IRISH HEART FOUNDATION

STROKE CARE

Towards excellence in stroke care in Ireland

An interdisciplinary initiative from the Council on Stroke of the Irish Heart Foundation

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This work represents three years of dedicated team work by representatives of all the national bodies associated with patient advocacy and concerned professionals. The officers of the Council on Stroke would like to thank all those who took part and gave so generously of their time. We would also like to acknowledge the support of the IHF through its President, Dr Dennis Boyle, Chief Executive Officer, Paddy Murphy, and administrative officers Annette Lehane and Kevin Gordon.

Desmond O'Neill — Chairman
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Summary

Stroke is an illness with a huge personal and societal impact. It is the most common cause of acquired physical disability and is the cause of the second most common form of dementia, vascular dementia. There were 8,584 acute strokes admitted to hospital in the Republic of Ireland in 1997 and the in-hospital mortality is 21% in general hospitals in the EHB region.

There are 30,000 people with residual disability from stroke, including hemiparesis (48%), inability to walk (22%), needing help with activities of daily living (24-53%), clinical depression (32%), and cognitive impairment (33%). This report arose from the realisation of the many groups (patient-advocacy and professional) on the IHF Council on Stroke that strategies for prevention and treatment for this devastating disease are randomly organised, incomplete and under-funded.

There is no clearly stated outline of best practice and policy which is relevant to the Republic of Ireland. Focussed prevention and treatment strategies for stroke can reduce the burden of death and disability associated with stroke. To this end, this report recommends the following measures:

1. Prevention and health promotion
The development of active programmes for primary, secondary and tertiary prevention for stroke. The primary prevention could most usefully be undertaken in conjunction with the Cardiovascular Initiative. Secondary and tertiary prevention should be based in stroke units.

2. Acute treatment and rehabilitation
In every general hospital admitting patients with acute stroke, people with stroke should be admitted to a stroke unit under the care of a dedicated specialist(s) in stroke care, associated interdisciplinary team, appropriate diagnostic technology (e.g. CT/MRI) and a clearly defined continuum of care. Access to tertiary services (i.e. carotid endarterectomy) should also be available. Rehabilitation strategies should start from admission and should be continued during the hospital stay.

3. Community rehabilitation
Out-patient rehabilitation should be made available for all patients of all ages in each Health Board area, on the basis of 250-300 patients per 250,000 population discharged to the community per year. These should encompass the full interdisciplinary team, with either a domiciliary focus or adequate transportation if provided as out-patient care. Services should be available at any age and the model of the stroke unit at Baggot Street Hospital, Dublin, should be considered. The activities of the Volunteer Stroke Scheme should be developed and supported.

4. Stroke Register
As stroke is such a devastating and costly illness, and as there is little data on stroke in Ireland, a register of people with acute stroke should be set up as a priority, much on the lines of the cardiac surgery, coronary care and cancer registries.

Introduction

This report arose from the realisation of the many groups (patient-advocacy and professional) on the IHF Council on Stroke that strategies for prevention and treatment for this devastating disease are randomly organised, and there is no clearly stated outline of best practice and policy which is relevant to the Republic of Ireland.

The aims of the report are to:

1. Outline current practice and provision of services for people with stroke.
2. Outline current best practice in stroke prevention, treatment and rehabilitation.
3. Provide a consensus-derived and realistic basis for the development of healthcare policy so that the principles of the Health Strategy can be fully implemented for people with stroke.

The Council on Stroke of the Irish Heart Foundation has been in existence since 1987 and consists of representatives of the following bodies:
Volunteer Stroke Scheme and (in alphabetical order)
An Bord Altranais
Association of Internal Medicine
Association of Occupational Therapists in Ireland
Faculty of Public Health Medicine, Royal College of Physicians of Ireland
Faculty of Radiology, Royal College of Surgeons in Ireland
Institute of Nutrition and Dietetics of Ireland
Institute of Public Health Nurses
Irish Association of Social Workers
Irish Association of Speech and Language Therapist
Irish College of General Practitioners
Irish Neurological Association
Irish Society of Chartered Physiotherapists
Irish Society of Physicians in Geriatric Medicine
Irish Association of Rehabilitation Medicine
Irish Association of Vascular Surgeons

Stroke in Ireland

Stroke is an illness with a huge personal and societal impact. The social impact is well captured by one stroke survivor who described the illness as having had "…more impact on me than my wedding or the birth of my first child."

It is second only to dementia as the most expensive illness in health and social care costs, and these costs exceed those of either cancer or ischaemic heart disease. It is the most common cause of acquired physical disability, the most expensive single diagnosis medically, and is the cause of the second most common form of dementia, vascular dementia. It is also the underlying disease in a major cause of unsteadiness in later life, vascular gait dyspraxia.

Stroke burden

There were 8,584 acute strokes admitted to hospital in the Republic of Ireland in 1997, and the in-hospital mortality is 21% in general hospitals in the Eastern Health Board region. From international studies it is estimated that there are 30,000 people with residual disability from stroke. Of these:

48% have a hemiparesis
22% cannot walk
24-53% need help with activities of daily living
12-18% are aphasic
5% have a residual swallow disorder
32% are clinically depressed
33% have cognitive impairment

Trends

In international terms, the incidence seems to remain steady, although mortality has been falling for some decades. The progressive increase in the elderly population in Ireland is likely to lead to an increased prevalence of stroke in the future.

Professional team members
(with brief descriptions of their role in stroke care)

The goal of the professional members of the team is to work in a co-ordinated fashion with the patient and his/her family to restore maximal health and well-being and to prevent any recurrence of stroke.

Doctors

Several different sub-disciplines of doctors are involved in stroke diagnosis and care. As with the rest of the multi-disciplinary team, good communication is critical between these groupings.

Family doctors are at the centre of healthcare system and are the main agents of primary prevention of stroke disease. They will also be the first to be called to a stroke or transient ischaemic attack and will initiate assessment and treatment as well as referring on to Stroke Units. The medical care of the patient after the stroke is directed by them, in conjunction with other services and they play a key role in coordination and communication.

Public health doctors assess healthcare needs arising from conditions such as stroke, monitor performance of healthcare providers (eg, Fan, 2000) and advise government, Health Boards and individual doctors of the best preventive and interventional strategies to maximize prevention as well as health and social gain after stroke.

A number of specialists may be involved in leading Stroke Units. If any one specialist does not provide all the medical care up to the time of discharge to the community, the continuum of care must be clearly defined.

Geriatricians, neurologists and **rehabilitationists** are all trained in the acute assessment and treatment of stroke, rehabilitation and discharge planning. Each bring particular and individual strengths to the assessment and management of stroke care and it is likely that the Irish health services will benefit from the active participation of each group in the direction of Stroke Units.

Radiologists and **vascular physicians** are important in ensuring adequate imaging of the brain and vascular system, using such technology as computerised tomographic scanning (CT scans), magnetic resonance imaging (MRI), doppler ultrasound imaging and angiography. Vascular surgeons have an important role for those patients who have a significant narrowing of their carotid arteries after a stroke or TIA. Many other specialists, such as **psychiatrists** and **cardiologists** will often be called upon by specialists in stroke care to provide a complete service to their patients.

Nurses

Several subdisciplines of nurses play important roles in stroke care. In Stroke Units, nurses play central care and coordinating roles. The nursing care is an intrinsic part of ensuring that patient and family are cared for in an holistic way. In essence this entails collecting and communicating relevant information to the physicians and different therapists. Postgraduate skills, such as the Diploma in Gerontological Nursing, are helpful in further developing their role. The nurse who is present on the ward 24hrs a day creates a positive atmosphere that facilitates the patient's possibilities of benefiting from the different therapies. Family members need to be given the necessary psychological help and insight required to cope with the changes that a stroke can bring. Nurses also have specialist skills in specific areas which are critical to well-being, including continence, skin care and counselling.

Follow-up care after discharge by the public health nurse is vital to helping both the patient and his family adjust to their new circumstances. It is also important to monitor the family's ability to provide support, as well as the patient's success in adjusting to his environment, ability to function independently, and compliance with any prescribed medication.

Occupational therapist

Occupational therapy uses everyday activities as the means of helping people achieve independence.

For the person with a physical disability, the focus is on performing critical daily activities, such as dressing, grooming, bathing and eating. Once these skills are mastered, the occupational therapy programme is built around the skills needed to perform a person's daily responsibilities, such as productivity (i.e. caring for a home and family, participating in education, driving, seeking and holding employment) and leisure.

The goals for a client with mental illness are also based on the ability to function independently. In treating mental or emotional problems, the occupational therapy programme often includes practice in managing time, working productively with others and enjoying leisure.

A stroke may affect the individual in one or more of the following functional areas:

- Motor
- Cognitive
- Perceptual
- Sensory integrative
- Psychological
- Social skills

Any of these may interfere with a person's ability to carry out the normal everyday demands of life in the areas of self-care, productivity or leisure.

After the initial assessment, the occupational therapist will determine the person's ability in the relevant areas and, with the client, set goals for regaining skills in the areas affected. This is achieved through the use of

purposeful activity.

Where possible, goals are achieved by fostering the maximum return of affected skills. However, when the stroke has been severe, the aims is to help the client acquire alternative methods of carrying out as many of the activities as possible. This may include the use of special equipment as aids to independence. It may also involve instructing carers in assisting the person with a stroke to carry out the activities.

Prior to discharge from hospital, the occupational therapist may carry out a 'home visit' with the client to assess his/her ability to cope in the home environment. This can be vital ensuring a safe and timely discharge. The hospital therapist will then, if appropriate, refer the client to the community occupational therapist. This may result in further treatment, adaptations to the home environment or provision of equipment to suit the client's needs and to maximise independence.

Physiotherapist

The aim of physiotherapy intervention is to maximize functional ability, thus enabling the patient with stroke to resume activity in all aspects of life to the best of their ability. Physiotherapy is vital following stroke and early referral to the service within the first 24 hours is essential.

Each patient is assessed to identify individual problems, which will guide subsequent treatment. This treatment incorporates a physical and educational component involving the patient, their family and carers. The physiotherapist also works closely with all members of the stroke team in the ongoing evaluation and management of the patient.

Treatment in the early acute stage may involve chest care, positioning and handling techniques and the assessment of disordered movement. Treatment is also directed towards the prevention of secondary complications which may occur following stroke, such as painful shoulder, soft tissue shortening and respiratory infections. Active rehabilitation commences when the patient is more stable and will focus on movement re-education and the restoration of functional independence.

The patient may also continue to receive physiotherapy treatment following discharge from hospital. This treatment may be provided in the physiotherapy outpatient department, day hospital, community stroke unit or by community physiotherapists involved in the domiciliary care of patients with stroke (e.g. district care units).

Speech and language therapist

Speech and language therapists (SLTs) are involved in the assessment, diagnosis and treatment of disorders of communication, speech, language and swallowing following stroke. Communication disorders arising as a result of stroke can have a devastating social and personal impact on the person with stroke as well as their carers/family. They occur in up to 75% of stroke patients.

Difficulty swallowing (dysphagia) can be life threatening in the acute stroke phase. If it is not detected and dealt with immediately the person is at high risk of developing malnutrition, dehydration and pneumonia. Up to 50% of stroke patients will have dysphagia.

The SLT will assess and diagnose such disorders and implement treatment strategies to maximise safe and efficient function and to prevent secondary complications. Additionally, the SLT evaluation may assist with diagnostic decision making by attributing signs and symptoms to lesion sites in the brain. The SLT works with both the patient and their carers from the beginning. Treatment can take place on an individual basis or in a group setting. It can take place in acute hospitals, rehabilitation units or in the community.

The therapeutic aims of the SLT are to maximise the speech, language and communication skills of the patient, to advise carers on specific individual strategies so that effective and efficient communication is possible, and to maximise safe and efficient swallow function for maximal oral intake.

As there are many stages in recovery, patients are reviewed and reassessed periodically to measure progress and to direct treatment plans. Many patients, particularly those with communication disorders, need ongoing treatment after discharge from hospital; often 6-12 months of follow-up treatment is not unusual.

Clinical nutritionist

Current knowledge of the links between nutrition, health maintenance, disease prevention and stroke indicate the necessity to integrate nutrition planning, nutritional screening, intervention, audit and research into any stroke development initiative.

Nutrition intervention is essential to optimize the patient's state of health, improve quality of life and reduce health care costs. This is achieved by assessing nutritional status and individual requirements, implementing a plan of care, monitoring progress, evaluation of the outcome of the intervention and appropriate follow-up.

The role of the clinical nutritionist/dietitian in stroke can be divided into three areas:

1. *Health maintenance and disease prevention*
   Expert dietary advice is essential to reduce the risk, or prevent the recurrence, of stroke in 'at risk' groups, such as those with diabetes, obesity, hypertension, hyperlipidaemia, renal impairment or previous stroke.

2. *Nutritional management post stroke in the acute setting*
   The clinical nutritionist/dietitian has a key role in post-stroke management. The risk of malnutrition in patients after stroke is high due to problems such as swallowing difficulties, inability to feed oneself, depression, cognitive impairment and hemiparesis, and poor appetite.
   The consequences of malnutrition are well documented and include delayed functional recovery, impaired immunocompetence and organ function, depression, apathy, irritability and increased morbidity and mortality rates. In addition, malnourished patients incur large health care costs as a result of longer length of hospital stay, more frequent hospital admissions and increased reliance on drug therapy. To prevent or reverse the effect of malnutrition, early dietetic intervention in this patient group is therefore essential. Nutritional intervention will involve full assessment, intervention (which may entail modified oral feeding), enteral tube or parenteral feeding, monitoring, evaluation, and outcome assessment, as well as patient and carer education

3. *Nutritional management of stroke in the community setting*
   The clinical nutritionist/dietitian has an important role in the continuing rehabilitation following discharge from hospital. Regular follow-up and reassessment subsequent to discharge is vital to ensure maintenance of optimal nutritional and health status. This service should be available in the community to pro-

vide continuity of care and the provision of a seamless service, as recommended in the Food and Nutrition policy 1995.

Social worker

The Medical Social Worker assists the patient and his/her family with the psychosocial aspects of illness. In the context of stroke, the aims of social work are:

- ❒ To provide support to the patients and their family members.
- ❒ To provide the necessary counseling and to help the patient and the family to deal with the emotional fallout from the stroke.
- ❒ To assist with the implementation of future plans, which could include a home visit with other team members.
- ❒ To facilitate family meetings, thus to provide all family members with a forum for discussion of their worries and concerns.
- ❒ To create a link between the family and the hospital multidisciplinary team.

Clinical psychologist

Clinical psychology is the study of the complex interactions between the many factors (e.g. biological, interpersonal and social) that can influence how we feel, think and behave in our everyday life. After a stroke, many people are affected emotionally as well as physically. Emotional symptoms experienced by individuals who have had a stroke are often appropriate reactions to a very stressful illness. This is especially the case given the unpredictable nature of the illness, and its often devastating impact on social, personal and vocational functioning.

The emotional symptoms frequently described by people following a stroke include depression, anxiety, agitation, irritability, apathy, euphoria and denial. Patients must grapple not only with the physical pain and suffering but also with the losses associated with having a serious illness.

As well as changes in mood, people can also experience changes in their ability to concentrate, think clearly, remember day to day events and to express themselves without feelings of frustration. They may also experience problems with planning and organisation, as well as perceptual problems that can affect their ability to perform everyday tasks, for example, dressing or preparing a meal.

The role of the clinical psychologist in the care of a patient who has experienced a stroke is to:

(1) Assess the difficulties they are reporting: this is usually done by using a range of tests and questionnaires that can identify the precise nature of the problem (e.g. does the person have a problem with concentration, or are the difficulties explained by visuo-perceptual problems?).
(2) Once the clinical psychologist has formed a thorough assessment and clinical opinion of what factors are contributing to the problem, relevant psychological theories, clinical experience and current research should direct the treatment plan. The treatment plan may include learning new ways of compensating for memory problems and/or therapy sessions to address the emotional sequelae of the stroke.
(3) The effectiveness of the treatment plan should be evaluated with the patient and their carers, if appropriate, and adjusted accordingly. The ultimate aim of the clinical psychologist is to facilitate the individual to overcome and cope with the particular problems they are experiencing following a stroke and resume their life as best as possible.

Prevention
Primary and secondary

It is clearly more beneficial to prevent stroke than to treat it. Common cause should be made with those promoting health in related domains such as cardiovascular disease, which shares many risk factors with stroke. Risk factors can be grouped into three main groups: those which are non-modifiable, those which are modifiable and apply to whole populations and those which occur in smaller sub-populations and which require a targeted or opportunistic health promotion approach.

The most cost-effective strategy is probably to diminish common risk factors by a modest decrement in the whole population rather than aiming for large decreases in a smaller sub-population: a combination of approaches is preferable than either in isolation.

A strategy of secondary prevention should be undertaken in all those who present to healthcare providers with stroke, TIA, vascular dementia or gait dyspraxia. A multiple risk factor intervention is indicated. The realisation that the probability of stroke is increased severalfold by the presence of multiple risk factors may help both patient and physician to more fully appreciate the need for serious risk factor management. This is supported by the Lausanne study where only one third of second strokes occurred in the same area of the brain as the first.

Risk factors for ischaemic stroke

Non-modifiable risk factors or risk markers

Age, gender, race, ethnicity, and heredity are markers of risk for stroke. These factors cannot be modified.

Potentially modifiable risk factors in the whole population for ischaemic stroke

Hypertension:
Hypertension is the single most important modifiable risk factor for ischaemic stroke.

Cigarette smoking:
Cigarette smoking increases the relative risk of ischaemic stroke nearly two times, with a clear dose-response relation.

Lifestyle factors:
Obesity, physical inactivity, diet, and acute triggers such as emotional stress have been associated with stroke risk. Moderate and heavy levels of physical activity have been associated with reduced incidence of coronary heart disease.

Potentially modifiable risk factors in sub-populations for ischaemic stroke

Cardiac disease:
Various cardiac diseases have been shown to increase risk of stroke. Atrial fibrillation (AF) is the most powerful and treatable cardiac precursor of stroke. One third of eligible patients in Ireland are not on aspirin or warfarin (White, 1998). Other cardiac abnormalities, in particular mitral stenosis, mitral annular calcification, valvular strands, left atrial enlargement, patent foramen ovale and atrial septal aneurysm and myocardial disease are recognized as risk factors for stroke.

Diabetes and glucose metabolism:
Case-control studies of stroke patients and prospective epidemiological studies have confirmed an independent effect of diabetes with a relative risk of ischaemic stroke in persons with diabetes from 1.8-3.0.

Lipids:
Although hypercholesterolemia is an important modifiable risk factor for coronary heart disease, the link to ischaemic stroke remains uncertain. However, data clearly support the positive relation between total and LDL cholesterol and a protective influence of HDL cholesterol on extracranial carotid atherosclerosis. Also, as many patients have ischaemic heart disease, it is reasonable to assess and treat hypercholesterolaemia for this co-morbidity.

Alcohol:
Moderate consumption of alcohol may reduce incidence of cardiovascular disease, including stroke.

Haemostatic and inflammatory factors:
Haemostatic factors have been related to incidence of cardiovascular disease generally, and in two prospective studies fibrinogen has been linked to increased stroke risk. The endogenous tissue-type plasminogen activator system, the primary mediator of intravascular fibrinolysis, has been independently associated with risk of heart attack and stroke.

Homocysteine:
Numerous case-control studies have shown a strong relation between stroke and both basal and postmethionine load hyperhomocysteinemia.

'Silent' stroke:
'Silent' stroke (subclinical disease), or disease detected noninvasively and without clinical signs or symptoms, is known to be related to both prevalent and incident stroke.

Transient ischaemic attacks (TIA):
After adjustment for major cardiovascular risk factors

predisposing a patient to stroke, TIA remains a significant independent risk factor for both stroke and heart attack. TIA referable to a high-grade carotid artery stenosis carries a higher risk for stroke than those beyond a mild stenosis, and the risk with hemispheric ischaemic symptoms is greater than for retinal ischaemia.

Risk factors for intracerebral and subarachnoid hemorrhage

Intracerebral hemorrhage (ICH) and subarachnoid (SAH), which account for only 15-25% of total strokes, result in significant morbidity, mortality, and cost. Aneurysms and arteriovenous malformations are the most commonly identified causes of SAH, while hypertensive arteriolar disease, amyloid deposition, intrainfarct hemorrhage, and arteriovenous malformations are the bases of most ICHs. ICH is twice as common as SAH in studies with CT documentation.

Recommendations

Public Policy

- ❒ Closer links between prevention of heart disease and prevention of stroke disease.
- ❒ Intensify efforts to prevent cigarette smoking and encourage smoking cessation through elimination of advertising, economic disincentives, public education, and other measures.
- ❒ Encourage lifestyle modification, and in particular exercise.
- ❒ Enhance support for screening and follow-up programs for hypertension and other modifiable stroke risk factors, and develop realistic strategies for targeting high-risk populations.
- ❒ Set up a registery of patients with stroke.
- ❒ Encourage specific funding of clinical stroke research appropriate to the major public health burden of this condition.

Public Education

- ❒ Provide more effective education about the importance of controlling hypertension, smoking, diet and exercise.
- ❒ Provide more effective education about risk factors for stroke and warning signs and the need for urgent treatment for stroke and TIA.

Healthcare Providers

- ❒ Stroke Register - as stroke is such a devastating and costly illness, and because there is little data on stroke in Ireland, a register of people with acute stroke should be set up as a priority, much on the lines of the cardiac surgery, coronary care and cancer registries.
- ❒ Organise professional education opportunities about risk factors for stroke and warning signs in conjunction with family doctors and public health nurses.
- ❒ Emphasise the importance of optimal management of atrial fibrillation in persons who are candidates for anticoagulation.
- ❒ Increase efforts to reduce coronary heart disease morbidity and mortality among patients with cerebrovascular disease, emphasizing management of risk factors, especially lipids.

Local Research Priorities

- ❒ Collect comprehensive stroke incidence, morbidity and mortality data: preliminary studies in south Dublin indicate a higher than expected prevalence of haemorrhagic stroke.
- ❒ Identify whether risk profiles in Ireland differ from other models, including genetic factors
- ❒ Identify strategies to improve dissemination of preventive information to healthcare providers and the public.

Transient ischaemic attacks (TIA)

TIAs are less common than stroke but present a more difficult diagnostic challenge. In the first instance many people affected by a TIA will not present to their family doctor. The diagnostic accuracy of clinical diagnosis is also much lower than that of stroke. A major health education initiative is needed to persuade the general public that a TIA is a harbinger of stroke and requires rapid assessment. In 12% of cases, TIAs go on to develop a stroke in the first year, and in 5% of cases annually thereafter. The risk of death is about 6.3-8% per annum (relative risk — compared to same age/sex without TIA — is increased by a factor of 1.4). About 25% of deaths are due to a stroke and 45% are cardiac. Intervention may help to reduce the onset of major stroke.

Most patients will be treated with medium-dose aspirin (75-300 mg) but patients with non-rheumatic and rheumatic atrial fibrillation will benefit more from treatment with warfarin. Rarer causes of a TIA/mild stroke need to be excluded (e.g. arteritis) and patients suitable for carotid endarterectomy selected out.

The specialist leading the stroke unit in each hospital should provide a rapid-access clinic for TIAs. The main 'diagnostic' tool for TIA is a careful clinical history. Of referrals from family doctors, 38% in one study had a 'true' TIA, 10% had migraine, 9% had faints, 9% had possible TIAs, 9% had 'funny turns', 6% had epilepsy, 6% had vertigo, 0.8% had hypoglycaemia, and 0.4% had brain tumours (Dennis et al 1989). The clinic needs access to appropriate imaging (CT/MRI, dopplers) as well as rapid access to a vascular surgery service.

Treating 1,000 patients with a history of cerebrovascular disease (stroke/TIA) will prevent 37 cardiovascular events at three years (death, non-fatal stroke or myocardial infarction).

Carotid endarterectomy is indicated for suitable patients with symptomatic carotid stenosis of 70-99%. Out of a population with TIAs and minor strokes it is likely

that 11-12% will come under serious consideration for carotid endarterectomy. While it will only decrease the incidence of stroke disease by a maximum of 1%, for these individuals it is critically important. Mortality from endarterectomy is now less than 3% in experienced centres.

A strategy for TIAs/non-disabling stroke

- ❒ Early specialist referral and appropriate imaging (CT/MRI, dopplers).
- ❒ Identify and treat any specific disease (rare — e.g. an arteritis, bacterial endocarditis).
- ❒ Anticoagulants in those with atrial fibrillation.
- ❒ Antiplatelet drugs.
- ❒ Modify vascular risk factors — hypertension, smoking, hyperlipidaemia.
- ❒ Select for duplex carotid scans, arteriography and endarterectomy.

There is now consensus that it is important to identify those patients presenting with TIAs who may have a significant degree of carotid artery stenosis by using sophisticated assessment techniques like colour duplex ultrasonography or MR angiography.

To ensure that the full benefit is gained in a rapid and efficient matter, an agreed protocol for 'fast-track' referrals is essential. General practitioners will need to be aware of the system to exploit it fully.

Acute treatment and rehabilitation in hospital

Current practice

Most patients with stroke in Ireland are admitted to the general hospital. The standards of care are variable, and there are only two coordinated stroke units described in general hospitals, one a stroke unit type approach (Tallaght Hospital — Collins et al, 2000) and the other a consultative model (St Vincent's Hospital — Horgan et al, 1996). The access to appropriate therapy is in general unsatisfactory: one study of stroke in the general hospital in Ireland showed that 45% of patients were not receiving the services of therapist/social workers that were indicated (Collins, 1998).

The Voluntary Stroke Scheme survey in 1999 showed that only five out of 38 general hospitals in the Republic of Ireland had a specialist with responsibility for stroke and 18 out of 38 did not have on-site CT scanning available. A substantial number of hospitals in certain health board areas have no access to a consultant-led rehabilitation unit within their own health board area (Crowe et al, 2000).

Stroke units

The aim of acute care of patients with stroke is to control and prevent medical and neurological complications as well as reverse the neurological effects of the stroke itself. The processes of acute care and early rehabilitation are not easily separated (see discussion on stroke below). The most important advance in stroke care is the realisation that organisation of stroke care into stroke units saves lives, and reduces disability and institutionalisation.

It is also a truly democratic treatment option as it is accessible to all patients with stroke, as compared to treatments such as hyperacute administration of r-TPA, which are likely to be applicable to less than one in 20 patients with stroke. Many of the components of the stroke team are available in general hospitals, and there is no evidence that this form of stroke care is more costly or leads to longer lengths of stay (Collins et al, 2000). The greatest barriers are likely to be internal, relating to

What is a stroke unit?

A stroke unit is a service where the acute and rehabilitation care of the patient with stroke is under the direct care of a specialist with training and expertise in stroke management, in conjunction with a dedicated interdisciplinary team.

Although this does not of necessity imply a distinct geographical location for the service, it is preferable to group as much of the service as possible into one area, so as to facilitate a philosophy of care, specialist nursing care and efficient and directed working of the interdisciplinary team.

Essential characteristics for Stroke Units in Ireland

1. Each Stroke Unit must have its primary base in the general hospital. This is essential as the first two weeks is critical in terms of early intervention. The rehabilitation process starts from day one! There are also technical reasons – all patients with stroke should have a CT scan of their brain within 48 hours of the acute stroke. The general hospital facilites will also be needed for hyperacute treatments as they are developed.
2. If further rehabilitation continues away from the general hospital, the staffing as well as the continuum of care and rehabilitation should be clearly defined
3. Stroke Units must have have the capacity to treat **all** patients with stroke attending the hospital (from 100-300 per year, depending on size): designing for less than this will cause blatant inequity.
4. Stroke Units should be resourced according to the guidelines in Table 3.
5. The pathways of care proposed for younger people (<65) with stroke should be clearly identified
6. The links with community services should be clearly defined

the redistribution of resources, or to be found in those general hospitals which do not have the basic components of the stroke unit care.

Stroke units reduce the risk of death or living in an institution at a median of 12 months after a stroke. Mortality is reduced by 28% at 17 weeks and 25% at one year. Stroke patients who receive specialist stroke unit care (centred on a multidisciplinary team with an interest in stroke) are more likely to be alive and living at home a year after the stroke than those managed in general medical wards. Stroke unit care does not apparently increase the time spent in hospital.

There is sufficient evidence to support the setting up of well organised services for acute stroke patients. The evidence indicates that these services should provide comprehensive care centred on an integrated multidisciplinary team who have a specialist interest in stroke rehabilitation. The way in which this is achieved is likely to reflect local circumstances.

The Stroke Unit Trialists' Collaboration paper on a systematic review of randomized trials has shown that organised stroke unit care resulted in long term reductions in death, dependency and the need for institutional care. At a median of one year after a stroke the following results illustrated in table 1 were obtained.

Table 1

Type of care	Dead	Dead/institution	Dead/dependent
Organised stroke care	20.9%	40.1%	59.8%
Control	25.4%	47.2%	66.4%

Table 2
Numbers of patients needed to treat in a stroke unit setting to gain one of the following benefits:

For one extra patient to survive	22 patients treated in a stroke unit
For one extra patient to return home	14 patients treated in a stroke unit
For one extra patient to regain physical independence	16 patients treated in a stroke unit

Overall, in stroke units, the chances of a patient dying were reduced by 18%, of dying or requiring institutional care by 25%, of dying or remaining physically dependent by 29%.

The stroke unit approach places the patient under the direct care of a team lead by a physician with specialist expertise in stroke. Acute treatment and rehabilitation should ideally take place as part of a continuum.

In the Irish setting, stroke specialisation takes place among geriatricians, rehabilitationists and neurologists. The precise contribution of each specialty will relate to local resources and strategic interests.

- ❒ Characteristics of an effective stroke unit:
- ❒ Multidisciplinary team approach
- ❒ Coordinated care through weekly team meetings
- ❒ Staff who are skilled and interested in stroke care/rehabilitation
- ❒ Carers involved in rehabilitation process
- ❒ Stroke training and education programmes

Table 3 outlines an authoritative review of stroke units that has suggested various staffing levels per 10 dedicated beds.

	BMJ	Irish Estimate
Designated Specialist Physician	0.5-1	0.5
NCHD cover	Not stated	1.0
Nursing	7-12	11
Physiotherapist	1-2	2
Occupational Therapist	0.9-1.3	1.3
Social Worker	0.4-0.7	1.0*
Speech and Language Therapy	0.2-0.6	1.0*
Clinical Nutrition	Not stated	1.0
Psychology	0.6	1.0*

**The higher figure is compensatory for the almost complete lack of these services in the community in Ireland compared to the United Kingdom.*

Published research on stroke units includes the following as core members of the stroke rehabilitation team:

- ❒ Specialist physician
- ❒ Nursing (specialised where possible)
- ❒ Physiotherapist
- ❒ Occupational Therapist
- ❒ Social Worker
- ❒ Speech and language therapist
- ❒ Clinical nutritionist

Access to clinical psychology/neuropsychology, psychiatry, podiatry, orthotic and pastoral care services are also important but unquantified. Access to vascular surgery will be indicated for a minority of patients.

Who should be admitted?

Although many of the studies of organised Stroke Units use a variety of means of filtering patients, there is no evidence that any sub-group of patients will not benefit from this approach. Unless data is generated to suggest the contrary, all patients should benefit from this approach.

Unanswered questions

One paper has suggested that some caution is required as variations in case mix may account for 24% of the variance between some stroke rehabilitation outcomes (Davenport, 1996). It is not also clear whether standard multi-disciplinary care in a geriatric medical setting will not be equally effective (Stone 1999).

Diagnostic access

Current practice indicates that patients may also have difficulty in access to timely computerised tomography of brain, and that the time interval from onset of symptoms to presentation is relatively long (Collins et al, 1999). The same factors that lead patients to delay seeking medical assistance for myocardial infarction also cause them to delay seeking medical help for stroke. Attempts to influence such behavior have had limited success. An initiative in the UK, "Improving Response in Stroke", may help to improve response time by working at several levels.

Pharmacological interventions

Two acute pharmaceutical treatments with proven but modest effect are:

1. *Aspirin*
   Taking the IST trail and the CAST trials together, aspirin produces a small but significant decrease of 13 per 1,000 fewer dead or dependent at six months, 10 fewer deaths or non-fatal strokes per 1,000 in the first two weeks, two extra haemorrhagic strokes or transformation in the first two weeks, seven fewer recurrent ischaemic or unknown strokes in the first two weeks. The trials suggest that aspirin should be given as soon as possible after a stroke; other trials show continuation of low-dose aspirin long-term after an ischaemic stroke gives long-term protection.

2. *Intravenous thrombolysis*
   Intravenous thrombolysis may be introduced in Ireland in the near future. The Cochrane review shows that thrombolytic therapy led to a significant excess of early deaths (9.1 per 100 patients treated) and an excess of total deaths (3.7 per 100 treated), but there was a significant decrease in the numbers dead or dependent (6.5 fewer per 100 treated).
   Of those randomized within three hours of stroke there was a statistically significant reduction in those dead or dependent at the end of follow-up (14.1 per 100 treated) and a non-significant increase in the number dead (0.9 per 100 treated).
   If 6% of patients with ischaemic stroke are suitable for therapy, this would mean approximately one less death or disability for every 140 patients admitted with stroke. Differences between the trials mean that the 'best' type of thrombolytic to use remains unknown.
   The introduction of this therapy will have profound implications for the delivery of stroke care. There is likely to be an increase in the number and urgency of referrals. Apart from improving response time, it requires rapid access to CT/MR, as well as the development of skills in reading the often subtle signs of established infarction. Possibilities include intensive training of senior clinical personnel, or the use of tele-radiology.
   There are also ethical difficulties about explaining to compromised patients and carers the trade-off between the benefits against the ten-fold increase in symptomatic ICH. Finally, the patient will require intensive monitoring after thrombolysis.

Other medications

Ancrod has had one positive U.S. study and one negative European study.

The role of anticoagulant drugs is uncertain. Conclusive data is lacking about the ability of heparin to prevent early recurrent embolism among persons with presumed cardioembolic stroke. Low molecular weight heparins and heparinoids have selective antithrombotic actions that may improve safety and reduce the risk of severe symptomatic autoimmune thrombocytopenia. There is no convincing evidence that any current neuroprotective drug is effective in either reducing size of infarction or improving overall outcome.

Candidates include calcium entry antagonists, glutamate antagonists, sodium channel antagonists, glycine antagonists, opioid antagonists and antioxidants/free radical scavengers.

Antidepressants have an important role in treating post-stroke depression.

It is likely the future strategies will involve the evolution from monotherapy to multiple concurrent or sequential therapies. Therapies targeted at only one facet of the complicated process of stroke are likely to be of only limited benefit.

Rehabilitation

Stroke is a condition with high incidence and moderate mortality rates, leaving a large proportion of survivors with significant residual physical, cognitive, and psychological impairments. In view of the high rate of medical and neuro-psychiatric complications of stroke, in-patient rehabilitation of stroke in Ireland should take place either on the general hospital site or in adequately equipped and staffed rehabilitation hospitals.

The rehabilitation process involves six major areas of focus:

1. Preventing, recognizing, and managing comorbid illness and medical complications
2. Training for maximum independence
3. Facilitating maximum psychosocial coping and adaptation by patient and family
4. Preventing secondary disability by promoting community reintegration, including resumption of home, family, recreational, and vocational activities
5. Enhancing quality of life in view of residual disability
6. Preventing recurrent stroke and other vascular conditions such as myocardial infarction that occur with increased frequency in patients with stroke.

To attain these goals, rehabilitation interventions should assist the patient in achieving and preserving maximum feasible functional independence.

Stroke rehabilitation is an active process beginning during acute hospitalisation, progressing for those with residual impairments to a systematic program of rehabilitation services, and continuing after the individual

returns to the community. It should be an organised effort to help patients with stroke to maximize all opportunities for returning to an active and productive lifestyle. Because the clinical manifestations of stroke are multifaceted and complex, stroke rehabilitation is best implemented through the coordinated efforts of a team of rehabilitation professionals.

A well-conceived rehabilitation management plan is the basis for all rehabilitation. The first step is to match the patient with the appropriate rehabilitation services and setting. Reasonable medical stability, functional disability, and the ability to learn are the primary criteria for rehabilitation.

Scientific basis for stroke rehabilitation

Rehabilitation is effective. At present, however, we cannot easily differentiate between the influence of specific interventions and the natural recovery process. The state of the science in stroke rehabilitation was summarized in the 1995 Agency for Health Care Policy and Research Post-Stroke Rehabilitation Practice Guideline.

The effective delivery of post-stroke rehabilitation requires development of an integrated care system that spans acute care and rehabilitation, outpatient rehabilitation services, home care, and community support services. Issues within the Irish healthcare system include:

Lack of a coordinated approach
Lack of full interdisciplinary teams
Rural/urban differences
Age issues
Lack of community resources, lack of transportation to out-patient care

Recommendations for acute treatment and rehabilitation in hospital

- ❒ The care of all patients with stroke should be under the care of an interdisciplinary team lead by a physician with specialist training in stroke, in the setting of a stroke unit, with a clearly defined continuum of care.
- ❒ The resources for these services should be funded by a transfer of resources currently used to treat patients with stroke in disparate settings with judicious top-up funding where these resources cannot be devolved readily or where they are not already existing.
- ❒ All patients with stroke should have access to timely CT/MR scanning, as well as modalities such carotid duplex scanning. Senior personnel need to be trained in the reading of CT scans in acute stroke.
- ❒ Procedures for thrombolysis in Irish hospitals need to be developed in conjunction with primary care if thrombolysis is licenced for the treatment of acute ischaemic stroke.
- ❒ Stroke units should increase awareness of the importance of early and successful treatment of persons with stroke to the following groups: the public, especially groups judged to be at the highest risk; physicians; other healthcare providers; hospital administrators; and government.

Stroke care teams need to:

- ❒ implement interventions during the acute phase of stroke to promote recovery and prevent complications;
- ❒ emphasize the importance of thorough and consistent interdisciplinary assessment at each stage of the recovery process to guide treatment decisions and monitor progress;
- ❒ prevent secondary disability by consistently promoting functional independence and opportunities to improve quality of life;
- ❒ ensure that rehabilitation should cover all aspects of function, including resumption of home, family, recreational, and vocational activities;
- ❒ maintain a patient and family focus throughout rehabilitation;
- ❒ develop a broad-based campaign for reintegrating persons with stroke disabilities into the community;
- ❒ support development and implementation of programs and legislation that address the physical, emotional, and economic burden of stroke;
- ❒ develop and refine valid, reliable, and sensitive instruments to measure improvement after stroke.

Rehabilitation in the community

While this is an essential component of a stroke care programme, the reality is that stroke-specific community rehabilitation is of limited availability in Ireland.

Outpatient rehabilitation

Outpatient rehabilitation is available for all ages at the Stroke Rehabilitation Unit in Baggot Street Community Hospital in Dublin, but transport and distance lessen the access to this service.

Older patients with stroke can avail of out-patient therapy at geriatric medical day hospitals in a limited number of hospitals around the country. The Volunteer Strokes Scheme run a number of self-help groups in Dublin.

Community services

Access to the public health nurse is available to patients with medical cards, but further support is often deficient. Many components of the rehabilitation team are absent from the community. Speech and language therapists, clinical nutritionists, social workers and psychologists are effectively unavailable. Waiting lists for physiotherapy and occupational therapy are often long, and input may be limited due to lack of personnel. There is also little infrastructural or administrative support for the clinicians to work in a team fashion.

The district care unit in the Eastern Regional Health Authority area (also known as the Community Ward) is a limited team (consisting of a physiotherapist, occupational therapist, nurse and home care attendant) which may provide community rehabilitation for older patients with stroke. The mean delay from discharge to acceptance is 11.5 days and the mean duration of therapy is less than six weeks. The service is also limited to those over 65 and those with medical cards

Those in long-term care, arguably the most disabled group of all, are more often than not denied access to therapy to maintain residual function and to prevent further decline.

Recommendations

- ❒ Full outpatient rehabilitation should be made available for all patients of all ages in each Health Board area, on the basis of 250-300 patients discharged to the community per year per 250,000 population.
- ❒ Transportation should be made available for outpatient care.
- ❒ Community services should be developed to encompass the full interdisciplinary team and appropriately supported to enable team work.
- ❒ Other strategies should be developed for rural areas where distances are greater: domiciliary services may be more appropriate.
- ❒ The activities of the VSS should be developed and supported.
- ❒ On-going therapy needs of those in long-term care must be fully supported.

Carers and families

A stroke is a family illness. Initially, as in any other acute illness, relatives need information and support through the crisis, but it is different from many other acute illnesses, in that they will usually need long-term practical, emotional, social and financial support to cope with the many residual problems.

The extent of the stress of caring for a disabled person and the factors influencing the nature and extent of stress have only recently been the subject of research. There is little research into ways of alleviating the distress. Consequently while there is little evidence to help with guidelines, some important common-sense principles can be outlined.

Guidelines

1. While recognising the privacy of the patient, the needs of the family to be given information, to be involved in taking decisions and making plans, and to be given support, must be considered from the outset.
2. Stroke units must be alert to the likely stress on carers, specifically recognising the stress associated with 'hidden' impairments such as depression cognitive loss, urinary incontinence, depression, and irritability.
3. Information should be given to families on the nature of stroke and its manifestations, and on relevant local and national services, including the Volunteer Strokes Scheme and the Carer's Association.
4. The community therapy and support services require a major investment so as to meet the needs of people with stroke and their carers.

Long-term care

A significant minority of people with stroke will require long-term care, despite maximal treatment and rehabilitation. The basic essential in long-term care is that, where possible, the person's own choices should be followed. Also, support provided should be appropriate to individual care needs. This long-term care can be provided either at home or in institutional care and both "The Years Ahead" and "The Health Strategy" have specified a preference for care at home wherever possible.

Currently there is no clear statement of policy on prevention, assessment, rehabilitation, standards of care, maintenance of quality of care, independence and dignity for long-term care. The Council on Stroke recommends the following principles and standards in each of these areas.

Gateways to care

No binding decisions should be made on long-term care until the course of remediation is considered by the relevant specialist to be as complete as is feasible.

Equity and financial access

The current system of a combination of public and voluntary contract beds in private nursing homes and subvented beds in nursing homes is distinctly inequitable. There is no clearly stated consistent and transparent policy among the health boards about means testing and the need to dispose of assets. This means that in one bed a patient and family may have gone to considerable distress and disturbance to dispose of assets and pay to make up the difference between subvention and nursing home cost, while in the next bed a patient with similar assets may be paying nothing at all as they are in a contract bed.

A similar situation occurs with access to publicly funded beds. This anomaly should be clarified immediately and there should be a level playing pitch. It is the responsibility of the health boards and not of individual clinicians to clarify the financial entry criteria.

When residual disability leads to a care need it should be assessed as to whether this can be provided in the community by a package of care or in institutional care. The person's choice should be facilitated in this regard and the resources should be equivalent and adequate, whether pursued in the community with a package of care or in institutional care.

Ongoing health needs

By nature, people who require packages of long-term care are compromised and are prone not only to exacerbations and deterioration of underlying disease processes but also to intercurrent illness. These health and ongoing rehabilitation needs will require expert medical and nursing and paramedical care. We would recommend that in cases where the package of long-term care (either residential or institutional) is not provided by the patient's own family doctor with appropriate support, it should be provided by a family doctor with a Diploma in Medicine for the Elderly. The input of medical care to patients receiving long-term care should be resourced to recognise the extra medical needs and demands on this medical service by this frail and vulnerable population.

There should be adequate training for the nurses and, where possible, should include a higher diploma in Specialist Care of Older People. There should be full and appropriate access to all members of the interdisciplinary team. Currently, community therapy services will often not serve patients who are in subvented or contract beds in nursing homes and many public institutions do not have a full complement of therapy staff available.

Standards of good practice for health and social care patients should be clearly outlined as these are not clearly outlined in the current legislation. These standards of care should apply to long-term care whether pursued in the community or in institutional care. If in institutional care, the standards of care should be pursued equally in public, private and voluntary institutions. Ongoing audit of these standards of care will require any independent inspectorate and the position of an ombudsman for long-term care should be instituted.

Environment

Current standards of residential accommodation for adults in the general community are that people have a room of their own unless they are sharing with a family or friend by choice. This principle should be adhered to in the provision of institutional long-term care. Patients who choose this route should have access to single rooms with en suite bathroom, unless they choose to share a room with a relative or close friend.

The system should facilitate independence and dignity and should include the provision of the patient's own clothes and should ensure the security of their personal effects so that they can create their own personal space in the nursing home.

The social and physical environment should ensure the fulfillment of needs for recreation, social interaction and stimulation, and these needs should be individualised rather than treated in a collective fashion. It is important that healthcare professionals are involved in the design of facilities for institutional care and it should be possible to design a template covering the minimum requirements.

The current system of funding may consume all of an older person's financial resources. Each older person in long-term care should be left a proportion of their income to cater for personal needs such as newspapers, toiletries etc., as is currently the situation in the United Kingdom.

Stroke in younger people

One in six strokes occur before the age of 60. Various strategies are possible to ensure services to the younger stroke patient, who in general do not have access to specialist stroke care as inpatients or outpatients.

These include:

- ❒ All-age stroke units in hospitals
- ❒ Separate services for younger and older people with stroke in larger centres
- ❒ Regional/national centres: resources should follow the patient
- ❒ The development of stroke units of the Baggot Street Hospital model in each Health Board
- ❒ The extension of community services to younger people with stroke
- ❒ Self-help groups along the lines of Different Strokes
- ❒ Respite care

Research

Despite the enormous health, social and financial implications of stroke, research into the topic has been limited. Apart from low overall funding for research, several institutional barriers have constrained natural growth. The Health Research Board has no sections for research in either rehabilitation or geriatric medicine. The National Rehabilitation Board gives pitifully small grants towards rehabilitation research, and require an initial outlay of several thousand pounds for fees.

Recommendations

- ❒ A register of people with acute stroke should be set up as a priority, much on the lines of the cardiac surgery, coronary care and cancer registries.
- ❒ The Health Research Board and National Rehabiliation Board should specifically recognize the importance of stroke as a topic for research.
- ❒ Specific and adequate research funds should be allocated to encourage research into the topic.

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