

Health, Wellbeing & Local Government Committee

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Inquiry into Stroke Services in Wales - Evidence from the Welsh Stroke Alliance

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Health, Wellbeing and Local Government Committee

National Assembly for Wales

Memorandum of Written Evidence

Dr Anne Freeman and Colleagues
Welsh Stroke Alliance

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Biographies

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Welsh Stroke Alliance

The Welsh Stroke Alliance was established in July 2007. Dr Freeman is the founder of this group and Chair of the Alliance since its inception.

The Welsh Stroke Alliance was set up to ensure a multidisciplinary and multi- agency approach to Stroke Service Development. It is the reference group for the Stroke Services Improvement Programme and potentially could become the main strategic and advisory body for stroke in Wales when the Stroke Services Improvement Program has completed its work.

Membership is wide-ranging, comprehensive, multi-disciplinary, multi speciality representing all aspects of the stroke care pathway from symptom onset to full recovery or to death/palliative care.

Executive summary of recommendations

1. There is an urgent need for an All Welsh Stroke Strategy and Implementation Project. This would facilitate the translation of evidence into practice. The project should report to the Minister and Head of NHS Wales via the National Delivery Board of the newly reformed NHS in Wales.
2. The strategy and work programme should be informed by the Wales Annual Operating Framework audit and Royal College of

Physicians audits.

3. The current regional Stroke "Networks" should be developed along the lines of those networks that have been successfully established in cardiac, renal and cancer services. The networks should be informed by the conclusions of the Stroke Services Improvement Programme.

4. Changes in service provision and infrastructure should take into account, and be conjugated with, the likely changes in Neurosciences in Wales and in Neurosurgery services in South Wales. This is of particular relevance in relation to neuroradiology, developments in which will define the future practice of stroke medicine.

5. The Welsh Stroke Alliance should become the strategic advisory group for stroke services in Wales and should report to the Welsh Medical committee.

6. The progress of individual units should be monitored using the Intelligent Targets developed through the work of the All Wales Stroke Services Improvement Collaborative (AWSSIC).

7. The goal of these changes of organisational infrastructure would be to ensure that all stroke patients should have access to stroke services which meet the Audit Standards and the National Clinical Guidelines of the Royal College of Physicians and the guidelines of the British Association of Stroke Physicians (BASP) including, as a minimum, the provision of:

(a) Comprehensive and appropriately staffed acute stroke units in all hospitals admitting stroke patients

(b) Sufficient numbers of fully trained specialist stroke physicians in each of the new health boards to comply with the BASP recommendation i.e.16 consultant sessions per 250,000 of the population.

(c) 24/7 access to clinical and radiological services to facilitate the use of thrombolysis for appropriately selected patients. This will need the involvement and cooperation of the Welsh Ambulance Service Trust and may require developments in Telemedicine services.

(d) A TIA service to offer assessment within 24 hours, 7 days a week.

(e) Rehabilitation services to include intensive early in-patient rehabilitation (first 7 days), supported by good quality longer term specialist in-patient rehabilitation (up to 28 days), and with early supported discharge services.

(f) A programme of accredited education and training for the specialist workforce including those in the managerial, caring, medical, therapy and nursing professions.

8. To ensure that all future service developments are closely linked to academic and research activity we would recommend:

(a) An academic department for Stroke Medicine in Wales

(b) Increasing opportunities for properly funded stroke research to include locally organised programmes but also more widespread participation in large international trials. The latter is an excellent way to promote research based clinical developments and at the same time have services audited by recognised agencies.

(c) The formation of a training scheme in stroke medicine for medical SpRs to allow them to be accredited in stroke medicine and to support the expansion of consultant numbers in Wales.

The burden of stroke

Stroke (also known as cerebrovascular disease) is extremely common, with one new stroke occurring every 5 minutes in the UK. There are significant health consequences. It is the third most common cause of death and the most common cause of neurological disability in the UK. The resulting long-term disability has a significant cost to the individual, the NHS, and to social services (Stiff, R, 2008).

In the UK more than 150,000 people have their first stroke each year. One third die within four weeks, one third will be significantly disabled with 5% of these requiring long term care. It is estimated that stroke costs the nation around £7 billion every year. This includes direct costs to the NHS of £2.8 billion, £1.8 billion to the wider economy in lost productivity and disability, and £2.4 billion informal care costs for home nursing and care borne by patients and their families (National Audit Office, 2007).

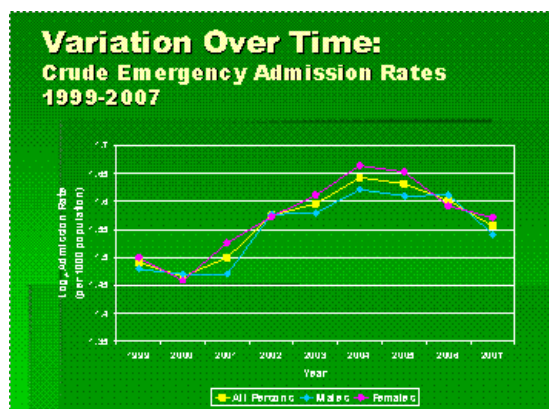
On a per capita basis for Wales, this approximates to direct costs to the NHS of £140 million per year; £90million per year to the wider economy and £230 million per year for informal care costs for home nursing and care borne by patients and their families.

In Wales there were 3063 deaths from cerebrovascular disease in 2006, a reduction from 3707 in 2001 (Stats Wales, 2009); obviously the figure of 3063 relates to patients who have had a stroke at some time, and not just in the year before.

There were 6,288 hospital spells in 2006 (Welsh Assembly Government, 2007a). Furthermore Quality and Outcome Framework data from general practices 2007 show that 1.97% of all GP Registered patients in Wales are on the Stroke and TIA Register - with a similar self-reported prevalence of 3% in the Welsh Health Survey (Stiff, R, 2008)

To better understand the epidemiology of stroke in Wales, research was carried out looking at the variation of emergency admissions over time according to age and area of residence of those affected, using Patient Episode Data for Wales from 1999 to 2007 (Stiff R, 2008).

Table 1: The variation in crude emergency hospital admission rates for stroke in Wales 1999 - 2006

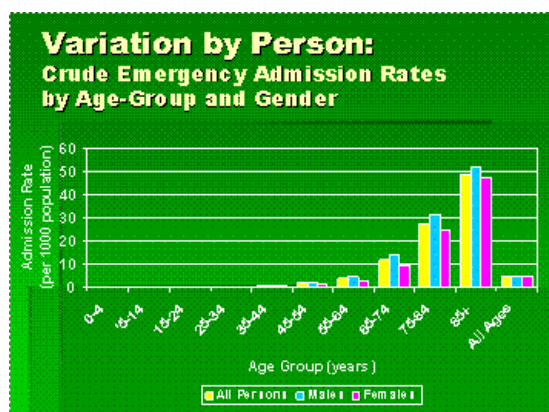


Source: Stiff R, 2008

There is relatively little variation in mean annual admission rates for each of the 9 years, with rates varying between 4 and 6 emergency admissions per 1000 population. This graph has a log scale to help accentuate trends.

It can be seen that there is possibly a trend in increasing rates of admission from 2000 to 2004 and a subsequent tailing off of admissions. It's difficult to interpret this, but it might be worth bearing in mind that the first edition of the Royal College of Physicians National Clinical Guidelines for Stroke was published in 2000 with subsequent editions in 2004 and 2008. In conjunction with this, there have been changes in provision of services e.g. provision of neurovascular clinics so that patients with TIAs need not be admitted and may be referred as an outpatient. It is also of note that the population of older people is increasing in Wales which is likely to offset any decline in admissions.

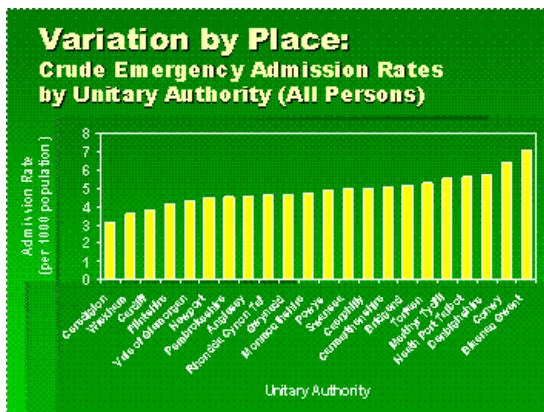
Table 2: The variation in crude hospital emergency admission rates in Wales by age and gender, 1999 - 2006



Source: Stiff R, 2008

Table 2 shows that emergency admissions vary considerably with age group, with increasing rates of admission as age increases. Males have a slightly higher rate of admission than females in each individual age-group, however, when all ages are considered together, the rates are similar. Most of the admissions occurred in the 75-84 year age group, although expressed as a percentage of the living population admission rates were higher in those aged over 85 years old.

Table 3: The variation in crude emergency admission rates to hospital in Wales by Unitary Authority 1999 - 2006

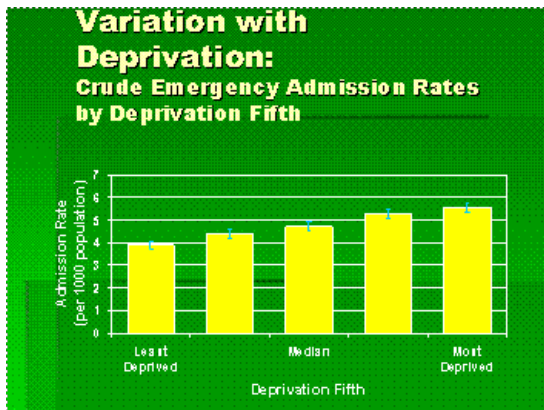


Source: Stiff R, 2008

Table 3 shows admission rates across Wales' unitary authorities. There is considerable variation. Ceredigion has the lowest rate with 3.14 per 1000 (95% confidence intervals 2.8-3.6) and Blaenau Gwent the highest rate of emergency admissions at 7.10 per 1000 (6.5-7.8). This equates to a 2.3 fold variation across unitary authorities.

Some of the variation can be correlated with deprivation. For instance Merthyr Tydfil doesn't have the highest admission rates as might be expected, and relatively deprived Newport has lower rates

Table 4: Variation of crude emergency admission to hospital by deprivation fifth



Source: Stiff R, 2008

However, when crude admission rates by deprivation fifth, using the Welsh Index of Multiple Deprivation, are considered (Table 4) it can be seen that there is a trend of increasing admission rates across the deprivation fifths from 3.83 per 1000 (3.7-4.0) in the least deprived areas of Wales to 5.57 per 1000 in the most deprived (5.4-5.8). The rate ratio between least and most deprived was 1.46 (1.38-1.54),

This shows that a person is nearly one and a half times more likely to be admitted for a stroke or TIA if they reside within an area in the most deprived fifth than is a resident of the least deprived.

These data are drawn from a population database of all strokes and TIAs over nine years that includes all NHS hospitals in Wales. There are limitations in that the rates are crude rates, admissions include primary admissions and readmissions, it does not include attendances only, emergency admission includes transfers between hospitals, and deprivation refers to the description of the area and does not necessarily apply to an individual.

Conclusion

Therefore stroke is a considerable burden on services in Wales and with an ageing population the incidence is likely to rise. Patients are admitted to the general medical intake and typically are over the age of 65 years.

In hospitals they are cared for by a wide range of professionals including those in the emergency departments, the medical assessment units, the general medical wards, stroke units and the rehabilitation units.

Future developments in service provision must take into account the age of the typical patient and the wide range of professionals involved in their care.

The evidence for the beneficial effect of interventions

Research

Three areas of practice have a particularly strong evidence base and are highlighted because of their relevance to service development in Wales.

Management of TIAs

A transient ischaemic attack, or mini-stroke, often heralds the onset of a full stroke. The mechanism of a TIA is thought to be a clot briefly occluding a blood vessel and then being dispersed. The deficits produced are the same as in a completed stroke but they resolve, typically, within half an hour. A stroke can occur for the same reasons but the clot is not dispersed and the area of brain downstream loses its blood supply permanently and ceases to function. Therefore, a TIA is a very significant event although the brevity of the symptoms and the lack of pain militate against it being recognised, even though it is now accepted as a medical emergency.

If these patients are seen promptly, ideally on the same day, the incidence of further events-TIAs and Strokes-can be reduced by up to 80% (Rothwell). The interventions required are already licensed and in use e.g. aspirin and other aspirin-like drugs, and medication designed to lower cholesterol and blood pressure.

Therefore rapid access TIA clinics in secondary care are required to ensure that a diagnosis is made (many of the patients who attend TIA clinics are found to have TIA mimics, often >50%) and the appropriate medication started.

As well as ensuring that the diagnosis of the presenting problem is secured TIA clinics also support the management and detection of a wide range of conditions known to increase the risk of TIA and stroke (hypertension, hypercholesterolaemia, atrial fibrillation) and offer opportunities to highlight the risks of obesity, binge drinking, smoking, the use of illicit drugs (particularly cocaine) and other lifestyle choices.

Stroke Units

There has been a considerable body of stroke research in recent years; of note are the following two studies:

One of the most significant recent advances in stroke medicine has been following the publication of a randomised controlled trial which considered the outcomes of mortality and institutionalisation for stroke patients dependant on the type of care received (Kalra et al, 2000). The study showed that mortality or institutionalisation was significantly lower for patients admitted to a stroke unit (14%) than for those having care from a stroke team (30%) or domiciliary care (24%) at one year. The proportion of patients alive and without severe disability at one year was also significantly higher on the stroke unit (85%) compared with the stroke team (66%) or domiciliary care (71%). This important research showed that stroke units are more effective than specialist stroke teams or specialist domiciliary care in reducing deaths, the need for full time nursing or residential care in an institution or dependence after stroke. These findings have been confirmed by others (Intredavik B).

A Cochrane systematic review of stroke unit care for stroke involving 31 trials with 6936 patients concluded that stroke patients who receive care in a stroke unit are more likely to be alive, independent, and living at home one year after the stroke (Stroke Units Trialists' Collaboration, 2007) The review found significant reductions in the odds of death, death or institutional care and death or dependency in patients cared for in stroke unit than alternative services.

Thrombolysis (clot busters)

The NICE guideline of 2007 and the RCP guideline of 2008 (see references) support the use of this treatment in centres that are appropriately equipped and staffed.

The evidence suggests that if patients who have had a stroke due to an occluded blood vessel are seen, investigated and treated within three hours of the onset of symptoms, treatment with a clot buster (thrombolysis) will reduce the number of people who die or are left disabled as a result of the stroke. The number needed to treat is ten i.e. for every ten people treated one person will be saved from death or disability. However the sooner patients are seen the greater the beneficial effect of the treatment is likely to be.

The treatment is dangerous (approximately 5% of treated patients will bleed as a result of the treatment) and the reorganisation of services required to deliver the treatment is a considerable challenge.

Standards and Benchmarks for service provision

National Health Gain Targets

A range of National Health Gain targets were established c2000 to help prioritise health gain in the Welsh population. Among the targets for the Health of older people is:

"to reduce the European Age Standardised Rate for stroke mortality by 20 per cent in 65 to 74 year olds by 2012, from baseline in 2002" (Welsh Assembly Government,c2000)

National Service Framework

A National Service Framework for Older People was launched in 2006 (Welsh Assembly Government, 2006). This followed the National

Service Framework Strategy for Older People in England, 2003. The National Service Framework through the setting of national, evidence based standards, aimed to improve health and social care services and equity of access for older people across Wales. The standards relating to Stroke are:

A reduction in the number of older people who have a stroke

A reduction in the number of stroke mortalities

Provision of stroke care services in accordance with clinical guidelines

Effective coordination of stroke care from prevention through to acute care, rehabilitation and longer term support

Each local health and social care community to design and have in place a care pathway for stroke care from prevention through to rehabilitation and long term support, so that all patients have access to appropriate treatment including a multi-disciplinary stroke team. Care pathways must incorporate:

- Preventive action and management within primary care of those at risk
- Effective referral to specialist mechanisms to specialist assessment and treatment services for those with suspected TIA or stroke
- Prompt access to specialist acute stroke services in accordance with Royal College of Physicians guidelines
- Co-ordinated longer term services, support and advice

British Association of Stroke Physicians - Stroke Service Specification

The British Association of Stroke Physicians Service Development & Quality

Committee (2005) developed a stroke service specification and described three grades of unit depending on the service offered.

The details of the specifications of units at level 1, 2 and 3 are included in Appendix 1 and offer some insights in to the sort of service that should be aspired to at different stages of service development.

Royal College of Physicians

The work done by the Royal College has underpinned many of the improvements in stroke services in Britain.

In their most recent guidelines (RCP 2008) they combine their own recommendations with those of NICE and make a number of key recommendations.

This document should inform future developments and justifies full reproduction here because of the range of recommendations made; this includes commissioning, acute services (for TIA and stroke), physiological monitoring, stroke units, rehabilitation, driving, and family support as well as many others.

The guidance about commissioning may be of particular relevance to the inquiry and informs the recommendations made at the beginning of this document.

In the following section we see how Wales is performing and starts with the RCP audit results.

How is Wales performing?

Royal College of Physicians Audits

The Royal College of Physicians undertakes bi-annual Sentinel Stroke Audits to measure both provision of care (organisational audit) and patient outcomes (clinical audit) against the standards described in their guidelines.

The audits show that services in Wales are variable and consistently perform at lower levels than England and Northern Ireland. There have been some improvements but they have not matched the improvements in England and Northern Ireland.

Table 5: Percentage compliance with Royal College of Physicians Audit Key Clinical Indicators for Wales 2001, 2004, 2006 and for 2008 (Key Indicators were modified in 2008) compared with the National* average 2006

Key Indicators	Wales 2001	Wales 2004	Wales 2006	Wales 2008	National* average 2008	Meets average	Trend
Treated on a stroke unit (%)	22	28	28	-	-	Red	Orange
>50% stay on stroke unit	17	23	22	-	-	Red	Orange

2008 Indicator: Patients treated for 90% of stay on Stroke Unit	-	-	-	41	58	Red	Orange
Swallow screen <24 Hrs	60	51	55	52	72	Red	Orange
Brain scan <24 Hrs	60	62	38	54	59	Red	Red
Aspirin <48 Hrs	72	73	76	85	85	Green	Green
Physiotherapy Assessment <72 Hrs	58	49	54	70	84	Red	Orange
Occupational Therapy Assessment < 7 days	62	55	50	-	-	Red	Red
2008 Indicator: Occupational Therapy Assessment < 4 days	-	-	-	43	66	Red	Orange
Weighed during admission	56	51	54	59	72	Red	Green
Mood assessment by discharge	52	47	53	46	65	Red	Orange
Rehabilitation goals set by multi- disciplinary team	58	67	70	74	86	Red	Green
Average for Indicators	57	56	54	58	72	Red	Orange

Source Royal College of Physicians, 2007

* National includes England, Wales and Northern Ireland

The table shows that there is only one clinical indicator that meets the national average (coded in green). For three clinical indicators the trend is improving; the remaining indicators show a mixed pattern or a fall. Most notable is the bottom row which shows poor performance across the indicators.

The priority findings and recommendations of the 2006 Sentinel Stroke Audits include (Royal College of Physicians, 2007, p.10):

"The late launch of a National Service Framework in Wales in 2006 appears to have handicapped the development of specialist stroke services in Wales, which need urgent attention. Given the evidence for the benefit of stroke units, the very low rate of stroke unit provision and admission is unacceptable. Patients in Wales will be dying or surviving with higher levels of disability than is necessary compared to England and Northern Ireland.

Action required: Wales needs to identify systems to raise the quality of stroke across the whole patient pathway, particularly through the development of stroke units."

Welsh Medical Committee Report on Stroke Services in Wales

The Welsh Medical Committee requested a review of the situation in 2007, in light of the Royal College of Physicians findings. The Stroke Special Interest Group (now the Welsh Association of Stroke Physicians) made the following key recommendations to the Welsh Medical Committee in their report:

All Welsh Trusts should have a specialist multi-disciplinary stroke unit by 2008. These will require sufficient capacity to ensure 80% of patients admitted to hospital with acute stroke in Wales will spend more than 50% of their stay in a Stroke Unit.

The lack of organized specialist stroke units is one reason why the outcomes of Welsh stroke patients are poor. This clinical governance issue must be addressed urgently.

All stroke patients should have brain imaging, unless deemed clinically inappropriate, within 24 hours of admission. The criteria for immediate access to brain imaging are outlined in the RCP Stroke Guidelines (outlined in the second edition 2004, and more recently in the third edition 2008).

Every LHB should develop systems by 2008 to ensure that all stroke patients have the opportunity to access a high quality Acute Stroke Unit which provides thrombolysis.

Every Trust should also have a rapid access stroke prevention clinic by the end of 2008.

Every Trust in Wales should have a specialist stroke service in the community

Where possible, physicians fully accredited in Stroke Medicine should be appointed to vacancies. New training posts for Specialist Registrars in Stroke Medicine should be created in Wales.

Measures should be taken to train multidisciplinary staff in Stroke Medicine.

How has Wales Responded?

Welsh Health Circulars, 2007

Two Welsh Health Circulars were produced in 2007 (Welsh Assembly Government 2007a, 2007b). The Circulars raised the profile of stroke services in Wales setting targets for service development and establishing the Stroke Services Improvement Programme (SSIP) to facilitate and inform improvements.

Stroke Services Improvement Programme

The Stroke Services Improvement Programme was established in September 2007 incorporating the Wales Centre for Health, National Public Health Service for Wales and National Leadership and Innovation Agency for Healthcare to meet the requirements of the Welsh Health Circular 058.

The Programme has a Project Board, initially chaired by the Deputy Chief Medical Officer, and currently chaired by Peter Lawler, and has support for quality assurance of the work of the project through two reference groups.

The Welsh Stroke Alliance acts as the Clinical Reference Group. A Policy Reference Group includes professional advisors to the Welsh Assembly Government.

A Project Management Team was established comprising representatives from NLIAH, NPHS and WCfH, clinical advisors and representatives from the Stroke Association to take forward the objectives of the programme.

The Stroke Services Improvement Programme objectives (National Public Health Service for Wales et al, 2008) were to:

1. Develop a specification for a comprehensive stroke care pathway (and associated facilities)
2. Specify the indicators and outcomes that should be measured in order to monitor both progress with, and the effects of, the implementation of the care pathway
3. Carry out a gap analysis comparing current service provision with the care pathway
4. Develop and oversee the implementation of an action plan, based on the gap analysis (and informed by regional and local action plans) for the full implementation of the care pathway across Wales
5. Develop and implement a mechanism for assessing development proposals (in support of the action plan) from Trusts and LHBs and for advising WAG on the allocation of resources to such proposals
6. Develop a service improvement collaborative involving a range of professionals from across Wales to take forward the implementation of defined elements of the action plan
7. Provide a workforce development tool which identifies the competences required to enable clinical and non clinical staff within stroke services to:
 - (a) lead and participate in the implementation of the care pathway
 - (b) deliver the care pathway to a high standard
8. Develop and implement a symptom awareness campaign for professionals and the public, aimed at ensuring that individuals take appropriate and timely action in response to relevant symptoms
9. Identify where there are gaps in availability of local and national resources and services to support risk reduction and develop action plan to address gap

Five Work streams were identified and resourced to take forward the work needed to meet the objectives.

Work Stream	Objectives
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A	1. Care Pathway; 2. Indicators and Outcomes; 3. Gap Analysis; 4a. Action Plan (development); 4b. Action Plan (overseeing of implementation); 5. Mechanism for Assessing Development Proposals
B	6. Service Improvement Collaborative (to implement defined elements of the Action Plan)
C	7. Workforce Development Tool
D	8. Symptom Awareness Campaign
E	9. Action Plan to address gaps in resources and services to support risk reduction

Most of the objectives have been met within the required timeframe (National Public Health Service for Wales, Wales Centre for Health, National Leadership and Innovation Agency for Healthcare, 2009a).

Key issues that have been identified include:

Integrated Care pathways have limited use. They are more likely to be used where there are co-located beds. Enthusiasm and motivation is not matched by the necessary organisational infrastructure across the whole pathway.

The All Wales Stroke Service Improvement Collaborative (AWSSIC) has identified bundles of care that are likely to have a beneficial effect on outcomes. The bundles of care are defined by time and in Year 1 of the project have included clusters of interventions required in the first three hours, the first 24 hours, the first three days, and the first seven days. However, the actions identified rely on considerable changes in the infrastructure of the services, notably radiography and radiology provision out of hours. Year 2 of the project will use the same bundle methodology for TIA assessment and rehabilitation services

Scoping and workforce planning needs to develop to ensure there is the capacity to staff multi-disciplinary teams.

Symptom awareness campaigns, for professionals and the public are behind those in England.

The need to coordinate primary prevention of stroke as part of the Vascular Risk Reduction Working Party.

In addition year two of the project will see the same bundle methodology applied to TIA assessment and rehabilitation services.

Financial Investment: Wales compared to the other home nations

Wales - In December 2007, the Deputy Minister for Health and Social Services in Wales, Gwenda Thomas, announce that £2.5 million would be made available in Wales from 2008-09 to improve acute stroke services (Welsh Assembly Government, 2007c). This followed the increased profile of stroke services in Wales following the publication of the Royal College of Physicians Sentinel Stroke Audit. The investment was intended for service development in health and social care.

England - In May 2008 The English Minister announced £77 million investment in England over 3 years. This was to support the introduction of the National Stroke Strategy (Department of Health, 2008). The money was to be allocated over 3 years to Local Authorities and Strategic Health Authorities in England. In addition a three year investment of £12 million was allocated for a stroke awareness campaign in December 2008 (News Distribution Service, 2008a). £64 million was also announced to improve research in major conditions including heart disease, stroke, diabetes and obesity (News Distribution Service, 2008b).

Scotland - In April 2004 the Scottish Executive announced £40 million for the Coronary Heart Disease and Stroke Strategy. This investment was over three years to implement the strategy (Scottish Government, 2004)

Northern Ireland - In June 2008 the Northern Ireland Executive announced £14 million over three years with recurrent funding of £9 million from year four (Northern Ireland Executive, 2008). The investment followed consultation and proposals to improve stroke services in Northern Ireland.

It is clear that the development of the Strategies in other UK countries has triggered a considerable investment in meeting the standards set in the strategies. The long term funding permits secured investment in service development.

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Appendix 1

British Association of Stroke Physicians Service Development and Quality Committee, 2005

Stroke Service Specification

This specification describes the characteristics of a stroke service that would satisfy the basic minimum requirements of the National Service Framework for Older People (NSF; Stroke chapter) in England (Level 1), but also describes those characteristics considered to indicate a service level beyond that minimum specification and thus eligible for accreditation as a Stroke Centre (Level 2 or Level 3). In assessing the quality of any stroke service, this specification should be considered with the results from national audit (National Sentinel Audit of Stroke or Scottish Stroke Care Audit).

A Level 1 Stroke Service comprises the basic minimum level of provision in any acute Trust providing care to patients with stroke, and includes all of the following components:

Acute Stroke Service
Medical cover for in-patients 24 hours a day
CT available on site 24 hours a day, with >75% of stroke patients scanned within 48 hours of onset
MRI available during working hours
Stroke consultant physician opinion available on site
Carotid ultrasound available at same or other site
Local availability of routine investigations e.g. cardiac echo
Emergency access to neurosurgery and interventional neuroradiology
Access to vascular surgeons
Stroke Unit
Adequate staffing levels incl. Medicine ¹
Multidisciplinary team includes nursing, physiotherapy, occupational therapy, speech and language therapy and social work

Access to clinical psychology, dietetics, pharmacist
Specialist nursing expertise e.g. tissue viability, continence
Weekly multidisciplinary rehabilitation meetings
Provision for gastrostomy insertion within one week of referral if required
Sufficient sessional commitment from Stroke Physician ²
All patients on the Stroke Unit under the care of a Stroke Physician
Stroke unit admission rate of at least 50% (for primary diagnosis of stroke) ³
Structured training and supervision available for all disciplines of staff
Neurovascular Clinic
Stroke/Neurovascular Clinic (in which patients are assessed by a Consultant Physician with specialist interest in Stroke) with a waiting time of <4 weeks, all investigations complete within 8 weeks
Access to the full range of relevant out-patient investigations
CT brain scanning available for outpatients presenting within 14 days
MRI scanning available for outpatients presenting beyond 14 days
Stroke Rehabilitation
Multidisciplinary domiciliary rehabilitation or Day Hospital
Rehabilitation provision for stroke patients of working age within same or adjacent hospital/Trust ⁴
Managerial/Audit
Existence of NSF Implementation Plan ⁵
Participation in National Audit
Presence within the trust of a nominated Lead Clinician for Stroke

Consultant Post
Adequate sessional commitments devoted to stroke ²
Sufficient medical junior staff support for the in- and outpatient workload

A **Level 2 Stroke Centre** provides all the components of a Level 1 Stroke Service, plus all the additional features in at least four out of the five following categories:

Acute Stroke Service
Carotid ultrasound available at same site
Access to specialised investigations e.g. TOE, cerebral angiography
Stroke Unit
Stroke unit admission rate of at least 70% (for primary diagnosis of stroke) ³
At least 75% of stroke unit admissions arrive on the unit within 24 hours of admission to hospital
Protocols for the prevention and management of venous thrombosis, fever, hyperglycaemia, nutrition and feeding
Neurovascular Clinic
Weekly Stroke/Neurovascular Clinic (in which patients are assessed by a Consultant Physician with specialist interest in Stroke) with a waiting time of <2 weeks, all investigations complete within 4 weeks
Referral protocol for Neurovascular Clinic available to all local GPs
Guidelines for secondary vascular prevention widely available ⁶
Referral protocol for carotid endarterectomy agreed with local vascular surgeons
Stroke Rehabilitation
Specialist stroke community rehabilitation ⁷

Capacity for follow-up of all stroke patients
Capacity for follow-up of all patients treated with gastrostomy
Established liaison with voluntary sector organisations
Managerial/Audit
Evidence of change in response to National Audit findings
Evidence of local audit, and practice change in response to the findings

A Level 3 Stroke Centre meets the criteria for a Level 2 Stroke Centre, plus provides at least four of the following additional features:

Stroke Unit
Stroke unit admission rate of at least 90% (for primary diagnosis of stroke) ³
Facility for direct referral and admission to Stroke Unit from home or Emergency Department
Thrombolysis protocol for ischaemic stroke presenting within 3 hours, with SITS-MOST participation
Neurovascular Clinic
Stroke/Neurovascular Clinic (in which patients are assessed by a Consultant Physician with specialist interest in Stroke) with a waiting time of <1 week, all investigations complete within 2 weeks
Consultant Post
Other specialist non-medical expertise available locally e.g. Stroke Specialist Nurse, Stroke Nurse Consultant
24-hour access to Consultant Stroke Physician advice
Research/Audit
Routine outcome measurement in all stroke in- and out-patients
Involvement in stroke-related research

Notes

1. The minimum staffing levels on the Stroke Unit should be: 8.0 trained or untrained nurses/10 beds; 1.0 junior doctors/10 beds for an acute unit; 0.9 sessions of physiotherapy/bed; 0.7 sessions of occupational therapy/bed; 0.35 sessions of SALT/bed.
2. The minimum timetabled commitment to Stroke in the consultant job plan should be: 1.0 sessions/10 beds for the in-patient Stroke service, 1.5 sessions/week for the out-patient Neurovascular Clinic.
3. The most objective and reliable measure of the level of Stroke Unit provision comes from the expression of the total number of bed days spent by patients with a primary diagnosis of stroke on a Stroke Unit as a proportion of the total number of bed days spent in the hospital as a whole by patients with a primary diagnosis of stroke. This proportion should reach the thresholds of 50%, 70% and 90% corresponding with the successive levels of Stroke Service.
4. This would include at the least the capacity to refer to a Consultant in Neurological Rehabilitation and access to a local young disabled rehabilitation facility, unless the Consultant Stroke Physician had themselves received accredited training in the specialty.
5. In Scotland, involvement with a Stroke Managed Clinical Network.
6. The NSF in England also specifies the use in primary care of registers for the "primary" prevention of stroke in those at risk. Requirements for this standard are beyond the scope of this specification.
7. The definition of specialist stroke rehabilitation is not made clear in the Stroke section of the NSF in England, but at a minimum this should represent a multidisciplinary team for whom stroke patients make up at least one third of the caseload.