

RECOMMENDATION 8.5

An annual audit of cardiovascular networks should be conducted to assess volume and quality of service delivery and to aid in service planning.

Lead organisations: Department of Health and Children and HSE

Role of information and communications technology

Information and communications technology (ICT) systems should support the management and delivery of patient care services, as well as their quality assurance, through audit, accreditation and other processes (see *Recommendation 8.6*).

RECOMMENDATION 8.6

Information and communications technology (ICT) infrastructure, capacity and training should be developed. This should include the implementation of patient identifier and electronic health records as a matter of urgency.

Enhanced electronic communication methods are needed to support new models of health service delivery. Information systems and technology need to be developed within and across secondary and primary care settings.

Lead organisations: HIQA (enabling mechanisms) and HSE (systems)

Research and evaluation, including health technology assessment

A research climate in the health services is fundamental to improving quality by contributing to policy development and planning efforts. A key component of evidence-based practice is the use of health technology assessment to ensure that health service resources are used effectively by assessing the clinical and cost-effectiveness of the medicines, devices, diagnostics and health promotion used across the health system. A coordinated research agenda is vital to ensure the projects needed to inform this policy are prioritised (see *Recommendation 8.7*). The research supported in the lifetime of this policy will provide the treatments and insights to inform the next policy.

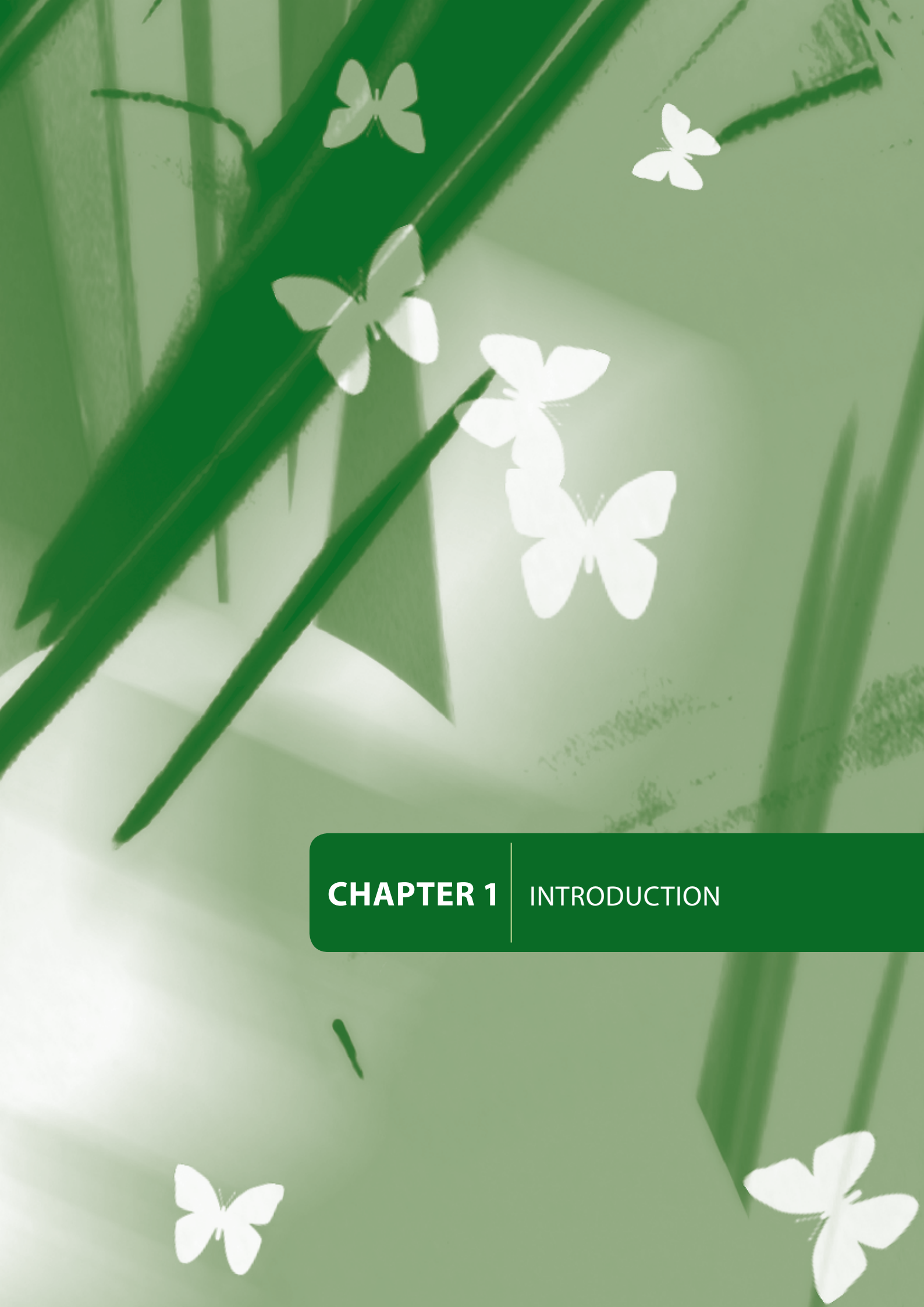
RECOMMENDATION 8.7

A national group representative of stakeholders should be convened to determine priorities for research and health technology assessment in cardiovascular care.

Tasks include ensuring that enabling research support skills in areas such as biostatistics and health economics are developed and that the information needs of this policy are enabled through research.

Lead organisation: Health Research Board to coordinate and involve key stakeholders, i.e. policy, service, academic and public representatives

In sum, the aim of this policy is to guide and drive change – to deliver a *Changing Cardiovascular Health* – such that the Ireland of 2020 will be a healthier place for all its citizens.

The background of the page is a soft, green-tinted illustration of a pond scene. Several reeds or bamboo stalks are visible, some in the foreground and others in the background. There are several lily pads floating on the water. White butterflies are scattered throughout the scene, some in flight and others resting on the reeds or lily pads. The overall mood is peaceful and natural.

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

CARDIOVASCULAR HEALTH POLICY GROUP

The Cardiovascular Health Policy Group was established by Ms. Mary Harney, TD, Minister for Health and Children. It had its first meeting in September 2007, with the following terms of reference:

Having regard to the audit of the implementation of the cardiovascular health strategy, *Building Healthier Hearts*, and the audit of stroke services, *Irish National Audit of Stroke Care*, and consistent with developments in relation to the management of chronic diseases and the Primary Care Strategy, to develop a policy framework for the prevention, detection and treatment of cardiovascular disease, including stroke and peripheral arterial disease, which will ensure an integrated and quality-assured approach in their management.

BACKGROUND

Cardiovascular diseases include conditions such as coronary heart disease and congestive cardiac failure (heart failure); cerebral (brain) conditions such as stroke; and peripheral (limb) conditions such as peripheral vascular disease. The main underlying cause of cardiovascular disease is atherosclerosis, a process where blood vessels are narrowed or become completely blocked. It is most serious when it affects blood supply to the heart, causing angina or heart attack, or to the brain, causing stroke.

Cardiovascular disease is the main cause of death in Ireland. While there have been substantial improvements in recent decades, death rates for cardiovascular disease continue to compare unfavourably with other developed countries and thus contribute substantially to our shorter lifespan compared to that of many neighbouring countries. Chapter 2 of this report outlines the current profile of cardiovascular disease and its management in Ireland.

This new cardiovascular policy, *Changing Cardiovascular Health* covering the period 2010-2019, comes a decade after the first national cardiovascular health strategy, entitled *Building Healthier Hearts*, was published by the Department of Health in 1999. The new policy is timely at this 10-year point given the accelerating pace of change in scientific development and medical practice internationally, the substantial changes in health service structures in Ireland within the last decade and the influences on individual and population health behaviours and healthcare practices and expectations. Much of our capacity to reflect on changes over this time derives from research conducted at population level through national health and lifestyle surveys, including the *Survey of Lifestyle, Attitudes and Nutrition* (SLÁN) for adults in 1998 (Friel *et al*, 1999), 2002 (Kelleher *et al*, 2003) and 2007 (Morgan *et al*, 2008); the *Health Behaviour in School-aged Children* (HBSC) Survey for children and adolescents aged 10-17 in 1998 (Friel *et al*, 1999), 2002 (Kelleher *et al*, 2003) and 2006 (Nic Gabhainn *et al*, 2007); and at a service level by audits on cardiac care (*Ireland: Take Heart* – HSE, 2007) and stroke care (*Irish National Audit of Stroke Care* (INASC) – Horgan *et al*, 2008). The overall message from these studies and from routinely collected data is that there has been a steady decline in age-adjusted death from cardiovascular disease, coupled with an increasing level of health service delivery in Ireland.

However, poor risk factor profiles, such as increasing obesity and diabetes in the population, now signal a potential reversal of the previous decade's mortality achievements. In parallel, comparison of service delivery against recommended targets demonstrates substantial capacity for improvement.

In sum, the cardiovascular mortality reductions seen in the last decade cannot be maintained, nor can acceptable levels of service delivery be assured, without significant complementary investment in the prevention and management of cardiovascular disease. This will require additional financial investment, but also, more importantly, a re-engineering of existing services and work practices to address cardiovascular health as a resource to cultivate and cardiovascular disease as a chronic condition to manage across the spectrum of services pertaining to health. Thus, at this time, we need an integrated approach to the promotion and protection of cardiovascular health as a key national resource.

A VISION FOR CARDIOVASCULAR HEALTH

Ireland has already provided leadership in areas of cardiovascular disease management. Ireland's first cardiovascular health strategy – entitled *Building Healthier Hearts* (Department of Health and Children, 1999) – was among the first of the national strategies launched internationally. Regarding legislation, Ireland became the first country in the world to introduce a ban on smoking in the workplace in 2005 – a ban that has been replicated in many countries since then. Politically, when Ireland held the Presidency of the European Union (EU) in 2004, cardiovascular disease was prioritised and the EU adopted Council Conclusions calling on the European Commission and Member States to ensure that appropriate action was taken to address cardiovascular disease. This was an important political catalyst for a series of EU events that ultimately resulted in a European Parliament Resolution to tackle cardiovascular disease. In 2007, a European Heart Health Charter was launched (*see www.heartcharter.eu*), with the following vision: *'Every child born in the new millennium has the right to live until the age of at least 65 without suffering from avoidable cardiovascular disease.'*

This commitment has been endorsed by many countries and professional bodies across Europe, including Ireland. The sentiments expressed in the European Heart Health Charter have a particular resonance in the Irish context at this time. We have had a decade of unprecedented economic success, yet our cardiovascular health profile is poor in comparison with most of our European counterparts. We are also approaching the 100th anniversary of the 1916 Rising, a pivotal historic period that led to the establishment of the Irish Republic. On the verge of a period of centennial reflection on the origin and direction of the State, it is also noteworthy that in the next few years, and for the first time in the history of the Irish Republic, the number of children in Ireland will approach one million. The European Heart Health Charter signals the need to work throughout the lifespan, from childhood, to promote and protect cardiovascular health. It also signals a commitment to social solidarity in identifying cardiovascular health as a right of all citizens. In sum, it is a very fitting commitment to adopt as the overall vision for this new national cardiovascular health policy, entitled *Changing Cardiovascular Health*. The policy will adopt a proactive approach to actively changing cardiovascular health for the better. This challenge is being met in quite different and disimproved national and international economic circumstances, where policy-led investment and service delivery will be all the more necessary to achieve benefit.

This new cardiovascular health policy is seen as an important framework for developments in the coming decade. While many of the specifics in terms of treatment possibilities a decade hence cannot now be even envisaged, their potential can be considered in a broad framework of safe, effective and equitable service delivery, within an overarching commitment to prevention and early management of cardiovascular health problems. The more specific focus of this policy in the first 5 years of its lifetime (2010-2014) reflects in part the need to focus on early achievements in this uncertain economic period, but also the need to take stock of the impact of changes in service delivery and

technological possibilities within a reasonable timeframe in order to further refine policy priorities in the second half of the 10-year policy period. The policy will be established alongside and complement other recently developed health-related policies, including policies on obesity, alcohol and chronic disease prevention and management. It will also work with existing and proposed service delivery frameworks of the Health Service Executive (HSE), in particular the hospital reconfiguration agenda, the critical care review, the consultant workforce developments, the establishment of primary care teams, the proposed new general practitioner contract, and the framework of the recently launched report *Building a Culture of Patient Safety* by the Commission on Patient Safety and Quality Assurance (Department of Health and Children, 2008b).

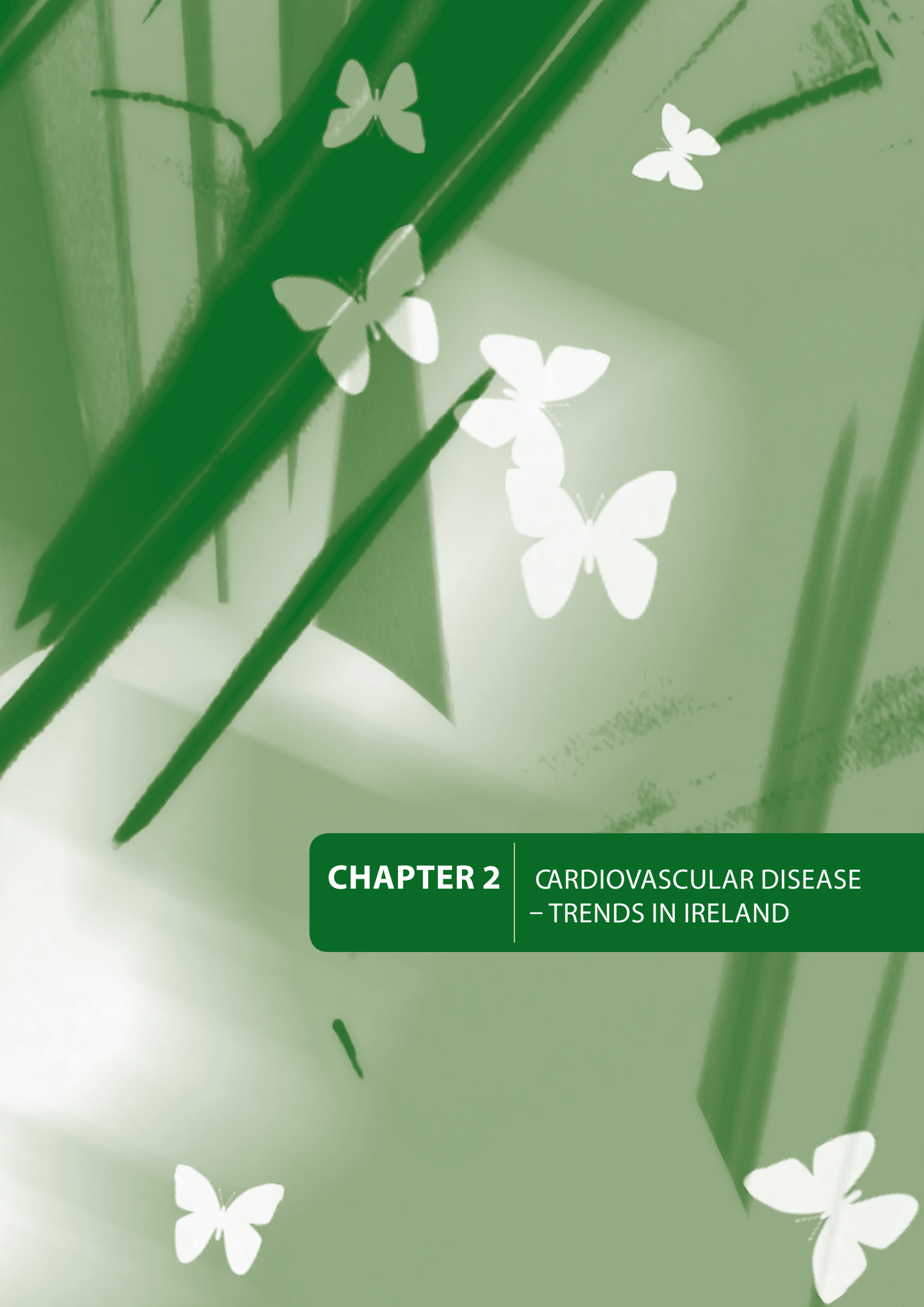
The policy is being launched in a climate of severe economic constraints. There is little likelihood, therefore, of immediate additional resources being available to fast-track delivery of the policy. Nonetheless, much can be done in the short to medium term in tandem with other policies and current and planned service delivery frameworks. A number of important recommendations which can be prioritised for early attention relate to achieving professional consensus on guidelines and protocols to inform service delivery. These can be achieved without significant investment and there is already evident professional enthusiasm to do so. Where resources are necessary for early implementation, these will have to come from existing initiatives, such as the HSE hospital reconfiguration programme and the development of primary care teams. Over the longer term, the requirement for additional resources in support of the policy will have to be balanced against service priorities, potential savings from staff redeployment and the reorganisation of the HSE resources. It is envisaged that these will be specified in future national service plans.

Cardiovascular disease prevention and management covers all aspects of health and healthcare – from childhood through old age, and from prevention through emergency care, rehabilitation and palliative care. Lifestyle is the overriding contributor to cardiovascular health and its maintenance. Changes in health behaviour – smoking, physical activity, healthy eating, weight management and moderate alcohol consumption – benefit both cardiovascular health and also the prevalence of most other common chronic health conditions. Cardiovascular health and its maintenance is thus a microcosm of health more generally. A policy that can improve cardiovascular health and cardiovascular disease management will have beneficial effects for the whole healthcare system.

The first century of the Irish Republic witnessed a steady rise in mortality from cardiovascular disease. As described in Chapter 2, there is some evidence of a reversal in this pattern over the last two decades. Recent population health behaviour profiles, however, give cause for serious concern that cardiovascular health may worsen, rather than improve, in the coming decades. If we are to truly commit to changing cardiovascular health, we must seize this opportunity at the start of the country's second century to establish a robust prevention approach, 'owned' by its citizens and complemented by an effective and equitable health system to manage cardiovascular health problems.

STRUCTURE OF REPORT

The following chapters outline the current cardiovascular health status in Ireland (*Chapter 2*) and then describe a policy approach to prevention and health promotion (*Chapter 3*), primary care (*Chapter 4*), hospital and emergency care services (*Chapter 5*) and rehabilitation and continuing care (*Chapter 6*). Workforce capacity is then considered and the education implications of the plans outlined (*Chapter 7*). Finally, a national quality framework for the policy is described, together with mechanisms to establish and monitor it over the 10-year period (*Chapter 8*).

The background of the entire page is a soft-focus photograph of a pond. Several dark, vertical reeds or grass stalks are visible, some in the foreground and some in the background. The water is a pale, milky green color. Scattered throughout the scene are several white butterflies, some in flight and others resting on the reeds or water surface. The overall lighting is bright and natural, suggesting a sunny day.

CHAPTER 2

CARDIOVASCULAR DISEASE – TRENDS IN IRELAND

2. CARDIOVASCULAR DISEASE – TRENDS IN IRELAND

This chapter outlines trends in demography and in the epidemiology of cardiovascular disease in Ireland and highlights the difference between the period before the first national cardiovascular health strategy (Department of Health and Children, 1999) and the latest available statistics. It builds on the comprehensive update of the first strategy undertaken in 2007, *Ireland: Take Heart* (HSE, 2007).

LIFE EXPECTANCY AND HEALTHY LIFE YEARS

Life expectancy in Ireland has increased in the last decade, with improvements in cardiovascular health contributing to this situation. However, life expectancy at birth and at age 65 remains below the EU15 average for both men and women (WHO, 2008a). For example, between 2002 and 2006, life expectancy in Ireland at birth increased by 1.7 years for men and by 1.3 years for women (CSO, 2009). However, comparing life expectancy at birth with EU15 countries in 2006, Ireland ranked joint 12th for men (76.8 years; EU15 range 75.5 – 78.8 years) and ranked 13th for women (81.6 years; EU15 range 80.7 – 84.4 years).

The concept of healthy life years (HLY) is a measure of the number of subsequent years that a person of a specific age is expected to live in a healthy condition, 'healthy' being defined as the absence of limitations in functioning/disability (Eurostat, 2008). HLY is based on the measurement of health-related limitations in daily activities. It may be a particularly important indicator of the potential demand for health services and long-term care needs of the population. Irish scores on HLY are intermediate among the EU15 countries. However, HLY scores are lower for both men and women in Ireland than for other countries with similar and relatively low life expectancy. For example, men in Ireland at age 65 will spend 81.4% of their remaining years in good health, compared to 90.1% for men with similar life expectancy in Denmark. Similarly for women – women in Greece and the UK will spend 82.3% and 80.1% respectively of their remaining years in good health, while the figure for women in Ireland is 78.4%.

Thus, EU comparative data indicate that despite improvements in Ireland in the past decade, we are notably behind our EU counterparts in both length of life and disability-free years of life.

CARDIOVASCULAR DISEASE

Cardiovascular disease mortality

Cardiovascular disease is the single largest cause of death in Ireland: in 2008, diseases of the circulatory system accounted for 9,883 (35%) of *all deaths* (CSO, provisional data). Of these, 5,188 were due to coronary (ischaemic) heart disease, 2,116 due to stroke and 2,579 due to other diseases of the circulatory system.

In terms of premature deaths (i.e. death in those under 65 years), 1,249 (20%) of all deaths were as a result of diseases of the circulatory system. Of these, ischaemic heart disease accounted for 727 deaths, stroke for 223 and other diseases of the circulatory system for 299.

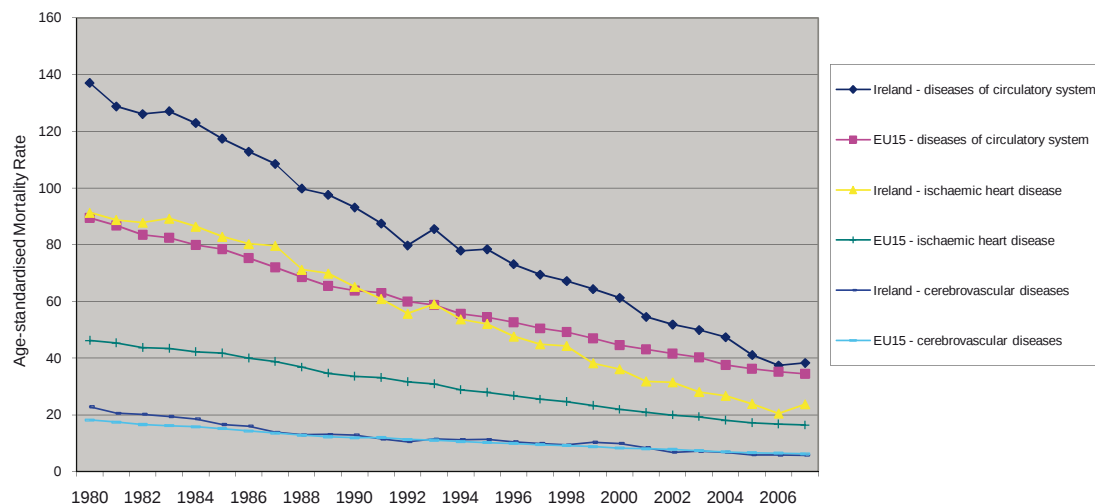
Age-standardised mortality rates for cardiovascular disease

Over the last 30 years, age-standardised death rates from diseases of the circulatory system in Ireland have decreased by 67%. This is the case both for those under 65 years of age and for those aged 65 and over (see Figures 1 and 2). The relative reduction has been highest in those younger than 65 years (a 75% decrease, see Figure 1). Most of the reduction comes from decreased coronary (ischaemic) heart disease mortality. In tandem with the decline in mortality from cardiovascular disease, the increasing workload for the health services is evident across hospital, primary care and prescribing sectors.

Comparing Ireland with other EU Member States from 2003 to 2007 across all ages:

- Ireland had, on average, 118 (age-standardised) deaths from ischaemic heart disease per 100,000 population annually. This was higher than the EU15¹ rate of 80 deaths per 100,000 and higher than the EU27² rate of 101 deaths per 100,000.
- Regarding premature deaths, ischaemic heart disease death rates annually in Ireland averaged 25 per 100,000, compared to 18 deaths in the EU15 and 24 in the EU27².
- Ireland had, on average, 44 deaths from stroke per 100,000 population annually. This was lower than the EU15¹, at 50 deaths per 100,000, and lower than the EU27², at 66 deaths per 100,000.

Figure 1: Age-standardised cardiovascular disease mortality rates per 100,000 population, aged 0-64 years (1980-2007)

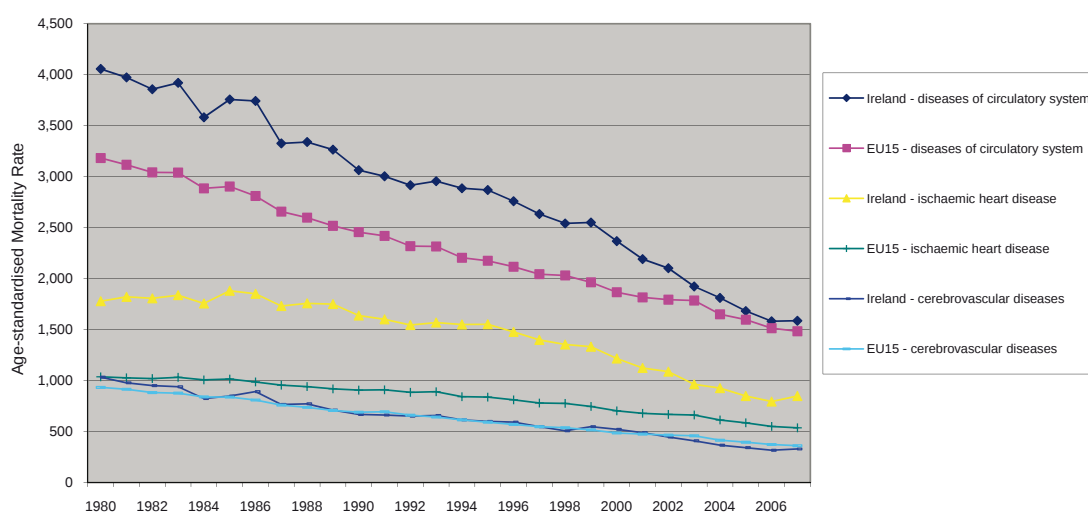


Source: WHO Health for All Database, January 2010

¹ EU15 data refers to 9 countries in 2007 and 12 in 2006 who had reported mortality data.

² EU27 data refers to 19 countries in 2007 and 23 in 2006 who had reported mortality data.

Figure 2: Age-standardised cardiovascular disease mortality rates per 100,000 population, aged 65+ years (1980-2007)



Source: WHO Health for All Database, January 2010

Cardiovascular disease hospital discharges

The numbers of hospital discharges from all hospitals reporting to the Hospital In-Patient Enquiry (HIPE) with a diagnosis of cardiovascular disease has increased since the publication of the first national cardiovascular health strategy, *Building Healthier Hearts* (Department of Health and Children, 1999) as shown in Tables 1 and 2, which compare 1998 and 2008 hospital activity.

Table 1 shows a very small increase in overall hospital discharges (1.1%) over the period, with substantial increases within conditions. For example, discharges from TIA and stroke increased by 13.1% and 9.2% respectively, while heart failure discharges decreased by 5.4%.

Table 1: Comparison of hospital discharges* for cardiovascular conditions (1998 and 2008)

	1998			2008			1998 versus 2008 Changes in discharge rates		
	In-patient	Day case**	Total	In-patient	Day case	Total	% change In-patient	% change Day case	% change Overall
CHD	17,937	3,498	21,435	16,569	5,477	22,046	-7.6	56.6	2.9
Heart failure	20,825	1,248	22,073	19,400	1,472	20,872	-6.8	17.9	-5.4
PVD	6,819	594	7,413	7,019	721	7,740	2.9	21.4	4.4
Stroke	6,826	50	6,876	7,326	183	7,509	7.3	266.0	9.2
TIA	2,362	15	2,377	2,643	46	2,689	11.9	206.7	13.1
Total	54,769	5,405	60,174	52,957	7,899	60,856	-3.3	46.1	1.1

* Discharges relate to 'Principal Diagnosis' for stroke, TIA and CHD, and 'Any Diagnosis' for HF and PAD. See Appendix 1 for ICD codes.

** Standard HIPE definition used to define 'Day case' episodes of care.

Source: HIPE and NPRS Unit, ESRI, for all acute and non-acute HIPE-reporting hospitals

Table 2 shows a 3.9% increase in bed days used for cardiovascular disease in 2008 compared to 1998. This was largely as a result of increased bed use for all forms of cardiovascular disease, except coronary heart disease (CHD) where a substantial reduction in bed use was evident (23.8%). Coronary heart disease accounted for 23.7% of bed use in 1998 and 17.4% in 2008. This is despite a major increase in the numbers of procedures performed (*see p. 44*). In general, Table 2 shows the considerable increase in day case activity in recent years.

Table 2: Comparison of hospital activity for cardiovascular conditions and bed usage (1998 and 2008)

	1998		2008		1998 versus 2008
	Total bed days	Median length of stay	Total bed days	Median length of stay	% change Bed days
CHD	156,231	6	119,059	4	-23.8
Heart failure	261,499	8	291,988	9	11.7
PVD	98,323	8	112,588	9	14.5
Stroke	127,672	10	145,510	10	14.0
TIA	16,236	5	16,419	4	1.1
Total	659,961		685,564		3.9

Source: HIPE and NPRS Unit, ESRI, for all acute and non-acute HIPE-reporting hospitals

Table 3 compares in-hospital mortality over the past decade and as can be seen, mortality in recent years from cardiovascular disease is much reduced.

Table 3: Comparison of in-hospital mortality (1998 and 2008)

	1998	2008
	In-hospital mortality	In-hospital mortality
CHD	6%	3.2%
Heart failure	16.7%	11.8%
PVD	12.4%	7.9%
Stroke	18.1%	14.7%
TIA	0.2%	0.3%

Source: HIPE and NPRS Unit, ESRI, for all acute and non-acute HIPE-reporting hospitals

Heart failure and stroke accounted for most bed use (42.6% and 21.2% respectively). Since the proportion of the population in older age groups had not changed substantially from 1998 to 2006 (and is very low, at 11%, by European standards), this increase in bed use will be greatly exaggerated in the coming decade, when the numbers of people aged 65 years and over are expected to increase by 41%. These figures, in what is one of the youngest populations in Europe, demonstrate how the status quo in terms of hospitalisation is unsupportable in the future and how treatment developments must address the numbers of cardiovascular disease patients in hospital, but more particularly their length of stay.

Cardiovascular disease procedures and interventions

Since 1998, two- to three-fold increases have taken place in coronary heart disease procedures, such as angiography and angioplasty procedures. For example, angiography rates increased from 8,174 procedures in 1998 to 15,467 in 2006 (an increase of 89%). In the same time period, angioplasty procedures increased from 1,478 to 4,537 (a 207% increase) and coronary artery bypass graft increased marginally, from 1,017 to 1,049 (a 3% increase). These figures – which do *not* include cardiovascular procedures completed in an increasing number of private hospitals – represent in part changing cardiology practice over the period and in part the significant increase in consultant cardiologist and related workforce numbers and facilities arising from investment supporting the previous national cardiovascular health strategy (1999). To comprehensively document changes in healthcare delivery, such as intervention volume, there needs to be the capacity to capture all private as well as all public healthcare activity in the coming years (see *Chapter 7 on workforce planning*).

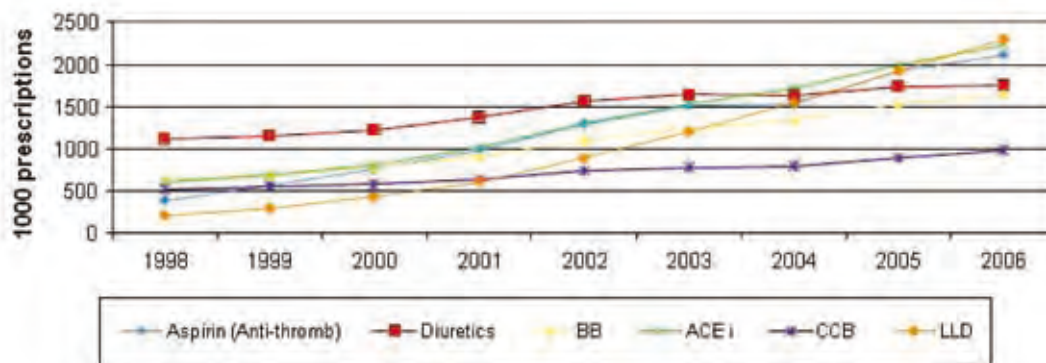
Cardiovascular medication prescribing

From 1998 to 2006, two- to four-fold increases have occurred in prescribing medications for cardiovascular conditions in primary care. Trends in prescribing frequency over time (1998 to 2006) are presented in Figure 3, using data from the HSE's Primary Care Reimbursement Services (PCRS, formerly the GMS Scheme). The entitlement to free general practitioner visits and the reimbursement of medicines for those aged 70 and over, as introduced in 2001, have further accelerated the already rising levels of prescribing of cardiovascular medications. Analysis of the prescribing database in the HSE's PCRS Scheme shows significant gender, age and geographic variation, suggestive of inequitable prescribing (Bennett *et al*, 2002).

The HeartWatch Programme of coronary heart disease management in primary care has demonstrated how structured chronic disease management also contributes to protocol adherence and increased medication prescribing (HeartWatch Programme, 2006). For example, in the prescribing of secondary preventive therapies after 2 years of the HeartWatch Programme, there was an absolute increase of:

- 7% in ACE inhibitors (from a 44% baseline);
- 4% in beta-blockers (from a 59% baseline);
- 11% in statin therapy (from a 78% baseline).

Figure 3: Prescribing frequency of cardiovascular medications in Ireland under the GMS Scheme (1998-2006)



In terms of trends in cardiovascular risk factors, these are considered in Chapters 3 and 4. They include hypertension, atrial fibrillation, hypercholesterolaemia, diabetes and obesity. Key lifestyle factors affecting cardiovascular disease are also addressed in Chapter 3 – smoking, poor diet, salt intake, physical inactivity and excess alcohol use. Trends in the prevalence of cardiovascular disorders – heart failure, peripheral arterial disease, sudden cardiac death, congenital heart disease and diabetes – are outlined next.

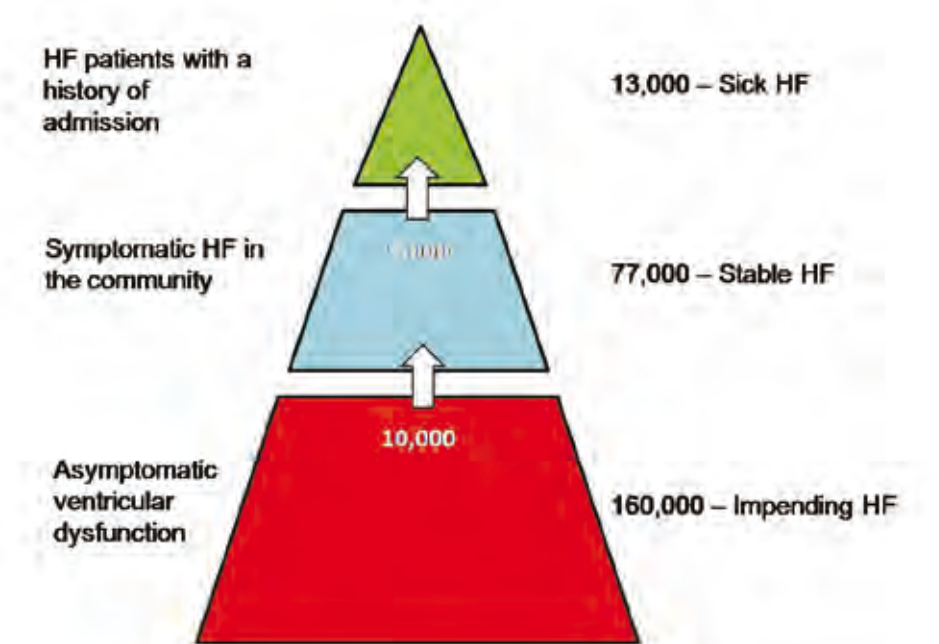
HEART FAILURE

The prevalence of heart failure is increasing in Ireland, as elsewhere around the world. This increase is due to better survival following acute coronary events, longer survival after diagnosis of coronary heart disease, continuing high prevalence of cardiovascular risk factors, and the ageing population. Current data suggest a 2% prevalence of symptomatic heart failure in the general population in Ireland, with a further 2% having left ventricular systolic dysfunction at risk of progressing to symptomatic failure. It is estimated that 10% of the population over 75 years of age have heart failure and that over 10,000 new cases are diagnosed each year (Irish Heart Foundation, 2002). Heart failure is thus more common than most cancers.

Heart failure is now the only major cardiovascular disease on the increase in Europe (Dickstein *et al*, 2008). It is predicted that by 2010 there will be a 70% increase from 2005 levels (Remme *et al*, 2005) in the number of cases in Europe. The number of people living with heart failure in Ireland can be estimated by applying prevalence rates to population projections from the Central Statistics Office (CSO). A best case scenario of *sustained prevalence* of 2% would result in an increase of approximately 8.5% in the number of people with heart failure over the next 10 years. A more likely scenario of *prevalence increasing* by 1% to 3% would result in a 63% increase in heart failure by 2019. If the number of people with asymptomatic (impending) heart failure is included, then the numbers are much greater. The Irish Heart Foundation has predicted that by 2010, 300,000 people in Ireland will be affected by heart failure (Irish Heart Foundation, 2002).

The personal burden of heart failure is great, with patients experiencing high levels of physical, functional and emotional distress. Life expectancy for patients with chronic heart failure has also been poorer than for most of the common cancers (Stewart *et al*, 2001). However, advances in treatment means that survival is improving and the disease can be controlled for many years in an increasing number of patients (Murphy *et al*, 2004; Dickstein *et al*, 2008).

Figure 4 shows the proportions of the population in Ireland in 2007 estimated to have symptomatic heart failure (13,000), those stable at present with episodic deterioration (77,000) and those with impaired left ventricular dysfunction, or impending heart failure, and living in the community (160,000) (McDonald, 2008). More than 10,000 new cases of heart failure are estimated each year and it is rapidly becoming one of the most common reasons for emergency admission to hospitals.

Figure 4: Estimated prevalence of heart failure (HF) in Ireland (2007)

PERIPHERAL ARTERIAL DISEASE

Peripheral arterial disease (PAD) is a considerable, but poorly quantified healthcare burden in Ireland. Those with diabetes are at particular high risk of developing PAD. While PAD accounted for only 12% of cardiovascular disease hospital discharges in HIPE in 2006, this represented 15% of bed days (over 100,000 bed days) – an increase of 4% from 1998 (see *Tables 1 and 2*).

The prevalence of coronary heart disease in patients presenting with PAD has been reported to be as high as 85%-90% (Fowkes, 2001). Carotid artery disease is present in 26%-50% of patients presenting with symptoms of intermittent claudication, a precursor to the diagnosis of PAD. The 15-year mortality rate for patients with intermittent claudication is approximately 70%.

Even in patients with asymptomatic peripheral arterial disease, there is a two-fold increased risk of cardiovascular death (Garg *et al*, 2000). It is therefore important to improve management of peripheral arterial disease in order to protect patients from an increased risk of coronary (ischaemic) cardiovascular events.

In recognition of the emergence of PAD as a significant healthcare problem, an information pack for GPs – entitled *Peripheral Arterial Disease: A Management Guide for General Practice* – was produced in 2005 by the Irish Heart Foundation, the Irish Association of Vascular Surgeons and the Irish College of General Practitioners. Its aim was to provide doctors with the latest information and developments on PAD, thereby enabling them to better detect and treat the condition. An Irish Heart Foundation Council on Peripheral Arterial Disease was also formed.

SUDDEN CARDIAC DEATH

Sudden cardiac death (SCD) is death due to natural causes within an hour of the onset of symptoms and assumed to have a cardiac cause in the absence of any other cause. The *Report of the Task Force on Sudden Cardiac Death* (Department of Health and Children, 2006) estimates that there may have been approximately 4,260 such deaths in Ireland in 2006. Approximately 5% of SCDs are unexplained and no structural abnormality is found at post-mortem (Chugh *et al*, 2004). The proportion of unexplained deaths rises to 20%-30% in those under the age of 35 (Doolan *et al*, 2004).

This national cardiovascular health policy endorses the recommendations of the Task Force on SCD with regard to public education and emergency service use (*see Chapter 5, Recommendation 5.26*).

CONGENITAL HEART DISEASE AND GROWN-UP CONGENITAL HEART (GUCH) DISEASE

The incidence of congenital heart disease in Ireland is approximately 540 births per year, or about 1% of live births. Many of these children can now be successfully treated surgically and the majority will survive into adulthood. This has resulted in a rapidly growing population of adolescents and young adults with grown-up congenital heart (GUCH) disease. It is estimated that there were over 13,000 adults in Ireland with GUCH in 2008, with numbers expected to reach 15,000 by 2010.³

Most of these young people will need medical attention throughout their adult life. Some will require repeat cardiac surgery and a proportion will need a heart or heart–lung transplant. While endorsing the need for further consultant expertise for this adult population (*see Chapter 7*), additional requirements for GUCH are beyond the scope of this policy document. However, dedicated investigation is warranted by a specialist sub-group to inform and plan for GUCH service development in line with international practice, with particular reference to European and UK guidelines (*see Chapter 8 for research and policy development priorities*) (Deanfield *et al*, 2003; Department of Health [UK], 2006).

DIABETES

Diabetes is a condition with significantly increased risk of developing cardiovascular disease. Patients with diabetes have a two- to four-fold risk of cardiovascular disease compared to others. Type 1 diabetes is estimated to affect approximately 0.4% of the population in Ireland. Type 2 diabetes is thought to affect at least 4.3% of adults (Balanda *et al*, 2006), but its true prevalence is almost certainly underestimated. This is because many cases go undiagnosed. Hyperglycaemia develops gradually and is often not severe enough in the earlier stages for a person to notice any of the classic symptoms of diabetes.

The prevalence of diabetes in Ireland is increasing due to ageing of the population and increased rates of obesity. Prevalence of the condition is predicted to increase by 37% over the 10-year period 2005-2015 (Balanda and Wilde, 2001). This has significant implications for cardiovascular statistics and services.

³ Estimates combining HIPE data, CSO birth-rate data and Our Lady's Hospital, Crumlin, cardiac database: acknowledgement Mater Hospital GUCH Services.

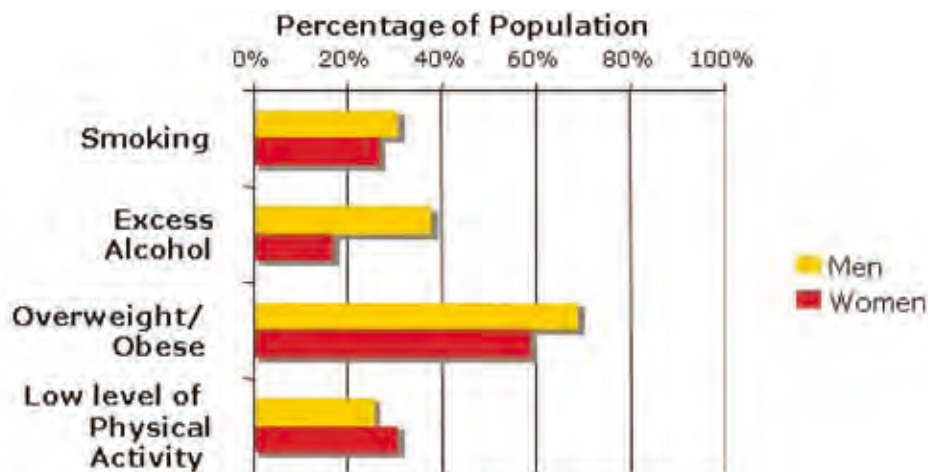
CARDIOVASCULAR TARGETS AND TRENDS IN RISK FACTOR PREVALENCE

National targets for the reduction of cardiovascular disease mortality, referred to in *Building Healthier Hearts* (1999), have been reached and exceeded according to the audit of progress on the implementation of the strategy over the period 1999-2005 (HSE, 2007). In addition, a reduction in cardiovascular risk factors for the adult population has contributed to the decline in coronary heart disease mortality (*see below*). However, overall, the change in prevalence of risk factors for cardiovascular disease has been variable, with some improvements in smoking in the past decade, but a deterioration in levels of obesity, physical activity and diabetes. Alcohol consumption also increased dramatically in the late 1990s, but there are some recent signs of modest improvements.

Findings from SLÁN 2007 (Morgan *et al*, 2008) highlight the poor risk factor profile of the general population, as seen in Figure 5 (*see also Chapter 3 for further details*):

- While smoking in 2002 decreased from the 1998 levels of 33%, no significant further reduction has occurred between the SLÁN surveys of 2002 (27%) and 2007 (29%).
- The prevalence of overweight and obesity is increasing. In SLÁN 2007, over one-third of the population (38%) were objectively assessed as overweight, as measured by Body Mass Index (44% men and 34% women). A further 23% of the population were assessed as being obese (22% men and 24% women). This compares with 39% overweight and 1% obese in the 1999 North/South Ireland Food Consumption Survey (Irish Universities Nutrition Alliance, 2001).
- In 2007, more than one-fifth of adults (22%) were physically inactive, with little evidence of change in levels of physical activity since 1998.
- In 2007, 28% of adults reported excessive drinking (i.e. having 6 or more standard drinks on one occasion), compared to 45% in 2002.

Figure 5: Profile of adult risk factors in Ireland – lifestyle health determinants (SLÁN 2007)



Source: Morgan *et al* (2008)

It is important to note that cardiovascular disease and its underlying health determinants are distributed unevenly in society. Differences in mortality across socio-economic groups as a consequence of cardiovascular conditions are evident in research conducted in Ireland (Balanda and Wilde, 2001). Considering mortality from major diseases, the greatest inequality across socio-economic groups is present in cardiovascular disease, consistent with international research (Mackenbach *et al*, 2000). In Ireland, the age-adjusted rates of cardiovascular deaths are now almost 4 times higher (368%) in the lower social groups than in the higher ones. Rate ratios (RR) represent the mortality gradient between higher and lower socio-economic groups. In younger groups – those aged 15-64 – the gap is highest: the all-cause mortality RR = 3.6 (CI: 3.57, 3.63), cardiovascular disease RR = 4.68 (CI: 4.16, 4.7) and cancer RR = 2.53 (CI: 2.48, 2.58). Even in older groups – those aged 65 and over – the risk of dying at a specific age in lower social groups is more than double that from higher social groups: all-cause mortality RR = 2.2 (CI: 2.19, 2.22), cardiovascular RR = 2.35 (CI: 2.32, 2.37) and cancer RR = 1.81 (CI: 1.78, 1.84). This gap appears to be widening – the most recent analysis covering the period 2000-2006 by Smyth *et al* (forthcoming) represents an increase of 156% in the gap between higher and lower socio-economic groups since the previous 1989-1999 analysis (Balanda and Wilde, 2001).

The lifestyle factors leading to cardiovascular disease are also distributed unevenly across society – in particular, smoking, alcohol consumption, diet and physical activity (*see Chapter 3*). The overall impact of lifestyle changes and treatment provision on cardiovascular disease mortality is now considered, using statistical modelling to determine relative impact.

EXPLAINING CHANGES IN CARDIOVASCULAR MORTALITY FROM 2000-2006

An IMPACT statistical modelling exercise, assessing population contributions to the falling cardiovascular disease mortality rates in Ireland for the period 1985-2000, showed that based on 1985 profiles, death rates were 47% lower in 2000 than could have been expected. About half of the reduction was as a result of preventive measures, such as reduced cholesterol and smoking, and half as a result of treatments, such as surgery and medication (Bennett *et al*, 2006).

A similar analysis was conducted for this national cardiovascular health policy for the period 2000-2006, using newly available SLÁN 2007 data on major risk factors and health behaviours. Findings show that between 2000 and 2006 there was a further 45% decline in coronary heart disease mortality rates in Ireland, similar among men and women (*see Appendix 2*). If coronary heart disease mortality rates in 2000 had persisted to 2006, there should have been 5,561 deaths from coronary heart disease in those aged 25-84 in 2006, given the increased population over this time. However, 3,246 deaths were observed, giving 2,315 fewer deaths than expected, or 'deaths prevented or postponed' (DPPs), between 2000 and 2006.

The majority of the explained decline could be attributed to improvements in the uptake of treatments and to reductions in population cholesterol (*see Appendix 2*). However, these positive effects were offset by the increasing coronary heart disease mortality attributable to increasing levels of diabetes and obesity, which negated almost half of the benefits of reductions in cholesterol. Overall, almost half (48%) of the change was explained by treatments and 16% only by preventive activities. While the overall rate of decrease in cardiovascular disease mortality has accelerated since 2000 (averaging 251 per year in 1985-2000 and 386 per year in 2000-2006), on average 165 lives per year were saved through prevention pre-2000 and 83 through treatment. Since 2000, these figures have been reversed – to 62 per year explained through prevention and 185 per year through treatment.

While there are limitations to modelling exercises (based on assumptions made and the accuracy and quality of the data available), it is clear that there has been a substantial reduction in both relative and absolute numbers of lives saved through prevention. Nonetheless, the more recent IMPACT figures for prevention are disappointing given the potential for further reductions in mortality if risk factors such as smoking cessation and obesity could be addressed. The dramatic increases in lives saved through treatment may be attributed to increases in both cardiac procedures and prescribed medication.

POPULATION PROJECTIONS AND EMERGING CARDIOVASCULAR DISEASE TRENDS

The cardiovascular disease risk profiles outlined above, and their impact on healthcare and other aspects of society, must be considered in the context of Ireland being a relatively young population compared to many European countries (only 11% of Irish people were aged 65+ in 2006). Over the next 10 years, conservative estimates indicate an expected 9% increase in the total population, with a 41% increase in the number of those aged 65+. This older group will comprise 15% of the total population by 2019 (CSO, 2008a). This proportion is predicted to rise more rapidly and double in the following 20 years, resulting in the 65+ age group comprising 23% of the total population by 2038. Hence, there needs to be a serious policy approach to shift the prevalence and management of cardiovascular disease in advance of the doubling of the over-65 age group in Ireland in the next 30 years.

In tandem with this anticipated population change, there are worrying international signals that the pattern of reducing cardiovascular mortality is coming to an end, particularly in younger groups (Ford and Capewell, 2007; O'Flaherty *et al*, 2008). Cardiovascular profiles in mid-life are powerful predictors of mortality and morbidity in early old age (Clarke *et al*, 2009; Sun *et al*, 2009). The concern is that there will be a reversal of the cardiovascular disease mortality patterns if current risk factor and health behaviour profiles (including obesity, smoking and alcohol consumption) are not addressed across all ages in society.

COSTS

Cardiovascular disease cost the European economy €192 billion in 2006, with an estimated 57% directly linked to healthcare, 21% to productivity losses and 22% to the cost of informal care provided by relatives and friends (European Heart Network, 2008). Evaluation of EU health spending on cardiovascular health suggests that Ireland fares poorly relative to its EU counterparts in the proportion of its total spend attributed to cardiovascular disease. A 2006 comparison of the 27 EU Member States reported that, on average, 10% of the total healthcare budget was spent on cardiovascular diseases and that the comparative Irish figure was 6% (European Heart Network, 2008).

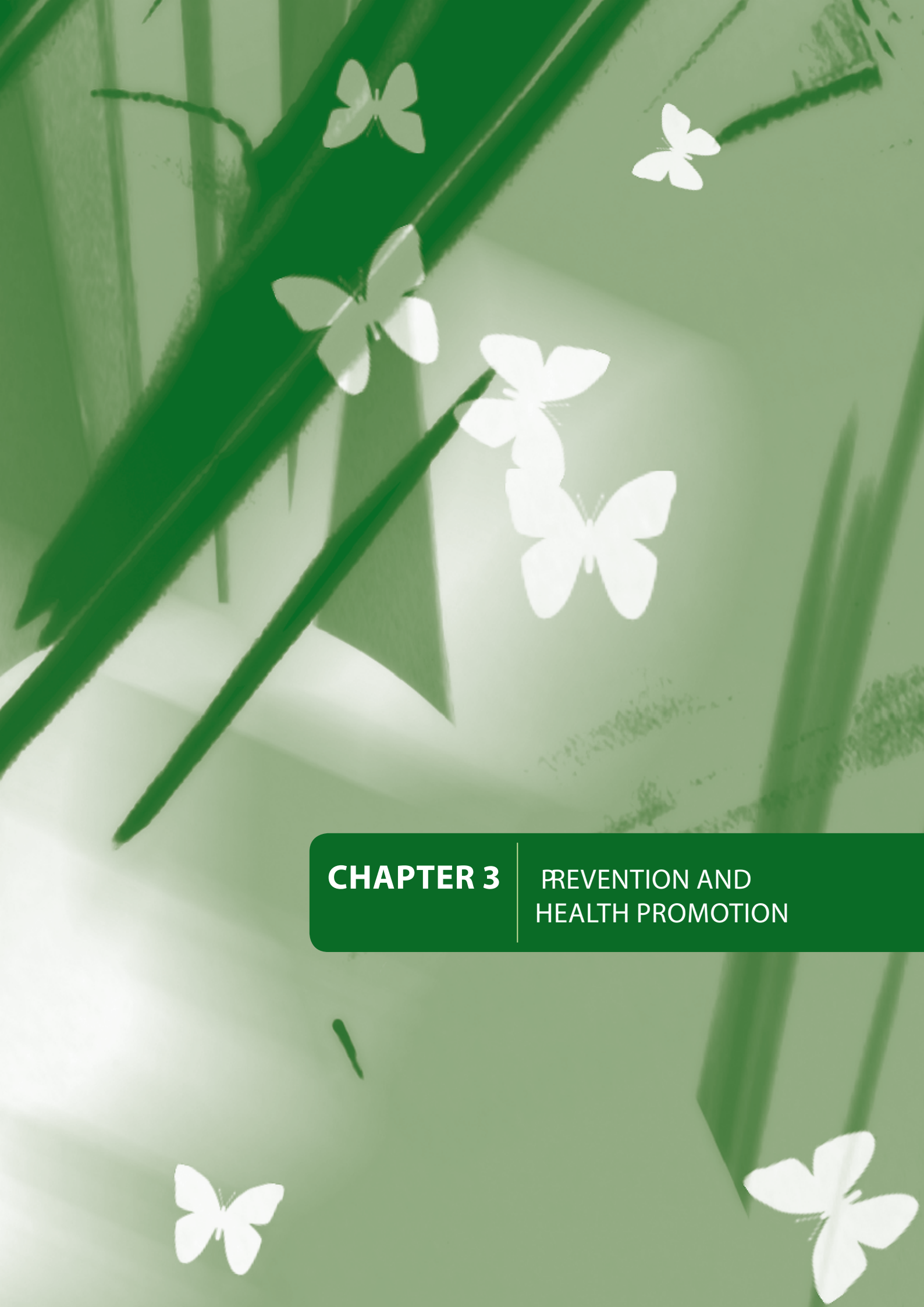
While evidence on the costs of cardiovascular disease to the Irish economy, both in direct costs and in productivity and informal care costs, is not currently available, it is reasonable to assume that the Irish economy is significantly affected by the cardiovascular disease burden. A much greater level of analysis and discourse about cardiovascular and other health spending (and potential saving) is needed to inform discussions about service investments and value for money over the timeframe of this policy. The findings of an Expert Group on Resource Allocation and Financing in the Health Sector, recently established by the Minister for Health and Children and due to report in mid-2010, should provide an important framework for such discussions.

SUMMARY

This overview on the trends of cardiovascular disease in Ireland documents the substantial improvements in mortality over the last decade and the increased volume of service delivery. However, current cardiovascular disease risk profiles in Ireland, coupled with international trends, must now provide a national ‘wake-up call’ to the health sector and beyond – that the cardiovascular health of the nation is in a precarious state.

Cardiovascular health needs to be robustly addressed at both population and individual level. Cardiovascular health management constitutes a national development investment, as important as current national infrastructural developments. Yet, we appear to spend little of our healthcare budget, relative to our EU counterparts, on cardiovascular health. We are at an important decision point in terms of a future – a future where we have either invested significantly to ensure that the cardiovascular health of the nation continues to improve, or a future where we did not seize the opportunity and so reflect back to this time as a turning point in terms of deterioration in national cardiovascular health.

The following chapters set out population and service approaches aimed at improving the population’s cardiovascular health status.

The background of the entire page is a soft-focus photograph of a green plant with long, slender leaves. Several white butterflies are scattered across the image, appearing to flutter. The overall color palette is a mix of various shades of green and white.

CHAPTER 3

PREVENTION AND HEALTH PROMOTION

3. PREVENTION AND HEALTH PROMOTION

Core concepts of disease prevention and health promotion were addressed in the first National Cardiovascular Health Strategy, *Building Healthier Hearts* (Department of Health and Children, 1999). Among the core concepts was the distinction between *population-based approaches*, which target the entire population, and *high-risk approaches*, which focus on individuals in contact with health services:

- Population-based preventive strategies combine elements of wider public policy (addressing the core determinants of health, such as poverty, education, food production and marketing, environment, transport policy) and *primary prevention*, which focuses on reducing the incidence of disease through factors that increase risk, such as cigarette smoking and high blood pressure.
- High-risk strategies incorporate *secondary prevention*, or the detection and treatment of disease at an early asymptomatic stage, and *tertiary prevention*, which focuses on minimising the progression and/or complications of established disease.

A combination of these approaches is essential, with prevention seen as a continuum if progress is to be made on reducing cardiovascular disease in Ireland.

Prevention has traditionally been characterised as having three levels, namely:

- primary prevention, which seeks to prevent the onset of disease;
- secondary prevention, which aims to halt the progression of the disease;
- tertiary prevention, which is concerned with rehabilitation and minimising the impact of complications.

These strands permeate the approach taken in this new cardiovascular health policy – from the macro level involving intersectoral action for health improvement, to care provided for individuals, whether it is in a primary care or acute hospital setting.

The critical role of healthy public policy was also highlighted in *Building Healthier Hearts*, in particular the need to acknowledge the basic social, economic, cultural and environmental determinants of health and well-being, and the need to place health on the agenda of policy-makers in all Government departments and all sectors of society. The challenge, in essence, is to create in Ireland a health-sustaining environment that supports individuals, families and communities in their efforts to avoid premature death and ill-health, and to promote positive health and well-being.

The Department of Health and Children's *Policy Framework for the Management of Chronic Disease* (2008a) recommends a '*national focus on population-directed disease prevention and health promotion*' as a best practice principle of chronic disease management. Cardiovascular health promotion and disease prevention also contribute to healthy ageing, which adds to the number of healthy years of life and improves the functional capacity of the older population. As described in Chapter 2, the generation of young adults beginning their working lives about now will face retirement in a country with over twice the percentage of older people (and also over twice the absolute number of older people). Thus healthy ageing is a personal and population imperative.

RISK FACTORS FOR CARDIOVASCULAR DISEASE

Cardiovascular health is a subset of general health and well-being, and is moderated by the wider socio-economic, cultural and environmental conditions within which the individual lives. The Dahlgren and Whitehead (1991) model of health determinants provides a valuable bridge that links the social patterning of the many determinants of health with their consequent distribution of health effects among different population groups. Cardiovascular health, as well as the risk factors that contribute to cardiovascular disease, is moderated by those wider socio-economic, cultural and environmental conditions within which the individual lives.

There is an uneven distribution of the factors that lead to the development of ill-health and chronic disease throughout the population. The burden of cardiovascular diseases and the lifestyle factors that contribute to them is borne disproportionately by those in the lower socio-economic groups. There are strong links between mental and physical health, with both related through common determinants such as low income, poor housing, poor nutrition, poor education and common risk factors such as smoking, high alcohol consumption and physical inactivity. As an example, the diets of those in lower socio-economic households are more likely to provide energy from fats, sugar, potatoes, fatty meats and fast foods, compared to more affluent groups (Drewnowski, 2007).

Differentials in cardiovascular disease across population groups are created across the lifecycle. The foundations of adult health are laid down in early life. For example, the babies of very young mothers and those with lower educational achievement are more likely to be of low birth weight, less likely to be breastfed and have increased risk of long-term conditions, including cardiovascular disease. The workplace is another key determinant of lifestyle and patterns of ill-health. Opportunities exist to reduce differentials in such life settings.

At the level of population, a small number of avoidable risks cause most of the burden of chronic disease. The World Health Organization (WHO) has attributed 60% of the disease burden in Europe to 7 leading risk factors, namely: hypertension, tobacco, alcohol, cholesterol, overweight, low fruit and vegetable intake, and physical inactivity (WHO, 2006). WHO estimates that 90% of Type 2 diabetes, 80% of coronary heart disease and 33% of cancers could be avoided by a healthier diet, more physical activity and smoking cessation.

Research demonstrates that the combined impact of a small number of risk factors can have a significant effect on dying at an early age. For example, a recent study of over 20,000 adults in the UK showed that engaging in 4 moderate 'protective' health behaviours (i.e. not smoking, being physically active, moderate consumption of alcohol and eating 5 or more daily servings of fruit and vegetables) resulted in a four-fold difference in mortality for both men and women, equivalent to an extra 14 years of life (Khaw *et al*, 2008).

Even modest changes in risk factor levels among the population will bring about important improvements in people's health. Importantly, the negative impacts of these risk factors for chronic disease can be quickly reversed and most benefits will accrue within a decade. To ensure a reversal of these negative impacts, a coordinated intersectoral approach to addressing the health determinants and health inequalities is required, led by Government through the Department of Health and Children.

The individual determinants of cardiovascular health and disease are similar to those relating to overall disease burden – smoking, raised blood pressure, raised blood cholesterol, physical inactivity, obesity and diabetes mellitus are the major factors that increase the risk of cardiovascular disease. Dietary fat is the major determinant of raised cholesterol in developed countries. Thus, saturated fats from foods such as fatty meats, dairy products, cakes and biscuits increase cholesterol levels, as do trans-fats from oils used in fast-food cooking. Replacement of such fats with monounsaturated and polyunsaturated fats in vegetable oils decreases cholesterol levels. Conversely, fruit and vegetables contain antioxidants that have a protective effect on the formation of atherosclerosis in arteries.

There is good evidence of the association between dietary energy and higher rates of obesity, diabetes and cardiovascular disease. Excess salt and alcohol intake and obesity raise blood pressure. High blood pressure contributes to coronary heart disease and is the main risk factor for stroke.

Obesity is one of the main drivers of cardiovascular disease through its effects on blood pressure, blood cholesterol and risk of Type 2 diabetes. The increasing prevalence of obesity throughout the world is regarded as one of the major challenges to global health. Internationally, there is increasing awareness of the link between obesity and the climate change agenda (Foresight Programme, 2007; McMichael *et al*, 2007). In essence, obesity represents an energy supply problem – an imbalance between energy expenditure through physical activity and dietary calorie intake. Reliance on fossil fuels has subsidised (through intensive farming and other mechanisms) the production of low-cost, calorie-dense food. It also sustains transport policies that are not supportive of regular physical activity. There are potential synergies in addressing the prevention of obesity, diabetes and cardiovascular disease and in the reduction of fossil fuel emissions, including through the promotion of activity-friendly transport policies.

IMPACT OF HEALTH BEHAVIOUR PATTERNS ON RISK OF CARDIOVASCULAR DISEASE

The health behaviour profile and resultant cardiovascular risk illustrated in the most recent SLÁN 2007 Survey requires a major readjustment in perceptions of disease patterns and the factors that contribute to these patterns (Morgan *et al*, 2008). For two decades, Ireland has enjoyed important reductions in cardiovascular disease mortality, including from coronary heart disease and stroke (see Chapter 2).

Research has indicated that approximately half of the decrease in coronary heart disease mortality in Ireland from 1985-2000 was attributed to prevention and control of risk factors, while the other half was due to treatments for these conditions (Bennett *et al*, 2006). A more recent analysis for this policy, using updated results from SLÁN 2007, has demonstrated a reversal in this pattern: for coronary heart disease mortality in 2000-2006, the mortality reduction was largely a result of treatment for conditions such as chronic angina and heart failure. However, while half of the reduction was explained by prevention and control of risk factors in 1985-2000, these accounted for only 16% of mortality reduction in the 2000-2006 analysis. This is as a result of increases in obesity, diabetes and hypertension, and a lack of progress in smoking cessation. If these patterns continue, decreasing mortality from cardiovascular disease and stroke may, in fact, be reversed and the burden of managing cardiovascular and other chronic conditions will certainly increase.

TARGETED HEALTH BEHAVIOUR INTERVENTIONS

Health behaviour and risk factor modification require a two-pronged approach: *a population approach*, which requires intersectoral action focused on reducing the level of key risk factors in the population, and *a high-risk approach*, which targets individuals who are at greater risk for cardiovascular disease. This is addressed in Chapters 4, 5 and 6.

Population interventions for consideration include tobacco control, reducing consumption of saturated/trans-fats and sugary/sweetened foods, reducing salt and alcohol intake, reducing body weight and increasing physical activity. Targets are considered below for key population health behaviour indices. (Specific targets for blood pressure and cholesterol are not proposed, although it is to be expected that changes in underlying health behaviours will impact on the levels of these two markers of cardiovascular risk.) Before details on the current status and population health targets are presented, the wider population context must be considered as the enabler of effective delivery of targets. The issues of equity, including health literacy, and of intersectoral action are thus considered next.

Equity and health literacy

Substantial improvement in population health targets is only possible if many individuals can achieve even modest changes. Any recommendations of measures to increase population health must thus permeate across all socio-economic groups. Citizens in more vulnerable groups, such as those of lower socio-economic status, need to be empowered to achieve the same relative benefit from each of the proposed health changes as those in less vulnerable groups (e.g. higher socio-economic groups).

Given the documented inequity in cardiovascular health and risk factor profiles in Ireland, specific measures must be taken to target vulnerable groups for each health behaviour. Alongside tackling broader social determinants to create a more equitable distribution of health in society, individuals can be empowered to protect their own health and that of their families by increasing health literacy in vulnerable groups. This policy document has been developed in accordance with the broad principles of social inclusion.

Health literacy is the ability to make reasonable healthcare decisions based on the individual's capacity to obtain, analyse and understand basic healthcare information and available services. It goes beyond the ability to read. Those with lower health literacy have less knowledge about health, receive less preventive care, exhibit worse control of chronic illness and have more emergency department visits and hospitalisations. Therefore, all means of communication used in the provision of cardiovascular health information should be designed to be accessible to all (Greene *et al*, 2005; Williams *et al*, 1998). Vulnerable groups include older adults, minority and immigrant populations, those earning a low income and people with chronic psychological and/or physical health conditions. In 2002, the National Adult Literacy Agency's *Health Literacy Policy and Strategy Report* (NALA, 2002) estimated that up to 53% of the population in Ireland experience literacy difficulties.

Measures to improve equity, including health literacy, with a specific focus on improving access to cardiovascular health-related resources, should underpin the approach to cardiovascular prevention and treatment. Such measures would include public awareness campaigns on cardiovascular health that are accessible to all; specific interventions for vulnerable groups aimed at promoting and improving cardiovascular health; that health literacy principles are applied to information relating to cardiovascular health; and that programmes are delivered in accordance with the broad

principles of social inclusion and should be evaluated. These principles will be included in the major recommendations to follow.

POPULATION HEALTH TARGETS TO ADDRESS CARDIOVASCULAR DISEASE

This national cardiovascular health policy proposes the setting of a series of cardiovascular-related population targets, based on current health behaviour profiles in Ireland and on international health recommendations for:

- maintaining a healthy body weight;
- healthy eating and physical activity;
- reducing salt intake;
- refraining from or quitting smoking;
- consuming alcohol responsibly.

Underpinning these targets are a number of intersectoral actions relating to nutrition and diet, physical activity, tobacco and alcohol (*see Recommendation 3.1*). Targets are set over a 10-year timeframe in line with international practice. An evaluation of progress will be completed during the first 5 years of this policy (by 2014).

RECOMMENDATION 3.1

The Department of Health and Children should prioritise actions that promote the health behaviour profiles underpinning cardiovascular health, with specific targets to actively pursue and achieve within a 10-year period.

The prioritised areas are:

- maintaining a healthy body weight;
- healthy eating and physical activity;
- reducing salt intake;
- refraining from or quitting smoking;
- consuming alcohol responsibly.

Actions will include fostering intersectoral support for initiation of activities promoting health and prohibition of activities that will maintain or foster unhealthy behaviours. Details on how to achieve these targets are contained in a range of recent Government policies. Reductions in inequalities in cardiovascular health across society must be an underlying principle in achieving improvements in health behaviour.

Lead organisation: Department of Health and Children

It is to be expected that some targets may change in line with evolving research evidence and upcoming national and international guidelines. It is important to note that differing health targets will be interlinked in ways that are often poorly understood. They merit formal assessment to increase our understanding of success and failure in approaches to behaviour change. For example, it is unclear if and how healthy eating and physical activity practices can stimulate and support each other. Distinctions between food energy and total energy (food and alcohol-related) need to be considered.

The targets as planned from current guidelines are outlined below in 7 health behaviour profiles, along with key strategies to address each target and the agency or agencies having primary responsibility for implementing the strategies. The strategies prioritised are those identified as having most relevance for cardiovascular health. They are not intended to be comprehensive national health promotion guidelines for all purposes. For example, dietary advice has been limited to nutrient-based recommendations for reducing salt and fat (foods from the 'top shelf' of the Food Pyramid) and increasing intake of foods from 'lower' shelves, especially fruit and vegetables. It is acknowledged that these recommendations should be part of a wider food-based approach to nutrition. These issues will be addressed in detail in the forthcoming National Nutrition Policy.

HEALTH BEHAVIOUR PROFILES IN IRELAND

The current trends in health-promoting and health-risk behaviours that contribute to overall health in Ireland are described first, followed by an outline of targets and measures planned to improve the situation during the timeframe of this national cardiovascular health policy (*see Tables 4-9*).

Body weight

FACT: Over half of the adult population in Ireland have an unhealthy body weight – 38% of the population are classified as overweight and a further 23% as obese, using independently measured Body Mass Index (BMI).

Body weight reflects nutrition and physical activity, and is a key risk factor for cardiovascular disease and diabetes. The prevalence of overweight and obesity is high in Ireland and is increasing. The SLÁN 2007 Survey provides the first national assessment of measured BMI in adults, aged 18 and over (Morgan *et al*, 2008; Harrington *et al*, 2008). Overall, 38% of the population were identified as being overweight (44% men and 31% women) and a further 23% were identified as being obese (22% men and 23% women). These figures are similar to rates in England and Scotland, and approximately 5% lower than rates in the USA. Findings from SLÁN 2007 also demonstrate that the trend in obesity is greatest in the lower socio-economic groups. Regarding waist circumference as an important marker of cardiovascular risk, the majority of SLÁN 2007 respondents (60%) had a mean waist circumference exceeding the threshold for central obesity. Women were more likely (70%) to be centrally obese than men (49%).

The best estimate of change in adult body weight over time is a comparison of SLÁN 2007 with the 1999 North/South Ireland Food Consumption Survey (Irish Universities Nutrition Alliance (IUNA), 2001). The IUNA study estimated that 39% of Irish adults were overweight (46% men and 33% women) and 18% were obese (20% men and 16% women). Thus the percentage of the population that is overweight or obese has risen from 57% to 61% in less than a decade, with all of the change reflecting a move towards increasing obesity.

Among children, there is also evidence of increasing obesity. The 2004 National Children's Food Survey found that 11% of children aged 5-12 were overweight (11% boys and 12% girls) and a further 11% were obese (9% boys and 13% girls). The HSE and Department of Health and Children, working with the National Nutrition Surveillance Centre, recently completed research as part of the WHO Childhood Obesity Surveillance Initiative (WHO, 2008c). Assessing 7-year-olds, they found that 27% of girls and 18% of boys measured were overweight or obese (McGloin *et al*, 2009).

Evidence also suggests that a substantial number of Irish adults *underestimate* their body weight. For example, findings in SLÁN 2007 show that 42% of those actually measured as ‘obese’ reported their own weight and height as ‘overweight’, while 31% of those actually measured as ‘overweight’ self-reported figures suggesting a normal, healthy weight. This indicates a need for a better awareness of body weight and the risks associated with obesity.

Table 4: 10-year targets for body weight, to reduce overweight and obesity

HEALTHY BODY WEIGHT – TARGETS

Restore the BMI distribution of adults to levels as assessed 10 years ago (in 1999, 43% healthy weight; 39% overweight; 18% obese). This is to be achieved by:

- halting the current annual increase in the prevalence of overweight and obesity in the medium term (by 2014);
- achieving a modest reduction in prevalence of obesity within 10 years (by 2019).

Targets for adults over 10-year timeframe:

- Healthy weight: increase from 38% to 43%
- Overweight: maintain overall levels at 38%
- Obesity: decrease from 23% to 18%

Targets for children over 10-year timeframe:

- Healthy weight: increase from 78% to 84%
- Overweight: decrease from 11% to 7%
- Obesity: decrease from 11% to 9%

Nutrition

It is important to ensure a balance between nutrition and physical activity in order to maintain a healthy weight. Food and dietary research with both children and adults indicates that people in Ireland need to change their diet to achieve current healthy eating recommendations. The SLÁN 2007 Survey reported that the adult diet is high in fats, saturates, salt and sugar, and low in iron, calcium, folate and vitamin D (Harrington *et al*, 2008).

Eating behaviour surveys have found that only one in five (20%) of children eat fruit more than once a day, while 40% eat sweets every day and more than one-quarter consume soft drinks on a daily basis. Among adults, while there has been an increase in the recommended consumption of 5 portions of fruit and vegetables a day, a major concern still exists in relation to the consumption of foods high in fats, sugar and salt (‘top shelf’ items on the Food Pyramid) – 86% of SLÁN 2007 respondents reported that they consume 3 or more servings of these foods each day (Harrington *et al*, 2008).

Table 5: 10-year targets for healthy eating**HEALTHY EATING – TARGETS**

- Increase by 20% the proportion of adults consuming the recommended 5 or more daily servings of fruit and vegetables (from 65% to 78%) by 2014.
- Ensure total fat provides less than 35% of dietary energy requirements. This is a 'short-to medium-term' goal, to be achieved by 2012. After 2012, the medium to long-term goal is less than 30% of dietary energy from fat by 10 years (2019).
- Reduce to less than 10% the dietary intake from saturated fats and trans-fatty acids.
- Reduce to less than 2% the dietary energy intake from trans-fatty acids.
- Reduce to less than 10% the dietary energy intake from foods with added sugars.
- Reduce to less than 3 daily servings those foods high in fats, salt and sugar from the 'top shelf' of the Food Pyramid (e.g. oils, butter, cakes, soft drinks).

Note: Dietary energy does not include energy from alcohol.

In its 2005 report, the National Task Force on Obesity made over 90 recommendations (Department of Health and Children, 2005). A review of this report in 2009 found that there had been significant progress on many issues and that other areas should be progressed as a matter of priority in the short to medium term. These priority areas include measures to increase physical activity among children, control on the marketing and advertising of food and beverages aimed at children and improving awareness on the dangers of overconsumption of foods high in fats, sugar and salt.

The Department of Health and Children is currently developing a National Nutrition Policy, drawing on the earlier recommendations of the National Task Force on Obesity and aimed at achieving better nutritional health for the total population. It will have a particular focus on the nutritional health of children and young people, to help halt the increase in obesity and to reduce food poverty. This should form part of an overall Government strategy in relation to nutrition.

Physical activity

Levels of physical activity among the population are inadequate. For example, only 55% of SLÁN 2007 respondents reported being physically active according to the following definition: '*Taking part in exercise or sport 2-3 times per week for 20 or more minutes at a time or engaged in more general activities, such as walking, dancing or cycling, 4-5 times per week accumulating to at least 30 minutes per day*' (Morgan *et al*, 2008). Men were found to take part more frequently and in more strenuous physical activity than women. However, over one-fifth of adults (22%) reported being completely physically *inactive*, with lack of interest or 'no time' being given as the main reasons for this. There has been little change in the levels of physical activity over the 3 SLÁN surveys of 1998, 2002 and 2007.

For children surveyed in HBSC 2006, slightly less than half exercised at least 4 times a week, with striking gender differences – 41% of adolescent boys and 28% of girls exercised 4 times or more a week (Nic Gabhainn *et al*, 2007).

In June 2009, the National Guidelines on Physical Activity and accompanying *Get Ireland Active* website were launched (Department of Health and Children and HSE, 2009a). Based on best international practice, the guidelines specify the recommendations for physical activity for adults, children, young people and people with disabilities. The aims are:

- to highlight the importance of physical activity for people's health;
- to outline the recommendations for physical activity for people of all ages and abilities;
- to provide information to support those promoting physical activity in their everyday work;
- to direct people to where they can access information and support to become more physically active.

Table 6: 10-year targets for physical activity

PHYSICAL ACTIVITY – TARGETS

- Increase by 20% the proportion of the population undertaking regular physical activity, i.e. increase proportion of physically active adults from 55% to 66% and children from 41% to 49% by 2019.

The Government is taking an intersectoral approach to tackling levels of physical activity, involving the related issues of the environment, obesity, transport and overall population health. For example, the Department of Health and Children participated in an inter-Departmental Group, lead by the Department of Transport, which helped to develop *Smarter Travel – A Sustainable Transport Future*, the transport and travel policy for the next decade. Under this policy, the concept of the 'active commuter' (i.e. walking, cycling and using public transport) is actively cultivated for the benefits of promoting both population health and the broader environmental impact. The Sustainable Travel Office of the Department of Transport is represented on the intersectoral group working on obesity. It published a National Cycle Policy Framework in 2009 and is working with the Department of Health and Children, among others, to develop a National Walking Policy. The Department of Health and Children is also working through the HSE to support community initiatives on increasing physical activity and with the Department of the Environment, Heritage and Local Government, together with local authorities, on prioritising pedestrians in urban planning and supporting the planning and development of exercise facilities in new housing estates and public spaces.

Salt consumption

FACT: Daily salt intake is over 50% higher than recommended, with most coming from foods as purchased rather than from adding salt in cooking or at the table.

Salt is an essential nutrient. However, there is robust evidence for an association between excess salt consumption and hypertension (raised blood pressure). Hypertension is a major contributing factor to heart disease and stroke. A reduction of 3g/day salt intake would reduce stroke mortality by an estimated 13% and coronary (ischaemic) heart disease mortality by 10%, i.e. approximately 700 deaths per year in Ireland. The recommended daily allowance (RDA) of salt for adults in Ireland is 6g/day as a population goal, with targets for individuals in clinical settings of 4g/day (Irish Heart Foundation, 2009). Targets for children are proportionately lower (Scientific Advisory Committee on Nutrition, 2003).

Findings from SLÁN 2007 show that the average daily salt intake by men was 10g/day and by women 9g/day, both significantly above the recommended amount of 6g/day. Furthermore, almost one-third of adults usually or always add salt to their food, either in cooking or at the table, and this 'discretionary' salt amounts to 20% of daily intake. However, most salt in the Irish diet comes from processed foods, with 80% of daily salt intake being 'obligatory' since it is added to manufactured foods during processing, preparation or preservation. Given this fact, 'upstream measures' – such as healthy policies for the production of food, food labelling, intelligent public procurement and direct engagement with the food industry – are all necessary to reduce the population's salt intake.

Ireland is not unique in this respect and, along with other EU Member States, has now committed to the EU Salt Reduction Initiative (European Commission, 2008). The target is a 4% annual reduction on current salt consumption rates over a 4-year period to 2012, i.e. an overall 16% reduction. Supported by the Food Safety Authority of Ireland and the Food Safety Promotion Board, the Department of Health and Children is developing proposals on a salt reduction strategy for Ireland, encompassing a reduction of salt in processed foods, the labelling of salt content in pre-packaged foods in the retail sector in line with planned EU food-labelling legislation and a public awareness campaign on salt intake.

Table 7: 10-year targets to reduce dietary salt intake

SALT CONSUMPTION – TARGETS

- Reduce salt consumption as set out in the EU Salt Reduction Initiative, i.e. reduction by 16% in 4 years (2008-2012).
- Achieve reduction to a target of no greater than 6g/day salt for adults within the lifetime of this policy.
- Particular attention to be given to salt reduction in children, with target setting as appropriate.

Smoking cessation

FACT: The challenge of an adult smoking rate of 29%, despite a national workplace smoking ban, needs novel and sustained approaches to achieve meaningful reductions.

Smoking is the leading cause of preventable mortality. Ireland ranks 2nd highest in the EU15 for smoking-related causes of death (Brugha *et al*, 2009). Findings from SLÁN 2007 show that 29% of respondents were current cigarette smokers. While smoking has decreased since the SLÁN 1998 level of 33%, no significant reduction has occurred between SLÁN 2002 (27%) and SLÁN 2007 (29%), despite the introduction of the ban on smoking in the workplace in 2005. Sub-groups of particular concern for smoking are young adults in the 18-29 age group (35% smoke) and those in the lower socio-economic groups (37% smoke). Encouragingly, SLÁN 2007 found that almost 10% of smokers were actively trying to quit and that 6 out of 10 households did not permit smoking on any occasion in their own homes.

A substantial proportion of adolescents in Ireland also smoke. The latest HBSC survey in 2006 showed that 25% of those aged 15-17 smoked regularly (23% boys and 28% girls). There was some evidence of lowered rates since HBSC 2002. Smoking initiation rates are an important marker of smoking trends. In the international HBSC survey, initiation rates by age 13 for those currently aged 15 has been taken as a marker of smoking status, early initiation being linked to the greater likelihood of continuing

smoking into adulthood. The Irish rate in HBSC 2006 was 31% of 15-year-olds (29% boys and 33% girls) had smoked cigarettes at or before the age of 13 years.

Table 8: 10-year targets to reduce smoking

SMOKING REDUCTION – TARGETS

- Reduce overall population prevalence of smoking by 1% per annum (from 29% to 19% by 2019).
- Reduce the smoking initiation rates by 1% per annum (from 31% to 21% by 2019).

The Department of Health and Children will support the raising of taxes on tobacco products to a level that effects consumer change. It will also develop proposals on other measures to reduce smoking, such as the removal of VAT from tobacco cessation products, on specific activities to minimise initiation of smoking among young people and on the requirement for further legislation and enforcement of existing legislation regarding the promotion, sale and use of tobacco.

Alcohol consumption

FACT: Alcohol consumption is over 40% higher than the EU average, with substantial numbers reporting excessive or risky drinking, or both.

Alcohol consumption in Ireland – especially relevant to population blood pressure and overweight/obesity – has increased dramatically since the 1990s. The number of litres of pure alcohol consumed rose from 5 to 8 litres per capita (of those aged 15 and over) during the period 1971-1991, and then from 8 to 13.4 litres per capita in the 15-year period 1991-2006 (Hope, 2007). Alcohol consumption per capita decreased somewhat to 12.4 litres in 2008. The EU average is 9 litres per capita.

Findings from SLÁN 2007 show that, while 1 in 5 adults did not consume alcohol, 28% of adults reported risky or 'binge' drinking (i.e. consuming 6 or more drinks on one occasion) at least once a week (38% men and 17% women). In addition, 8% (11% men and 5% women) reported excessive drinking (consuming above the recommended units for men or women) (Morgan *et al*, 2009). In HBSC 2006, the majority of school-going adolescents aged 15-17 reported having 'been drunk' on occasion, with approximately one-third having 'been drunk' in the past 30 days (Nic Gabhainn *et al*, 2007). There is anecdotal evidence that the risks of alcohol use are mostly seen to relate to public order effects (e.g. drunkenness, violence) and immediate health and social effects (e.g. hangovers, absenteeism), with less awareness of the longer term negative health effects (e.g. liver and cardiovascular health problems).

Table 9: 10-year targets to promote responsible alcohol consumption

ALCOHOL CONSUMPTION – TARGETS

Reinforce the Strategic Task Force on Alcohol (2004) consumption targets by:

- reducing the total per capita consumption of alcohol to 9 litres per annum (the EU average);
- reducing the harmful individual consumption of alcohol, especially related to risky and excessive drinking.

The Department of Health and Children will support proposals to increase the cost of alcohol by raising tax/excise on alcohol and preventing low-cost selling. It will also support measures to reduce access to alcohol by restricting marketing, advertising, sponsorship and sale of alcohol. It will work closely with the Department of Justice, Equality and Law Reform on any legislative actions that are considered necessary.

Blood pressure and cholesterol

FACT: Almost two-thirds of middle-aged and older adults in Ireland have at least 2 of 4 key risk factors for cardiovascular disease – raised blood pressure, raised cholesterol, obesity and smoking.

In SLÁN 2007, 1,207 adults aged 45 years and over took part in a physical examination, providing the first population profile of cholesterol and blood pressure in Ireland. About 60% of respondents had high blood pressure and over three-quarters (82%) had raised cholesterol. Most were either not on medication or had uncontrolled risk factors on medication. Almost all (94%) had 1 out of 3 risk factors (obesity, high blood pressure or cholesterol), 59% had 2 out of 3 risk factors, while 18% had all 3 risk factors. In addition, 20% were smokers. Management of blood pressure and cholesterol will in part be addressed by targeting the health behaviour profiles as outlined above and also by improving management in primary care (see Chapter 4).

INTERSECTORAL WORK

The challenge for the health sector is the imperative to have *action across multiple sectors* of society. For example, in order to increase levels of physical activity, important partners for the healthcare sector would include the education sector, the sports and leisure sector, urban planning and construction, transport, agriculture, the private sector, the food industry and the media.

Effective prevention requires a shift of the entire distribution of a risk factor (e.g. raised cholesterol) to lower values. It should extend beyond a focus on high-risk individuals, utilising cholesterol-lowering therapies, to *population-based approaches*, preventing the development of the risk factors themselves. A population-based strategy may include, for example, programmes to reduce the consumption of energy-rich and fat-rich foods, including public education, legislation to eliminate misleading health claims for foods and reduction of fat in some foods. This could help reduce body weight in all segments of the population, while at the same time reducing levels of cholesterol, blood pressure and glucose. Overall, such an approach would reduce the number of people with raised cholesterol, raised blood pressure or diabetes, and would therefore have a much larger long-term impact than intervening only with high-risk individuals in middle age.

Since the health status of the population is largely determined by factors outside the health sector, it is important that health policy interfaces with policies in sectors other than health. This approach is advocated in the European Commission's White Paper on *A Strategy for Europe on Nutrition, Overweight and Obesity related health issues* (European Commission, 2007) and the World Health Organization's policies on chronic diseases (WHO, 2005). In Ireland, the recently published *Policy Framework for the Management of Chronic Disease* (Department of Health and Children, 2008a) supports the establishment of an intersectoral committee through which health improvement actions will be

channelled (see *Recommendation 3.2*). The targets proposed above for specific health behaviours (e.g. smoking, salt intake) must be set in the wider context of a national health promotion policy, with intersectoral cooperation for initiatives, including legislation, to support them. It is acknowledged that there are already a number of initiatives by the Department of Health and Children on healthy eating, tobacco, alcohol and obesity, and that these will continue as before; these include the reports of the Alcohol Task Force (2007) and the Task Force on Obesity (2005).

RECOMMENDATION 3.2

Intersectoral work should be given the priority it needs to deliver health-related benefit.

To achieve real change, actions should be led by the Department of Health and Children, reporting to Government on a regular basis through the Cabinet Committee on Health.

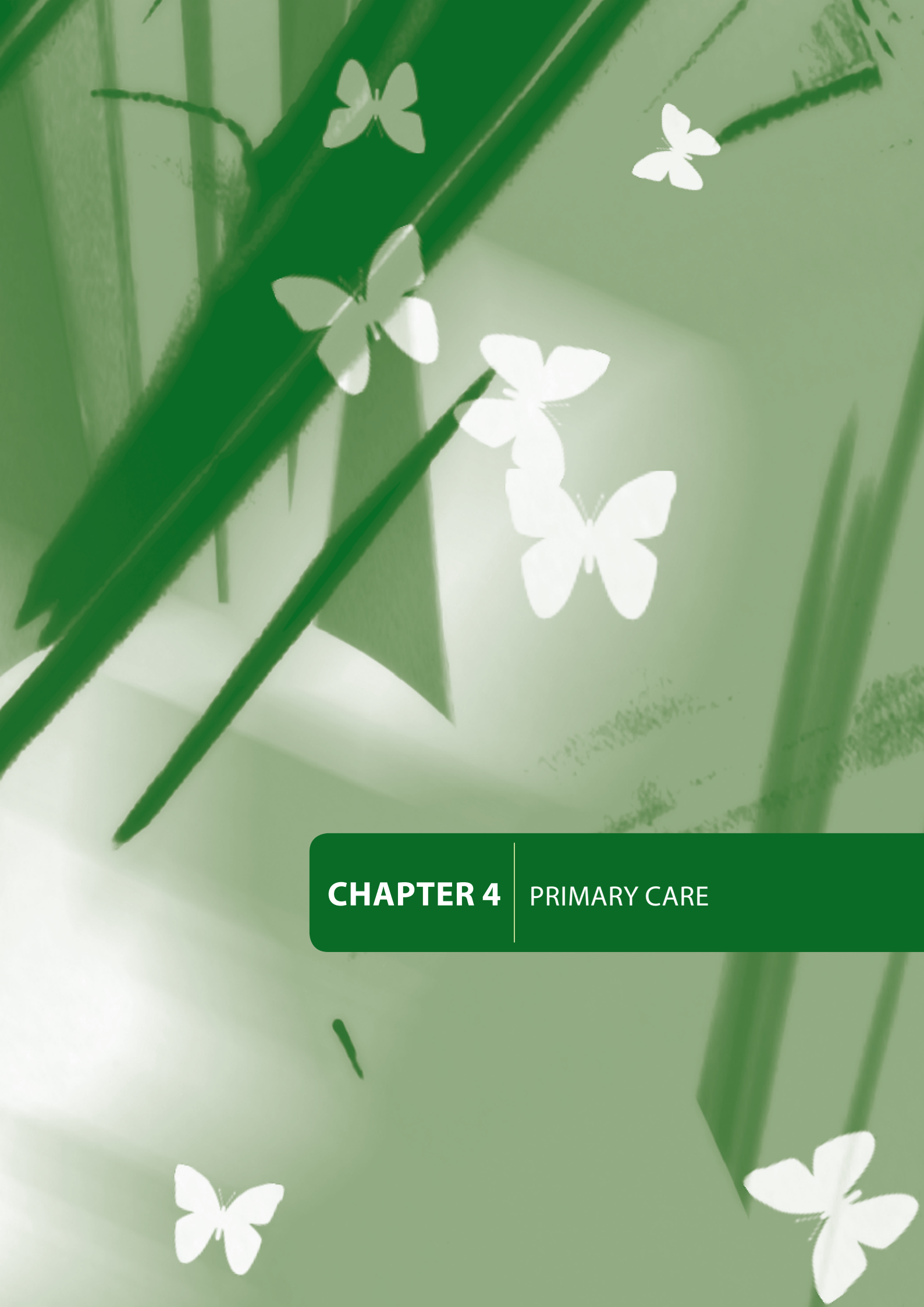
A key deliverable in evaluating the success of this work will be reductions in inequality in cardiovascular health targets.

Lead organisation: Department of Health and Children

The population behavioural targets proposed earlier (see *'Health behaviour profiles in Ireland'*, pp. 59-65) should operate over a 10-year timeframe and form the basis for proposals on health improvement. It is acknowledged that public policies and healthcare programmes, promoting healthier lifestyles and improving the environments in which we live and work, will prevent the emergence of these risk factors and hence reduce diseases and the burden to families and society. While many sectors, agencies and individuals themselves have responsibility for the delivery of these targets, the Department of Health and Children should lead and develop proposals on healthier lifestyles, including programmes and legislation as appropriate. These will need to be addressed in the context of evolving evidence from Ireland and elsewhere on initiatives that deliver results.

In this context, it is proposed that the targets outlined in this chapter form the basis for health improvement actions that will be the subject of proposals brought to the Cabinet Committee on Health. This work programme should be focused and identify priority future actions, including the development of screening tools to evaluate the health impact of relevant policy proposals being submitted to Government. Areas for early consideration should include:

- **Diet, nutrition, physical activity and obesity** – Considered as priority - should be the measures outlined early in relation to restricting the availability of energy-dense foods through marketing and advertising; labelling salt content of pre-processed foods; reducing energy, fats and salt content in food; and promoting physical activity and public facilities.
- **Tobacco** – Considered as priority – should be further consideration to taxation increases and other measures to restrict the availability of tobacco products and measures on pricing to inhibit smoking, especially among younger people.
- **Alcohol** – Considered as priority – should be proposals to restrict alcohol availability and to increase excise duties in order to lower consumption. Consideration should also be given to an advertising ban on alcohol, proposals to reduce alcohol sponsorship and labelling to include advice on pregnancy and drink-driving.



CHAPTER 4

PRIMARY CARE

4. PRIMARY CARE

Primary care has a vital role to play in raising awareness of cardiovascular disease and in its prevention, early detection, emergency response, risk assessment, and management (including long-term management and rehabilitation). While there have been useful advances in the management of cardiovascular disease and cardiovascular disease risk in primary care, particularly through the implementation of the HeartWatch Programme as recommended by the first cardiovascular health strategy (*Building Healthier Hearts*, 1999), the full potential of primary care to contribute to the containment of cardiovascular disease morbidity and mortality has yet to be realised.

This chapter addresses the need for population awareness of cardiovascular risk factors, including the key role of primary care in targeted education of individuals in their care. It then addresses general standards in cardiovascular risk assessment and management. Specific details are then discussed concerning established cardiovascular disease management and specific management of diabetes, stroke (including hypertension and arterial fibrillation), heart failure and peripheral arterial disease. Issues on funding eligibility for primary care management of chronic conditions are addressed separately, in Chapter 7.

PRIMARY CARE AND RISK AWARENESS

There is a need to promote awareness in the population at large of the need for regular monitoring of blood pressure, cholesterol and the symptoms of diabetes (*see Recommendation 4.1*). Adults should know important numbers relating to their cardiovascular risk, such as blood pressure and cholesterol levels, through educational programmes such as ‘Know your numbers’. They should also be aware of relevant family history. There is a need to promote awareness of the early symptoms of and appropriate emergency response to heart, stroke and vascular disease and associated conditions so that effective interventions can be administered in a timely fashion to reduce morbidity. Reputable settings, such as GP practices and pharmacies, can make such information readily accessible.

RECOMMENDATION 4.1

Media and education campaigns should be undertaken to increase awareness by the general public of cardiovascular risk factors and levels of risk associated with them. This awareness should be reinforced in primary care settings, such as GP practices and pharmacies, by the HSE in partnership with voluntary agencies.

Such campaigns should include raising awareness of risk factors, symptoms and appropriate responses to heart attack, stroke, trans-ischaemic attack, heart failure, peripheral arterial disease and other vascular conditions. Given the primacy of awareness to attitude and behaviour change, a series of campaigns needs to commence immediately and in a phased manner, with interim evaluations guiding the next educational phase.

Lead organisation: HSE, in partnership with voluntary agencies

PREVENTION – GENERAL PRINCIPLES

Cardiovascular diseases are complex and multifactorial. Thus it is imperative that preventative strategies are similarly multifaceted. As recommended by the 2007 *ESC Clinical Practice Guidelines* by the Fourth Joint Task Force of the European Society of Cardiology [ESC] and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (Graham *et al*, 2007), the objectives of cardiovascular disease prevention are:

1. To assist those at low risk of cardiovascular disease to maintain this state lifelong and to help those at increased total cardiovascular disease risk to reduce it.
2. To achieve the characteristics of people who tend to stay healthy, i.e.
 - no smoking;
 - healthy food choices;
 - physical activity: 30 minutes of moderate activity a day;
 - BMI <25kg/m² and avoidance of central obesity;
 - BP <140/90mmHg;
 - total cholesterol <5mmol/L (-190mg/dL);
 - LDL cholesterol <3 mmol/L (-115mg/dL);
 - blood glucose <6mmol/L (-110mg/dL).
3. To achieve more rigorous risk factor control in high-risk individuals, especially those with established cardiovascular disease or diabetes:
 - no smoking, with smoking cessation support and NRT if appropriate;
 - blood pressure under 130/80mmHg if feasible;
 - total cholesterol <4.5mmol/L (-175mg/dL);
 - LDL cholesterol <2.5mmol/L (-100mg/dL), with an option of <2mmol/L (-80mg/dL) if feasible;
 - fasting blood glucose <6mmol (-110mg/dL) and HbA1c < 6.5% if feasible.
4. To consider cardio-protective drug therapy in these high-risk individuals, especially those with established atherosclerotic cardiovascular disease.

The first cardiovascular health strategy, *Building Healthier Hearts* (1999), opted for a 'high-risk' approach rather than a general population approach, prioritising activities that were targeted at those patients with highest risk. The audit of the implementation of the strategy, *Ireland: Take Heart* (HSE, 2007), identified that most progress had been made in primary care on those interventions that involved pharmacotherapy. While lifestyle interventions are more desirable, for a variety of reasons, they tend to be less effective when applied at the individual level. Multisectoral and intersectoral interventions are required to have significant population impact. That said, evidence is emerging that multidisciplinary input into preventive cardiovascular disease programmes in high-risk individuals can also impact on lifestyle-related risk factors (Wood *et al*, 2008). As more of the multidisciplinary primary care team members become available in Ireland through primary care team establishment, they will need to be acutely involved in cardiovascular prevention so as to achieve greater impact on lifestyle-related factors. These team members include smoking cessation counsellors, dieticians and physiotherapists.

MANAGEMENT OF HIGH RISK, INCLUDING ESTABLISHED DISEASE

Chronic disease management is deliverable through a shared care model, facilitated by multidisciplinary teams with designated care pathways. Shared care models need to be expanded and developed in order to achieve optimum chronic disease management for patients with cardiovascular disease.

Strategies need to be developed and implemented to support a multidisciplinary team approach that promotes continuity of care. Patients should be provided with appropriate information about the disease, treatment options and expected outcomes, follow-up and support services to facilitate self-management of the physical, psychosocial and economic impacts of their condition. Self-management education programmes also need to be developed, with access to these programmes and identification of support groups for patients, all of which will facilitate people to gain the knowledge, skills and confidence to 'help themselves'. Teams should be charged with ensuring that the psychosocial needs of people with cardiovascular disease are met at the sequences of stages in their management. This model can be applied to the management of specific cardiovascular risks – such as hypertension and raised lipid levels – as well as to all types of vascular disease, including ischaemic heart disease, heart failure, stroke and peripheral arterial disease.

Such activities could be seen as part of the cycle of chronic disease management and provided in tandem with the ongoing education and support needed for patients with established cardiovascular conditions when transferred from focused early post-hospital discharge rehabilitation programmes into continuing care in the community. Both groups can be catered for by the same primary care personnel, with the same education and behaviour change support strategies, within a philosophy of prevention and in established 'prevention services' in the local community settings. The role of general practices, pharmacies and other centres in the community in supporting chronic disease management needs to be examined (*see also Chapter 6*).

HIGH RISK

The definition of 'high risk' needs to be extended from just those who have had an event and/or a revascularisation procedure, and should include all patients in the priority groups listed below, as identified by the *ESC Clinical Practice Guidelines* (Graham *et al*, 2007):

- patients with established atherosclerotic disease;
- asymptomatic individuals who are at increased risk of cardiovascular disease because of multiple risk factors resulting in total cardiovascular disease risk (>5% 10-year risk of cardiovascular disease death);
- diabetes Type 2 and Type 1 with microalbuminuria;
- markedly increased single risk factors, especially if associated with end organ damage;
- close relatives of patients with premature atherosclerotic cardiovascular disease or those at particularly high risk.

The SLÁN 2007 data suggest that a large proportion of the population in Ireland has multiple risk factors and would be categorised as being at 'high risk'. *Building Healthier Hearts* (1999) recommended that a risk assessment programme be piloted and implemented. This was developed through the HeartWatch Programme, but limited to a subset of patients with established heart disease in 20% of GP practices in Ireland. This risk assessment and management approach now needs to be extended

to include the list of high-risk individuals defined above. All groups of professionals addressing cardiovascular disease need to work to common definitions and guidelines. With regard to prevention in clinical practice settings, this policy recommends the *ESC Clinical Practice Guidelines* (now in its 4th version (Graham *et al*, 2007), with the 5th version due in 2011) for common professional standards across groups (see *Recommendation 4.2*).

RECOMMENDATION 4.2

Professional standards: The 2007 ESC Clinical Practice Guidelines should be adopted and a care protocol for primary care based on these guidelines should be developed. Protocols on best practice in cardiovascular clinical care should be agreed.

This extends the group of individuals considered at high risk and includes patients with established disease, close relatives of people with premature atherosclerotic disorders and individuals with multiple risk factors.

Lead organisation: HSE, in partnership with Irish Heart Foundation, Irish Cardiac Society, Irish College of General Practitioners, Department of Health and Children, and HIQA

The Fourth Joint Task Force of the European Society of Cardiology [ESC] and Other Societies on Cardiovascular Disease Prevention in Clinical Practice is supportive of an opportunistic approach to the detection of biological risk factors or lifestyles to detect people at high risk. The Task Force analysed barriers to implementing prevention in clinical practice. In an Irish context, this indicates the requirement to provide:

- routinely available, accurate and adequate systems of measurement;
- time for advice or treatment as appropriate;
- continuity of care;
- patient access to treatments, regardless of socio-economic status.

The ongoing establishment of primary care teams by the HSE provides a mechanism to deliver such services. The plan is to have over 500 teams in place by the end of 2011, each team to serve populations of up to 8,000 individuals.

There is now compelling scientific evidence for the benefit of interventions for single targets listed above. This lays a foundation for multifactorial screening and intervention programmes, providing the programmes target people at high risk and include the necessary resources to respond to the risk factors identified (see *Recommendation 4.3*). The EuroAction study has shown that multidisciplinary cardiovascular prevention programmes targeted at those at high risk, although complex and resource-intensive, are feasible and worthwhile (Wood *et al*, 2008).

Risk identification and management programmes involve ongoing monitoring of risk factors, including blood pressure, lipids, body mass index and blood glucose. Challenges such as familial hypercholesterolaemia need to be considered within the risk assessment programme. The interventions offered by such a programme need to be based on a single set of guidelines.

RECOMMENDATION 4.3

Structured clinical care: Develop structured clinical care, which includes prevention of cardiovascular disease, in clinical practice.

This will provide targeted individualised assessment and management of cardiovascular disease in primary care, in accordance with the 2007 *ESC Clinical Practice Guidelines*, i.e. those at risk, those with established cardiovascular disease and selected family members. Structured clinical care is considered a key requirement to future general practitioner contract agreements.

Lead organisation: HSE, in conjunction with Irish College of General Practitioners

Proposal for action on opportunistic risk ascertainment

Since opportunistic risk ascertainment of cardiovascular disease has not yet been evaluated, it is proposed that a structured programme for cardiovascular risk ascertainment in primary care, with opportunistic recruitment of patients into the programme, be instituted within the context of a rigorous scientific study (see *Recommendation 4.4*). This work should be based on current best evidence on effective clinical interventions and healthcare delivery systems, and should be organised to determine clinical outcomes in terms of risk factor modification; to provide a detailed cost-effectiveness evaluation; and to advise on process and organisational challenges of expanding the programme beyond this evaluation phase. The programme should be initiated with higher risk groups (e.g. older patients and patients from socio-economically deprived groups) whom existing evidence suggests are at highest risk and have the most to gain. This should be designed so as to determine the most cost-effective targeting of such a programme for extension to routine clinical practice. Given the large proportion of the adult population in Ireland that appears to be at cardiovascular risk (from recent evidence on lifestyle in SLÁN 2007), this work should be commenced without delay and the results acted on promptly to target cardiovascular risk in primary care in a cost-effective manner.

RECOMMENDATION 4.4

Population approach: Evaluation of a structured programme for cardiovascular risk ascertainment and management in the primary care setting is required to inform the development of a model for the delivery of care.

A health technology assessment and clinical study will determine the health and economic benefits of such systematic risk ascertainment for different population groups (compared to usual care). As clinical and cost-effectiveness benefits become clear, implications for service development must be agreed and interventions targeted at relevant population groups implemented. The evaluation should be completed and recommendations delivered in the first half of the lifetime of this policy (2010-2014).

Lead organisation: Department of Health and Children, in association with HSE, HIQA and Health Research Board

PREVENTION OF CARDIOVASCULAR DISEASE IN THOSE WITH DIABETES MELLITUS

Those with Type 2 diabetes and those with Type 1 diabetes who have microalbuminuria are priority groups for the prevention, early detection and management of cardiovascular risk. Harkins' (2008) *A Practical Guide to Integrated Type 2 Diabetes Care* provides detailed guidance on these aspects of the care of patients with diabetes in Ireland. The guidance also sets out a model for service delivery that is relevant to other patients at high risk of cardiovascular disease. The model of integrated care includes registration of those with the condition, initial assessment and review at regular intervals, and fast-tracking of patients requiring urgent assessment in the hospital diabetes centre. These guidelines should provide the basis for shared care for patients with diabetes who also present with cardiovascular disease (see *Recommendation 4.5*).

RECOMMENDATION 4.5

A protocol for the early detection and structured cardiovascular care of patients with diabetes should be agreed in order to manage this high-risk group.

Lead organisations: HSE and Irish Heart Foundation, in partnership with Irish Cardiac Society, Irish College of General Practitioners and Irish Endocrine Society

PREVENTION OF STROKE IN PRIMARY CARE

In addition to the *ESC Clinical Practice Guidelines* on cardiovascular prevention, two aspects of prevention of particular relevance for the prevention of stroke are (1) the detection and management of raised blood pressure (hypertension) and (2) anti-thrombotic therapy for those with atrial fibrillation.

Assessment and management of hypertension

Guidelines on the management of arterial hypertension, from the Task Force of the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC) (Mancia *et al*, 2007), recommend assessment of total cardiovascular risk in the management of arterial hypertension, rather than intervening on separate risk factors. However, elevated blood pressure has been considered the most important determinant of the risk of stroke due to cerebral infarction or haemorrhage, and thus warrants particular attention (Kuller, 2000). As age increases, over the age of 55, pulse pressure is increasingly associated with raised risk of death from stroke and coronary heart disease (Lewington *et al*, 2002).

Factors that are associated with raised blood pressure (such as obesity, increased consumption of salt and high alcohol intake) also increase the risk of stroke. Those with elevated blood pressure are more likely to have other risk factors for cardiovascular disease, such as diabetes, insulin resistance and dyslipidaemia. Even if blood pressure is only moderately raised, the presence of other risk factors may place an individual in a high-risk category. Findings from SLÁN 2007 highlight the high prevalence of raised blood pressure in adults, the low proportion of those in which it had been detected and the low proportion of those whose blood pressure control was satisfactory.

Repeated measurements are required to accurately characterise and assess blood pressure, with attention to the accuracy of the measurement device (Mancia *et al*, 2007). Ambulatory blood pressure measurement is of value to assess blood pressure over the course of the day and night, and is useful in predicting cardiovascular risk. The Rambler Study demonstrated the feasibility of ambulatory blood pressure measurement in general practice in Ireland and quantified its impact on prescribing to improve blood pressure control (Uallachain *et al*, 2006).

The overall contribution of ambulatory blood pressure monitoring to primary care detection and management of high blood pressure has yet to be fully ascertained. It is thus recommended that practices be encouraged to invest in this technology and further research be undertaken to determine the benefits of ambulatory blood pressure monitoring and the particular patient groups for which the benefits match or exceed the additional costs (*see Recommendation 4.6*).

RECOMMENDATION 4.6

Effective management of hypertension should be prioritised in primary care.

Guidelines are needed on standards of assessment, management and review of patients in primary care based on best practice and health technology assessments. In addition, general practices need to be supported to establish rigorous systems for blood pressure assessment, management and review for their population of patients. This requirement should be considered in the context of future arrangements pertaining to the general practitioner contract.

Lead organisation: Department of Health and Children, in partnership with Irish College of General Practitioners

Risk assessment of hypertension in the context of overall risk assessment

Risk assessment is relevant in those with elevated blood pressure or other identified risk factors. It also requires consideration of major risk factors such as smoking, blood cholesterol, diabetes and family history. Blood pressure is then managed in the context of the overall risk of cardiovascular disease. SCORE risk charts are used to estimate risk of fatal cardiovascular events. Absolute 10-year risk can be calculated or risk can be expressed as a relative risk in comparison to risk if different levels of risk factors pertained.

All those who have had symptomatic cardiovascular disease are considered to be at high risk, warranting ongoing intervention to reduce risk of recurrence. Lifestyle interventions and prescription of medication should be managed with the patient, taking into account the person's cardiovascular disease risk, health behaviours and socio-economic circumstances. Evidence in relation to interventions to improve blood pressure control concluded that 'an organised system of regular review, allied to vigorous anti-hypertensive drug therapy, was shown to reduce blood pressure' (Fahey *et al*, 2006).

More generally, all aspects of non-pharmacological management of stroke prevention should be incorporated within the general plans for education of the public regarding risk factors and their management for cardiovascular disease.

Detection and management of atrial fibrillation

Atrial fibrillation is a common cardiac arrhythmia, occurring in 1% of the general population. The estimated prevalence is 4%-7% in women and men aged 65-74, increasing to 14%-19% in those aged 85 and over (Fitzmaurice *et al*, 2007). It is a potent risk factor for stroke, increasing the risk five-fold. Irish and international data consistently show that stroke due to atrial fibrillation is more severe, leading to greater mortality and disability, increased lengths of hospital stay and greater requirements for long-term institutional care, compared to stroke in those without atrial fibrillation.

The risk of thrombotic complications, such as stroke, in patients diagnosed with atrial fibrillation can be dramatically reduced by treatment with anticoagulants. Up to 70% of stroke events can be prevented by warfarin anticoagulation. 40% to 60% of patients with atrial fibrillation are eligible for treatment with anticoagulants. The use of anti-thrombotic therapy must be balanced with the anticipated benefit of reduced thromboembolic complications and risk of bleeding in patients with atrial fibrillation. Assessment of thromboembolic risk is helped by several risk-stratification models. This predictive ability may allow clinicians to target high-risk patients for more aggressive intervention.

Despite the well-recognised association between atrial fibrillation and ischaemic stroke, and the benefits of anticoagulation therapy, a large proportion of patients with atrial fibrillation remain undetected or untreated. The reported overall rate of treatment with anticoagulants in patients with atrial fibrillation is approximately 31%, indicating substantial under-use of anticoagulants in these patients. For illustration, in the North Dublin Population Stroke Study (Kelly *et al*, 2009), less than 25% of individuals with stroke due to known atrial fibrillation were anticoagulated with warfarin prior to stroke onset. A previous study of general practice in Dublin showed a significant opportunity to increase prophylaxis in those known to have atrial fibrillation by their GPs given appropriate support (White *et al*, 2004).

One strategy to improve anticoagulation rates is to develop structured systems between primary care and the hospital setting, aimed at devolving anticoagulation monitoring to primary care with appropriate hospital support (*see Recommendation 4.7*). Anticoagulation can be managed effectively in primary care using near-patient tests to determine INR (international normalised ratio) and computerised decision support software. However, it is essential that hospital supports are provided for this service to operate effectively and safely. Shared decision-making and management would be required between GPs, hospital physicians and nurses based at anticoagulation clinics. An integrated model of hospital and primary care anticoagulation services is recommended to provide training for primary teams new to anticoagulation treatment provision and quality assurance of anticoagulation services. Furthermore, an integrated model would support the development of self-management options in suitable patients. This model has shown positive results, further complemented by improved patient education and knowledge about the risks and benefits of anticoagulation therapy, which can improve the safety and efficacy of such treatment.

Targeted resource provision with IT infrastructure would be required for participating GPs and hospital anticoagulation services. Dedicated resources would also be required to provide GP and primary care training to fulfil this role.

A second strategy to improve anticoagulation rates is screening. An estimated 50% of individuals with atrial fibrillation remain undetected and at high risk of stroke (25%). There is evidence that detection of atrial fibrillation in general practice is improved by opportunistic case finding, prompted by flagged

case notes in those aged 65 and over. Atrial fibrillation lends itself to screening as it is relatively inexpensive to follow a suspected irregular rhythm during pulse-taking with a confirmatory ECG. It is proposed that a screening programme for atrial fibrillation, targeted at those aged 65 and over and those with existing coronary disease or heart failure, be implemented and evaluated.

It is important that in parallel to screening for atrial fibrillation, anticoagulation treatment facilities continue to be developed to deal with anticipated increases in detected atrial fibrillation.

RECOMMENDATION 4.7

Anticoagulation service management should be formalised, including:

- **Clinical leadership of integrated anticoagulation services:** This must be established within service networks so that GPs and hospital staff (including stroke specialist consultants, consultant haematologists and nurse specialists) achieve and assure optimal care for all.
- **Structured anticoagulation services:** These will have to be developed between and within primary care services and hospital anticoagulation clinics. This will necessitate appropriate resourcing being provided to participating practices (e.g. IT linkages to hospital/GP/pharmacy anticoagulation services, 'near-patient' anticoagulation testing, practice nurse appointments).
- **A screening programme for atrial fibrillation:** This should be established, with formal evaluation, to ensure an effective means of implementation for people aged 65 and over.

Lead organisation: HSE

HEART FAILURE

There is an impending epidemic of heart failure in Ireland, with the projected prevalence expected to increase significantly during the next 10 years (*see Chapter 2*). The current pattern of care of heart failure patients often involves presenting acutely to an emergency department, being admitted for lengthy hospital stays and returning home to an environment with little support for complex chronic disease management, followed by a likely early readmission. This is neither desirable nor sustainable. Heart failure, being a chronic condition in a population of mainly older people, requires integrated community-based care, led by the general practitioner. A focus on keeping the person out of the hospital setting is paramount.

To do this well, there is a need for a paradigm shift in care – from hospital to community base – with a reorientation from largely hospital care to increasing structured proactive care in GP and primary care, supported by specialist ambulatory services. Structured heart failure care modelled on evidence-based therapy is clinically very successful in reducing hospital and emergency department use. It is also cost-saving and it improves quality of life for the patient (Conlon *et al*, 2006).

The aims of treatment of heart failure (as set out in the ESC Guidelines on heart failure (Dickstein *et al*, 2008) are:

- prevention;
- prevention and/or reducing the prevalence of diseases leading to cardiac dysfunction and heart failure;
- prevention of progression to heart failure once cardiac dysfunction is established;
- maintenance or improvement in quality of life;
- improvement in survival.

Prevention and early detection of heart failure

The following categories of patients benefit from close follow-up:

- patients with established risk factors for ventricular dysfunction, such as hypertension and coronary heart disease;
- all survivors of myocardial infarction with significant ventricular damage;
- screening of relatives with genetically linked cardiomyopathies.

Treatment in primary care

There is a need to change the emphasis from reactive care of sick hospitalised patients to proactive care in the community (*see Recommendation 4.8*). This will be achieved by increasing and developing capacity in general practice and primary care to improve early detection and active treatment of patients with heart failure. This development should take place in the context of current developments in primary care teams and evolving supports for chronic disease management programmes. This will require:

- Education of GP and practice nursing staff.
- Access to specialist opinion: Accurate diagnosis and specialist-initiated investigation and therapy is the cornerstone of best practice for this condition. This will necessitate easy availability for GPs to specialist opinion and diagnostics and 7-day specialist referral.
- Improved communication between community-based professionals and with supporting specialist services.
- Appointment and development of the role of specialist heart failure nurses. This role should be developed in the community setting, in cooperation with the GP, practice nurse and other nurses caring for patients with chronic diseases.
- Additional capacity and development of the wider primary care team members to support the management of patients with heart failure. A multidisciplinary team approach will include nutritionists, psychologists, physiotherapists, occupational therapists and social workers, who are likely to be working with patients with other chronic conditions. The community pharmacist can have an important contribution in supporting adherence to medication in heart failure, alongside other chronic cardiovascular conditions.
- Management of multi-morbidity, such as diabetes and chronic obstructive airways disease.
- Information and communications technology (ICT) developments, to (a) facilitate registers for structured care; (b) ensure easy access to communication with hospital specialists, HF specialist nurses, etc. for shared care, virtual consultations; and (c) promote audit of care.

- Development of tele-monitoring, to promote patient education and adherence to medication and also the other extensive set of self-care tasks advised.
- Clarity on contractual arrangements for staff, including 7-day cover by specialists.

In order to facilitate this transition from hospital to community, models of care of patients with heart failure, based on agreed national guidelines, will need to be established. Local adaptation between GPs and multidisciplinary teams and hospital cardiology services would be possible within this framework.

Models of service delivery need to include:

- the care of patients at risk of ventricular dysfunction or with ventricular damage post-AMI who will benefit from early detection;
- the care of newly diagnosed patients;
- the care of patients with clinical deterioration;
- regular and annual review mechanisms;
- easy access to hospital-based heart failure services lead by a cardiologist or physician with an interest in heart failure, so that diagnostics, ambulatory assessment and 7-day specialist support are available;
- care of patients with heart failure living in long-stay institutions.

The provision of specialist palliative care for patients suffering from heart failure needs to be explored in the context of developments for non-cancer palliative care. This should also address the expected need for respite care. This will require a shift in thinking since patients with end-stage chronic diseases have a different illness course to patients with cancer.

RECOMMENDATION 4.8

A programme should be developed to increase and support the capacity of primary care to detect heart failure at an early stage and to provide proactive care, including:

- **Education of the primary care team**, particularly GPs and practice nurses, in accordance with agreed national guidelines across primary and secondary care providers.
- **Agreement on and introduction of models of shared care**, supporting the key role of the GP and primary care team (*see Chapter 5, Hospital section*).
- **Deployment of specialist heart failure nurses** within an integrated system to maximise the value of these nurses to work with GPs and primary care teams.
- **Deployment of other staff to increase the capacity of primary care teams** to support the community-based management of patients with heart failure, including specialist palliative care.
- **Staffing arrangements to provide 7-day access** for heart failure patients with clinical deterioration.
- **IT capacity to facilitate communication** between primary and secondary care, including the establishment of heart failure registers and audits.
- **Tele-monitoring to support patients in adopting and maintaining self-care**. This will involve the adoption of agreed national guidelines across primary and secondary care providers.
- **Specialist palliative care** for heart failure patients.

Lead organisation: HSE

PERIPHERAL ARTERIAL DISEASE

While the main concerns associated with peripheral arterial disease (PAD) have traditionally been seen to be critical ischaemia and/or gangrene and their consequences, it is now recognised that these patients have a very substantial risk of other cardiovascular diseases (*see Recommendation 4.9*). Up to 30% of patients with established peripheral arterial disease will die within 5 years, mainly from associated coronary or cerebrovascular disease. Peripheral arterial disease typically presents with pain in the calf, thigh or buttock brought on by exercise and relieved by rest. Many patients with symptoms fail to present as they may attribute symptoms to normal effects of ageing or physical inactivity. Greater public awareness is needed regarding this disorder. The recommended assessment strategy for peripheral arterial disease is the arterial brachial index (ABI). Measurement of the ABI enables lower limb systolic blood pressures to be compared with normal brachial blood pressure. The ratio of the two gives the ABI which if less than 1 is indicative of some degree of peripheral arterial disease. By convention, a scale of circulatory impairment is agreed such that:

>1.10	normal (although if higher may indicate incompressible/calcified arteries)
0.90 – 1.10	normal range
0.70 – 0.89	mild-to-moderate PAD
<0.70	moderate-to-severe PAD

It has been recommended that ABI measurements should be undertaken in the following groups of patients:

- any patient with absent peripheral (dorsalis pedis or posterior tibial) pulse;
- any patient with symptoms of peripheral arterial disease;
- men older than 55 years with significant risk factors for cardiovascular disease;
- women older than 65 years with significant risk factors for cardiovascular disease.

Patients with absent pulses and/or other indications of peripheral ischaemia require referral to a vascular surgeon – those with critical ischaemia will require urgent referral. For asymptomatic patients, treatment is focused on the management of cardiovascular risk factors, including lifestyle modifications (stopping smoking, losing weight, increasing physical activity) and pharmacotherapy, such as anti-platelets, lipid-lowering therapy and anti-hypertensives as appropriate.

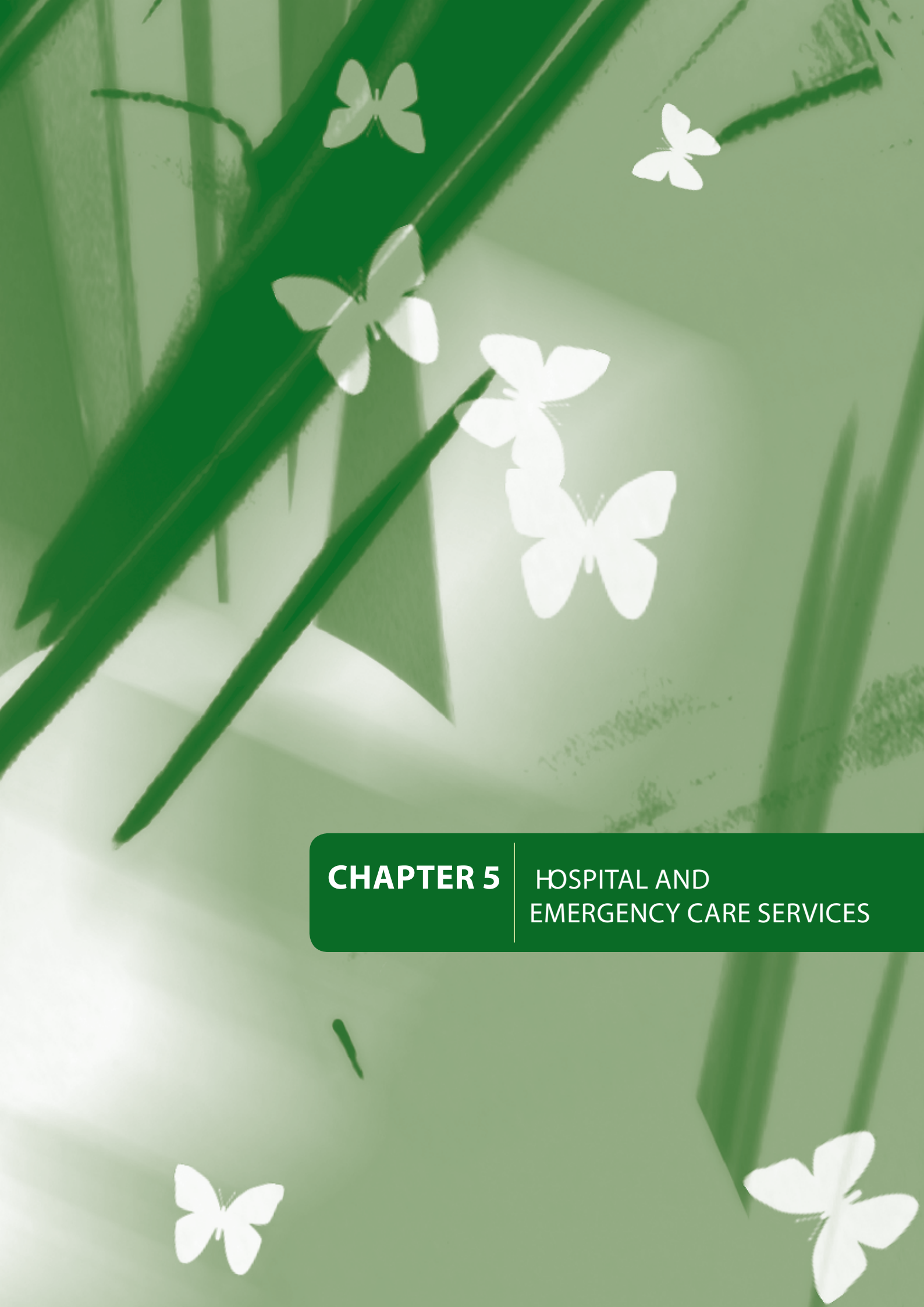
RECOMMENDATION 4.9

A protocol for risk assessment and management of patients with suspected peripheral arterial disease (PAD) should be developed and evaluated in primary care.

Lead organisation: HSE, in partnership with Irish College of General Practitioners and Royal College of Physicians in Ireland

INFORMATION SYSTEMS IN PRIMARY CARE

Reiterating the recommendation of the *Primary Care Strategy* (Department of Health and Children, 2001), general practices need to be supported to establish population and disease registers that will support cardiovascular disease management. Information systems are needed to support risk assessment and intervention programmes. This includes data standards to record and calculate risk factors and scores for patients, and to incorporate follow-up protocols. The HeartWatch dataset has demonstrated the feasibility of implementing structured data collection systems in general practice in Ireland. Other systems such as SCORECARD, used in a number of European countries, provide models for quantified delivery of care. Routine recording of an adequate minimum dataset as part of clinical practice must be the aim of any system introduced. The shift towards structured care emphasized in this policy depends on a systematic patient recall system. These systems can support shared care protocols within a chronic disease management model (e.g. for heart failure) and will also provide mechanisms for audit of such care (*see Chapter 8 for further discussion*).



CHAPTER 5

HOSPITAL AND EMERGENCY CARE SERVICES

5. HOSPITAL AND EMERGENCY CARE SERVICES

This chapter addresses hospital care for cardiovascular conditions, including emergency and acute cardiac and stroke care, and related pre-hospital emergency services; and the non-emergency role of hospitals concerning surgery and management of heart failure, peripheral arterial disease and grown-up congenital heart (GUCH) disease.

The approach taken for acute cardiac and stroke services is:

- to outline service delivery imperatives based on best practice guidelines for emergency and acute settings;
- to outline a network model of service reconfiguration and development to deliver these services;
- to specify pre-hospital emergency service priorities in line with this model;
- to outline the role of hospital care for heart failure, peripheral arterial disease and grown-up congenital heart disease.

Some general consideration of the role of cardiovascular care pathways is provided before moving on to discuss cardiac-specific and stroke-specific aspects of acute care pathways. The models of acute care presented here reflect best international practice with respect to the organisation of services and the nature of clinical care provided. While this chapter focuses on the acute services, clinical pathways also relate to how cardiovascular disease is prevented, its early detection, its ongoing treatment, rehabilitation and palliative care. One of the key objectives of this policy is to provide evidence-based recommendations on optimal cardiovascular care pathways; to reflect on the organisation of the current health services in Ireland and the capacity of healthcare professionals; and then to identify conditions for successful implementation of these proposals.

Within the current resource framework, there is much that can be done to improve clinical care and outcomes, particularly for emergency patients, as well as to reduce costs without sacrificing quality. The HSE's 2007 *Ireland: Take Heart* was an audit of progress on the implementation of the first cardiovascular health strategy, *Building Healthier Hearts* (1999) and it reported that good progress had been achieved generally. There remains, nonetheless, healthcare variation across the HSE due to a variety of causes, including how services are organised and the application of resources across the system. There is much that can be put in place by way of organisational change, applying best practice procedures, developing new cardiovascular models of care and the introduction of clinical pathways that stress the improvement of clinical processes in cardiovascular care to enhance clinical effectiveness and efficiency. The introduction of these clinical pathways and cardiovascular models of care will provide an effective strategy for the HSE to develop better care and reduce clinical performance variations across the system. These new cardiovascular pathways are an evidence-based response to specific care needs and go beyond practice guidelines because they build on the organisational change already underway. In tandem with the development of clinical networks and with appropriate managerial support, such pathways will enable more effective cardiovascular care, in particular for patients who require emergency treatment.

It is acknowledged that significant reconfiguration and restructuring is already underway within the HSE. At the centre is the requirement to provide more effective healthcare while maximising the use of scarce resources, such as facilities and specialist healthcare staff. This is against a backdrop where

the burden of chronic diseases is likely to continue to increase and the current system of clinical care will need to change if patient needs are to be met. Secondary specialist services will need to adapt and provide more support to primary healthcare providers. Emergency care facilities are often at capacity due to lack of alternative care pathways to manage patients referred from the community. Technology has also changed and new models of care for cardiac conditions and stroke mean that, in effect, many cases of stroke and acute coronary syndrome can be prevented.

These changes are already taking place in some hospitals and regions throughout the country. If these benefits are to be realised, however, the new cardiovascular care pathways and models of care will need to be implemented on a systematic basis across the HSE. This will have to occur in an economic environment where there is likely to be no additional specified resources dedicated to this new cardiovascular health policy in the short term. Instead, it is proposed that the development of new emergency models of care and new clinical networks will take place within current resources. This policy will, however, inform future service and staffing developments (e.g. the deployment of additional medical consultant staff) and future capital developments subject to resource availability. Many of the steps for development of these pathways of care and emergency care models are, or can be put, in place at present. This work and policy should inform the existing reconfiguration programme and new work practices that emerge.

Changing the cardiovascular model of care is considered to be a priority in the way we plan and deliver services in order to avoid potential risks in how services are currently provided. In terms of implementation of the hospital and emergency care service recommendations of this policy, the first stages should include the adoption of the new care pathways for cardiac conditions and stroke, particularly in emergency settings. This should be complemented by the development of hospital networks to support this care. Many of these elements are already in place. On an incremental basis, the HSE should implement these new policy requirements subject to the reconfiguration programme and to developments that are planned and agreed in the national service plans.

ACUTE CARDIAC CARE PATHWAYS

1. Emergency care pathway for acute myocardial infarction

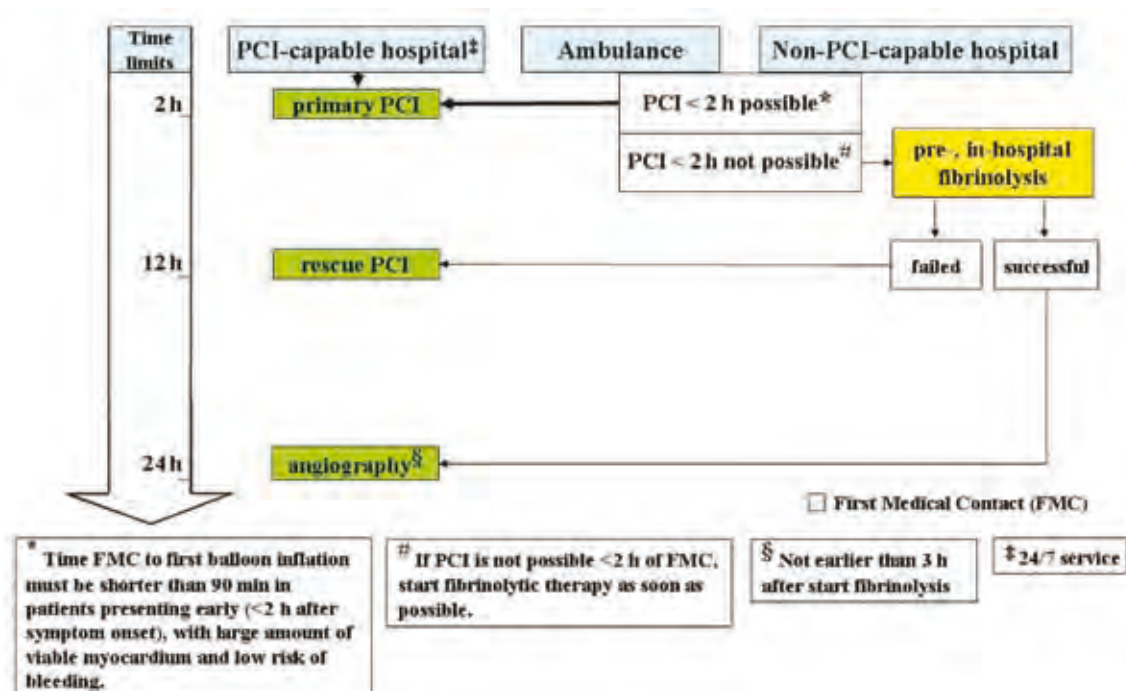
Survival followed by speedy reperfusion is the goal of emergency care. For acute myocardial infarction (AMI) patients who present with ST elevated AMI (STEMI), thrombolysis within the treatment time window has been the mainstay of emergency reperfusion to date.

Mechanical reperfusion through primary percutaneous intervention (PCI) has a major advantage over thrombolytic therapy. It achieves full reperfusion in over 90% of patients soon after the initiation of the procedure, without an increase in the risk of hemorrhagic stroke. Overall, the benefits of primary angioplasty – as shown in major studies (Anderson *et al*, 2003; Aversano *et al*, 2002; Widimsky *et al*, 2003) – are a reduction in mortality, re-infarction, stroke and recurrent ischaemia. More specifically, a meta-analysis comparing the outcome of thrombolysis and PCI at 30 days post-infarction found that PCI prevented 20 deaths, 40 re-infarctions and 10 strokes for every 1,000 patients treated (Keeley *et al*, 2003). Organisationally, potential benefits are reduced thrombolytic medication use, reduced hospital stay (since angioplasty is undertaken shortly after hospital admission) and reduced need for cardiac surgery.

Effectiveness of both primary PCI and thrombolysis depends on timeliness of delivery (the concept of 'time is muscle'). PCI (angioplasty/stenting) delivered within 120 minutes of first medical contact is now the ESC recommendation for maximal reperfusion of blocked coronary vessels (Van de Werf *et al*, 2008). Where this is not feasible, thrombolysis delivered as early as possible using pre-hospital or hospital facilities will restore perfusion in about half of patients. Early catheterisation and intervention with thrombolysed patients is then required at the earliest possible time within the following 24 hours.

The decision tree for management of acute cardiac care, as outlined in the ESC STEMI Guidelines (Van de Werf *et al*, 2008), is presented in Figure 6.

Figure 6: Decision tree for management of acute cardiac care



Source: Van de Werf *et al* (2008). Reproduced with permission of the copyright owner.

PCI must be delivered in accordance with international standards relating to the staff providing the service and the facilities where the services are delivered. Criteria are specified in Box 1. Where patients cannot reach PCI services within the time specified for safe and effective care, early reperfusion is to be provided by building up services that have well-resourced and trained pre-hospital emergency facilities and staff. A balance of primary PCI facilities and pre-hospital services to complement existing primary cardiac centres providing thrombolysis will provide the widest and most equitable coverage of these services to the public in Ireland (see *Recommendations 5.1-5.5*).

Box 1: Focus on requirements for primary PCI programmes

A range of programme requirements is specified by the ACC/AHA criteria for competency per year. Core requirements are related to volume per operator and throughput per institution annually. Key points are summarised:

- Physicians performing primary PCI should complete 75 or more total PCI cases per year.
- Institutions providing primary PCI should:
 - admit a minimum of 60-65 and optimally 85-90 or more acute ST-segment elevation MIs annually;
 - perform a minimum of 36 and optimally 49 or more primary PCIs annually.

These requirements are likely to change in this rapidly evolving area of practice. Irish standards should adjust to new recommendations as required.

For patients who present with acute ischaemia without evidence of STEMI, the ESC Guidelines on heart failure (Dickstein *et al*, 2008) recommend early angiography and relevant intervention following risk assessment. Five recommendations are made below on acute management (see *Recommendations 5.1-5.5*).

RECOMMENDATION 5.1

Patients with ST elevation myocardial infarction should be treated with primary percutaneous intervention (PCI) as first-line therapy, in accordance with the 2007 ESC Clinical Practice Guidelines if the time from first medical contact to primary PCI can be achieved within 120 minutes.

Optimal treatment under this development will require an emergency medical system to link a network of hospitals having cardiac facilities, with a clear designation of geographic coverage, shared risk stratification protocols for pre-hospital diagnosis and triage, and fast transport in appropriately equipped ambulances or helicopters.

Lead organisation: HSE

RECOMMENDATION 5.2

If PCI cannot be provided within 120 minutes of first patient contact, the patient should be assessed for thrombolysis as soon as possible. Treatment options should include pre-hospital thrombolysis in addition to the in-hospital service, depending on patient presentation.

Protocol-driven emergency thrombolysis should be provided in either pre-hospital or hospital settings. The priority in service development will be to deliver the fastest service to the widest range of patients and this should be reflected in future service plans. Pre-hospital thrombolysis has been incorporated in the advanced paramedic scope of practice by the Pre-Hospital Emergency Care Council and a supporting clinical practice guideline has been published. A programme to train GPs for appropriate roles in pre-hospital emergency care, including thrombolysis in certain rural areas, is also underway.

Lead organisation: HSE

continued

RECOMMENDATION 5.3

Emergency PCI services should be delivered on a 24-hour 7-day basis in a small number of centres, sited to maximise patient access and workforce expertise and coverage.

Some centres which do not provide emergency services may be able to provide PCI for patients presenting directly to them during restricted hours, provided that there is a sufficient throughput to maintain expertise.

Lead organisation: HSE

RECOMMENDATION 5.4

Patients assessed as having forms of acute myocardial ischaemia other than ST elevation myocardial infarction should be taken to the nearest acute medical facility, triaged at the emergency department, treated and stabilised, moved to the nearest acute coronary care setting and then transferred within 24 hours to the nearest comprehensive cardiac centre.

Most of these patients will require diagnostic angiography and some will require early intervention. These recommendations refer to patients transferred to hospital by ambulance. The same diagnostic and treatment protocol applies for those patients (currently approximately 50%-55%) who arrive at hospital independently of the emergency services.

Lead organisation: HSE

RECOMMENDATION 5.5

Designation of cardiac networks providing diagnostic and interventional services should include non-invasive diagnostic imaging facilities, in addition to echocardiography, catheterisation and angiography.

Pragmatically, a minimum of two investigative/angiographic laboratories are needed in each centre providing the service to deliver on a timely basis. Furthermore, the period of changeover from a largely thrombolysis-based reperfusion service to a primary PCI needs to be carefully monitored to ensure that standards of patient care are maintained in the transition period. Network development is a core first step in the implementation of this policy.

Lead organisation: HSE

2. Intensive cardiac care

The work undertaken by coronary care units has changed significantly in recent years. Rates of acute ST segment myocardial infarction are falling, while the presentation of other acute coronary syndromes is increasing. Other activity suited to these units includes management of potentially life-threatening arrhythmias, severe or resistant heart failure, haemodynamically controlled interventions in acute heart failure and the management of unstable patients with cardiac problems transferred from other disciplines. The Coronary Care Unit now needs to evolve to become an Intensive Cardiac Care Unit (ICCU), functioning in close liaison with the emergency department while remaining under the control of the cardiology service (as described in the ESC STEMI Guidelines – Van de Werf *et al*, 2008) (see Recommendation 5.6).

ICCU will continue to be responsible for the management of all forms of acute ischaemic heart disease. As this is now largely intervention-based, patient stay is shortened and there is often insufficient time for patient education about their disease and its long-term management. Protocols

must ensure that individualised patient treatment plans, including adequate patient education, are formulated and put in place *before discharge* (see *Recommendation 5.7*). This is essentially Phase I of an integrated rehabilitation programme and needs to commence during hospitalisation (see *Chapter 6 on rehabilitation*).

With a shift to primary PCI in a small number of comprehensive cardiac centres, ICCUs in smaller general centres will care for a different case mix of patients, with a greater focus on high-dependency patients (such as those with heart failure and rhythm disorders) as well as lower risk acute coronary syndrome patients. A review of the need for, and supply of, this type of cardiac care is necessary to inform service reconfiguration.

RECOMMENDATION 5.6

The current Coronary Care Unit should be substantially reconfigured, following needs assessment, to become an Intensive Cardiac Care Unit (ICCU), meeting the changing clinical profile of the patients now encountered.

A review of the changing pattern of need and supply for acute cardiac care is required to underpin this reconfiguration.

Lead organisation: HSE

RECOMMENDATION 5.7

Protocols need to be developed to ensure provision of individualised patient treatment plans in Intensive Cardiac Care Units, incorporating education of patients within a tailored, phased rehabilitation framework.

It is acknowledged that new procedures and increased efficiency, resulting in shorter stays in hospital, challenge the traditional model of patient education and early rehabilitation at this point. New ways to achieve the same effects are needed.

Lead organisation: HSE

3. Emergency and ambulatory care of patients with chest pain

There are two components to efficient and effective assessment and management of patients with chest pain: (1) care of acute presentation to an emergency department and (2) sub-acute presentation in ambulatory settings, usually following referral by a GP.

In the acute setting, the goal is to triage the high-risk patient for urgent treatment of acute coronary syndrome and to assess the lower risk patient, so that those with ischaemic heart disease are identified and treated, while those without are discharged (see *Recommendation 5.8*). Such a service, in or near an Emergency Department or Medical Assessment Unit or CCU, has been established in many countries. It is based on a focused and protocol-driven assessment, and has been found to be rapid, safe and cost-effective, with reduction in litigation, on the one hand, and reduction in inappropriate admissions, on the other.

In the sub-acute setting, there is a requirement to address the needs of patients referred by their GP where there is a pressing concern about emerging ischaemic heart disease. To meet the needs of this group of patients, there is a requirement to provide same-day specialist expertise and relevant

diagnostic services. This can be achieved by reorganising out-patient clinics to accommodate urgent evaluation. In some countries, this urgent 'one-stop' assessment has been fashioned into a specific model (e.g. the Rapid Assessment Chest Pain Clinic). An example of an algorithm developed in the Irish setting is included in Appendix 3.

Other aspects of ambulatory care include the evaluation of patients with acute dyspnoea, tachycardia or bradycardia, suspected cardiogenic syncope and suspected acute or increasing heart failure. This requires timely access to the relevant diagnostic tests and specialist expertise.

Specific clinical presentations benefit from specialised ambulatory focus. These include conditions such as heart failure, pacing, hypertension and lipid disorders. Certain conditions are concentrated in specific centres, e.g. follow-up of grown-up congenital heart (GUCH) disease. Evidence on emerging investigative techniques needs ongoing monitoring to inform necessary evolution of ambulatory care services.

RECOMMENDATION 5.8

Hospitals admitting patients with acute cardiac conditions should have a protocol-driven assessment of patients with lower-risk chest pain to maximise detection of those with acute ischaemia and to minimise inappropriate admissions.

In tandem, priority ambulatory care must be formulated to deliver specialist expertise, ideally by the next working day or within 72 hours at the latest for GP-referred patients with acute or suspicious presentations. In addition, a specialist ambulatory focus for a number of clinical presentations should be considered so that appropriate expertise and techniques can be made available and used to maximum effect in the context of a rapidly changing clinical evidence base.

Lead organisation: HSE

4. Heart failure care

There were over 18,000 hospitalisations in Ireland in 2006 as a result of heart failure. Approximately 1 in 5 of the population with heart failure will be admitted to hospital in any one year and many will be readmitted. The adoption of a structured approach to heart failure is proposed in Chapter 3, as embodied in the ESC Guidelines on heart failure (Dickstein *et al*, 2008). Structured heart failure programmes can achieve significant reductions in rehospitalisation rates, improve patient quality of life and prognosis, and have been shown to be cost-effective.

This model requires a move from emergency in-hospital care to accessible ambulatory specialist care that supports proactive care by GPs and primary care teams (see *Recommendations 5.9-5.11*). The HSE's (2007) *Ireland: Take Heart* report found that two-thirds of relevant acute hospitals had initiated a structured heart failure service.

Key requirements for a specialist heart failure ambulatory service

Personnel:

- Cardiologist with an interest in chronic disease management.
- Specialist heart failure nurses and appropriate cardiac technician support.
- Access to other members of a comprehensive multidisciplinary team.
- Administrative support to help coordinate the interface between hospital and community.

Facilities and organisation:

- Timely diagnostics in support of diagnosis and care.
- Ambulatory care based on 5-day open or appointment-based access clinic, with arrangements for 7-day cover for clinical deterioration.
- Designated consultant(s) and service specialising in heart failure in each hospital where heart failure services are provided.
- Quality control, support, rapid transfer when needed and protocol supervision by the heart failure cardiologist specialist(s) at the network cardiac referral centre.
- Appropriate rehabilitation programmes for heart failure patients (*see Chapter 6 on rehabilitation*).

Shared heart failure care between hospital and community services

Agreed models of shared care for patients with heart failure should be developed for:

- patients at risk of ventricular dysfunction or with ventricular damage post-AMI who will benefit from early detection;
- newly diagnosed patients;
- patients with clinical deterioration.

Local adaptation of guidelines between GPs/multidisciplinary teams and hospital cardiology services should be possible. Effective shared care requires developments in ICT to facilitate communication between hospital and community, including to minimise unnecessary referral and expedite needed referral.

RECOMMENDATION 5.9

All hospitals evaluating patients with heart failure should restructure in-hospital and out-patient cardiac care to allow for specialist heart failure ambulatory services that support the key role of the GP and primary care team.

Lead organisation: HSE

RECOMMENDATION 5.10

Models of shared care of patients with heart failure should be established, based on agreed national guidelines and on models currently being elaborated in Ireland and internationally.

Lead organisation: HSE, in association with Irish College of General Practitioners and Irish Heart Foundation

continued

RECOMMENDATION 5.11

ICT-enabled communication between hospitals and GPs or primary care teams should be actively used to support shared heart failure care.

Lead organisation: HSE

ORGANISATION OF SPECIALIST CARDIAC SERVICES

Specialist cardiac services should be organised into regional networks, as envisaged in the recent ESC STEMI Guidelines (Van de Werf *et al*, 2008), in order to deliver a comprehensive range of cardiac services. Proposed cardiac networks will be based on an approximate ratio of 1 network per 500,000 population, depending on geography and population density (*see Recommendation 5.12*). Partner hospitals within each network will work collegially in order to provide a comprehensive and equitable service to all in the region and in some cases providing national specialty care. Central to the network concept is the principle that every hospital delivers a comprehensive range of cardiac services, either on site or in formal partnership with others. Acute and national specialty services are provided in a smaller number of regional centres to ensure the high volume 24-hour 7-day throughput needed for rapid, responsive and accessible high-quality care. Non-acute and out-patient services are core aspects of specialist cardiac care. They are provided at both general and comprehensive cardiac centres (as defined in Box 2, *see p. 91*) to facilitate patient access.

RECOMMENDATION 5.12

Specialist cardiac services should be organised into population-based cardiac networks, with network hospitals designated as (i) General Cardiac Centres or (ii) Comprehensive Cardiac Centres.

A broad plan for service reconfiguration needs to be developed. This should identify general and comprehensive cardiac centres and allow service planning – involving workforce and emergency service development in particular – to evolve within the new network structure.

Lead organisations: HSE and Department of Health and Children

Specialist cardiac services provided on a network basis will include an intensive cardiac care unit, a heart failure service, arrhythmia management service, invasive and non-invasive diagnostic services, out-patient services, rehabilitation, teaching, management functions, in-patient care for chronic cardiovascular disorders, sub-specialist clinics where appropriate and, in many cases, sub-specialist electrophysiological services. Hospitals must be staffed by medical, nursing and allied health professionals to an appropriate level, in conformity with recognised professional standards (*see Chapter 7*). Ongoing care and rehabilitation and liaison with primary care are recognised as important components of these services (*see Chapter 6*). Every cardiac specialist, whatever the individual's sub-specialty interest, will be a member of the regional network and will be allocated specific responsibility for services at a hospital within the network. Every network should have a cardiologist, whose primary function is the organisation of preventive services and liaison with primary care and GP services.

Every cardiac specialist within the network, irrespective of the location of their main workplace, will have parity of esteem and equal access to appropriate facilities and services within the network. Services for certain areas – such as primary PCI, surgery, specialist electrophysiology and grown-up congenital heart disease – may be provided in partnership with other cardiac centres. In addition, each network must provide facilities, either within the network or by direct partnership arrangements with national centres, for the management of grown-up congenital heart disease, peripheral arterial disease facilitation of paediatric cardiological assessment and assessment of families at risk of sudden cardiac death. The aim of the network will be to provide the same level of service for all who need it, incorporating a seamless service with appropriate inter-hospital transfer for acute, sub-acute and chronic care across the network. Box 2 provides a summary of the range of services available at network level.

Box 2: Cardiac networks – Roles of hospitals designated as general and comprehensive cardiac centres

GENERAL CARDIAC CENTRES

Role: To provide sub-acute and chronic care services.

Services provided:

- Liaise with pre-hospital emergency services to determine reperfusion type and treatment location appropriate to individual patient circumstances.
- Triage and transfer eligible on-site acute myocardial infarction patients for primary PCI.
- Provide thrombolysis where appropriate and where primary PCI is not feasible.
- Provide diagnosis and treatment of sub-acute presentations of cardiac disease and chronic cardiac conditions.
- Provide heart failure services.
- Provide rapid access chest pain services.
- Provide cardiac rehabilitation and palliative care services.
- Provide out-patient cardiac care services in liaison with primary care services. This may include rapid access chest pain clinics depending on regional need.
- Provide primary management of rhythm disorders.
- Promote preventive services in the community in liaison with primary care staff.

Facilities needed:

- 24-hour 7-day emergency services, including chest pain assessment service.
- Intensive cardiac care unit.
- Cardiac rehabilitation facilities.
- Specialist cardiology consultant and multidisciplinary support staff.
- Diagnostic and treatment support for sub-acute and chronic cardiac disease.
- Community-based facilities and resources to deliver preventive cardiology services in tandem with primary care staff.

continued

Box 2: Cardiac networks (continued)

COMPREHENSIVE CARDIAC CENTRES

Role: To provide acute care services.

Services provided:

- All will provide interventional (cardiac catheterisation, stenting) and non-interventional investigation and treatment over the working day.
- Some will provide 24-hour 7-day catheterisation, including stenting/PCI for acute MI (estimated at approximately one centre per 500,000 population).
- All will provide specialist heart failure services.
- All will provide rapid access chest pain services.
- All will provide management of rhythm disorders.
- All will provide treatment of peripheral arterial disease.
- Some will provide designated national sub-specialties, including electrophysiology, cardiac surgery, congenital heart disease services and transplantation.
- All will coordinate aspects of the cardiac network, to include identification of community liaison staff and network facilitation through use of ICT.

Facilities needed (in addition to those for general cardiac centres):

- Two cardiac catheter laboratories as a minimum, with 24-hour 7-day availability.
- Electrophysiology laboratory.
- National or regional sub-specialty services, including cardiac surgery, transplantation, congenital heart disease to be available in some units.
- Vascular surgery.

CARDIAC SURGERY

Surgery for acquired heart disease in adults

Recent changes in medical practice and patient demographic profiles have had a major impact on cardiac surgical practice. Changes in the profile of patients seen in Ireland reflect international experience. Fewer patients are now referred for cardiac bypass grafts (CABG) due to the increased use of drug-eluting stents for multi-vessel coronary artery disease. Patients presenting for surgery are now older due to improved life expectancy and raised quality of life expectations in older adults. Patients have more co-morbidity and present with more complex case mixes. Procedures now include combined valve and grafts, double valve procedures, grafts with carotid endarterectomy and a greater proportion of 'second time' or repeat procedures. Thus, although fewer operations are being carried out, there is very little spare capacity in the operating time currently available for cardiac surgery in Ireland.

Future demands on cardiac surgery are anticipated with the projected ageing population, as outlined in Chapter 2. The increased immigrant population in recent years, some with genetic backgrounds that will influence the spectrum and severity of disease, will also have an effect in time. Overall, the decrease in number of cases of CABG surgery will be offset by the changing patient profile, including more complicated case mixes.

Bed demands

While there is consensus that the numbers of existing and approved consultant surgeon posts are adequate to meet demand at present and into the immediate future, availability of intensive care beds represents a serious challenge to cardiac surgery activity. Average length of stay in ICU has been significantly prolonged because of a combination of the increasing age of patients, the increase in co-morbidities and the more complex case mix. Lack of availability of intensive care beds is a rate-limiting step for scheduled cardiac surgery. This is true for both adult and paediatric cardiac surgery. For the years 2006 and 2007, approximately 2,000 cases needed to be carried out annually. The four adult surgery units carried out on average 1,400 cases; a further 300 were performed through the National Treatment Purchase Fund and carried out in the private sector; and the combined waiting list was about 300 cases. Dedicated cardiac surgical intensive care units, separate from the general intensive care delivery, are needed in all hospitals. Specifically, a dedicated unit for paediatric cardiac surgery is needed. There is also a shortage of intensive care beds in some of the established units. Because of the increasing problems encountered with hospital-acquired infection in Ireland, there is also a need for more single/isolation rooms. Almost all new beds should be single-room beds (*see Recommendation 5.13*).

RECOMMENDATION 5.13

Cardiac surgical units should have a dedicated Intensive Cardiac Care Unit, with adequate numbers of beds (the majority to be provided in single rooms).

Lead organisation: HSE

Anaesthetic and intensive care

Another area of change in the delivery of cardiac surgery today is the model of anaesthetic and intensive care in individual units. It has been shown that optimal outcomes are achieved when consultant anaesthetic staff with specialty training in cardiac anaesthesia are available for all cardiac surgery procedures, whether carried out during the routine working day or on-call (*see Recommendation 5.14*).

RECOMMENDATION 5.14

All consultant anaesthetists and intensivists providing care to cardiac surgery patients should have specialist training.

All anaesthetists providing cardiac anaesthesia should carry out at least one cardiac surgery list per week. A dedicated cardiac anaesthetic on-call rota should be established in each hospital providing cardiac surgery.

Lead organisations: HSE and relevant postgraduate training bodies

Transplantation

The current demand for heart transplants is up to 20 patients per year and for lung transplants (including single lung, double lung and heart–lung) is up to 30 patients per year. In terms of waiting lists, there were 18 patients awaiting heart transplantation and 33 awaiting lung transplantation in mid-2008. A significant barrier to thoracic organ transplantation in Ireland is availability of suitable donor organs for current matching recipients. The selection criteria for thoracic donor organs are more complex than for other organs, resulting in additional constraints on access to adequate numbers of organs. While Ireland has a very good deceased donor rate compared to some other countries, improved access to an adequate number of organs is needed (*see Recommendation 5.15*). The Minister has agreed with the Health Service Executive, as part of its 2010 Service Plan, that the HSE will establish an Organ Donation and Transplantation Unit within its existing national structures and resources. This unit will provide a national focal point for reporting, monitoring and assessing organ donation and transplantation activities. It is appropriate that these functions be carried out at a national level, on the basis of regular, comprehensive performance data provided by all the transplant centres. This approach will provide a sound basis for evaluating performance and examining other issues related to transplantation.

RECOMMENDATION 5.15

Solutions to maximise access to donor organs for transplantation should be explored.

Specific initiatives will be informed by the work of the Organ Donation and Transplantation Unit, to be established within the HSE's existing national structures and resources.

Lead organisations: Department of Health and Children and HSE

Congenital heart disease and grown-up congenital heart (GUCH) disease

All paediatric surgery for congenital heart disease in Ireland is carried out in Our Lady's Hospital for Sick Children in Crumlin (OLHSC). The waiting list for routine surgery is now about 3 months, with approximately 90 children waiting. While these surgical and waiting list figures are satisfactory, inadequate access to operating theatre time and insufficient ICU beds mean that approximately one-third of these procedures takes place outside of normal working hours, i.e. in the evenings or at weekends. Operations may be cancelled or postponed at short notice, creating difficulties for children and their families and a challenging work environment for the staff involved.

The population of children surviving into adulthood with congenital heart disease is increasing. Many of these patients will require further surgery as adults, as outlined in Chapter 2. In 2007, 70 operations were undertaken. The prediction is that this number will more than double within 5 years, i.e. by 2014 (*see Recommendation 5.16*). This type of surgery is usually much more complex than conventional adult cardiac surgery. For these reasons, GUCH procedures are associated with a greater use of facilities.

RECOMMENDATION 5.16

A review of service needs and availability for GUCH patients (Grown-Up Congenital Heart disease) should be carried out in the context of international trends, followed by a service development plan for this expanding population of patients.

Lead organisation: HSE

Cardiac-related surgery

Decisions concerning recommendations for screening and surgical repair of aortic aneurysm are not considered here, but should be considered further as part of general policy requirements for health screening.

ACUTE STROKE CARE

There is substantial evidence of improved outcomes with organised and dedicated facilities and systems to care for patients with stroke. This includes admission to rapid access trans-ischaemic attack (TIA) clinics for those with suspected TIA, a major risk for subsequent stroke; timely access to stroke thrombolysis with onset of ischaemic attack for suitable patients in order to improve overall clinical outcome; and delivery of care for those with stroke in a stroke unit setting with adequate rehabilitation throughout recovery following discharge. The first *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, found that stroke services in Ireland require substantial development to meet international standards of care (Horgan *et al*, 2008).

There are 4 acute stroke care pathways, described below.

1. Stroke unit care

Stroke units are the foundation of timely and comprehensive stroke care in hospital and are a minimum standard internationally for audit and accreditation of stroke services. Expert guidelines from groups such as the European Stroke Organisation (ESO), the UK's National Institute for Clinical Excellence (NICE) and the Irish Heart Foundation recommend that a stroke unit exist in every acute hospital admitting stroke patients.

The benefits of stroke unit care, compared to care on a general medical ward, have been extensively studied. A recent summary of 23 randomised clinical trials reported a highly significant reduction in death and dependency by one-fifth of patients (22%) receiving stroke unit care. Results indicated that one death or dependency was prevented for every 16 patients treated in a stroke unit, and one extra patient was returned to independent community living for every 20 patients treated (Stroke Unit Trialists' Collaboration, 2007).

The goal of stroke unit care is to organise hospital stroke care in a specialised area with immediate access to specialist medical, nursing and rehabilitation health professionals, providing efficient and coordinated stroke care that is focused on the patient and family.

The European Stroke Organisation (ESO) defines a stroke unit as follows: 'A stroke unit consists of a discrete area of a hospital ward that exclusively or nearly exclusively takes care of stroke patients and is staffed by a specialist multidisciplinary team. The core disciplines of the team are medicine, nursing, physiotherapy, occupational therapy (OT), speech and language therapy (SLT) and social work. The multidisciplinary team should work in a coordinated way through regular meetings to plan patient care. Programmes of regular staff education and training should be provided' (ESO, 2008).

The first *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, found that only one acute hospital (3% of acute hospitals) in Ireland operated a stroke unit in 2006 (Horgan *et al*, 2008). While this number has since increased, it remains very far behind neighbouring systems.⁴ For example, 96% of hospitals in England and 92% in Northern Ireland have such units. Scotland, with 34 acute hospitals serving a population of 5 million, has a stroke unit in 24 hospitals (70%). It is estimated that universal introduction of stroke units in Irish hospitals would prevent 445 deaths or dependent outcomes each year and allow 356 extra survivors to return to independent community living who would otherwise require long-term care. It is also likely that stroke units reduce mean length of stay in hospital. For example, in the UK, stroke unit care was associated with an 18% reduction in length of stay between 2001 and 2004 (National Audit Office [UK], 2005).

As many acute hospitals in Ireland already have several elements of the staffing and infrastructure required to create a stroke unit, it is expected that widespread implementation of stroke unit care in the acute hospital system could be achieved with relatively little effort (*see Recommendation 5.17*). It would require re-organisation of existing services and targeted investment, including the strategic appointment of stroke-trained consultant geriatricians and neurologists to provide on-site clinical leadership and the appointment of specific nursing and rehabilitation staff (e.g. speech therapists) where service gaps exist in particular hospitals.

The establishment of stroke units requires designation of protected beds for stroke care, as a separate ward or within a defined area on an existing ward. The number of beds required will depend on the population served, the number of patients admitted annually (inflow) and the availability of post-acute rehabilitation and community support services (outflow). The Stroke Unit Trialists' Collaboration (1997) recognised that in-patient care for acute stroke may be provided in an acute unit, a rehabilitation stroke unit or a unit combining both acute care and rehabilitation. Stroke units must be adequately resourced, with sufficient capacity to admit patients directly from the emergency department, rapid access TIA clinics and transfers from other hospitals within the stroke network, and to treat all stroke/TIA patients for most of their hospital stay.

RECOMMENDATION 5.17

All hospitals admitting patients with acute stroke should have a stroke unit, as defined by the European Stroke Organisation.

Each stroke unit should have sufficient capacity to admit patients directly from the emergency department and the rapid access TIA clinic, to accept transfers from other hospitals within the stroke network when required, and to provide care for all stroke/TIA patients for their hospital stay. This should be a key priority for the hospital reconfiguration programme.

Lead organisation: HSE

⁴ There were 11 stroke units in place in 2009, although not all of these were fully staffed and equipped. A thrombolysis service has commenced in 10 hospitals, with a service on weekdays in a further 5 hospitals.

The majority of stroke patients have substantial medical co-morbidities and most mortality is from medical complications of stroke. The co-morbidities and complications of stroke require consultant stroke specialist input throughout the care pathway of stroke. Stroke physicians with specific expertise in cerebrovascular disease come from a variety of backgrounds, including consultant geriatricians, neurologists, pharmacologists and rehabilitation medicine (*see Chapter 7 for workforce implications of developing stroke services*).

Specialist stroke nursing care and multidisciplinary stroke rehabilitation must be available to stroke patients according to need in the acute and non-acute phases of their illness, on discharge to the community and in continuing care (*see Recommendation 5.18*). Care should be integrated across disciplines and care locations, with regular review of the needs of each individual patient. Stroke patients are physiologically vulnerable and often highly dependent in terms of mobility, feeding and communication, making adequate staffing a priority.

RECOMMENDATION 5.18

Stroke units should have adequate and appropriate staffing.

This includes a designated lead consultant stroke physician working within a stroke network group. In addition, stroke units should have adequate multidisciplinary teams of staff to cater for the complex needs of patients with stroke, many of whom will have high levels of dependency. Such teams should include physiotherapy, occupational therapy, speech and language therapy, social work, clinical nutrition and dietetics, clinical psychology/neuropsychology, and specialist nursing.

Lead organisation: HSE

Stroke unit facilities should include:

- Capacity for intensive monitoring of physiological variables.
- A clinical workstation and networked computers, ideally allowing on-site review of brain scan images.
- A well-equipped assessment area and rehabilitation gym close to, or incorporated within, the stroke unit.
- On-site CT brain scanning, with access on- or off-site to MRI scanning.
- Same-day availability of essential routine investigations, particularly carotid artery imaging, with early access to cardiac investigations.

Stroke unit care typically includes:

- **Medical assessment and diagnosis**, including imaging (CT and MRI) and early assessment of patient's neurological, surgical, neuroradiological, pharmacological, nursing and therapy needs.
- **Early multidisciplinary team assessment and management**, including positioning/seating, swallow, nutritional and communication assessment, venous thromboembolic prophylaxis and early mobilisation, prevention of complications and treatment of hypoxia, hyperglycaemia, pyrexia and dehydration.

- **Acute medical treatment** – Almost 2 out of 3 patients will develop neuromedical complications within one week that can adversely affect recovery. Stroke unit management includes prevention, assessment and treatment of infection, pain, progressive stroke, thromboembolism, arrhythmias, myocardial infarction, seizures and depression.
- **Rehabilitation planning and initiation**, involving coordinated multidisciplinary team care, assessment of pre-morbid and current function, treatment of spasticity and pain, initial goal-setting with patient and family, and early assessment of patient and family needs after discharge.

Comprehensive guidelines for the acute hospital care of patients with stroke are in development by the Council on Stroke of the Irish Heart Foundation, with the intention of agreeing and disseminating guidelines appropriate to Ireland. Protocols of care will support the implementation of guidelines, laying the foundations of quality of care and risk management, with evaluation through clinical audit.

The phases of acute care – emergency evaluation and treatment followed by the initiation of in-hospital rehabilitation – are described next.

2. Emergency stroke treatment with thrombolysis

Acute stroke is a medical emergency. Thrombolytic therapy is of proven benefit for selected patients with ischaemic stroke. In patients with acute ischaemic stroke (approximately 70% of all stroke patients), delivery of emergency stroke thrombolysis within 180 minutes of the onset of stroke symptoms improves overall clinical outcome, i.e. ‘time is brain’ (see *Recommendation 5.19*). In some patients, this treatment can cause complete early recovery from their stroke or substantial improvement with rehabilitation. The benefit is greatest for patients treated earliest after symptoms begin. Thrombolysis is an internationally recommended standard of care for appropriate patients in the early hours of stroke and is cost-effective. The evidence from clinical trials is that stroke thrombolysis confers substantial benefits after stroke, with one patient recovered or improved for every 3 patients treated. However, recent Irish studies (Kelly, 2009; Horgan *et al*, 2008) found that less than 1% of Irish stroke patients received emergency stroke thrombolysis in 2005 and 2006. By comparison, some centres in the UK and Europe report thrombolysis rates of 15%-20%.

Stroke thrombolysis carries a risk of brain haemorrhage. Therefore, international and EU guidelines dictate that stroke thrombolysis can be administered only under the direct supervision of a stroke physician, specifically trained and experienced in emergency stroke treatment. Access to CT or MRI neuro-imaging is required in order to exclude those at risk of further clinical deterioration due to brain bleeding or swelling with the treatment. A HSE National Hospitals Office survey in 2008 found that CT scanning was available in 32 of the 36 hospitals surveyed (27 had 24-hour 7-day services; 4 had a day-time service; and one had a half-time service). MRI scanning was available on a 24-hour 7-day basis in 19 of the 36 hospitals surveyed, with 2 having MRI on 2 days per week.

Acute stroke patients should be pre-triaged by ambulance paramedical staff, using recognised assessment tools, and transported as quickly as possible to an acute hospital providing emergency stroke treatment delivered by a consultant stroke physician and immediate brain imaging by CT or

MRI. Clinical practice guidelines have been developed by the Pre-Hospital Emergency Care Council for responders (cardiac first responders, occupational first aiders, emergency first responders) and practitioners (emergency medical technicians, paramedics and advanced paramedics) to recognise and appropriately respond to stroke patients.

RECOMMENDATION 5.19

Emergency stroke treatment by a consultant stroke physician should be available on a 24-hour, 7-day basis to all acute stroke patients within each stroke network.

When it is not feasible to transport the patient within the timeframe for emergency evaluation and treatment with thrombolysis, tele-medicine supported by an on-call consultant stroke physician should be available. This emergency treatment will be developed on an incremental basis.

Lead organisation: HSE

The introduction of emergency stroke thrombolysis within 180 minutes of stroke onset as the standard of care for eligible patients will require a reconfiguration of services in order to provide access to brain imaging and a consultant stroke physician within 180 minutes of the onset of symptoms on a 24-hour 7-day basis. While some acute general hospitals may provide a partial stroke thrombolysis service (e.g. 9-5pm, Monday-Friday), it is unlikely that the capacity to provide 24-hour 7-day consultant-delivered thrombolysis will exist at most general stroke centres. For audit and quality assurance purposes, and because future emergency treatments may require sophisticated brain imaging unavailable at these hospitals (e.g. diffusion-perfusion MRI), joint provision of emergency stroke care by a network of hospitals acting as general and comprehensive stroke centres is considered to be the optimal model of care (see *Recommendation 5.20*). Proposals to deliver this service may include rotation across the network, specialist-supported tele-medicine and out-of hours regionalisation. Future delivery of a 24-hour 7-day emergency stroke thrombolysis service will require formal agreement and clear protocols within each stroke network. The most suitable model for such a development will depend on factors such as geography and location of hospitals.

RECOMMENDATION 5.20

Each stroke network should agree a model of service delivery to meet the need for a 24-hour 7-day thrombolysis service.

Clear protocols and patient pathways should be identified, implemented and reviewed on a regular basis.

Lead organisation: HSE

3. Hospital in-patient stroke rehabilitation

Reviews of stroke rehabilitation provide firm evidence that organised, specialist in-patient care, such as provided in a stroke unit, is associated with improved outcomes (Young and Forster, 2007; Stroke Unit Trialists' Collaboration, 2001). Stroke rehabilitation is addressed in Chapter 6, but some issues are highlighted here in relation to acute hospital care.

Stroke rehabilitation starts soon after admission and should be continued throughout the patient's hospital stay. Early rehabilitation for all stroke patients should occur in a stroke unit, as an integral component of the work of the unit. This permits the multidisciplinary team to efficiently care for patients across the spectrum – from emergency assessment to discharge from hospital. The team can also act as a locus of expertise on stroke care for the population it serves.

Where the capacity of the unit providing emergency and early acute care is not adequate to accommodate early hospital in-patient rehabilitation, the stroke rehabilitation unit should be located as near as possible to the acute unit, using integrated care protocols and holding regular patient-focused multidisciplinary team meetings. These principles are particularly important where this phase of hospital in-patient rehabilitation is provided off-site.

Rehabilitation involves speech therapy, occupational therapy and physiotherapy working as a team, building on assessments done soon after admission, setting goals and reviewing them along with medical and nursing staff during meetings of the multidisciplinary team. Integrated care should be provided by the multidisciplinary team, implementing localised protocols of care (see *Recommendation 5.21*). Protocols for multidisciplinary team care should include acute assessment and early mobilisation. Goals for rehabilitation should be discussed with the patient and progress reviewed at multidisciplinary team meetings.

Rehabilitation provides opportunities for communication about stroke and about the person's progress towards recovery. The provision of information should be addressed in care protocols and recorded to ensure that patients and carers are provided with timely and appropriate advice on all aspects of the patient's condition, including:

- aetiology and prevention of stroke;
- basic care, such as lifting and management of medication;
- management of disabilities, use of equipment, communication difficulties;
- finance and access to additional information;
- further rehabilitation and care when the patient leaves the acute hospital.

Guidelines on the location and delivery of early assessment and in-hospital rehabilitation are described further in Chapter 6.

RECOMMENDATION 5.21

Evidence-based guidelines and protocols of care should be developed and adopted for acute and rehabilitation management of stroke patients.

Lead organisation: Irish Heart Foundation, in association with Department of Health and Children, HSE and HIQA

Discharge from the acute hospital

While most patients with stroke are discharged to their own home, some are transferred to another in-patient setting, either for intermediate rehabilitation or for long-stay care in a nursing home or long-stay hospital. The place to which the patient is transferred depends on the level of residual impairment, but also on the availability of carers and on the suitability and potential for adaptation of the patient's home.

The transition from the care of the staff in the acute hospital is a major landmark in the journey to recovery for the patient with stroke. The timing of discharge and requirements for continuing care are closely related to functional recovery and residual impairment and independence, or potential to regain independence, in activities of daily living. The *Irish National Audit of Stroke Care (INASC)* found that many patients and carers did not know who to contact in the hospital if problems arose after the patient left hospital (Horgan *et al*, 2008). Protocols of care should include providing details to patients of who to contact (e.g. a stroke liaison nurse) should they require help in the early days and weeks after leaving hospital. Preparation for discharge should begin as soon as the likely discharge scenario is apparent (*see Recommendation 5.22*). Clear structures and protocols should be in place for collaboration between stroke network staff who are hospital-based and those in the community, including staff in primary care teams. Community liaison staff are required in each stroke centre, including a medical social worker and stroke liaison nurse.

RECOMMENDATION 5.22

Patients should have a full needs assessment prior to admission to hospital, aiming to support discharge home or to their place of residence.

Placement in long-term care should only be considered on the basis of medical or social need, rather than as a result of inadequate community services and facilities.

Lead organisation: HSE

4. Transient ischaemic attack

Transient ischaemic attack (TIA) represents an important warning symptom of stroke and an opportunity to intervene to prevent the condition developing. Up to 30% of stroke patients have a TIA before their stroke, the majority in the preceding week. The risk of stroke after a TIA may be as high as 8% in the first week and 20% at 90 days. Approximately 2,500 patients are assessed in hospitals in Ireland each year with suspected TIA (as estimated from HIPE and the North Dublin Population Stroke Study data). Symptoms can be difficult to recognise for patients and carers, and can be a diagnostic challenge for staff. Because pain is not a feature of TIA, it may often be dismissed or its significance misunderstood by patients. However, early investigation and treatment of TIA can prevent stroke.

Available evidence suggests that same-day assessment and treatment by a consultant stroke physician-led team can prevent stroke and this is now a European Stroke Organisation standard of care (*see Recommendation 5.23*). Same-day rapid access TIA clinics allow appropriate diagnosis and risk stratification of suspected minor stroke and TIA. This service model has substantial proven benefits in preventing stroke in high-risk ambulatory patients, often avoiding hospital admission. These patients must be treated according to evidence-based protocols and pathways, and have access to specialist opinion, carotid imaging, other diagnostic investigations and facilities for immediate hospital admission when required. Where daily clinics are not possible in a hospital, rotating the clinics

between hospitals in the stroke network is a possible solution. If appropriately resourced rapid access TIA clinics are not available, patients with suspected TIA should be admitted to hospital.

After clinical and diagnostic assessment, patients should be given a diagnosis, commenced on anti-platelet medication where appropriate and have their vascular risk factors identified and treated. Access to early carotid endarterectomy is essential for symptomatic carotid artery stenosis in cases of TIA and minor stroke, requiring clear pathways of referral to vascular surgery units and operations completed within 2 weeks. All patients with a recent TIA should have access to lifestyle advice, including healthy diet and exercise, and where required smoking cessation support and treatment. In addition, all TIA patients should be advised not to drive or fly until it is formally deemed medically suitable to do so.

RECOMMENDATION 5.23

Patients experiencing transient ischaemic attacks (TIAs) should be referred to consultant-led, same-day, rapid-access TIA/stroke prevention clinics with appropriate diagnostic and management facilities, including secondary prevention advice, pharmacological management and access to vascular surgery, where needed, within 2 weeks.

Clear pathways of referral and use of risk stratification are needed to identify high-risk patients and aid 'immediate admission' decisions to be made in primary care and in emergency departments.

Lead organisation: HSE

Carotid stenosis and carotid endarterectomy

An estimated 20% of ischaemic stroke is due to emboli from high-grade carotid stenosis, with a smaller contribution from carotid occlusion. Carotid disease may be asymptomatic, symptomatic or remotely symptomatic, reflecting the dynamic nature of atherosclerotic plaque formation, inflammation, rupture, thrombus formation and healing by fibrosis and calcification.

The degree of carotid stenosis is most commonly calculated by Doppler ultrasound estimation of velocities in the common carotid and internal carotid arteries. Research evidence strongly supports the benefits of surgery over medical management alone in symptomatic moderate-to-severe (70%-99%) carotid stenosis to reduce the incidence of recurrent neurovascular events (TIA and stroke) (see *Recommendation 5.24*). The absolute risk reduction in stroke varies from 15%-21% over 2 years. This benefit is greatest when carotid endarterectomy is performed within 2 weeks of symptoms, with no significant benefit for carotid endarterectomy if patients wait 3 months. A smaller benefit of carotid endarterectomy over best medical treatment is also demonstrable in moderate stenosis (50%-69%), but not in mild stenosis (<50%).

Asymptomatic carotid artery disease is a risk factor for stroke, with an estimated annual risk of stroke of 4%. Carotid endarterectomy in asymptomatic patients has been shown to halve this risk in randomised controlled trials, but this was before strategies for intensive medical treatment were fully developed. Selection of high-risk patients (predominantly older men with a low intraoperative risk and/or demonstrable microemboli on trans-cranial Doppler, unstable plaque morphology) ensures most benefit from surgical intervention. Carotid stenting or angioplasty may have a role in reducing risk of stroke where carotid endarterectomy is technically difficult or where operative risk is prohibitively high. Its application as a wider strategy for stroke prevention in carotid disease is still being evaluated.

RECOMMENDATION 5.24**Clinical management of carotid disease should involve the following:**

- All patients with recent TIA or non-disabling stroke should have urgent ipsilateral carotid assessment by Doppler ultrasound or CTA/MRA. Carotid endarterectomy should be offered to all patients with symptomatic moderate-to-severe (70%-99%) carotid stenosis and performed within 2 weeks of symptoms.
- Patients with asymptomatic moderate-to-severe carotid stenosis should be considered for carotid endarterectomy on a case-by-case basis and have a full risk assessment, including TCD monitoring/intima medial thickness measurement.

Organisational management at stroke network level should involve the following:

- Defined care pathways with vascular surgery units experienced in performing carotid endarterectomy.
- Access to expertise in carotid imaging and vascular surgery.
- Decision-making forum about surgical intervention to incorporate multidisciplinary neurovascular meetings involving geriatricians/stroke physicians, neurologists, vascular technicians, neuroradiology and vascular surgeons.
- Regular audit of carotid interventions to ensure high standards; this could contribute to a national register of carotid surgery.

Lead organisation: HSE, in collaboration with Irish Association of Vascular Surgeons and other relevant professional organisations

ORGANISATION OF HOSPITAL SERVICES FOR STROKE

Similar to cardiac networks outlined above (*see 'Organisation of specialist cardiac services', see p. 90*), it is proposed that hospital stroke services be configured into stroke networks, with a number of hospitals working together to provide the comprehensive range of services needed for optimal stroke care, working closely with community services (*see Recommendation 5.25*). The stroke network would consist of a series of general stroke centres, with associated comprehensive stroke centres (*see Appendix 4 for an overview of relationships within stroke networks*). One or more hospitals (comprehensive centres) within the partnership will provide acute services for the network, i.e. services that are not expected to be available at all hospitals. It is proposed that each network would have at least one comprehensive stroke centre, with general stroke centres in other acute general hospitals. Certain services would be provided in one location on a network level, in some cases providing national specialty care.

RECOMMENDATION 5.25**Specialist stroke services should be organised into population-based stroke networks, with network hospitals designated as (i) General Stroke Centres or (ii) Comprehensive Stroke Centres.**

A broad plan for service reconfiguration needs to be developed. This will identify general and comprehensive stroke centres and allow service planning – involving workforce and emergency service development in particular – to evolve within the new network structure.

Lead organisations: HSE and Department of Health and Children

Stroke networks will be configured on an approximate ratio of one network per 500,000 population, depending on geography and population density, and in line with current regional health service reconfiguration plans.

Specialist stroke services provided on a network basis

Services provided on a network basis will include a stroke prevention service and a same-day TIA service, emergency thrombolysis for eligible patients, advanced diagnostics, vascular surgery and comprehensive rehabilitation. Given the complexity of stroke and vast array of complications, networks may involve rotation of clinics, tele-medicine support for hospitals serving remote areas and off-site rehabilitation. Certain services will be provided on a national or network comprehensive centre level, such as vascular neurosurgery, interventional radiology, neuropathology and the services of the National Rehabilitation Hospital. Box 3 outlines the services provided at a general and comprehensive stroke centre level within each network.

Box 3: Stroke networks: Roles of hospitals designated as general and comprehensive stroke centres

GENERAL STROKE CENTRES

Role: To provide sub-acute and chronic care services.

Services provided:

- Care for patients ineligible for thrombolysis as well as providing limited thrombolysis for suitable patients and multidisciplinary rehabilitation and general prevention.
- Work with pre-hospital emergency services to determine emergency stroke thrombolysis appropriate to individual patient circumstances.
- Triage and transfer of eligible acute stroke patients for emergency thrombolysis.
- Provide diagnosis and treatment of other sub-acute and chronic cardiovascular conditions.
- Provide secondary prevention advice, rehabilitation and palliative care.

Facilities needed:

- A mixed acute/rehabilitation stroke unit or separate acute and rehabilitation stroke units. These must also be adequately resourced with appropriate medical, nursing and rehabilitation staff (including physiotherapy, occupational and speech/language therapy) and sufficiently large to allow capacity for direct admission from the emergency department and allow treatment of all stroke/TIA patients.
- Core diagnostic infrastructure: CT brain imaging, carotid imaging (may be performed by CT carotid angiography, carotid ultrasound or MRI angiography), trans-thoracic echocardiography and 24-hour ECG recording, videofluoroscopy imaging for swallow assessment.
- Emergency stroke thrombolysis may be provided by some general stroke centres within working hours or at nights/weekends as arranged within the stroke network.
- Tele-medicine facilities may be required by some general stroke centres, particularly those at some distance from the comprehensive hospital or serving geographically remote areas.
- Close liaison and integration with community services, including community rehabilitation, by medical social work, stroke liaison nurse and rehabilitation staff.
- Stroke/TIA clinics. Some general stroke centres may provide same-day rapid access TIA clinics.

continued

Box 3: Stroke networks (continued)**COMPREHENSIVE STROKE CENTRES**

Role: To provide acute care services.

Services provided:

- 24-hour 7-day thrombolysis; MRI; vascular surgery; multidisciplinary rehabilitation; assess, treat and return protocol; rapid access TIA clinic; cardiac assessment; carotid artery stenting; tele-medicine support.

Facilities needed (in addition to those available in general stroke centres):

- Acute and rehabilitation stroke units must be adequately resourced with appropriate medical, nursing and rehabilitation staff. There must be sufficient capacity for direct admission of all patients with suspected stroke from the emergency department and for patients transferred from other hospitals in the network when required.
- Facility for same-day rapid specialist assessment of suspected minor stroke and TIA, as in-patient or out-patient, including protected access to diagnostic investigations and beds for selected patients requiring admission for observation and monitoring.
- Emergency stroke thrombolysis to the population served by the comprehensive hospital and a stroke thrombolysis service to the population served by general stroke centres within the network as required (24-hour 7-day or nights/weekends/leave coverage, depending on specific arrangements in individual hospital networks).
- Expertise frequently required by stroke patients, including neurology, rehabilitation medicine, neuropsychology, neuroradiology (including diagnostic neuroradiology and some interventional neuroradiology procedures, e.g. intra-arterial thrombolysis, carotid stenting), vascular surgery, neuro-intensive care beds, related care needs (e.g. dialysis), interventional cardiology (e.g. patent foramen ovale closure, coronary stenting), dietetic services.
- Access to relevant diagnostic investigations: CT and MRI imaging, carotid duplex ultrasound, trans-thoracic and trans-oesophageal echocardiography, prolonged cardiac rhythm monitoring, advanced diagnostic imaging (neurovascular MRI, invasive cerebral angiography, trans-cranial Doppler ultrasound).
- Tele-medicine/video-conference facilities will be required by many network hospitals to provide links to general stroke centres in the stroke network and to comprehensive and national specialty services.
- Community liaison staff, including medical social workers and stroke liaison nurses.

EMERGENCY RESPONSE FOR ACUTE CARDIOVASCULAR EVENTS

Emergency response services

Recommendations for best practice in the emergency treatment of acute cardiac and cerebrovascular events, as outlined above, highlight the importance of rapid onset of treatment (in particular thrombolysis and primary PCI). Detailed recommendations for the development of the emergency services and in cultivating an integrated emergency medical service community response were outlined in the 2006 report of the Task Force on Sudden Cardiac Death (Department of Health and Children, 2006) (*see Recommendations 5.26 and 5.27*). Much progress has been made since then on the configuration of services and on education and training in emergency medical response and intervention for both priority healthcare staff and in the auxiliary, voluntary and community sectors.

A single National Ambulance Service has been established within the HSE. Over 170 advanced paramedics have been introduced. Dublin Fire Brigade has deployed advanced paramedics in a rapid response vehicle in Dublin. The HSE has implemented the strategic deployment of, and thrombolysis by, advanced paramedics in the North East Region. However, their strategic deployment nationally is still awaited, as is the implementation of pre-hospital thrombolysis nationally.

Public awareness and response

One of the most important impediments to good outcomes in AMI is the time taken to initiate help-seeking by the patient or member of the public. This is still unacceptably long in Ireland (Doyle *et al*, 2005). Reducing delay is equally important for improving outcomes in people who develop ventricular fibrillation or stroke. At community level, first-responder programmes, basic life support training and training in the use of automated external defibrillators have been rolled out in certain community, voluntary and school settings. However, implementing national roll-out of training in the community is required, involving strategic and national involvement of the Gardaí, the retained fire services and auxiliary and voluntary services, and providing comprehensive basic life support training in all schools.

More generally, the lack of public awareness about the warning signs of cardiovascular conditions must be addressed as an important contribution to reducing mortality and morbidity. For example, recent Irish research suggests poor recognition of symptoms of stroke (Hickey *et al*, 2009). Public education is challenging and lessons from international experience are needed to inform any effective education campaign.

Sudden cardiac death

An estimated 5,000 people die every year in Ireland as a result of sudden cardiac death (SCD) (Department of Health and Children, 2006). Survival rates following cardiac arrest are directly related to time to resuscitation and, in particular, defibrillation. The ESC Task Force on SCD recommended a target time of 5 minutes for out-of-hospital cardiac arrest, i.e. from call to defibrillation (Priori *et al*, 2001). It is therefore important that procedures are in place to enable rapid response and intervention in the community setting.

Regional evaluation of an out-of-hospital cardiac arrest register (OHCAR) has been implemented in the HSE North West Region and national roll-out is being planned. A national electronic patient-care record (ePCR) has also been implemented in the HSE North East Region, with plans ultimately for

national roll-out; the ePCR includes live data links between ambulance control stations, vehicles and hospital emergency departments. Spatial analysis research has been undertaken to inform ambulance service and community response developments. However, national collection, collation and analysis of pre-hospital data needs to be implemented as a matter of urgency. This should include analysis of regional variation and of equitable access to emergency services.

Since the publication of the report by the ESC Task Force on SCD (Priori *et al*, 2001), evidence-based educational standards have been developed by the Pre-Hospital Emergency Care Council. These include the Cardiac First Response standard, the first statutory standard for Basic Life Support and Automated Advisory Defibrillator Use in Ireland. In addition, clinical practice guidelines have been developed to support delivery of cardiac interventions by emergency medical technicians, paramedics and advanced paramedics.

RECOMMENDATION 5.26

This policy endorses the recommendations of the Task Force on Sudden Cardiac Death (2006) for the development of emergency medical service capacity to respond and deliver timely acute cardiovascular care.

The following initiatives are seen as having the highest priority within the new network structures:

- Strategic deployment of advanced paramedics and implementation of pre-hospital triage and cardiac thrombolysis nationally.
- Prioritised national roll-out of the electronic patient-care record in order to guide emergency medical services in the collection, collation and analysis of pre-hospital data.
- National roll-out of information systems, including the out-of-hospital cardiac arrest register, the register of sudden cardiac deaths in young people, and the general patient electronic patient-care record.
- Integration of emergency medical service activities through coordinated approach to the participation of auxiliary and voluntary services, Gardaí and retained fire services.
- Improved first response and therefore survival from cardiac arrest through development, coordination and integration of the emergency medical service with co-responder networks (auxiliary and voluntary services, Gardaí and retained fire services) and community first-responder programmes across the country.

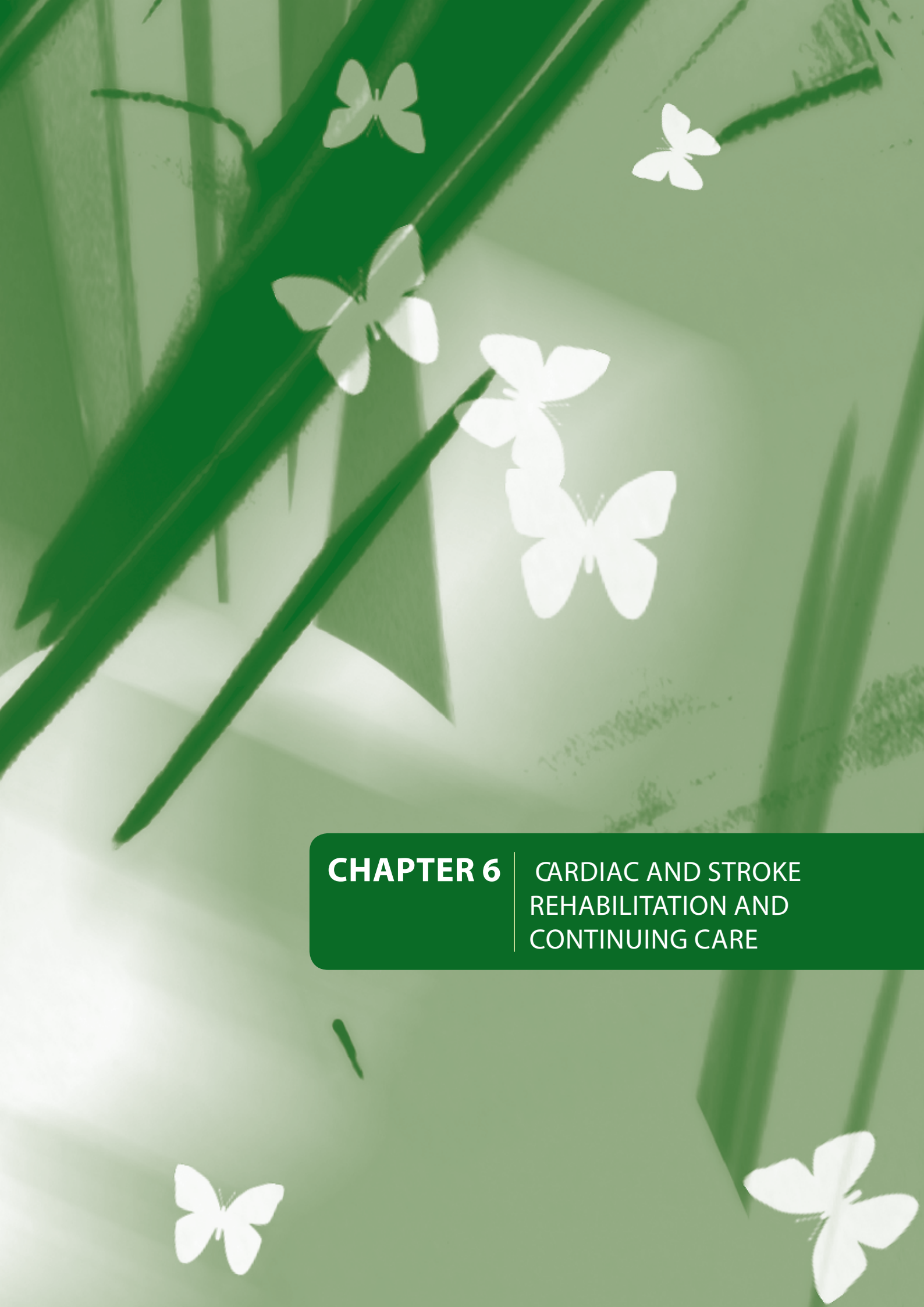
Lead organisation: HSE, in association with Irish Heart Foundation

RECOMMENDATION 5.27

Increase the proportion of the public who are aware of the major signs and symptoms of acute cardiovascular events (e.g. ACS, TIA and stroke), who know the importance of immediately contacting ambulance services and who are skilled in basic life support.

A public education campaign should be undertaken to raise awareness of the symptoms of acute cardiovascular events and of the need to take urgent and appropriate action. In parallel, basic life support training in schools could help develop an upcoming generation with greater awareness and skills in this area.

Lead organisation: HSE, in association with Irish Heart Foundation

The background of the page is a soft, green-tinted illustration of a pond scene. Several reeds or bamboo stalks are visible, some in sharp focus and others blurred, creating a sense of depth. Scattered throughout the scene are several white butterflies, some in flight and others resting on the reeds. The overall mood is peaceful and natural.

CHAPTER 6

CARDIAC AND STROKE REHABILITATION AND CONTINUING CARE

6. CARDIAC AND STROKE REHABILITATION AND CONTINUING CARE

Rehabilitation is the phase following acute medical intervention, during which structured approaches to halt or slow progression of the underlying health condition are undertaken and where the patient is enabled to return to an optimal level of physical, psychological and social well-being. Rehabilitation goals focus on recovering lost function and reconditioning, reducing the risk of a recurrent event (secondary prevention) and optimising quality of life. To be effective, rehabilitation must start as soon as the patient is stabilised in the acute medical setting. Rehabilitative care should be integrated across acute, out-patient and community services, to include access to both intensive acute rehabilitation and long-term follow-up. The ambitions for seamless and comprehensive rehabilitation and continuing care services for cardiovascular patients as outlined in this policy are consistent with the current objective of transferring care as appropriate from acute hospitals to community services, including via rehabilitation in-patient/out-patient services when disability is severe. The rehabilitation perspective considered in this policy will complement a specific *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*, to be published by the Department of Health and Children/HSE during 2010.

A review of secondary prevention profiles of almost 14,000 community-dwelling coronary (AMI and revascularisation) patients in 22 European countries in 2005/06 (EuroASPIRE III) showed that most did not meet professional targets for cardiovascular prevention in clinical practice (Kotsova *et al*, 2009). Furthermore, the general profile has disimproved since previous surveys, with increasing obesity and diabetes, along with high rates of hypertension, signalling the ongoing need for structured delivery of rehabilitation and prevention to achieve recommended lifestyle, risk factor and therapeutic targets. The challenges are similar for preventive targets for stroke patients. For example, a major UK study of male stroke survivors found that only one-third were on the appropriate evidence-based profile of medication (Ramsay *et al*, 2007).

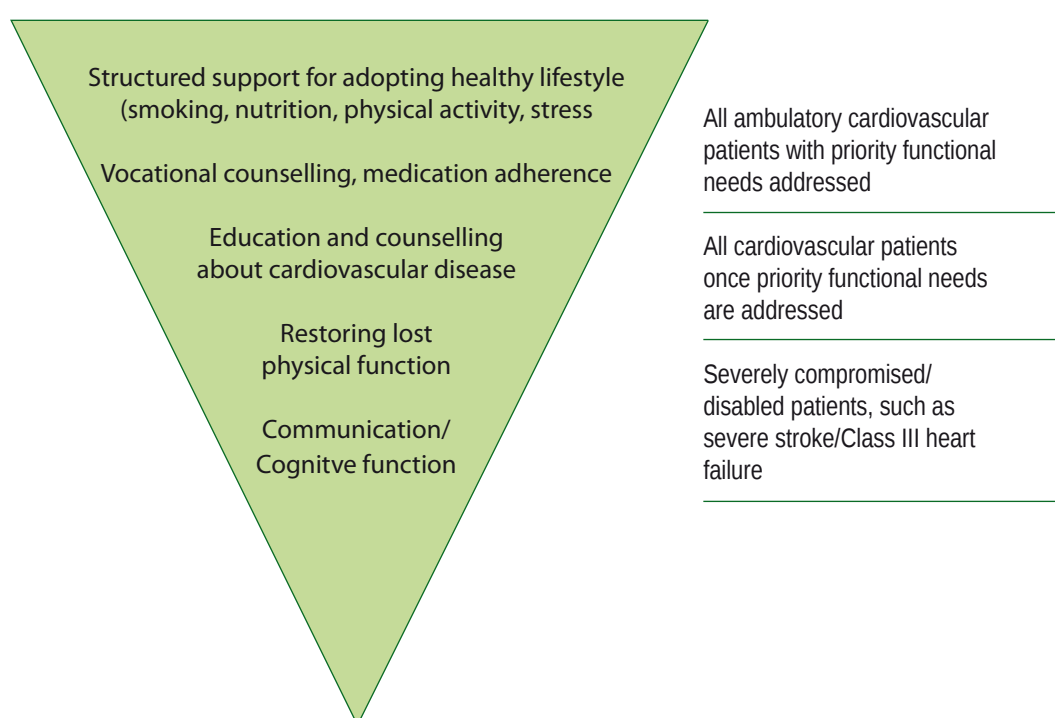
For patients with coronary heart disease, rehabilitation is offered in the form of structured 'cardiac rehabilitation' programmes, delivered by a multidisciplinary team. The aim is to improve physical and psychological function, with a focus on secondary prevention and lifestyle modification. Cardiac rehabilitation is characterised by a continuum of rehabilitation services that spans in-patient (Phase I), early out-patient (Phase II), medium-term out-patient (Phase III) and ongoing community rehabilitation (Phase IV). Phase III (typically a structured 8-10 week out-patient rehabilitation programme) is the main component of out-patient cardiac rehabilitation as delivered in Ireland. Out-patient cardiac rehabilitation includes assessment, review and follow-up; low or moderate intensity physical activity and exercise training; and education, discussion and counselling in relation to lifestyle and risk factor modification. Attendance at structured out-patient cardiac rehabilitation programmes should start soon after discharge from hospital, ideally within the first month (Saner *et al*, 2003).

Stroke patients need support similar to cardiac patients for lifestyle and risk factor modification. However, stroke can also incur serious motor, sensory, cognitive or communication deficits, and many stroke survivors are left with severe long-term disabilities. Stroke rehabilitation is essential for minimising the overall burden of stroke for the stroke survivor and the family/caregiver, and also for the healthcare system. A specialist multidisciplinary stroke team is required to deliver comprehensive rehabilitation, whether in hospital or in the community. The care pathway for people with stroke must include access to both intensive acute rehabilitation and long-term follow-up. Hospitals admitting

stroke patients should have in-patient rehabilitation in a stroke unit, with associated day service and out-patient units to facilitate patients to progress through an integrated service. Initial rehabilitation assessment should occur within the first 24 hours of admission or as soon as feasible according to the patient's condition. Secondary prevention should be incorporated in a structured manner within stroke rehabilitation.

Until now, rehabilitation services for cardiac, stroke and other vascular conditions have mostly been considered as separate entities, in Ireland as elsewhere. This is despite their common philosophies of integrated delivery of care to address individual patient needs, their shared aims of improving physical function and reducing risk of a further vascular event, and their overlapping expertise. In line with the philosophy of this report, development of the rehabilitation potential of the Irish health system needs to be considered as a single task. Figure 7 illustrates the hierarchy of rehabilitation activities, ranging from (top) those activities that should be available to all cardiovascular patients who have achieved ambulatory status, to (bottom) more specialist rehabilitation services needed by the minority with serious and very individualised needs. Conceptualising a common pathway does not negate the importance of disease-specific training and expertise. Disease-specific rehabilitation programmes deliver rehabilitation expertise via multidisciplinary teams. Those who work in rehabilitation programmes require disease-specific training. In Ireland, cardiac rehabilitation is directed by cardiologists and stroke rehabilitation by a combination of specialists in geriatric and general medicine, rehabilitation medicine and neurology. Service delivery needs to be fully integrated throughout the system. The cardiac rehabilitation system is currently more developed, but the increasingly rapid pace of throughput of patients in the in-patient system challenges the delivery of early rehabilitation. As acute stroke intervention develops, an integrated comprehensive stroke service will be able to deliver the rehabilitation phase.

Figure 7: Hierarchy of rehabilitation phases – from services for all ambulatory cardiovascular patients to services for severely compromised patients



To make recommendations for service development, it is first necessary to outline the present status of rehabilitation services for both cardiac and stroke populations since there have been very different developments to date in each.

CARDIAC REHABILITATION

Cardiac rehabilitation programmes have been thoroughly evaluated, with robust clinical trials evidence showing that they reduce mortality and morbidity, increase quality of life and are cost-effective (Taylor *et al*, 2004). Cardiac rehabilitation programmes are, in effect, the quintessential chronic disease management programme for hospitalised patients. Thus, apart from provision of services to cardiovascular patients, consideration should be given to the potential wider contribution of the cardiac rehabilitation context as a mechanism for delivering on the Department of Health and Children's (2008a) recently developed policy framework for the management of chronic disease.

Cardiac rehabilitation was addressed in the first national cardiovascular health strategy, *Building Healthier Hearts* (1999), with 10 recommendations ranging from service provision to national training and audit systems. When *Building Healthier Hearts* was launched, the necessary environmental enablers were in place to deliver on its recommendations. Pioneering activities outside of formal service delivery commitments, such as initiatives to train specialist coordinators in the 1990s, meant that a group of trained coordinators could be deployed to establish services in accordance with international guidelines. While services had been in development in Ireland since the mid-1970s, cardiac rehabilitation programmes were available in only 29% of relevant hospitals in 1998. This increased to 95% by 2005, with a three-fold increase in staff and six-fold increase in patients receiving a service (Delaney *et al*, 2006). All centres now have programmes. Cardiac rehabilitation was thus a notable success of the first cardiovascular health strategy.

Current status of cardiac rehabilitation services in Ireland

In recent years, there has been a loss of momentum in relation to programme development in cardiac rehabilitation. What was a significant national service achievement for the early part of this decade is now a very overstretched service, at risk of under-coverage of the increased population who need the service. Instead of being weakened, cardiac rehabilitation urgently needs to move from a phase of establishing programmes to one of ensuring all who can benefit will be able to do so, in keeping with the 2008 chronic disease management national framework (Department of Health and Children, 2008a). It has been estimated that approximately half of those who could benefit are currently enrolled, compared to 8% coverage in 1996 (Delaney *et al*, 2006; Jennings and Carey, 2003). In terms of setting targets, the UK National Service Framework has set a target of 85% of relevant groups being offered cardiac rehabilitation services (NSF, 2000).

The evidence shows that most patients invited to attend a cardiac rehabilitation programme do so and most continue with the programme once initiated. Thus the block to service delivery is invitation and enrolment. Many centres (11 of 35 surveyed in 2005) are staffed by only one individual, with only 24 of 35 having dedicated facilities. Evidence suggests that other growing patient groups with challenging needs, such as heart failure or peripheral arterial disease, may benefit from participation in tailored multidisciplinary rehabilitation programmes (Corra *et al*, 2003; Ashworth *et al*, 2005; Jeger *et al*, 2008). However, cardiac rehabilitation services have generally not been able to accommodate these patient groups because of staff and resource constraints (Saner *et al*, 2003; Delaney *et al*, 2006).

In sum, although there has been an expansion of cardiac rehabilitation services, many services are staffed by one individual, without dedicated facilities and without administrative support. These centres need to be supported and developed (see *Recommendation 6.1*). On the positive side, the current set of cardiac rehabilitation programmes across all relevant hospitals does provide core expertise and an important basis for a harmonised cardiovascular rehabilitation system in many hospitals.

Prevention programmes in community settings for cardiovascular patients

Community settings are the appropriate source of preventive activities, such as education and lifestyle support, for individuals identified as having high cardiovascular risk and those who have attended hospital-based rehabilitation programmes following acute events or interventions. Until now, the needs of these two groups have been addressed separately, if at all (see *Recommendation 6.2*).

For post-coronary event or intervention patients, community-based Phase IV cardiac rehabilitation programmes aim to facilitate long-term maintenance of lifestyle changes and monitoring of risk factors and secondary prevention, following participation in a structured (Phase III) hospital out-patient programme. Such programmes provide an ongoing opportunity for patients to maintain supported physical activity and other advised lifestyle changes in the community. Many Phase IV programmes have physical activity as a central component and provide exercise programmes in supervised community environments. In the UK, many Phase IV exercise classes operate in leisure centres or similar settings. This facilitates discharge from the hospital setting following completion of a Phase III cardiac rehabilitation programme. In these settings, supervision is provided by members of the Register of Exercise Professionals, who must have completed a dedicated Phase IV training course of the British Association of Cardiac Rehabilitation. In Ireland, community-based Phase IV cardiac rehabilitation has not been formally established. However, a training programme for gym instructors has been developed in conjunction with the Irish Association of Cardiac Rehabilitation: 20 gym instructors have been trained to professional standards, legal and insurance issues have been clarified, and Phase IV classes have commenced in 5 centres across the country.

Essential and complementary to Phase IV cardiac rehabilitation is the secondary prevention programme in GP/primary care, where the emphasis is on improvement in risk factors and the attendant pharmacological treatments. On the recommendation of the first cardiovascular health strategy, a programme called HeartWatch, involving 20% of GPs and a specified cohort of established coronary heart disease patients, was set up to achieve these secondary prevention goals. At this point, a model addressing all patients who can benefit, including high-risk patients (as specified in the *ESC Clinical Practice Guidelines – Graham et al, 2007*), is needed to provide proactive and cost-effective cardiovascular care to maximise life expectancy and quality of life.

Also in the primary care setting, a GP exercise referral scheme for high cardiovascular risk patients has been underway as a demonstration project in the HSE South Region. A wide range of preventive activities is provided in these settings to comprehensively address the range of cardiovascular risks. Health promotion staff cover smoking cessation, physical activity and dietetics, and provide individualised services as well as supporting other community-based staff. The community pharmacist also plays a role in promoting adherence to medication in this group of patients.

Until now, little attention has been given to coordinating these activities within the community sector. Furthermore, focusing attention on the individuals identified as having high cardiovascular risk, alongside those who have been provided with early hospital-based rehabilitation following acute events or interventions, is now important. Consequently, it is desirable that all community-based efforts to support individuals in developing and maintaining lifestyles consistent with preventive cardiovascular guidelines be united – whether they focus on individuals with high cardiovascular risk or established cardiovascular disease.

One model combining high-risk patients and those with established coronary heart disease is the EuroAction model developed to support patients to achieve the lifestyle, risk factor and therapeutic targets defined in the ESC Prevention Guidelines (Wood *et al*, 2008). This multidisciplinary, family-based ambulatory programme demonstrated that participation resulted in greater lifestyle changes and improvements in risk factors for patients and their partners than those in usual care. The model addresses family lifestyle (including diet, physical activity and smoking), medication adherence and psychological and motivational factors, and is designed to be delivered in primary care settings by a multidisciplinary team, including a physician, nurse, physiotherapist and dietician.

Building on these initiatives, it is proposed that 'Prevention Services' be established in the community setting, to provide coverage across a number of primary care teams and to be staffed by these teams with hospital linkages (*see Recommendations 6.3-6.6*). Staff would include members of the multidisciplinary team needed to run cardiovascular prevention activities, including links with referring physicians for pharmacological management. Participants could be high-risk individuals identified in risk assessment consultations, alongside those referred following completion of Phase III cardiac rehabilitation programmes and ambulatory patients from stroke and other vascular services. In time, such services could grow as models of prevention across the chronic disease spectrum, to include patients with diabetes and pulmonary diseases. The philosophy of such services would be to promote and maintain 'wellness', rather than to move clinical care activities out into a community setting. Supervised physical activity sessions would combine with programmes on topics such as healthy eating, stress management and smoking cessation. Staff time and expertise could be more efficiently used by providing such prevention support in group sessions rather than in individual sessions. Flexible timing of activities could also accommodate participants with scheduling challenges, such as employment or childcare.

Demonstration services in at least two different geographic areas would provide valuable evidence on the delivery and effectiveness of these proposed 'Prevention Services' before considering more widespread establishment. Areas where Phase IV cardiac rehabilitation programmes or GP exercise referral programmes have been established should provide 'early start' models for such services.

RECOMMENDATION 6.1**Ensure adequate and equitable coverage of cardiac rehabilitation for all eligible patients through investment in staffing and facilities in all relevant hospitals.**

Eligible patients (i.e. ACS or coronary intervention patients and patients with heart failure and peripheral arterial disease) should be offered cardiovascular rehabilitation services. All programmes should have adequate facilities and be delivered by a multidisciplinary team, in accordance with agreed national standards.

Lead organisation: HSE

RECOMMENDATION 6.2**Cardiac rehabilitation should be an integral part of the spectrum of cardiac services in public and private healthcare settings.**

Cardiovascular rehabilitation services are not routinely provided in private hospitals or reimbursed for private patients in public hospitals. This has significant implications for capacity and for access of patients in private hospitals to evidence-based care. A requirement for rehabilitation service provision, as a core component of evidence-based care, should be included in the HIQA-managed licensing requirements for acute hospitals.

Lead organisation: HIQA

RECOMMENDATION 6.3**Cardiac patients should have timely access to cardiac rehabilitation services.**

Active early rehabilitation should commence in line with international professional guidelines. The early rehabilitation challenge is to deliver appropriate and adequate rehabilitation advice and support in the ever-shortening phase before hospital discharge of cardiac patients. The next main challenge is to commence Phase III cardiac rehabilitation as soon as possible – approximately one month post-discharge to optimise benefits. All cardiac patients should leave hospital with a formal plan for subsequent rehabilitation activities.

Lead organisation: HSE

RECOMMENDATION 6.4**Equity of access to services and models of care: A menu-driven system of delivering rehabilitation should be established to support equitable access for groups vulnerable to exclusion from traditional programmes.**

Age, gender, education, income, distance from specialist services and transport availability, all mitigate against equitable access to cardiac rehabilitation programmes. Rehabilitation services must ensure that the particular physical, psychological, vocational and social needs of differing groups of patients are addressed.

Lead organisation: HSE

continued

RECOMMENDATION 6.5

Models of care and patient preferences: Criteria should be established for the endorsement of different models of programme delivery, based on delivery of agreed cardiovascular targets.

A number of models of programme delivery exist, with variations on programme duration and emphasis. This is an area of ongoing debate and innovation. From a service perspective, all models of programme delivery should audit their output against agreed short-term targets (programme end) and long-term targets (one year).

Lead organisations: HSE and Irish Association of Cardiac Rehabilitation

RECOMMENDATION 6.6

Ensure that cardiac rehabilitation services are effective and efficient through regular evaluation, with robust ICT systems and appropriate governance.

Eligible patients (i.e. ACS or coronary intervention patients and patients with heart failure and peripheral arterial disease) should be offered cardiovascular rehabilitation services. All programmes should have adequate facilities and be delivered by a multidisciplinary team, in accordance with agreed national standards.

Lead organisation: HSE, in association with Irish Association of Cardiac Rehabilitation

STROKE REHABILITATION

Underlying principles

- All patients with stroke will need multidisciplinary rehabilitation.
- Rehabilitation needs to be tailored to patient need and may involve improving cardiovascular fitness; restoring physical, mental, communication and cognitive function and well-being; adaptation to loss of function and impairment of participation; treatment of associated co-morbidity affecting function and prevention of further impairment; promoting a return to independent living and full participation in society; continuing assessment of patient and carer needs to sustain as full a quality of life as possible; and return to independent living.
- The principles of good stroke rehabilitation apply to all ages. Most stroke patients are over 65 years of age and many have multiple age-related co-morbidities. However, approximately 30% are younger and many also have vascular risk factors and co-morbidities. Thus absolute age cut-offs for rehabilitation services in stroke are not acceptable – services must be responsive to patient need, regardless of age.
- Rehabilitation in stroke is multidisciplinary, involving medicine, nursing, physiotherapy, occupational therapy, speech and language therapy, psychology, dietetics and medical social work.
- Rehabilitation input in stroke is interdisciplinary and for stroke patients usually involves geriatric and general medicine, rehabilitation medicine, neurology and psychiatry as the main medical disciplines with clinical input.

Stroke rehabilitation services in Ireland

The first *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, found stroke rehabilitation services to be seriously inadequate, leaving many patients with potentially avoidable or unduly prolonged disability (Horgan *et al*, 2008):

- Acute rehabilitation was only available to 1 in 4 patients or was delayed beyond the point at which it could be most effective.
- Less than half of stroke patients were seen by a physiotherapist within 72 hours of admission and only 1 in 4 had been assessed by an occupational therapist within 7 days of admission.
- There was little evidence of systematic management of secondary prevention targets before hospital discharge.
- Continuing care, long-term recovery programmes and community stroke services were haphazardly organised or did not exist.

Most rehabilitation for stroke patients is provided through geriatric and rehabilitation medicine. Some stroke services are restricted on the basis of age, with limited access to intensive rehabilitation facilities for most people and a lack of age-appropriate physical and vocational rehabilitation services for younger patients and those with less severe strokes. Vocational services are also inadequate for older patients, many of whom were in employment or actively contributing to society in other ways prior to their stroke.

Some patients with serious disability or complex needs post-stroke require specialist rehabilitation services. There is a current shortage of such services, involving rehabilitation medicine consultants, multidisciplinary rehabilitation teams, in-patient rehabilitation beds and out-patient treatment services. This leads to unacceptable delays in accessing specialist rehabilitation services.

Models for delivery of stroke rehabilitation services

The configuration of services is influenced by local demographic and geographic characteristics and the nature of existing healthcare facilities.

Acute care and early stroke rehabilitation: Patients in the early acute phase of stroke need a comprehensive multidisciplinary assessment of functional loss and therapeutic input to prevent complications (e.g. aspiration pneumonia, pressure sores, early spasticity and contractures). Most patients follow one or more of the following care pathways:

- in-patient rehabilitation in the acute hospital setting or in a rehabilitation unit on-site;
- return to own home, with hospital, community or home-based rehabilitation;
- specialist in-patient rehabilitation on another site;
- long-term residential care.

In-patient early stroke rehabilitation: Early acute stroke rehabilitation should occur within an acute or comprehensive stroke unit, delivered by a multidisciplinary team with input from geriatric and rehabilitation medicine and other specialist services as required (*see Recommendation 6.7*). Active rehabilitation should commence within the first 24 hours of admission post-stroke. There should be weekly multidisciplinary team meetings to review progress and update rehabilitation goals.

Stroke rehabilitation units should be properly resourced and staffed (see, for example, UK standards at: www.dh.gov.uk/en/Healthcare/Stroke/DH_081389). Similar standards of care should apply where patients are transferred to an on-site or off-site stroke or general rehabilitation unit.

Transfer of patients to an off-site stroke or mixed rehabilitation ward facilitates access to the acute stroke unit for new patients and provides a less acute, more rehabilitation-focused environment for patients and their carers. Many stroke patients, however, will continue to experience ongoing neuro-medical complications of stroke and non-acute rehabilitation units should have an appropriate specialty mix to address patient medical and rehabilitation needs, including liaison services from psychiatry, neuropsychology and neurology.

RECOMMENDATION 6.7

A multidisciplinary assessment of rehabilitation needs, using a formal procedure or protocol, should be completed within 5 working days of admission for stroke. An appropriate service plan should then be commenced.

Lead organisation: HSE

Out-patient and day hospital rehabilitation: Out-patient care may be in a day hospital setting or in specialised stroke rehabilitation units, such as in the National Rehabilitation Hospital, Dun Laoghaire, or Baggot Street Hospital, Dublin. A hospital-based out-patient setting with a transportation service is appropriate for those patients who are suitable for discharge, but still require substantial multidisciplinary team input. Complex cases may need a further period of regular medical follow-up or ongoing investigations, specialised rehabilitation facilities (e.g. orthoptic (visual) rehabilitation services, spasticity treatment, botulinum therapy, splinting or orthotics) and rapid access to diagnostics, specialist opinion and ongoing multidisciplinary input in a hospital environment.

Specialist hospital-based rehabilitation units: For patients with very severe stroke, specialist rehabilitation units are needed to provide rehabilitation care as early as possible. Medically unstable patients continue to need the acute hospital to access facilities such as gastroenterological PEG insertion, ENT tracheostomy interventions and radiologically-guided video fluoroscopy. Shared 24-hour 7-day clinical team cover is needed in order to facilitate transfer to in-patient rehabilitation managed care.

Acute hospital stroke rehabilitation units allow acute stroke units to improve throughput and admit new stroke patients. The presence of an on-site acute stroke rehabilitation unit facilitates the timely transfer from acute care to rehabilitation, with subsequent home discharge or onward transfer to rehabilitation in a non-acute hospital facility after a short in-patient phase.

Experience elsewhere has demonstrated that 25-bed general rehabilitation units work well within a larger acute hospital setting. The number, size and location of specialist rehabilitative care of such units should be determined by a national policy that takes into account the needs for this level of care for patients with other conditions such as acquired brain injury. One such model is the development by the National Rehabilitation Hospital of a service at Beaumont Hospital, Dublin. It will cater for a range of neurological patients, including those with severe stroke referred for rehabilitation during

their in-patient stay in the acute hospital. A similar unit is being developed in Cork University Hospital. These units will be accessible by patients of all ages with complex rehabilitation needs. They will not be used for the type of in-patient rehabilitation required by most stroke patients prior to discharge from the acute hospital setting. The forthcoming *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*, to be published in 2010 by the Department of Health and Children/HSE, will provide guidance on the development of further units and on the size of such units to meet the needs for intensive in-patient rehabilitation.

Early supported discharge

As recommended in Chapter 5 on acute hospital services for stroke (*see Recommendation 5.22*), each patient should have a full needs assessment, aiming to support discharge home or to their place of residence prior to admission to hospital. Placement in long-term care should only be considered on the basis of medical or social need, rather than as a result of inadequate community services and facilities. People with mild-to-moderate levels of disability achieve at least equivalent outcomes if, instead of receiving rehabilitation in the acute hospital setting, they are discharged to specialist and fully resourced rehabilitation teams. Advantages include a patient-centred discharge focus and reduced hospital stay. However, early discharge should only be considered where there are adequate community services for rehabilitation and carer support (Australian National Stroke Foundation, 2005). Care delivered in the community by multidisciplinary teams with rehabilitation and geriatric medicine inputs is recommended as best practice (*see Recommendation 6.8*). Hospital discharge for stroke will be informed by the wider Code of Practice for Integrated Discharge Planning, recently launched by the HSE (2008b).

RECOMMENDATION 6.8

For patients with stroke who are suitable for early supported discharge, resources and systems should be in place to facilitate early rehabilitation in a community setting, delivered by a multidisciplinary team with input from rehabilitation and geriatric medicine. This should begin with a full needs assessment.

Lead organisation: HSE

Community rehabilitation

Integration between hospital-based and community-based stroke services is essential to ensure quality of care, including the early detection of neuro-medical problems or functional decline needing more intensive input to prevent re-admission or discharge failures. Quality of life issues for people living with stroke, including return to work, management of long-term communication difficulties and spasticity, and the supports required for families and carers, can usually be addressed within the community setting.

Comprehensive community rehabilitation should be developed to facilitate early supported discharge and to deliver maintenance rehabilitation programmes to people with stroke, at home or in a nursing home or other residential care location. This should be supported by a liaison rehabilitation medicine consultant service for specific catchment populations, as in other countries. Those organising delivery of community rehabilitation services should strive to find solutions that combine the patient

and family preferences with high-quality care. In addition, a comprehensive transport system for people with mobility problems following stroke is essential to facilitate access to community-based rehabilitation services from home or from long-term care locations (see *Recommendation 6.9*).

Ongoing/longer term rehabilitation

When a person with stroke has gained as much benefit as possible from the initial phase with the rehabilitation team, he or she should be transferred into the care of the GP and primary care team. A system of review (e.g. 6 months from hand-over) would serve to systematically identify residual problems and provide both the person with the stroke or other cardiovascular condition and their family with a link back to specialist services where indicated.

Those who require admission to residential care or 'slow to recover' units should have access to appropriate levels of rehabilitation, delivered by a multidisciplinary team with input from rehabilitation and geriatric medicine. The role of the community stroke team in extended care facilities includes setting up treatment programmes to manage the complications of chronic stroke and to educate relevant staff in the care plan. Therapy assistants can provide treatments in extended care facilities under the supervision of more experienced staff. For those in such facilities, a system of periodic review and active treatment phases from the community stroke team will maximise independence in mobility, communication and lifestyle. In addition, stroke patients should have access to secondary prevention and cardiovascular reconditioning programmes where applicable.

Some patients will transfer to, or return as prior residents to, a nursing home following stroke. The *Irish National Audit of Stroke Care (INASC)* showed that stroke patients were considered as effectively 'discharged from active care' when transferred to nursing home care (Royston *et al*, 2007). Good quality stroke care in the community should also extend to those residents whose home is in a nursing home setting. The HIQA should include structured care for patients with stroke in their standards for nursing homes and long-stay care facilities, including a review of each patient's needs (e.g. for physiotherapy, speech and language therapy, occupational therapy and neuropsychology) at least every 6 months.

Reintegration of people with stroke into the community

There is very little information on the profile of stroke patients in the community in Ireland (Horgan *et al*, 2008; Hickey *et al*, 2009). A pilot stroke rehabilitation programme found that participants did not maintain acquired levels of physical activity after one year (Lennon *et al*, 2007). Nonetheless, the social potential of structured physical activity sessions for patients following stroke living in the community was highlighted in the study. Expansion of the current Volunteer Stroke Service (VSS) would facilitate community reintegration for people with stroke; to become involved, participants may require enabling supports, such as transport (see *Recommendation 6.9*).

RECOMMENDATION 6.9

A partnership framework should be developed between the HSE and the voluntary sector to enable expansion of stroke rehabilitation support services and the provision of services, such as transport, where needed.

Lead organisations: HSE and Local Authorities

Equity of access to rehabilitation and models of service

All stroke patients should have access to appropriate levels of rehabilitation regardless of age or location (see *Recommendation 6.10*). Rehabilitation services must ensure that the particular physical, psychological, vocational and social needs of differing groups of patients are addressed. This applies to younger patients (those under 65 years of age), who represent nearly one-third of those who have a stroke each year, as well as to the oldest patients, who benefit as least as much from focused stroke care and rehabilitation. For those in rural areas, efforts should be made to avoid fragmentation of services.

RECOMMENDATION 6.10

All stroke patients should have access to appropriate levels of rehabilitation, regardless of age or residential location.

Lead organisation: HSE

Integrated, patient-centred services to provide a continuum of care

Within each stroke network, acute hospitals should have stroke rehabilitation units with associated out-patient and day-service units to facilitate patient throughput, and good liaison with community health services. Care should be under the direction of both geriatricians and rehabilitation medicine specialists so as to manage and provide the continuum of care needed – from acute care to rehabilitation units and the community. The forthcoming *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*, to be published in 2010 by the Department of Health and Children/HSE, will address the complex neuro-rehabilitation needs of patients who require this and provide guidance on how these services should be integrated.

Given the particularly wide spectrum of rehabilitation needs following stroke, a key worker should be assigned to each person with stroke to develop an individualised discharge plan with the patient and carers, and to liaise between hospital and community services on behalf of the patient (see *Recommendation 6.11*). A discharge document on each patient should capture key information to facilitate seamless transfer of care from acute to community teams. There needs to be an effective interface between acute team and community teams. A single manager should be appointed for therapists between the hospital and community settings; this is consistent with plans to amalgamate the acute hospital and community services management structures of the HSE.

RECOMMENDATION 6.11

Stroke rehabilitation services should be patient-centred, to include individual assessment of need and ongoing review, and coordinated by a key worker to ensure that rehabilitation is available as required on an ongoing basis. There needs to be a continuum of care from hospital to community. Stroke rehabilitation services should be consistent with the broader neuro-rehabilitation service requirements as identified in the forthcoming *National Policy and Strategy for the Provision of Neuro-Rehabilitation Services in Ireland 2010-2015*.

Lead organisation: HSE

AN INTEGRATED APPROACH TO CARDIOVASCULAR REHABILITATION

At this juncture, there is much to be learned from experience with cardiac rehabilitation about building a comprehensive rehabilitation system for all cardiovascular patients. Components of a successful approach are most likely to include staff training and development; systematisation of programme delivery; resources for staff deployment; a forum for continuing professional development and exchange; mechanisms to share expertise; and audit. The phases of rehabilitation, starting with a hospitalised patient, are outlined in parallel for cardiac and stroke patients. While there may be different emphases, with stroke patients typically needing more individually tailored rehabilitation inputs, the principles of a rehabilitation programme tailored for the individual patient, with group or individual therapeutic inputs as appropriate, is a common one. A common system seeks to share staff and facilities efficiently and to allow for both individual specialisation and general skills development of staff towards a common goal of tackling residual disability and promoting a single cardiovascular prevention message. There will be a need to specify the types of patients who can be amalgamated in specific levels of cardiovascular prevention programmes. For example, a programme aimed at reasonably mobile, but de-conditioned or anxious patients might also include mild-to-moderately impaired coronary heart disease patients (acute coronary syndromes and revascularisation); those with mild-to-moderate heart failure (e.g. Class II and III); those following TIA or mild strokes with minor cognitive or motor deficit; and peripheral arterial disease patients with mild-to-moderate impairment.

Service development

A complementary rehabilitation system is envisaged for patients traditionally seen as ‘cardiac’ or ‘stroke’ (see *Recommendation 6.12*). This would accommodate differences in patient needs that are in part dictated by the nature of the cardiovascular condition, but also by the severity of the condition and patient characteristics such as age and co-existing morbidity. Individualised assessment of patient needs, rather than set programmes to determine the level of rehabilitation inputs, is required.

A review of current rehabilitation capacity (both cardiac and stroke) and an outline of resources and facilities needed for cardiovascular prevention is needed as a first step in developing integrated services. These services can then be re-engineered to deliver the range of rehabilitation services needed in an efficient manner. For more specialised services, a regional or network approach should provide economies of scale alongside specialist access. For more general rehabilitation support services – for example, regarding understanding and establishment of secondary prevention targets, such as physical activity and stress management – a common approach across hospitals should ensure that patients have the opportunity to attend programmes at a location that maximises their capacity to enrol and adhere to programme attendance. Thus, for example, for the most ambulatory patients, a combined out-patient programme (modelled on the Phase III cardiac rehabilitation programme) could be provided with exercise sessions as the timetabling anchor and with all but the condition-specific educational sessions equally suited for all patients (e.g. acute coronary syndrome, post-PCI, TIA, mild stroke and peripheral arterial disease). This could maximise staff resources, provide more timely access to rehabilitation to a wider group of patients and enable flexibility to be built into the system (e.g. through out-of-hours sessions for those working regular office hours).

Mechanisms for the auditing of rehabilitation services and quality assurance are discussed in Chapter 7.

RECOMMENDATION 6.12

There is a need to establish or redirect services to address effectively the common rehabilitation goals of all cardiovascular patients.

Lead organisation: HSE

Staff training and leadership needs

Training programmes should build on the achievements of cardiac rehabilitation training programmes, aiming to advance the skills of a range of staff in cardiovascular rehabilitation (see *Recommendation 6.13*). This will require investment to support skills development among the relevant multidisciplinary professionals through a range of formats for continuing professional development, including workshops, short multidisciplinary courses and personal distance learning. There should be greater emphasis on population health, prevention and management of chronic disease in undergraduate medical, nursing and related health professional training programmes in order to facilitate understanding of concepts of integrated care.

Appropriate recognition of the pivotal role of the Rehabilitation Coordinator is needed, through senior staff level grading, if the position is to attract the calibre of professional necessary to fast-track a comprehensive rehabilitation network across hospitals.

Consultant leadership is also pivotal in service development, evaluation and innovation. As advised in *Building Healthier Hearts* (1999) concerning cardiac rehabilitation, each hospital with cardiovascular patients should have an identified Lead Consultant for rehabilitation services. This has implications for consultant recruitment to ensure that specialties such as preventive cardiology and rehabilitation medicine are identified as recruitment priorities.

RECOMMENDATION 6.13

There is a need to deliver a structured training and leadership system for professionals involved in cardiovascular rehabilitation.

Lead organisations: Irish Heart Foundation (IHF), Irish Association of Cardiac Rehabilitation and IHF Stroke Council, in association with professional and educational bodies

Role of primary care in community rehabilitation

The new service model for primary care, as described in the Primary Care Strategy (Department of Health and Children, 2001), is designed to deliver locally accessible services to communities, particularly to those with long-term conditions such as cardiovascular diseases. The primary care team can develop a coordinated team response to the spectrum of cardiovascular needs after discharge, in conjunction with hospital liaison services (see *Recommendation 6.14*). The primary care team can also manage the referral process for review by the cardiovascular rehabilitation team, as part of integrated long-term care. Ideally, members of the community team, in partnership with hospital services, will develop lead roles in community cardiovascular disease management, similar to GP roles in diabetes, asthma and methadone programmes.

GPs must be involved in the care of cardiovascular patients as early as possible following diagnosis to ensure ongoing and appropriate clinical care and support. They have a pivotal role in preventing subsequent cardiovascular events by monitoring and treating known risk factors. They should also be supported to participate in the development of self-management programmes for people who have been discharged from hospital following cardiovascular episodes or procedures. GPs are also well positioned to refer patients to, and collaborate with, specialist providers of rehabilitation care to improve functional outcomes.

RECOMMENDATION 6.14

Primary care teams and cardiac and stroke rehabilitation services need to be developed to deliver integrated, shared care between hospitals and the community.

Lead organisation: HSE

Information and education for patients and carers

Education is a vital support for optimum recovery from cardiovascular illnesses. Provision of information alone is not effective. Inclusion of the person with the illness, family members and formal and informal caregivers enables all involved to have a better understanding of the needs of the patient and enhances recovery and coping.

Information and education should be provided for all patients, and their families and caregivers, at all stages of care across the continuum – from prevention, acute care and rehabilitation, to community reintegration (*see Recommendation 6.15*). Information and educational materials should be interactive, timely, up-to-date and provided in relevant languages and formats (written, oral, counselling approach), as well as being specific to the needs and impairments of the patient, family and caregiver. Information and education can be provided in the hospital and GP setting, but also usefully in more publicly accessible settings, such as community pharmacies.

There should be national integration of the development of educational materials and mechanisms for ongoing delivery and updating, to replace duplication of effort and expertise across many sites and individuals.

RECOMMENDATION 6.15

Information and education should be provided for patients, their families and caregivers. Information should be timely, up to date, accessible and responsive to the needs of the particular patient and family.

Lead organisation: HSE, in partnership with Irish Heart Foundation and other voluntary agencies

Psychosocial support and community reintegration

In terms of emotional well-being, patients with cardiovascular conditions experience relatively high levels of psychological distress, particularly depression. Depression is an independent predictor of cardiovascular mortality (Carney *et al*, 2002; Pelle *et al*, 2008). Cardiovascular patients should be screened and where appropriate managed for depression at appropriate times, including time of diagnosis, discharge from hospital and at key stages of the rehabilitation process. Individual psychosocial and support needs should be reviewed on a regular basis as part of the longer term management of cardiovascular conditions (*see Recommendation 6.16*).

RECOMMENDATION 6.16

Access should be provided to comprehensive psychosocial support, including management of depression, for cardiovascular patients and their families.

Lead organisation: HSE

Needs of carers

The needs of family members and carers should also be addressed as part of the rehabilitation process (*see Recommendation 6.17*). Caregivers are at risk of high levels of stress, depression and other psychological problems, particularly, but not exclusively, in the short- and longer-term after stroke. There is evidence that provision of information, together with necessary training of carers following stroke, can reduce stress and improve knowledge and satisfaction (Kalra *et al*, 2004). Carers should be supported and trained as needed, particularly in relation to manual handling skills, and personal and domestic activities of daily living. Informal family caring should be supplemented with home care provided by the HSE, as well as by voluntary organisations.

Those who have experienced serious limitations from their cardiovascular condition (e.g. heart failure or stroke survivors) and their carers must have access to aids and appliances to assist with daily living. An enhancement of the 'Aids and Appliances' grant is needed to ensure timely access to required adaptations in the home and work environment. In the UK, legislation has been developed to provide for a 'Carer Needs Assessment', providing adult carers with an assessment of their needs by social services in order to consider the carer's own needs and to provide information on practical support, benefits, grants, carer groups and voluntary services. Similar legislation should be considered in Ireland.

RECOMMENDATION 6.17

Families and carers should be provided with the appropriate information, support, training, appliances and facilities, including respite care, to enable them to contribute to their relative's care in a way that optimises quality of life and supports independent living for relative and family.

Lead organisation: HSE

End of life issues/Palliative care

In-hospital mortality rates for cardiovascular conditions are considerable. For example, the CCU 2003 census reported 9% in-hospital mortality for those admitted for acute coronary syndromes (Doyle *et al*, 2005), while 19% of those admitted with stroke died in hospital (Horgan *et al*, 2008). A large proportion of cardiovascular care is in the context of the threat of sudden death and the likelihood of a long terminal phase for many patients. Palliative care is the continuing active total care of patients and their families at a time when the expected medical outcome is no longer cure. It responds to physical, psychological, social and spiritual needs, and extends to support in bereavement.

There is substantial evidence of considerable unmet palliative care needs for patients with cardiovascular disease and their informal carers, for example, in relation to heart failure. Issues of sudden death and living with uncertainty are pertinent to all patients with heart failure. The palliative needs of patients and carers should be identified, assessed and managed at the earliest opportunity (see *Recommendation 6.18*). Patients with heart failure and their carers should have access to professionals with palliative care skills within the heart failure team.

In tandem, greater skills in relation to end-of-life care need to be available in the general cardiovascular setting. An initiative called the Hospice Friendly Hospitals Programme, launched by the Irish Hospice Foundation in May 2007, is being undertaken in two phases over a 5-year period, in partnership with the HSE, HIQA and a range of public service and academic organisations. It aims to put hospice principles into general hospital practice by addressing all aspects of dying, death and bereavement in an integrated way. This programme is striving to transform the culture around dying and death to ensure that good end-of-life care is consistently available in Irish hospitals. Its implications for cardiovascular settings need to be formally considered to enable maximum benefit for patients in a reasonable timeframe. Heart failure is one of the specific conditions considered in the 2008 report published for consultation by the HSE and Irish Hospice Foundation, entitled *Palliative Care for All: Integrating Palliative Care into Disease Management Frameworks*.

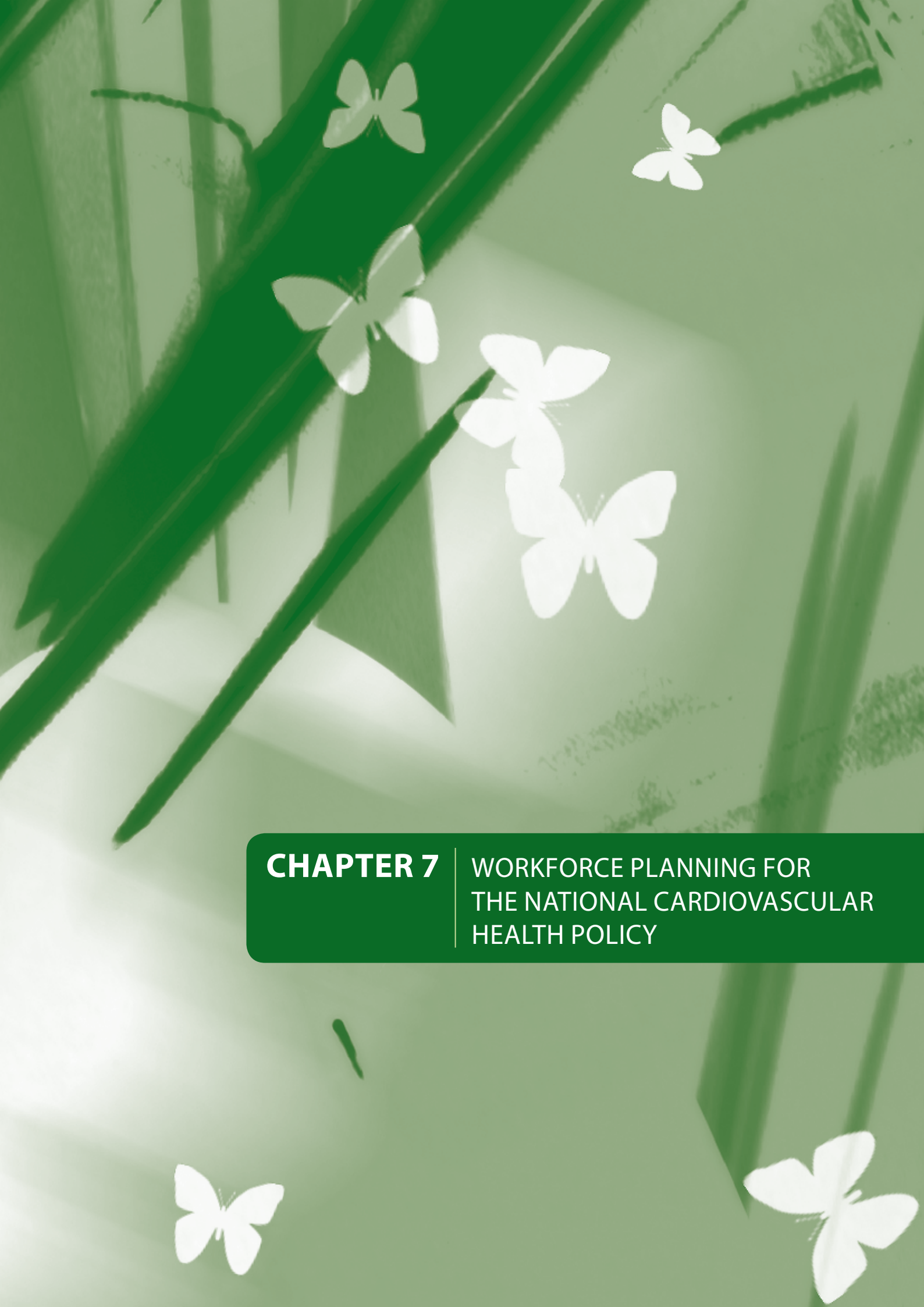
The principles of end-of life care are, of course, also relevant to patients with severe stroke and their families.

RECOMMENDATION 6.18

Each cardiac and stroke network should have access to a comprehensive specialist palliative care service and should actively seek to incorporate hospice and end-of-life care principles into its routine practice.

A proportion of cardiovascular patients will need palliative care services. Palliative care should be incorporated into care pathways and protocols for all patients with end-stage cardiovascular disease. Many patients with heart failure, for example, will have a palliative care phase, with disimproving health and risk of death, during which patients and carers will need to be supported. Care structures, processes and services need to be put in place, or be adapted, to meet these needs.

Lead organisation: HSE

The background of the entire page is a photograph of a green plant with long, slender leaves. Several white butterflies are scattered across the image, some perched on the leaves and others in flight. The overall color palette is a mix of various shades of green and white.

CHAPTER 7

WORKFORCE PLANNING FOR THE NATIONAL CARDIOVASCULAR HEALTH POLICY

7. WORKFORCE PLANNING FOR THE NATIONAL CARDIOVASCULAR HEALTH POLICY

The workforce is the ultimate enabler of policy and service development. This national cardiovascular health policy envisages new or adapted roles within existing services as the basis for its delivery (see *Recommendation 7.1*). Additional staff, recruited within the framework of the policy, will be a crucial component of the developments envisaged and necessitated in terms of delivering on duty of care commitments to best practice. Two further key enablers are resourced and tailored programmes of continuing professional development across disciplines and grades and universal access to integrated ICT systems.

Shortages of personnel – as identified in recent audits of cardiovascular service provision, such as *Ireland: Take Heart* (HSE, 2007) and the *Irish National Audit of Stroke Care* (Horgan *et al*, 2008) – already limit current capacity and impair service quality. The proposed restructuring and re-organisation of the current system of care into stroke and cardiac networks will require some redefinition of existing posts and development of additional cardiovascular leadership roles. Acute and non-acute service reconfiguration will also require new or redefined nursing, general practitioner and allied health professional and auxiliary service roles in hospital, community and administrative settings.

RECOMMENDATION 7.1

Workforce planning for cardiovascular services needs to be integrated effectively with service planning, liaising closely with education and training bodies.

Training and development must be considered a continual process, encompassing continuing professional education, personal development planning and management development. An annual audit of cardiovascular services should include information on workforce needs, in line with the current national cardiovascular health policy, and on training and continuing professional development needs in order to deliver an integrated cardiovascular service.

Lead organisations: Department of Health and Children and HSE

An annual audit of cardiovascular services should include information on workforce needs in line with the national cardiovascular health policy and on training and continuing professional development needs in order to deliver an integrated cardiovascular service.

Workforce planning will require:

- An accurate registry of cardiovascular health personnel, including discipline, professional association and training completed.
- Adequate stakeholder participation and communication in the development and maintenance of the cardiovascular workforce plan.
- An annual report describing the cardiovascular workforce and an inventory of staffing needs by discipline and location within each network.
- Identification of key standards, assessment and accreditation processes to support training and continuing professional development in cardiovascular health professionals.

- Close liaison with education and training bodies responsible for training members of the cardiovascular workforce.
- Demonstrated and ongoing commitment to continuous learning and facilitating employees to undertake education and development programmes, which contribute to their career development and enhance the quality of patient care.
- Facilities to support the information and communications technology (ICT) needs of services and to support research, consistent with a continual service quality improvement model of service delivery.
- Ongoing research to investigate professional development needs, recruitment and retention issues, and role development and evolution for cardiovascular service enhancement.

Detailed recommendations on all aspects of the cardiovascular health workforce are beyond the scope of this document. Specific recommendations are outlined below regarding consultant numbers and key areas of attention for other disciplines are highlighted. Workforce issues should form a key part of the annual audit process proposed in Chapter 8. Effective planning and investment in education, training and continuing professional development will be required, in line with the new structures of cardiovascular health service delivery.

Development of existing cardiovascular services will require attention to workforce in a number of areas:

- Adequate hospital consultant numbers to deliver a consultant-led service, as committed to in the new consultant contract.
- Adequate provision of non-consultant hospital doctors (NCHDs) dedicated to cardiovascular services to ensure that the next generation of senior medical staff in cardiovascular services are fostered.
- Development of nursing roles to enable further specialisation in cardiovascular services, including more integration of skills across previously separate roles in cardiac and stroke care.
- Development of the multidisciplinary team to include adequate access to health and social care professionals.
- Adequate provision of technical support staff for cardiovascular diagnostics and procedures.
- Establishment of primary care teams with skills to address group and health-promoting tasks, as well as individual disease-managing tasks, for defined populations. General practitioners working within a risk assessment and chronic disease management framework are key to the delivery of this cardiovascular health policy. Projections about inadequate supply of GPs in the coming years need to be addressed in this regard.
- Adequate administrative support, including expertise in database and patient register development and management.
- Fostering of community and voluntary involvement.
- Support for private sector contributions to the overall thrust of the policy.

Priority areas for attention are outlined in the following sections.

MEDICAL CONSULTANT LEADERSHIP ROLES

Adequate consultant leadership is essential for the delivery of this national cardiovascular health policy.

Consultant cardiology within cardiac networks

Cardiology – Hospital consultants

The final report of the Joint Working Group to review consultant cardiology requirements in 2004 recommended a consultant cardiology ratio of 1 per 48,000 population, giving a total complement of 81 posts at that time. In 2008, there were 56 established consultant posts, not including those working in the private system. The Joint Working Group further recommended a ratio of one per 500,000 population paediatric cardiologists, including adequate numbers to provide a specialist service in grown-up congenital heart (GUCH) disease, making a figure of at least 8 paediatric cardiologists needed. There are currently 5 paediatric cardiologists in place. Services for GUCH disease currently rely on one specialist team nationally, a situation that needs to be addressed with a concerted national plan for service delivery.

Regarding cardiac surgery, staffing has increased from 7 surgeons in 1998 to 16 nationally in 2008. Numbers now in post or approved are deemed adequate to meet current cardiac surgical demand.

Cardiac network establishment should include, alongside adequate numbers of interventional specialists to deliver emergency care, a consultant with a major interest in preventive cardiology and rehabilitation. This role might also include responsibility for the organisation of cardiac services at primary care level, in conjunction with general practitioners. The second key appointment within each cardiac network will be a consultant specialising in heart failure. All networks should ensure that there is available expertise in chronic disease management, as well as peripheral arterial disease, GUCH and hypertension (*see Recommendation 7.2*). There are increasing demands on vascular surgery more generally which have implications for comprehensive management of peripheral arterial disease.

Paediatric cardiology services are effectively configured as a single specialty of national networks delivered from Dublin and this is considered appropriate. Other networks will seek to ensure that staffing to provide the 24/7 cover and operator volumes necessary for delivery of quality services are in place.

RECOMMENDATION 7.2

The Joint Working Group on consultant cardiology requirements (2004) should be used as a guide to consultant cardiology workforce planning in future national service plans.

Decisions on the appropriate level of consultant cardiology staff to deliver the expanded emergency PCI and other cardiac services as set out in Chapter 5 of this policy should involve a gap analysis at each cardiac network level with reference to the above guidelines and taking into consideration any effective developments in medical technology and good practice in this and related areas since 2004.

Lead organisation: HSE

STROKE CONSULTANT PHYSICIANS

Stroke – Hospital consultants

The majority of stroke patients have substantial medical co-morbidities. Co-morbidities and complications of stroke require consultant/specialist input throughout the care pathway. There is a requirement to provide acute stroke care as well as ongoing care in the community. Stroke physicians with specific expertise in cerebrovascular disease come from a variety of backgrounds, including consultant geriatricians, neurologists, pharmacologists and rehabilitation medicine specialists.

Total stroke consultant requirements

Up to recently in Ireland, patients with acute stroke were admitted into a variety of medical specialties. To provide specialist stroke services, the British Association of Stroke Physicians estimate that a typical hospital serving a population of 350,000 and admitting approximately 600 acute stroke patients per year would require 3.3 consultants with a sub-specialty stroke interest. This equates to 5 consultants in a stroke network serving a population of 500,000. These estimates are based on stroke physicians providing the required emergency acute treatment.

The British Association of Stroke Physicians also highlights the acute consultant requirements for out-patient care and community rehabilitation. It is estimated that the additional service requirements identified in this policy, such as rapid access TIA clinics, atrial fibrillation management and other aspects of stroke care, would include an additional 2 or 3 consultants per network and additional rehabilitation physician expertise to meet the ongoing stroke care needs identified in Chapters 5 and 6 of this policy.

Specific numbers in each network will require a gap analysis at the network level with adequate and appropriate staffing levels specified in the national service plan (*see Recommendation 7.3*). There are several existing consultant appointments where stroke expertise and partial stroke service delivery exist. These may be reconfigured to create full-time stroke specialist posts, with non-stroke duties of these existing consultants being assigned to additional incoming consultant staff. This will establish an early cadre of identifiable stroke specialist physicians. The number and distribution of consultants between comprehensive and general centres in each network will depend on the number of stroke centres, the population of the network and the density of the population and distance between centres. Some posts should be reserved to boost the number of consultants in centres providing a tele-medicine support service.

RECOMMENDATION 7.3

The staffing ratios and roles outlined in this policy should be used as a guide to consultant appointments and workforce planning in formulating future national service plans.

This will require an appropriate level of consultant neurologists, geriatricians and rehabilitation medicine specialist stroke staff to meet the need for stroke units, emergency thrombolysis, rapid access TIA clinics and other elements of stroke care as set out in Chapters 5 and 6 of this policy. This should involve a gap analysis at the stroke network level so that staffing levels are compatible with the comprehensive range of stroke services outlined previously. Consultant workforce for stroke services should be reviewed midway through implementation of this policy.

Lead organisation: HSE

Comprehensive stroke centres: Stroke physicians with expertise in emergency stroke thrombolysis will be required to provide a consultant-delivered 24-hour 7-day emergency stroke service in the comprehensive stroke centres of each stroke network. This includes provision of same-day rapid access specialist assessment of TIA/minor stroke and a tele-medicine stroke service to patients attending hospitals with primary stroke centres in the network.

It is expected that these stroke consultants will engage in dual/sub-roles as network clinical co-directors and as a director for each of the following areas – the stroke unit in the comprehensive centre, community liaison/integration, tele-medicine, preventive medicine including management of atrial fibrillation and TIA, and education within the network.

To ensure an appropriate mix of skills within each stroke network, appointments should be balanced between geriatric medicine and neurology with a special interest in stroke. The consultant neurologist appointments are additional to those recommended previously by Comhairle and others since stroke services were specifically excluded from the terms of reference of these reports.

General stroke centres: Depending on the configuration of the stroke network and patient volumes, one or two consultant stroke physicians (geriatrician, neurologist or rehabilitation medicine physician) will be required at each hospital providing general stroke care. These consultants are responsible for the acute care and rehabilitation of patients with suspected stroke who are not eligible for thrombolysis and are admitted directly to the general stroke centre. Stroke physicians based in general stroke centres also have a role in relation to patients eligible for thrombolysis. This should be agreed in the context of planning services at stroke network level, to provide thrombolysis using a common protocol by day and participate in the network out-of-hours rota for thrombolysis; consultants may also participate in any tele-medicine service in the network. One consultant will take a leadership role on all aspects of care of TIA and acute stroke in the hospital, including clinical audit. The other will lead on coordination of care between the hospital and community settings, including quality assurance for community-based stroke services.

Rehabilitation: An additional one or two consultants in rehabilitation medicine will be required per stroke network, depending on the population served.

Consultant neuroradiology: All stroke networks should have network-level access to expertise provided by one or more consultant neuroradiologists, who have completed at least one additional year in neuroradiological training. Although some expertise may be provided by tele-radiology linkage, it is essential that a consultant neuroradiologist is available on-site at each comprehensive stroke centre for regular interdisciplinary discussion of neuro-imaging.

NON-CONSULTANT HOSPITAL DOCTORS

An adequate supply of dedicated non-consultant hospital doctors (NCHDs) is essential to deliver consultant-provided services in an expanding scheme of consultant appointments. It is also essential to build capacity for the next generation's consultant workforce in cardiovascular disease. A ratio of 3 NCHDs per 2 consultant stroke specialists is preferable, with at least one of these posts at registrar or specialist registrar level. While acknowledging the value of these ratios, particularly in the context of

the need to expand the consultant stroke physician workforce for the future, it is acknowledged that a one-to-one staffing ratio of consultant-to-NCHD is more realistic in the short to medium-term, in line with staffing guidelines in the HSE in the present economic circumstances.

MULTIDISCIPLINARY TEAM INVOLVING HEALTH AND SOCIAL CARE PROFESSIONALS

The audit of the first national cardiovascular health strategy, *Ireland: Take Heart* (HSE, 2007), assessed workforce deficits in hospital cardiology services. There were also variations in levels of coronary care unit nursing, cardiac technician and multidisciplinary cardiac rehabilitation staff across locations. The *Irish National Audit of Stroke Care (INASC)* identified major shortages in specialist stroke nursing care and in the multidisciplinary health professionals necessary to provide comprehensive stroke rehabilitation (Horgan *et al*, 2008).

As emphasized throughout this report, input from the multidisciplinary team is a basic requirement to provide quality care. Management of cardiac and stroke patients requires specialist teams led by clinicians with differing relevant expertise. However, it is possible to have many multidisciplinary team members work across the cardiovascular services spectrum in a manner that shares resources and builds expertise, for example, in secondary prevention and rehabilitation activities.

The core cardiovascular multidisciplinary team should include:

- A consultant cardiovascular-related physician with relevant expertise, who is responsible for care provision by the team.
- Adequate non-consultant hospital doctor staffing to support current service delivery and development of future cohorts of cardiovascular specialists.
- A clinical nurse specialist with relevant expertise, supported by nursing teams.
- Technical support staff for diagnostics and ICT service requirements. A database manager will facilitate development of integrated information systems across each network.
- Access to speech and language therapist, physiotherapist and occupational therapist services, depending on individual patient needs.
- Access to dietician, psychologist/neuropsychologist, pharmacist and social worker services.
- Community liaison coordinator, which role can be allocated to a particular team member depending on workforce capacity.

It is difficult to be prescriptive about staffing ratios. For specialist multidisciplinary services available as needed, local arrangements within networks will vary and will thus reflect somewhat differing use of staffing resources. Over time, the annual review by the Cardiovascular Policy Monitoring Group will provide information to inform more specific workforce planning. One useful example of workforce estimates for stroke unit care is provided by the UK's Department of Health 2009 *Workforce Planning Resource* (see www.dh.gov.uk/en/Healthcare/Stroke/DH_081389).

DEVELOPMENT OF NURSING ROLES

The roles of clinical nurse specialists and advanced nurse practitioners have developed significantly since the Commission on Nursing (Government of Ireland, 1998). Implementing new directions in cardiovascular health service delivery will provide an important window of opportunity for cardiovascular nursing.

Clinical nurse specialists will have undertaken formal recognised post-registration education at higher diploma level. A clinical nurse specialist should form part of every specialist cardiac and stroke multidisciplinary team, with a view to expansion to advanced nurse practitioner level. Such posts are not yet widely available in Ireland. For example, the INASC study reported only 5 clinical nurse specialists in stroke across all (37) relevant hospitals audited (Horgan *et al*, 2008). All posts were accredited by the National Council for the Professional Development of Nursing and Midwifery (NCNM). Clinical nurse specialist positions should not be limited to hospital services, but should also be used to develop a seamless service into the community (*see Recommendation 7.4*). For example, clinical nurse specialists can facilitate atrial fibrillation, TIA, chest pain and heart failure services in conjunction with the multidisciplinary team.

Other nursing roles will also evolve in line with implementation of this policy, including practice nurses, community and public health nurses, and nursing roles across the cardiovascular rehabilitation spectrum. For example, with the widespread introduction of cardiac rehabilitation programmes following the first national cardiovascular health strategy, formal diploma and masters level training in programme coordination was established for nursing and other professionals.

RECOMMENDATION 7.4

Workforce planning is needed to ensure adequate development and provision of cardiovascular clinical nurse specialists and other specialist cardiovascular nursing roles to ensure adequate provision of personnel in line with best practice guidelines.

Development of a group of cardiovascular clinical nurse specialists will be an important resource in delivering on this policy. Training and recruitment should prioritise a community liaison role for some of this expanding group of specialists.

Lead organisation: HSE, in association with nursing training organisations

TECHNICAL SUPPORT STAFF FOR CARDIOVASCULAR DIAGNOSTICS AND PROCEDURES

The capacity to deliver cardiovascular services depends on all of the team members being available in sufficient quantity. Technical support staff for existing and emerging diagnostic and procedural work must be factored into workforce planning if services are to be delivered to the maximum potential of other medical and nursing team members (*see Recommendation 7.5*). Workforce review can identify existing or emerging gaps in specialist personnel and plan for these identified training needs. For *Building Healthier Hearts* (1999), an early initiative to train additional ECG technical staff meant that an adequate supply of personnel was available when more consultant cardiologist posts became available from mid-way through the delivery period.

RECOMMENDATION 7.5

Workforce planning is needed to ensure adequate development and provision of cardiovascular nursing, health and social care professionals, and related clerical and technical support personnel in line with best practice guidelines.

Appropriate representation is needed within multidisciplinary teams, covering a range of nursing, health and social care professionals, and clerical and technical support staff. Assistant or support grades of health and social care professionals are also needed to help increase efficiency of service provision. An annual review of workforce issues will assist in planning.

Lead organisation: HSE, in association with Department of Health and Children

PRIMARY CARE AND COMMUNITY SERVICES

Primary care teams are currently being implemented in line with the Primary Care Strategy (Department of Health and Children, 2001) (see *Chapter 4*). The development of these teams is such that they can become a major driver of this cardiovascular health policy (see *Recommendation 7.6*). With a focus on cultivating a preventive and primary care-led system, the aspirations of the primary care teams and this policy are as one. Support for primary care team members will be required to enable effective management of patients with chronic cardiovascular disease and high cardiovascular risk. Structured care services, such as heart failure services, will require re-organisation in conjunction with hospital services and development of specialist nursing and multidisciplinary care roles. Current roles may need to be reconfigured to support cardiovascular prevention activities, including the development of centres of prevention in community settings. The *Ireland: Take Heart* audit identified specific shortages in the supply of dieticians and public health nurses in current community prevention and treatment activities (HSE, 2007).

RECOMMENDATION 7.6

Planning and coordination is needed to ensure that the community healthcare workforce addresses the cardiovascular prevention and rehabilitation recommendations of this policy.

Lead organisation: HSE

CLERICAL AND ADMINISTRATIVE SUPPORT, INCLUDING STAFF WITH EXPERTISE IN DATABASE AND PATIENT REGISTER DEVELOPMENT AND MANAGEMENT

Implementing the integrated information systems proposed in Chapter 8 will require adequate clerical and technical support. The change-over from paper-based to electronic systems will require training and skills that should be factored into continuing professional development opportunities available to clerical staff. A database manager may be required across each network to coordinate this process.

COMMUNITY AND VOLUNTARY INVOLVEMENT

Voluntary sector involvement must be considered within the overall context of cardiovascular care delivery. Formal voluntary sector organisations, such as the Irish Heart Foundation, play a pivotal role in patient support, advocacy and empowerment. It is important also to note that such organisations represent a very small component of the care provided to individual families and communities on an ongoing basis.

Voluntary organisations should be acknowledged by service providers and involved at every opportunity in filling in some of the gaps in care that are difficult to provide on a formal basis, such as peer support and community initiatives of benefit to cardiovascular health and psychosocial well-being. The importance of the role of carers and their needs is addressed in Chapter 6.

The private sector, including business and philanthropic agencies, also have a valuable contribution to make in promoting cardiovascular health. Many examples of good citizenship exist and private sector contributions deserve acknowledgement for supporting innovation, start-up or demonstration projects, and local initiatives in the interests of cardiovascular health.

The background of the entire page is a green-tinted photograph of a pond. Several reeds are visible, some in the foreground and some in the background. White butterflies are scattered throughout the scene, some resting on the reeds and others in flight. The overall mood is peaceful and natural.

CHAPTER 8

A NATIONAL FRAMEWORK FOR QUALITY IN CARDIOVASCULAR HEALTH

8. A NATIONAL FRAMEWORK FOR QUALITY IN CARDIOVASCULAR HEALTH

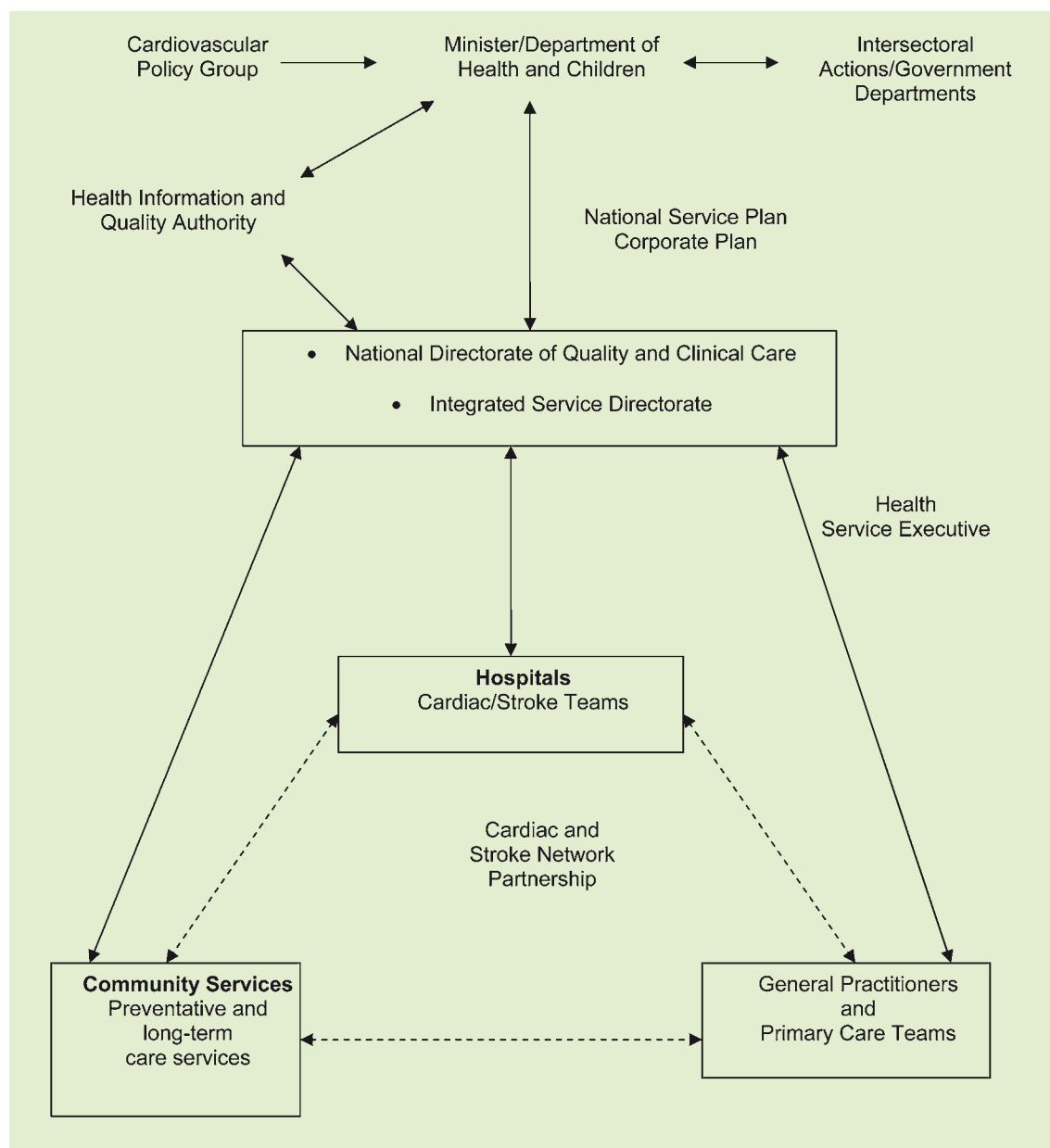
This chapter presents a national framework for the delivery of high-quality care in cardiovascular services. This includes identifying key requirements to enable quality service delivery. These requirements include information and communications technology (ICT) and, as discussed in Chapter 7, workforce planning and investment alongside a programme of continuing professional development. Staff will need support to integrate rapidly changing evidence-based practices and methods of team-working into a responsive quality-focused system.

Cardiovascular health policy is developed and agreed by the Department of Health and Children, in this instance through the appointment by the Minister of a Cardiovascular Health Policy Group in 2007. That policy is then delivered through a range of agencies, primarily the Health Service Executive (HSE) and the Health Information and Quality Authority (HIQA). Mechanisms include the annual National Service Plan between the Department of Health and Children and the HSE. Evaluation of policy implementation is an integral component of this new cardiovascular health policy covering the period 2010-2019. A Cardiovascular Policy Monitoring Group will advise the Department of Health and Children on the achievement of policy objectives.

Some of the key structures and relationships in this framework are outlined in Figure 8. As discussed in Chapter 5, the HSE will reconfigure hospital services into networks for cardiovascular care. Reports on progress with the policy will come from these networks, as well as from primary care teams and other community-based services. The Cardiovascular Policy Monitoring Group will include Department of Health and Children officials and a small group of external experts. The group will meet twice annually and will provide a brief annual report highlighting progress and identifying potential barriers in order to guide service planning. It will also coordinate a major mid-term review of progress on the policy, reporting in Year 5 (2014).

Key components of delivering high-quality healthcare are effectiveness, patient-centeredness, timeliness, safety, efficiency and equitable access. To ensure a 'whole systems' approach in delivering these components, committed governance and clinical leadership are necessary. In order to monitor and improve outcome of care for the population, a number of developments will be important to institute:

- workforce planning (*see Chapter 7*);
- standards setting (*see below, next section*);
- education, training and ongoing professional development (*see Chapter 7*);
- information and communications technology (ICT) (*see below*);
- research and health technology assessment (*see below*).

Figure 8: Cardiovascular Policy and National Treatment Programmes

NATIONAL STANDARDS OF CARDIOVASCULAR HEALTH SERVICES

Cardiovascular health services in Ireland should be based on international best practice and deliver the best possible health return on investment. Previous chapters in this report have presented plans for systematic development of cardiovascular health services. These plans need to be developed and delivered in a quality framework with guidance and accountability. The development of national cardiovascular management guidelines involves many stakeholders and includes the development of national service plans/corporate business plans. It is recommended that the governance structure for the development of national treatment programmes reflects the development of national standards for quality and safety, and develops performance indicators as well as treatment guidelines in support of better quality in cardiovascular health services (*see Recommendation 8.1*).

This will involve representation from the Department of Health and Children, the HSE, HIQA and other stakeholders as appropriate. The work will involve:

- the development of evidence-based guidance;
- performance indicators relating to guidance and national standards for quality and safety;
- information and data requirements.

A number of standards are in use internationally. These are based on guidelines from professional societies, including the European Society of Cardiology (ESC) and the European Stroke Organisation (ESO), as well as on agreed local priorities and structures. Adoption of uniform standards across professional groups and components of the health system is needed if targets are to be set and achieved. Guidelines for shared care between hospital and community settings (e.g. in heart failure and atrial fibrillation) need to be developed. The HSE, through the National Directorate of Quality and Clinical Care, is responsible for oversight of the disease programmes, for developing clinical guidelines and for providing clinical leadership in this area. It is important that these functions are supported and evaluated as part of the mid-term 5-year review of this policy.

RECOMMENDATION 8.1

Evidence-based guidelines and standards should be agreed, with appropriate performance indicators identified and reporting structures established.

Lead organisations: Department of Health and Children, HIQA and HSE

CARDIOVASCULAR HEALTH SURVEILLANCE

Surveillance consists of the ongoing collection, analysis and dissemination of data of public health importance to allow for the planning and implementation of health policy. The objectives of a cardiovascular health surveillance system are:

- to access and analyse routine mortality and morbidity data to estimate trends in the burden of cardiovascular disease at population level;
- to monitor the state of the health of the population with regard to lifestyles and risk factors for cardiovascular disease;
- to support clinical audit of care of patients with cardiovascular disease and evaluation of health promotion programmes;
- to estimate the use of health services resources and to support health services planning.

The *Irish National Audit of Stroke Care (INASC)*, carried out in 2006-07, identified many gaps in hospital and community services for patients with stroke and their carers (Horgan *et al*, 2008). These findings are in the absence of a Government strategy for stroke. There have, on the other hand, been notable developments in cardiology services as a result of the Government strategy *Building Healthier Hearts* (1999), as outlined in *Ireland: Take Heart* (HSE, 2007). For example, the identification of minimum datasets for cardiac care (i.e. the Cardiology Audit and Registration Data Standards system) has been internationally credited and is now used at European level. Much consensus was also achieved by groups such as the National Cardiovascular Information Systems Group. However, substantial national changes at Government and health service levels in recent years have meant little consolidation of much effort in this regard. Thus, cardiovascular health information in Ireland is still collected and processed by various agencies in a fragmented, non-standard and inconsistent way.

A systematic approach needs to be implemented as a matter of urgency to facilitate the collection and use of patient-based data for surveillance, audit and research (*see Recommendation 8.2*). This would require:

- **Systematic validation of data and annual reporting** as part of a quality and standards monitoring system. High-quality routine mortality and morbidity data collection requires development in a number of areas, including training in death certification and training and access to national information services, particularly HIPE.
- **Development and implementation of common data standards nationally** to ensure that the various systems can interact.
- **Progress on finalising the unique patient identifier** is essential and will benefit the whole system.
- **A heart and stroke registry should be initiated** and informed by current datasets (e.g. the Coronary Heart Attack Ireland Register (CHAIR), HeartWatch, the Cardiac Rehabilitation Information System (CRIS), HeartBeat, SCD Register, INASC, North Dublin Population Stroke Study). Priority databases should be established, including for acute stroke care and stroke thrombolysis.

These initiatives would benefit cardiovascular services and also wider health system surveillance. A comprehensive system should also be capable of delivering information on equity regarding access to service and disease prevalence across socio-economic groups.

RECOMMENDATION 8.2

A comprehensive cardiovascular health services information system should be developed as a priority to enable the implementation of this policy.

This will entail agreement on systematic data collection methods and analytic standards across healthcare pathways nationally to ensure coordinated collation, analysis and evaluation of data.

Lead organisation: HSE

Registers and information systems

Comprehensive and interpretable service provision data and information on patient care pathways cannot be achieved without the development of nationally comprehensive and compatible cardiovascular information systems, including patient registers. Registration of cardiovascular disease events is particularly important given the changing epidemiology of the disease. At present, a number of independent systems are used to collect and present data on patient care, including the Central Statistics Office (CSO), Hospital In-Patient Enquiry Scheme (HIPE), Public Health Information System (PHIS), Patient Information Management System (PIMS), the Primary Care Reimbursement Scheme, the Disability Database and the National Cancer Registry. There is a need to develop a comprehensive Cardiovascular Disease Registry containing data on people with, or at risk of, cardiovascular disease (*see Recommendation 8.3*). The National Cancer Registry can provide valuable expertise from which to start in the Irish setting.

RECOMMENDATION 8.3

Minimum cardiovascular-specific datasets should be agreed and mechanisms established for collection of this information as part of routine care and in a manner that enables ready collation of national profiles.

Lead organisations: Department of Health and Children, HIQA (standards) and HSE (audit system)

Development of current patient registers

A number of independent cardiovascular registers are in development in Ireland as outlined below in 'Data Standards'. While the priority for cardiovascular registers across care settings in Ireland is to support patient care and to enable service evaluation, such registers should also take population-based measurements into account when agreeing data standards. Common data standards are needed across health and social services to allow for inter-operability of information systems. Clinically based registers will facilitate the provision of quality care by promoting improved processes of care. To facilitate integrated care for the benefit of the patient, information using a standard format should be shared between primary care and secondary care.

Data standards

During Ireland's EU Presidency from January to June 2004, the Department of Health and Children worked with the European Society of Cardiology (ESC) on the Cardiology Audit and Registration Data Standards (CARDS) project. Data standards (variables, definitions and coding systems) were agreed for three topics within cardiology: acute coronary syndromes, percutaneous coronary interventions and electrophysiology. Cardiac rehabilitation standards were subsequently developed and agreed. The CARDS dataset has now been agreed for use in coronary heart disease throughout the European Union.

Experience with existing registers in Ireland can inform the establishment of a national cardiovascular disease registry. These include:

- the Coronary Heart Attack Ireland Register (CHAIR) system for acute coronary syndrome, which has registered patients with a diagnosed acute coronary syndrome admitted to acute hospitals in Co. Cork and Co. Kerry since 2002;
- the Cardiac Rehabilitation Information System (CRIS), established in 2002;
- the UK-developed Sentinel audit system for stroke, as used in the *Irish National Audit of Stroke Care (INASC)* in 2006-07;
- data managed by the Independent National Data Centre (INDC), which was established to collect and analyse data from HeartWatch, a pilot secondary prevention programme.

HEALTH SURVEYS

Population health data can be achieved through regular national health surveys. There have been repeated surveys of health-related behaviours among adults (SLÁN) and school-aged children (HBSC) in Ireland in 1998, 2002 and 2006/07. The main aims of these surveys are to produce reliable, representative cross-sectional population data to inform Government policy and programme planning. Over the lifetime of this national cardiovascular health policy, high-quality population-based data will be essential in measuring its challenges and achievements (*see Recommendation 8.4*). As the key national nutrition and health behaviour profiles assessed in these surveys are also those central to cardiovascular health, these surveys provide invaluable cardiovascular population health profiles.

RECOMMENDATION 8.4

Regular population-based surveys should be conducted to establish health profiles in adults and children.

Challenges in delivering such surveys need to be addressed promptly to enable ongoing delivery of high-quality and robust data for service planning. At least two national adult and child surveys are needed during the 10-year lifetime of this policy.

Lead organisations: Department of Health and Children and HSE

AUDIT

Clinical audit involves structured review against agreed standards in order to promote improvements in healthcare and public health. There have been two national audits on cardiovascular care (mainly cardiology services) since *Building Healthier Hearts* (1999) and a *Irish National Audit of Stroke Care (INASC)* was completed in 2007. However, there is no routine national system of clinical and organisational audit of cardiovascular disease services at hospital or community level.

A routine national audit system for all aspects of cardiovascular care is needed, based on agreed standards and minimum datasets as discussed above. While a comprehensive system will take some time to establish, it is important that a system of review be established from the start of this policy.

Until compatible data standards are fully implemented and data routinely collected, each sphere of cardiovascular healthcare should be encouraged to conduct a brief annual audit, highlighting developments and barriers in relation to service delivery, for submission to the Department of Health and Children (*see Recommendation 8.5*). Data should be extracted from existing databases and registers, and from those that will require establishment to implement service recommendations in this report, e.g. primary care registers to support cardiovascular risk screening and heart failure, and stroke registers to support chronic disease management in the community.

A national audit review process will enable rapid identification of common barriers and transfer of information on innovative solutions across cardiovascular networks in a quality enhancement framework. This review process will have the capacity to deliver a feedback report on progress and to identify barriers to implementation and provide specific recommendations to address these barriers.

The key areas for audit would be:

- patient throughput and key performance indicators in relation to recommendations and adherence to best practice guidelines;
- workforce issues;
- facilities and equipment issues, including ICT development.

RECOMMENDATION 8.5

An annual audit of cardiovascular networks should be conducted to assess volume and quality of service delivery and to aid in service planning.

Lead organisations: Department of Health and Children and HSE

ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

Information and communications technology (ICT) systems should support the management and delivery of patient care services, as well as their quality assurance, through audit, accreditation and other processes (*see Recommendation 8.6*). Electronic health records and a unique patient identifier, as outlined in the Health Information Strategy (Department of Health and Children, 2004), have not yet been developed and implemented. The lack of a unique patient identifier is a formidable barrier to integrated patient care and to service monitoring and development. In particular, it is needed to enable integrated care pathways between hospital and primary care, decision support systems, costing of interventions and processes of care, audit and accreditation.

RECOMMENDATION 8.6

Information and communications technology (ICT) infrastructure, capacity and training should be developed. This should include the implementation of patient identifier and electronic health records as a matter of urgency.

Enhanced electronic communication methods are needed to support new models of health service delivery. Information systems and technology need to be developed within and across secondary and primary care settings.

Lead organisations: HIQA (enabling mechanisms) and HSE (systems)

RESEARCH AND EVALUATION, INCLUDING HEALTH TECHNOLOGY ASSESSMENT

A research climate in the health services is fundamental to improving quality by contributing to policy development and planning efforts. Recent commitments by the Department of Health and Children (2009b) to a plan for a successful health research economy (*Action Plan for Health Research 2009-2013*) and by the Health Research Board (HRB, 2009) to a complementary plan for research to transform the Irish health services (*Strategic Business Plan 2010-2014*) set the scene for what is needed in cardiovascular research, for both economic and health gain. Programmes of research within both biomedical and health services research fields should continue to be supported in relation to cardiovascular care.

A key component of evidence-based practice is the use of health technology assessment (HTA). The HTA function is to ensure that health service resources are used effectively by assessing the clinical and cost-effectiveness of the medicines, devices, diagnostics and health promotions used across the health system. Topics that require further investigation to inform delivery of this policy include projects evaluating the effectiveness of risk factor assessment and intervention in primary care; population quantification and management of people with PAD and GUCH; and evaluation of the needs of community multidisciplinary teams for rehabilitation and continuing care services for stroke. A coordinated approach is vital to ensure the projects needed to inform this policy are prioritised and funds made available in order to deliver findings during the lifetime of the policy (*see Recommendation 8.7*). The research supported will provide the treatments and insights to inform the next policy. In this way, the continuum of 'research to policy to practice' can be fostered and the Ireland of 2020 will be a healthier place for all its citizens.

RECOMMENDATION 8.7

A national group representative of stakeholders should be convened to determine priorities for research and health technology assessment in cardiovascular care.

Tasks include ensuring that enabling research support skills in areas such as biostatistics and health economics are developed and that the information needs of this policy are enabled through research.

Lead organisation: Health Research Board to coordinate and involve key stakeholders, i.e. policy, service, academic and public representatives



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APPENDICES

APPENDIX 1: ICD CODES

International Classification of Disease (ICD) Codes pertaining to Cardiovascular Disease Discharges in Hospital In-patient Enquiry (HIPE) analyses

	ICD-9-CM Codes (1998)	ICD-10 AM Codes (2006)
CHD	410-414	120-125
Stroke	430-434, 436-438	160-169
TIA	435	G45
PVD/PAD	440, 441, 442, 443.1, 443.9, 444	170, 171, 172, 173.1, 173.9, 174
Heart Failure	402, 425.4, 435.5, 435.9, 428	111.0, 111.9, 142.0, 142.2, 142.5, 142.6, 142.7, 142.8, 142.9, 150

APPENDIX 2: IMPACT CHD MORTALITY MODEL 2000-2006

Factors contributing to the total deaths prevented or postponed (DPPs)

Note: Negative values indicate that the factor has contributed to increases in CHD mortality; positive values to decreases in CHD mortality.

Risk factors*	DPPs	% of total DPPs
Smoking (self-report)	138	6.0%
Population Blood Pressure (physical exam)	-25	-1.1%
Population Cholesterol (physical exam)	580	25.1%
Physical inactivity (self-report)	34	1.4%
Diabetes (self-report)	-178	-7.7%
Obesity (physical exam)	-172	-7.4%
Total Risk Factors	376	16.3%

Treatments	DPPs	% of total DPPs
AMI treatments	79	3.4%
Secondary prevention post-AMI	268	11.6%
Secondary prevention post-CABG/PTCA	88	3.8%
Chronic angina CABG/PTCA	134	5.8%
Community aspirin/statin	115	5.0%
Unstable angina**	7	0.3%
Heart failure (hospital)	102	4.4%
Heart failure (community)	185	8.0%
Hypertension	16	0.7%
Statins primary prevention	113	4.9%
Total Treatments	1,107	47.8%
Total Risk Factors and Treatments	1,483	64.1%

* Data from SLÁN 2007

** Made assumption that there was a 10% increased uptake of treatments for unstable angina between 2000 and 2006 since no data available.

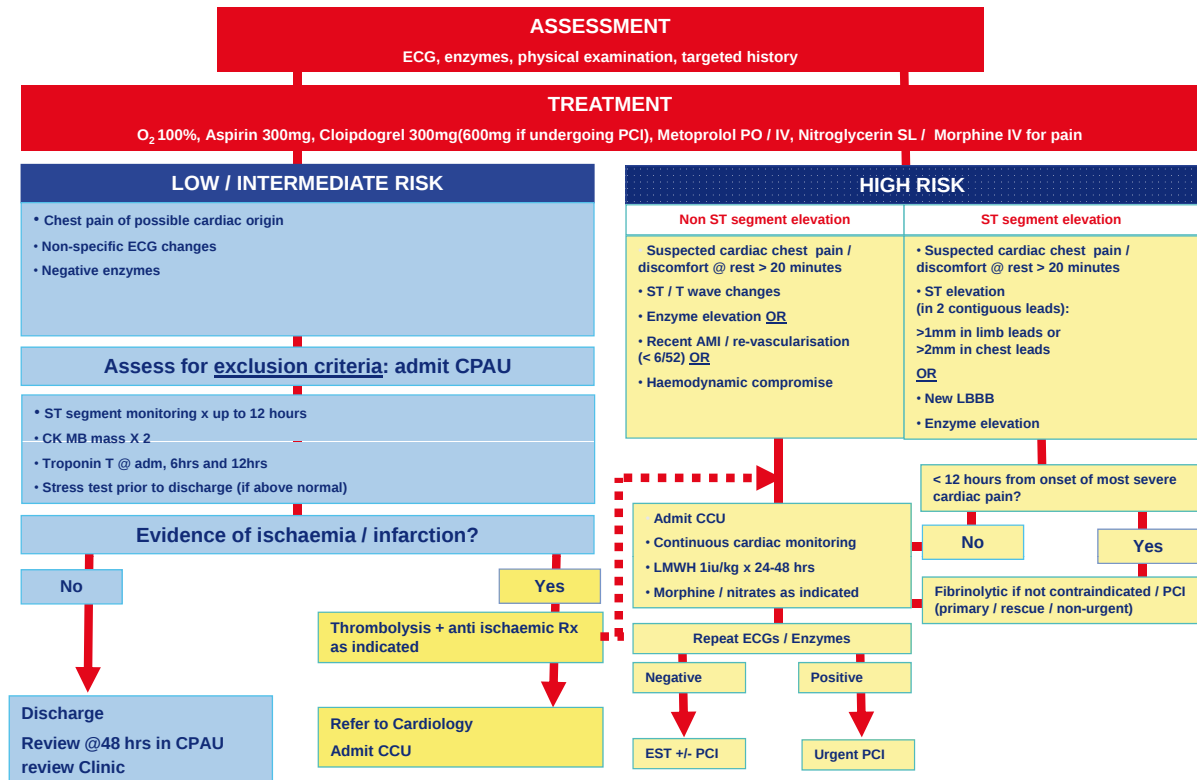
Comparison of findings of 1985-2000 and 2000-2006 IMPACT CHD Mortality Model		
1. 1985-2000 changes were associated with 47% reduction in mortality (variance explained by model: 93%).		
2. 2000-2006 changes were associated with a further 45% reduction in mortality (variance explained by model: 58% men and 77% women).		
Proportions explained	1985-2000	2000-2006
Improved risk factor profile	+60%	+32%
Worsened risk factor profile	-15%	-16%
Treatments	+55%	+48%
Smoking	+26% contribution to improvement in 1985-2000 evaluation	
	+6% contribution to improvement in 2000-2006 evaluation	

APPENDIX 3: ALGORITHM FOR MANAGEMENT OF PRESENTATION TO HOSPITAL OF SUSPECTED ACUTE CORONARY SYNDROME

Model as developed by St. James's Hospital, Dublin (reprinted with permission)

ST. JAMES'S HOSPITAL

Guideline for management of patients presenting with ACS



APPENDIX 4: STROKE NETWORKS – DESCRIPTION AND GOVERNANCE

Evidence and rationale

A stroke network model is recommended internationally as the favoured system to improve regional stroke care. This model has substantial international precedent, having been successfully introduced in Canada, the USA, UK, Austria, Germany and other European countries. The creation of a partnership model of stroke networks has also been supported by the Council on Stroke of the Irish Heart Foundation, which represents all major professional, patient and advocacy groups involved in stroke care in Ireland.

The stroke network model proposed has important differences with the ‘hub and spoke’ model introduced elsewhere. A key feature of the proposed Irish model is that it aims to balance the elements of stroke care that can be delivered effectively at all ‘general’ hospitals with those that are most efficiently delivered at one ‘comprehensive’ hospital. It recognises the importance of the role of the general hospital for provision of many aspects of stroke care close to the patient’s home. These include medical management of many acute stroke patients not eligible for thrombolysis or other highly specialised interventions (e.g. carotid endarterectomy), provision of multidisciplinary rehabilitation and prevention services.

The Irish stroke network model does not propose to centralise stroke care. Instead, it aims to strengthen the quality of care available to patients attending general hospitals, by improving access to services available at the comprehensive hospital (e.g. MRI, neurology, vascular surgery, out-of-hours thrombolysis) and having stroke specialists at general hospitals become part of multidisciplinary stroke groups integrated across all hospitals in the network. In many cases, it is anticipated that patients referred to the comprehensive hospital will be managed on a ‘treat-and-return’ basis, with ongoing care provided in their nearest general hospital.

It is expected that each stroke network will provide same-day out-patient or in-patient services for rapid access to stroke prevention services, emergency thrombolysis, advanced diagnostic facilities, vascular surgery services and comprehensive multidisciplinary rehabilitation and follow-up services. Models may involve rotation of clinics, tele-medicine support for hospitals serving remote areas, centralised services for stroke occurring out of regular working hours, regional or supraregional centres for surgery and advanced diagnostics, and off-site rehabilitation services as appropriate to local demographics and service needs. The overriding principle will be delivery of high-quality stroke care.

Key features of proposed stroke networks

It is proposed that stroke networks will comprise a number of hospitals working together to provide a comprehensive range of services needed for optimal stroke care and integrating with community services. A single larger hospital within the partnership will provide specific comprehensive services that are not expected to be available at all general hospitals. In some regions (e.g. Dublin city), two or more large teaching hospitals may provide the services within the stroke network that are provided by one comprehensive hospital elsewhere.

Services must meet international criteria for stroke care. The definitions of the European Stroke Organisation (ESO) for primary and comprehensive stroke centres are as follows:

Primary stroke centres: Centres with the necessary staffing, infrastructure, expertise and programmes to provide appropriate diagnosis and treatment for most stroke patients. Some patients with rare disorders, complex stroke or multi-organ disease may need more specialised care and resources that are not available in primary stroke centres.

Comprehensive stroke centres: Centres that provide both appropriate diagnosis and treatment for most stroke patients, and also high technology medical and surgical care (new diagnostic and rehabilitation methods, specialised tests, automatic monitoring of multiple physiological parameters, interventional radiology, vascular surgery, neurosurgery).

Each stroke network will have at least one hospital meeting international criteria for a comprehensive stroke centre. In some instances, this may be through a formalised arrangement at a supra-regional level for services needed by a minority of patients. These may include:

1. vascular neurosurgery;
2. selected (but not all) interventional neuroradiological procedures (e.g. intracranial aneurysm coiling, vascular malformation ablation);
3. neuropathology;
4. some specialist services available at the National Rehabilitation Hospital.

Other hospitals treating stroke/TIA within the stroke network will meet criteria for an ESO-defined primary stroke centre. It is intended that each stroke network will have all services needed by most patients at a comprehensive level. The populations served by each stroke network will vary depending on geography and population density. The configuration of each stroke network should allow most (at least 80%) of the population to access a consultant-delivered 24-hour 7-day thrombolysis service by ground ambulance within 90 minutes of stroke onset. It is expected that stroke networks will provide services to geographic regions of approximately 500,000 population.

Stroke specialist groups

The stroke specialists at general and comprehensive hospitals (geriatricians, neurologists, rehabilitation medicine physicians, vascular surgeons, neuroradiologists) will work together in an integrated manner in stroke groups. To ensure an adequate mix of specialist skills within each stroke network, there must be a balanced appointment of stroke specialists from all three main parent specialty areas (i.e. geriatric medicine, neurology, rehabilitation medicine) within the network.

Stroke groups will operate regular clinical care, academic and audit meetings integrated between specialties and between the individual hospitals in the stroke network to ensure good communication and maintain high standards of clinical care within the network. These meetings may be facilitated by video-conferencing to ensure participation by all members of the stroke group.

Where required, timely access to expertise (whether by on-site consultation, video-conferencing or transfer) in neurology, neuroradiology, rehabilitation and vascular surgery and to the advanced diagnostics located in the larger comprehensive hospital must be made available for patients treated in general hospitals within each stroke network.

Governance of stroke networks

- It is proposed that clinical governance of each stroke network be provided by two stroke specialist consultants, acting as Lead Physician and Deputy Lead Physician, and serving terms of 3-5 years. They may be appointed by consensus or interview.
- To facilitate integration and foster close working relationships between medical specialties and hospitals within the stroke network, it is recommended that these positions are filled by two stroke consultants from different parent specialties and from different hospitals.
- Given the importance of developing emergency stroke thrombolysis at a comprehensive level, it is recommended that at least one of the two Lead Physician positions is filled by a stroke specialist who provides emergency stroke thrombolysis.
- The Stroke Network Lead and Deputy Lead Physicians should be supported by a business manager and secretary, and have responsibility for assignment of the stroke network budget, including personnel appointments within the stroke network.
- It is recommended that reporting relationships of staff within the stroke network should be via the departmental line manager to the Lead and Deputy Lead Physicians.
- A management group should be established within each stroke network. This should meet on at least a quarterly basis to review implementation of recommendations within the region. Recommended membership is:
 - Stroke Network Lead Physician and Deputy Lead Physician;
 - HSE Area Network Manager;
 - CEOs of all hospitals within the stroke network;
 - Stroke Network Business Manager;
 - Senior member of nursing staff from one hospital stroke unit;
 - Senior member of allied health professions (physiotherapy, occupational therapy, speech/language therapy, social work, psychology);
 - Senior General Practitioner within the stroke network.

Summary of stroke network recommendations

1. Comprehensive stroke networks, consisting of groups of hospitals providing a comprehensive range of services for stroke and TIA, should be established nationally.
2. Core standards should be met by all hospitals providing acute care for stroke within the stroke network to fulfil recommended international standards for either a Primary Stroke Centre (general hospitals providing stroke care) or Comprehensive Stroke Centre (comprehensive hospitals).
3. Stroke specialist physicians (including neurologists, geriatricians and rehabilitation medicine physicians) in participating hospitals within each stroke network should form joint stroke groups providing high-quality comprehensive hospital care for patients with stroke and TIA, integrated within hospitals and across comprehensive and general hospitals, working in a shared partnership within the network.

4. Physician members of stroke groups should establish multidisciplinary (i.e. between neurology, geriatric and rehabilitation medicine) structures and work processes to ensure regular communication, audit and education on clinical practice within the stroke network.
5. Clinical governance of each stroke network should be provided by a Lead Physician and a Deputy Lead Physician from different parent specialties (neurology, geriatric or rehabilitation medicine), ideally from different hospitals within the stroke network. At least one of these physicians should have expertise in emergency stroke care.
6. The Stroke Network Lead Physician and Deputy Lead Physician should be supported by a Stroke Network Management Group, comprising the HSE Area Network Manager, hospital CEOs and senior representatives from nursing, allied health professionals and general practice.

