Scottish Intercollegiate Guidelines Network

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Management of Patients with Stroke

Rehabilitation, Prevention and Management of Complications, and Discharge Planning

A national clinical guideline

November 2002

KEY TO EVIDENCE STATEMENTS AND GRADES OF RECOMMENDATIONS

LEVELS OF EVIDENCE

1^{++}	High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias
1^{+}	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1^{-}	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2^{++}	High quality systematic reviews of case control or cohort studies High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2^{+}	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2^{-}	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

GRADES OF RECOMMENDATION

Note: The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

A	At least one meta-analysis, systematic review of RCTs, or RCT rated as 1^{++} and directly applicable to the target population*; or* A body of evidence consisting principally of studies rated as 1^{+}, directly applicable to the target population, and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2^{++}, directly applicable to the target population, and demonstrating overall consistency of results*; or* Extrapolated evidence from studies rated as 1^{++} or 1^{+}
C	A body of evidence including studies rated as 2^{+}, directly applicable to the target population and demonstrating overall consistency of results*; or* Extrapolated evidence from studies rated as 2^{++}
D	Evidence level 3 or 4*; or* Extrapolated evidence from studies rated as 2^{+}

GOOD PRACTICE POINTS

☑	Recommended best practice based on the clinical experience of the guideline development group

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Scottish Intercollegiate Guidelines Network
Royal College of Physicians
9 Queen Street
Edinburgh EH2 1JQ

www.sign.ac.uk

1 Introduction

Stroke is the third commonest cause of death and the most frequent cause of severe adult disability in Scotland. 70,000 individuals are living with stroke and its consequences and each year, there will be approximately 15,000 new stroke events. Immediate mortality is high and approximately 20% of stroke patients die within 30 days.

For those who survive, the recovery of neurological impairment takes place over a variable timespan. About 30% of survivors will be fully independent within three weeks, rising to nearly 50% by six months.[1]

Disabling conditions such as stroke are best considered within an agreed framework of definitions. The World Health Organisation (WHO) International Classification of Impairment Disabilities and Handicaps (ICIDH) provides the following framework for considering the impact of stroke on the individual:[2,3]

- pathology (disease or diagnosis): operating at level of the organ or organ system
- impairment (symptoms and signs): operating at the level of the whole body
- activity (disability): observed behaviour or function
- participation (handicap): social position and roles of the individual.

A number of contextual factors may influence this framework as recognised in the International Classification of Functioning, Disability and Health (ICF).[4] ICF has two parts, each with two components:

- Part 1 Functioning and disability
  a) Body functions and structures
  b) Activities and participation
- Part 2 Contextual factors
  c) Environmental factors
  d) Personal factors.

The ICF also outlines nine domains of activity and participation, which can provide the focus for rehabilitation efforts:

- Learning and applying knowledge
- General tasks and demands
- Communication
- Mobility
- Self-care
- Domestic life
- Interpersonal interactions and relationships
- Major life areas
- Community, social and civic life.

Within this framework, rehabilitation aims to maximise the individual's activity, participation (social position and roles) and quality of life, and minimise the distress to carers.

1.1 REHABILITATION

The conventional approach to rehabilitation is a cyclical process:

- assessment: patients needs are identified and quantified
- goal setting: goals are defined for improvement (long/medium/short term)
- intervention: to assist in the achievement of the goals
- reassessment: progress is assessed against the agreed goals.

Rehabilitation goals can be considered at several levels:

- aims: often long term and referring to situation after discharge
- objectives: usually multi-professional at the level of disability
- targets: short term time limited goals.

The process of rehabilitation can be interrupted at any stage by previous disability, co-morbidities and complications of the stroke itself.

1.2 THE SIGN STROKE GUIDELINES SERIES

Four SIGN stroke guidelines have been published:

- Management of patients with stroke part I: Assessment, investigation, immediate management and secondary prevention[5]
- Management of patients with stroke part II: Management of carotid stenosis and carotid endarterectomy[6]
- Management of patients with stroke part III: Identification and management of dysphagia[7]
- Management of patients with stroke part IV: Rehabilitation, prevention and management of complications, and discharge planning.[8]

This guideline is a complete revision of part IV and supersedes it. Part III is currently under review and is due for publication around mid 2003. Parts I and II will be reviewed jointly and a single publication is expected late 2004.

1.3 AIMS OF THIS GUIDELINE

The aim of this national guideline is to assist individual clinicians, primary care teams, hospital departments, and hospitals to optimise their management of stroke patients. The focus is on general management, rehabilitation, the prevention and management of complications and discharge planning, with an emphasis on the first 12 months after stroke. Although stroke can cause continuing problems in subsequent years and decades, a review of the continued management of people with stroke is beyond the scope of this guideline. However, the guideline includes some guidance that may also be relevant beyond the first year of stroke. Specific aspects of assessment, secondary prevention and dysphagia are dealt with in separate guidelines from SIGN[5,7] and from the Royal College of Physicians, London.[9]

This guideline has five main sections:

- **Organisation of services:** this section addresses the issue of how services should be configured to provide optimal care for people who have had a stroke. This section will be of most relevance to those responsible for commissioning and providing rehabilitation services.
- **General rehabilitation principles:** this section addresses general rehabilitation principles, which are relevant to the majority of stroke patients.
- **Specific management and prevention strategies:** this section aims to inform the assessment and management of common impairments or complications resulting from a stroke. The section is based on epidemiological studies which have identified common and important impairments, disabilities and complications following stroke. This section aims to be useful to multidisciplinary teams and individual clinicians when planning treatment of individual patients.
- **Discharge planning and transfer of care:** this section addresses the planned transfer of care of patients from the hospital to the home setting.
- **Roles of the multidisciplinary team:** this section is derived from stroke unit trials plus supporting information and aims to provide guidance on the levels of care and expertise to be provided within stroke services.

Creating regional/local consensus on the use of standardised set of assessments when patient related information is transferred from one centre to another (or the community) may be an important aspect for improving quality of care of stroke patients.

1.3.1 TERMINOLOGY

"Disability" and "handicap" have been replaced with new terms of "activity limitations" and "participation restrictions". The above terms are used interchangeably in this document.

1.4 STATEMENT OF INTENT

This guideline is not intended to be construed or to serve as a standard of medical care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. These parameters of practice should be considered guidelines only. Adherence to them will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement regarding a particular clinical procedure or treatment plan must be made in light of the clinical data presented by the patient and the diagnostic and treatment options available. However, it is advised that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

1.5 REVIEW AND UPDATING

This guideline was issued in 2002 and will be considered for further review in 2006, or sooner if new evidence becomes available. Any updates to the guideline in the interim period will be noted on the SIGN website: **www.sign.ac.uk**.

2 Organisation of services

When an individual experiences a stroke a series of clinical decisions are made (either implicit or explicit) about the most appropriate setting for their care. These decisions can be considered in the form of four main issues, recognising that each individual stroke patient presents a unique set of problems and potential solutions. Efficient and effective management of patients depends on a well-organised expert service that can respond to the particular needs of each individual patient. To achieve this, the organisation of stroke services must be considered at the level of the Health Board, Primary and Acute Trusts and in the patient's own home or care home.

The main issues in planning services for stroke patients are:

- Organisation of hospital care
- Hospital or home-based care
- Discharge and post-discharge services
- Ongoing rehabilitation and follow-up.

An important part of the assessment process should include identifying whether there were any pre-stroke problems or co-morbidities.

2.1 ORGANISATION OF HOSPITAL CARE

A Cochrane review of the benefits of stroke rehabilitation in an organised hospital stroke unit found that in comparison with a general medical hospital ward:[10]

- 18% reduction in death (95% confidence interval (CI) 6-29%)
- 20% reduction in death or institutional care (95% CI 10-29%)
- 22% reduction in death or dependency (95% CI 11-32%).

These benefits were seen for those under and over 75 years of age, male or female and those with mild, moderate or severe stroke.

Length of hospital stay appears to be reduced by between two to ten days but this result is inconsistent between trials. 1++

The benefits of a stroke unit were seen in units that admitted patients directly from the community or took over their care within two weeks of admission to hospital. The evidence of benefit is most clear for units which can provide several weeks of rehabilitation if required.

The numbers needed to treat for stroke unit care are:

- For every 33 patients treated in the stroke unit there is one extra survivor (95% CI 20-100)
- For every 20 patients treated in the stroke unit one extra patient is discharged back to their own home (95% CI 12-50)
- For every 20 patients treated in the stroke unit there is one extra independent survivor (95% CI 12-50)

The confidence intervals are wide reflecting modest to substantial benefits.

A **Patients admitted to hospital because of acute stroke should be treated in a multidisciplinary stroke unit.**

The stroke unit trials did not directly address the management of younger stroke patients, but subgroup analysis indicates that stroke unit care is of equal benefit to those aged below and above 75 years. Younger stroke patients with specific needs (e.g. vocational rehabilitation, caring for young family) may benefit from referral to rehabilitation services for younger adults.[10] 1+

Although admission to an organised stroke unit is the treatment of choice, it may not always be feasible. Small hospitals in rural areas with small numbers of stroke patients may have generic rehabilitation services. The systematic review of stroke units included trials of mixed rehabilitation wards (i.e. where multidisciplinary care is provided to a range of disabled patients including those

with stroke).[10] Six trials compared a mixed rehabilitation ward with care in the general medical ward and found that patients in the mixed rehabilitation ward were less likely to die or require long term institutional care or remain dependent. Direct comparisons of mixed rehabilitation wards with stroke rehabilitation wards favour the stroke-specific ward,[10] with fewer patients dying or requiring institutional care or remaining independent. 1+

B **Where rehabilitation in stroke rehabilitation units is not possible, rehabilitation should be provided in a generic rehabilitation ward.**

2.1.1 INTEGRATED CARE PATHWAY

An integrated care pathway (ICP) aims to provide organised and efficient multidisciplinary patient care. It should be based on the best available evidence and guidelines. A Cochrane review[11] identified three randomised controlled trials (RCTs) and seven non-randomised studies where the use of an ICP was associated with positive and negative outcomes. Although there was evidence of more appropriate use of investigations and fewer urinary tract infections, patient satisfaction was lower in the ICP groups. ICPs may not provide any additional benefit in a well established organised stroke unit if usual care is already excellent. 2+

2.1.2 STROKE LIAISON NURSE/CO-ORDINATOR

The 'Scottish Stroke Services Audit' reviewed the structure of stroke services in Scotland at April 1998.[12] The audit involved both NHS Trust providers of care and Health Board commissioning bodies. The audit showed that structures of care for stroke patients were varied and complex, although patterns could be identified. The role of the stroke liaison nurse/co-ordinator was valued where introduced. The main responsibilities varied, but all job descriptions included the co-ordination of hospital care.[13] Further work is required to define the optimum role and service characteristics of such posts, and to demonstrate their effectiveness. Given the audit evidence of significant gaps in stroke service provision in Scotland, it is reasonable to expect nurse co-ordinators to help improve care. The role of the stroke liaison nurse/co-ordinator is different and complementary to that of the stroke family support worker (*see section 3.8*). 3 4

D **Trusts should consider appointment of a stroke liaison nurse/co-ordinator.**

2.2 ADMIT TO HOSPITAL OR REMAIN AT HOME?

For patients who have had a mild stroke, the healthcare team may wish to consider whether to admit them to hospital or to arrange care in the patient's own home. Care at home is an attractive idea for patients with acute stroke, but studies evaluating potential alternatives to hospital have been inconclusive. A systematic review[14] found no benefit for care at home against unorganised hospital care. One study compared domiciliary care against two types of hospital care (general wards with a stroke team giving advice and an organised stroke unit).[15] Stroke outcome was significantly better when patients were treated in the organised hospital stroke unit compared to organised domiciliary care or general ward hospital care (with stroke team advice). If hospital stroke unit care is not available, organised multidisciplinary domiciliary care has similar outcomes to unorganised (general medical ward) hospital care.[15] 2++

B **Stroke patients who are dependent in activities of daily living should receive hospital-based care in organised stroke units.**

It is worth noting that even if patients are thought to have had a mild stroke, they still need to be investigated.

☑ Patients who have a non-disabling stroke need to be urgently investigated and this may be most efficiently done by immediate admission to hospital or by early access to a neurovascular clinic. Computed tomography (CT) scanning should be performed within 48 hours. If investigation is delayed, CT scanning may miss a small primary intracerebral haemorrhage and rare but devastating causes of stroke such as bacterial endocarditis may be overlooked.

2.3 EARLY SUPPORTED DISCHARGE AND POST-DISCHARGE SUPPORT

Stroke unit care typically involves an early assessment of discharge needs and the development of a discharge plan involving the patient and carers. A Cochrane review[16] of seven completed trials indicates that early supported discharge (ESD) services can reduce the length of hospital admission in selected stroke patients. ESD services were provided by a co-ordinated multidisciplinary team who assessed individuals during hospital admission, co-ordinated their discharge and provided post-discharge rehabilitation. Most services excluded those with very mild or very severe stroke and were available for approximately 30% of all hospitalised stroke patients. These services appear to provide an outcome at least as good as hospital care. The impact on service costs is likely to be modest. 1+

A **Early supported discharge services provided by a well resourced, co-ordinated specialist multidisciplinary team are an acceptable alternative to more prolonged hospital stroke unit care and can reduce the length of hospital stay for selected patients.**

2.4 REHABILITATION FOR PATIENTS IN THE HOME

Many of the principles of good stroke rehabilitation are relevant to people who are not admitted to hospital. Where applicable the evidence to guide practice for patients at home will be discussed in the guideline.

3 General rehabilitation principles

Stroke rehabilitation in hospital or within the community is a patient centred process with a variety of professional staff contributing to the overall management of an individual patient. An important principle of rehabilitation is goal setting. Stroke unit care usually incorporates a process in which individual recovery goals are identified and monitored (*see RCP London stroke guideline*[17]).

3.1 MULTIDISCIPLINARY TEAM MEMBERSHIP

The core multidisciplinary team should consist of appropriate levels (*see section 6*) of nursing, medical, physiotherapy, occupational therapy, speech and language therapy, and social work staff. Other disciplines are also regularly involved in the management of stroke patients including clinical psychologists, psychiatrists, dietitians, and others.

The typical staffing structure within stroke unit trials was as follows (approximated to a 10-bed stroke unit).[18]

- Nursing: 10 whole time equivalents (WTE) per 24 hour shift (*see section 6.1.2*)
- Medical: 0.6-1.5 WTE of medical input (divided between consultant and junior staff). Staffing levels tended to be higher in units with acute admission than in second line rehabilitation units 1+
- Physiotherapy: one to two WTE divided between qualified and assistant staff
- Occupational therapy: one to two WTE divided between qualified and assistant staff
- Speech and language therapy: 0.2-0.6 WTE
- Social work: part-time social work input.

B **The core multidisciplinary team should consist of appropriate levels of nursing, medical, physiotherapy, occupational therapy, speech and language therapy, and social work staff.**

☑ Members of the core team should identify problems and invite allied health care professionals to contribute to the treatment and rehabilitation of their patients as appropriate.

3.1.1 PATIENT AND CARER INVOLVEMENT

A characteristic feature of stroke unit care is the early active involvement of patients, carers and family in the rehabilitation process. How best to involve all relevant individuals in this process is less clear.[18] 1+

B **Patients and carers should have an early active involvement in the rehabilitation process.**

☑ Where appropriate, carers should be invited to attend therapy sessions at an early stage.

3.1.2 MULTIDISCIPLINARY TEAM COMMUNICATION

Regular weekly meetings for members of the stroke unit multidisciplinary team have been shown to improve patient outcome.[18] These meetings serve as a focus for collective decision making. 1+

B **Stroke unit teams should conduct at least one formal multidisciplinary meeting per week at which patient problems are identified, rehabilitation goals set, progress monitored and discharge is planned.**

A number of units also incorporate one or two informal operational meetings per week attended by nursing and therapy staff, and often patients and family. These meetings are an additional opportunity for noting progress, highlighting problems and providing patients and carers with information.

☑ Occasional "family conferences" between the multidisciplinary team and the patient and carers should be arranged.

3.2 EDUCATION AND TRAINING

Effective stroke unit care includes programmes of education and training for staff to provide them with the knowledge, skills and interest, to deliver effective therapeutic care and rehabilitation. A variety of approaches have been described, from weekly short seminars to less frequent study days.[18] 1+

A programme of training and education for members of the stroke unit multidisciplinary team has been reported in four case studies (which contributed to the systematic review for the effectiveness of stroke units).[10] These ranged from informal weekly educational events, to a programme of formal education ranging from one to six days per year. 3

There was concern that specialist staff would reduce the skills of junior staff, however, this was felt to be easily overcome by rotating staff and students through the unit.

B **Members of the multidisciplinary stroke team should undertake a continuing programme of specialist training and education.**

☑ Healthcare providers should provide adequately funded training opportunities.

3.3 EARLY MOBILISATION

A number of post-stroke complications are associated with immobility. Early mobilisation therefore seems to be a useful intervention. In the systematic review of stroke unit trials, there was a high degree of consistency in the reporting of policies of early mobilisation, usually beginning on the day of admission.[18] A survey of stroke unit trials indicated that early mobilisation was a component of stroke unit care in eight out of nine relevant trials. It is difficult to assess the clinical impact as the available information describes one part of a much larger package of stroke unit care, but the current evidence suggests that early mobilisation benefits patients. 1+

B **Stroke patients should be mobilised as early as possible after stroke.**

3.4 INFORMATION PROVISION

A characteristic feature of stroke unit care is the provision of information about stroke and stroke rehabilitation to patients and carers. What is less clear is how best to disseminate such information.

Results from a Cochrane review of information provision indicate that educational sessions, compared with the provision of information in leaflet (or similar) form, may result in improved knowledge about stroke but do not improve mood, perceived health status, or quality of life for patients or carers. The effectiveness of structured information provision has not been demonstrated.[19] However, the provision of information is generally regarded as a very important task for all members of the multidisciplinary team. 1+

D **Stroke patients and their carers should be offered information about stroke and rehabilitation.**

3.5 CARER SUPPORT

It is common for carers to experience strain, including anxiety and/or depression at some point after the stroke, into longer term care.[20,21] In other areas of acquired brain injury, anxiety has been associated with the presence of cognitive deficits or behavioural changes in the patient. Studies of carers of stroke patients have also found this but not consistently. Patients who are irritable or depressed may be more likely to have a depressed spouse. There is no evidence that any of these associations are causative. However, these factors may serve as warning signs to those assessing whether a family is under strain. 3

☑ Where a carer is suspected of being clinically depressed or anxious, they should be encouraged to seek help by contacting the appropriate member of the general practice team.

Family support workers have been shown to be of benefit to carers (*see section 3.8*). A list of some of the organisations that provide support and information for stroke patients and their carers is included in section 7.5.

3.6 REHABILITATION FOR PEOPLE LIVING AT HOME WITHIN ONE YEAR OF STROKE

Trials including a total of 1,617 patients (who were never admitted to hospital or treated after discharge home from hospital) were identified which compared a therapy intervention with a control group who received either an alternative form of therapy or no therapy intervention.[22-34] Some trials showed inadequate reporting of randomisation and/ or allocation procedures and/ or blinded outcome assessor.

Three types of therapy-based rehabilitation service for stroke patients living at home within one year of stroke were included. These were provided by physiotherapy, occupational therapy or multidisciplinary team. The nature of therapy-based rehabilitation services evaluated varied across groups. However, they have been included together as they have the common aim of reducing physical disability by altering task orientated behaviour. 1++ 1+

Data on death or poor outcome (i.e. deterioration or dependency) were available for 1,350 (83.4%) patients from 12 trials. The pooled results show that overall, outcome was improved.

The main conclusion is that patients living at home, who receive therapy-based services, are on average more likely to avoid a poor outcome and achieve a higher level of function in activities of daily living.

A **Stroke patients living at home, within one year of stroke onset, should be considered for specialist therapy-based rehabilitation services.**

3.7 REHABILITATION FOR PEOPLE LIVING AT HOME MORE THAN ONE YEAR AFTER STROKE

Four RCTs[29,35-37] and one crossover trial[38] (385 patients), comparing therapy-based rehabilitation services for stroke patients more than one year post-stroke and living at home, were identified. Three types of therapy-based rehabilitation service were included and were provided by either physiotherapy, occupational therapy or multidisciplinary teams. Some of these trials are small and subject to methodological limitations, resulting in only weak evidence to support these interventions. Until further evidence is available, health care professionals should not assume that any one service for patients living at home one year after stroke is more efficacious than others in improving limited activity and participation. 1++ 1+ 1-

☑ Stroke patients should have access to services, which can review their long term rehabilitation needs after stroke.

3.8 STROKE FAMILY SUPPORT WORKERS

The potential role and clinical competencies of family support workers have been investigated in four RCTs.[39-42] A review of these four studies concluded that there were no significant benefits for patients but there were significant psychosocial benefits for carers in two of the studies.[43] One study identified improved activities for carers. The Edinburgh study[42] identified a significantly poorer emotional outcome for patients allocated the family support worker. Although the role and input of these workers need to be clarified and defined, the overall benefit of having stroke family support workers is clear. The role of the stroke family support worker is different and complements that of the stroke liaison nurse/co-ordinator (*see section 2.1.2*). 1+

B **The provision of stroke family care workers by charities, voluntary groups, social services and Health Boards should be considered as part of a strategy of improving the care of families affected by stroke.**

4 Specific management and prevention strategies

Stroke patients may experience a whole range of barriers to recovery of normal activities and participation. These can take the form of impairments directly caused by the stroke or other complications of the stroke *(see Box 1)*.[44,45] This section looks at specific treatment strategies addressing commoner impairments, limitations and complications after stroke. It should be noted that not all impairments or complications have been addressed in this guideline, e.g. visual impairment has been excluded and fever is covered by the SIGN acute stroke guideline.[5]

Box 1: Common impairments, limitations and complications after stroke

The common impairments after a first ever stroke include:	
■ Arm/hand/leg weakness	■ Homonymous visual field defect
■ Facial weakness	■ Sensory loss (proprioception)
■ Sensory loss (spinothalamic)	■ Cognitive impairment
■ Dysarthria	■ Visuospatial dysfunction
■ Aphasia	■ Balance problems
The common physical limitations of activity in the first three days after hospital admission include:	
■ Stair climbing	■ Toileting
■ Bathing	■ Transferring between hospitals
■ Walking	■ Feeding
■ Dressing	■ Urinary and/or faecal incontinence
The common complications for stroke patients during hospital admission include:	
■ Medical problems (e.g. chest pain, gastro-intestinal haemorrhage)	■ Other infections
■ Confusion	■ Depression
■ General pain	■ Anxiety
■ Falls	■ Emotionalism
■ Urinary tract infection	■ Shoulder pain
■ Chest infection	■ Recurrent stroke
■ Pressure sore / skin break	■ Epileptic seizure
	■ Venous thromboembolism

4.1 INTENSITY OF THERAPY

Within the stroke unit trials, patients received an average of 45 (range 30-60) minutes of physiotherapy and 40 (30-60) minutes of occupational therapy per weekday.[10] Other trials have investigated the intensity of therapy.[31-34,46-50] Some of these trials included small numbers of subjects, reported heterogeneous interventions and possessed possible selection bias. Most of these studies reported a small positive result. A select proportion (perhaps the fittest 10%) of the stroke population may derive moderate benefit from greater intensity of therapy. There is insufficient evidence however, to make a judgement on the cost effectiveness of this increased intensity of therapy or to make an overall recommendation.

1++
1+
1-

See section 4.4 for details of the intensity of speech and language therapy.

4.2 MOVEMENT

4.2.1 MOTOR WEAKNESS- DIFFERENT PHYSIOTHERAPY TREATMENT APPROACHES

Different treatment approaches exist for all therapy interventions. The area with most published evidence is physiotherapy where a number of different approaches to treatment for patients with stroke have been compared. These include: Bobath (or normal movement) approach,[51,52] Motor Learning (or Motor Relearning or Movement Science) approach,[53] Brunnstrom,[54] Rood,[55] Proprioceptive Neuromuscular Facilitation,[56] and Johnstone.[57]

Questionnaire studies indicate that the Bobath approach is currently the most widely used approach in Sweden,[58] Australia[59] and the UK.[60,61] A lower proportion of Scottish physiotherapists (65%) use the Bobath approach than physiotherapists in England (91%), Northern Ireland (97%) and Wales (92%).[61] In contrast to England, Northern Ireland and Wales, 18% of Scottish physiotherapists use the Motor Learning approach.[61] 2+

The few high quality RCTs investigating the relative efficacy of different physiotherapy treatments provide no evidence that any one treatment approach improves functional ability more effectively than any other.[62-68] A systematic review of RCTs of exercise therapy for arm function concluded that there was no difference in the effectiveness of different types of exercise therapy.[69] There is therefore insufficient evidence to conclude that any one approach to treatment is more efficacious than others in promoting effective rehabilitation. Four heterogeneous RCTs indicate that task-specific training may result in improvement in outcomes specific to the task trained, for example training specific to reaching improves maximum reach,[62] training specific to gait improves gait speed,[63,64] and training specific to strength improves strength.[65] There is limited evidence from controlled trials that approaches incorporating strength training may lead to improvements in gait speed,[70] activities of daily living[65] and strength.[65] 1+ 1-

One well-conducted but small RCT found that patients treated with a Motor Relearning Approach to physiotherapy had a shorter length of acute inpatient stay than patients treated with a Bobath approach to physiotherapy.[71] 1+

Until further evidence is available, any one approach to treatment should not be assumed to be more efficacious than others in promoting effective rehabilitation.

B **Task-specific training can be used in order to improve performance of selected tasks.**

4.2.2 SPASTICITY

There are very few trials of the physical management of spasticity (e.g. exercise, splinting, electrotherapy) and these are too small and inconclusive to guide present practice.

Specific pharmacological measures to treat spasticity can be found in the RCP London stroke guideline *(see Table 9.7)*.[17]

4.2.3 GAIT DISORDERS - TREADMILL TRAINING

There is limited evidence in this area. A small number of trials suggest that treadmill training, particularly with partial (30-40%) body weight support with a harness, may be effective in re-educating the patient in walking after stroke. There is no evidence to suggest that this method is more beneficial than conventional physiotherapy. The subgroups of subjects that benefited most were those who were non-ambulant late after severe stroke, and those with co-existing pathologies affecting cardiovascular fitness.[72-83] 1+ 2+

B

- **Carefully selected non-ambulant patients, late after severe stroke, may benefit from treadmill training.**
- **Patients with co-existing pathologies affecting cardiovascular fitness may benefit from training using a treadmill that offers partial body weight support.**

4.2.4 BIOFEEDBACK

Biofeedback (BF) provides a patient with auditory or visual feedback relating to the movement or posture of their body or limbs. This feedback may relate to muscle activity (electromyographic: EMG BF) or to body position (e.g. weight distribution between the legs during standing or while rising to stand).

Four meta-analyses of trials of the benefits of BF for patients with stroke have been carried out.[84-87] Three were limited to EMG BF and the fourth[87] only looked at range of movement as an outcome, excluding the majority of non EMG BF trials. The available evidence is not sufficient to support the routine use of EMG biofeedback in the rehabilitation of movement and function after stroke, although there is no evidence that EMG BF is detrimental to outcome. 1++ 1+

B **EMG biofeedback need not be used routinely in the rehabilitation of function and movement following stroke.**

4.2.5 ANKLE FOOT ORTHOSES

Ankle foot orthoses (AFOs) can be prescribed to patients with dropped foot following stroke with the aim of maintaining ankle dorsiflexion, reducing spasticity and improving the pattern and safety of gait.

Only one RCT investigating the efficacy of a polypropylene AFO was found; this included 60 patients and investigated the effects of thermocoagulation of the tibial nerve and an AFO.[88] This study found no evidence that AFOs were useful in the reduction of motor impairments or the improvement of function. Over 67% of patients reported a problem or harm associated with the use of the AFO. Approximately 50% of patients did not fully comply with the use of the AFO. 1+

Although there is a lack of evidence to support an AFO having a measurable effect on gait parameters, in clinical practice there are distinct benefits in their use, particularly to allow early ambulation in patients with severe hemiplegia.

A joint assessment by a physiotherapist and an orthotist of patients for whom ankle stability can only be achieved through orthotic means, will allow a decision to be made on whether AFOs are appropriate.

B **Although ankle foot orthoses may help some patients with foot drop, they should not be used routinely without proper assessment prior to use and follow-up to establish their effectiveness in the individual.**

4.2.6 ELECTRICAL STIMULATION

Electrical stimulation (ES) applies bursts of electrical current to a muscle or a peripheral nerve, using either surface or internal electrodes, in order to create or assist a voluntary muscle contraction.

A meta-analysis[89] of four poor quality RCTs and additional trials[90-92] suggest that ES may improve muscle force in selected patients. There was no evidence to indicate whether or not this improvement would be sustained after the period of ES treatment had ceased. Different types and regimes of electrical stimulation (including electromyography triggered) were used in the different studies. The meta-analysis only considered muscle force as an outcome, so no conclusions can be made regarding the benefits or harm of ES relating to other outcomes. There remains limited evidence to support the use of electrical stimulation as an adjunct to physiotherapy. Electrical stimulation may improve muscle force, strength and function in selected patients. The multidisciplinary team will be able to decide which patients are likely to benefit most. 1+ 1-

B **Electrical stimulation (ES) should be considered for use in improving muscle force, strength and function in selected patients. ES must not be assumed to have sustained effects.**

4.3 VISUOSPATIAL DYSFUNCTION

Unilateral spatial neglect is a cognitive disorder which disrupts many activities of daily living. There is limited evidence that cognitive rehabilitation may improve performance on neglect, when tested on paper and pencil tests.[93] However, there is no evidence that this transfers to gain in everyday function.

4.4 COMMUNICATION

4.4.1 APHASIA

Aphasia is 'an acquired impairment of the cognitive system for comprehending and formulating language, leaving other cognitive capacities **relatively** intact'.[94] It can co-exist with other cognitive deficits. Although a distinction had sometimes been made between aphasia and dysphasia, aphasia now tends to be used regardless of severity level. The reporting of the proportion of stroke cases demonstrating aphasia at initial assessment varies from 20%[95] to 38%.[96] In the latter study 12%, 6% and 20% have mild, moderate and severe impairment, respectively and 19% continue to have

aphasia at six months. Aphasia is usually associated with left hemisphere damage, but symptoms such as subtle communication deficit, affecting communication interaction, notably non-verbal communication, and communication of non-literal or inferred information, may also occur following right hemisphere stroke.[97]

The role of the speech and language therapist (SLT) in aphasia includes assessment, differentiation of aphasia from other communication difficulties, advice and education about maximising communication, counselling, provision of alternative or augmentative communication (AAC) and direct intervention.

A Cochrane review concluded that there was no RCT evidence of effectiveness, nor of ineffectiveness following speech and language therapy for people with aphasia following stroke.[98] A meta-analysis which included group quasi-experimental studies where aphasia was not necessarily of stroke origin concluded that outcomes for treated individuals are superior to those for untreated individuals in all stages of recovery, and especially in the acute stages.[99] Two additional RCTs have demonstrated the benefits of intervention for aphasia following stroke, with therapy sessions of three hours per week over six months[100] and five hours per week for four months.[101] Overall, there is now good evidence that people with aphasia benefit from speech and language therapy. 1+ 2+

In a study of global aphasia where subjects were randomised to intensive therapy (daily sessions) and regular therapy (three sessions per week), more patients in the intensive group achieved significant improvement.[102] The meta-analysis similarly indicated amounts of treatment and magnitude of change to be positively related, with the outcome of low intensity treatment being only slightly better than no treatment.[99] Treatment length in excess of two hours per week brought about gains exceeding those that result from shorter durations.[99]

B **Aphasic stroke patients should be referred for speech and language therapy. Where the patient is sufficiently well and motivated, aim for minimum of two hours per week.**

☑ Where appropriate, treatments for aphasia may require a minimum period of six months to be fully effective.

☑ Referral to the volunteer stroke service (through CHSS) should be considered as an adjunct *(see section 7.4)*.

4.4.2 DYSARTHRIA

Dysarthria is a motor speech impairment of varying severity affecting clarity of speech, voice quality and volume, and overall intelligibility.[103] Frequencies of between 20% and 30% have been reported for dysarthria following stroke.[44,104,105] It may also co-exist with other communication disorders such as aphasia. Communication and quality of life can be significantly affected. No useful information is available regarding persistence of this symptom.

SLTs offer a diagnostic and management service for this condition. A Cochrane review has determined that evidence for the effectiveness of intervention is restricted to small-group or single-case studies or to expert opinion.[106] At this time, expert opinion remains firmly in favour of effectiveness of SLT interventions.[103,107-109] Service providers will need to take into account the possible provision of prosthetic devices and of AAC systems which range from basic to highly sophisticated electronic devices.[110,111] Advice on the provision of AAC systems is available from the national Scottish Centre of Technology for the Communication Impaired or from local centres such as KEYCOMM (Edinburgh) and FACCT (Fife; *see section 7.5 for details*). 3

D **Patients with dysarthria should be referred to an appropriate speech and language therapy service for assessment and management.**

4.5 COGNITION

Cognitive changes post stroke may be general (e.g. slowing of information processing), or may occur within specific domains (e.g. orientation, attention, memory, visuo-spatial and visuo-constructive, mental flexibility, planning and organisation and language).[17] It should also be

recognised that cognitive impairment may have existed before the stroke. Some patients may experience problems with reasoning or limited awareness or lack of insight into their difficulties. Around one quarter of patients may sustain severe and generalised cognitive impairment.[17] With less severe impairment, recovery occurs but residual deficits may be long lasting. There is little consistent information on the frequency of these problems or their effect on everyday living, although they can be associated with slower progress in rehabilitation.[17] Full assessment is important; an apparent lack of motivation in self-care could be due to a problem of initiating or planning actions or a visuo-spatial disturbance or both.

☑ A full understanding of the patient's cognitive strengths and weaknesses should be an integral part of the rehabilitation plan.

4.5.1 SCREENING

Short, standardised cognitive screening measures can be used by a health professional with knowledge and experience of the presentations of cognitive functioning and factors influencing it. They can be used as a broad screen to reduce the possibility that problems will be missed and as a measure of progress.[112] It is important for staff to understand that these screening measures will miss some of the cognitive problems which can be most important for rehabilitation and eventual functioning. These are varied but can include such issues as poor awareness of deficits or their implications, slowing of information processing, and the ability to cope with distraction.[113]

4.5.2 ASSESSMENT

Screening measures do not provide information about the depth and nature of the patient's problems or strengths and therefore do not constitute an assessment sufficient for rehabilitation planning or for establishing suitability for a particular work role (e.g. operating machinery). Administering and interpreting full assessment results requires specialist training and should be carried out in the context of clinical interviews with access to background information.

☑ In order that cognitive impairment can be assessed fully, stroke patients should have access to neuropsychological expertise.

4.5.3 COGNITIVE REHABILITATION

Cognitive rehabilitation concerns efforts to help patients understand their impairment and to restore function or to compensate for lost function (e.g. by teaching strategies) in order to assist adaptation and facilitate independence).[114] There is not yet sufficient evidence to support or refute the benefits of cognitive rehabilitation for patients with problems of attention or memory.[115,116] When cognitive problems are suspected and relatives report personality change, the patient can be referred to a clinical psychologist to provide assessment and where appropriate, psychological intervention which may include carer education and support. One RCT found a trend only toward reduced carer strain when this service was provided.[117] Assistant psychologists, not fully trained clinical psychologists were used in this study.

It is important that such approaches address how cognitive difficulties are manifest in a patient's life and ensure that any gains made in a formal therapy setting generalise to the daily living environment. Formal neuropsychological assessment should be conducted initially in order to identify the cognitive abilities and deficits of the patient and consider these within the individual's wider personal and social context.

4.6 NUTRITION AND SWALLOWING

Careful assessment of nutritional status and of swallowing impairment, careful fluid management, and routine use of intravenous fluids are consistent features of early management for patients in stroke units. The advice of dietitians and SLTs should be sought (*see the SIGN guideline on dysphagia in stroke patients which also covers nutrition)*.[7]

4.7 INFECTION

Infections are relatively common during stroke rehabilitation, with approximately 20% of patients experiencing chest infection or urinary tract infection while in hospital.[45] Staff providing rehabilitation services should be aware of the possibility of infection particularly among patients whose progress is less satisfactory than expected.

☑ Stroke unit staff should be vigilant in recognising, investigating and treating common infections such as chest or urinary tract infections.

4.8 CONTINENCE

Incontinence of urine and faeces is dramatically increased by stroke. Reported frequency of urinary incontinence varies widely between studies due to selection biases but about 50% of all patients with acute stroke can be expected to be incontinent at some time. Faecal incontinence is a less common but more distressing problem. Unfortunately there is very little useful evidence specifically from studies of incontinent patients following stroke.[118] Usual continence management should be appropriate for patients with stroke, although special attention should be paid to the practical problems faced by patients with stroke, e.g. functional disability, aphasia and cognitive impairment.

☑ Every service caring for patients with stroke should have local continence guidelines including advice on appropriate referral.

4.8.1 URINARY INCONTINENCE

Urinary incontinence may have been a problem prior to the stroke, but more commonly is due to the stroke.

Every patient with urinary incontinence should be assessed in order to make an accurate diagnosis. Routine assessment should include a standard medical and nursing assessment.[118]

4

The medical assessment of every patient with urinary incontinence must include:

- a history of how long incontinence has been a problem
- current drug history
- obstetric history for women
- prostatic symptoms for men
- abdominal examination to help exclude palpable bladder
- rectal examination (both sexes)
- vaginal examination (to exclude prolapse, vaginitis and neoplasia)
- mental state examination
- urinalysis (for glucose, protein, blood, white cells)
- mid-stream urine if proteinuria or haematuria (for microscopy and culture)
- urea and electrolytes and a frequency and volume bladder chart.

D **The presence or absence of incontinence of urine should be documented for all patients after a stroke.**

Although the evidence was not examined systematically, anticholingergic drugs to treat urinary incontinence must not be prescribed until post micturition urine retention has been reliably excluded by scanning or catheterisation.

4.8.2 URINARY CATHETERISATION

Urinary catheters should only be used after a diagnosis of urinary incontinence has been made. Indwelling catheters should be used to treat painful urinary retention without delay. Once precipitating causes have been removed or treated, the patient's care plan should include a planned trial without catheter. Occasionally, urinary catheters may be considered to protect the vulnerable skin of patients with chronic urinary incontinence. The continued use of such catheterisation

should be reviewed regularly and appropriate diagnosis made of the cause of the incontinence. Long term urinary catheterisation should only be considered when an accurate diagnosis of the cause of the incontinence has been documented together with a reason why a curative treatment has not been, or cannot be, offered. Stroke services should have access to urinary catheter protocols and staff who insert catheters need appropriate training and continued professional training. Sexual function needs to be recognised when long term urinary catheterisation is considered. Intermittent self (or assisted) catheterisation may be appropriate, as guided by local specialist continence advisors. Cosmetic appearances and the ease of use will guide providers in selecting the best continence aid.

4.8.3 FAECAL INCONTINENCE

The assessment of patients with faecal incontinence is very similar to that of urinary incontinence and will identify most causes of faecal problems. Constipation is also a problem and needs management. The importance of rectal examination cannot be overemphasised. Faecal incontinence after stroke can be improved in most patients and, after the simple problems of faecal loading and infective diarrhoea (e.g. due to *Clostridium difficile*) have been treated, there are a number of management strategies that can help achieve continence. These include:

- manipulation of the gastrocolic reflex where bowel evacuation is common after meals
- helping the patient to sit on the toilet after meals to promote voiding
- regular use of a constipating agent and bowel care with an enema.

Annex 1 has been compiled by the SIGN guideline review group as an example approach to incontinence after stroke.

4.9 PAIN

Stroke patients are particularly prone to pain, most commonly associated with the musculo-skeletal ramifications of paralysis and immobility, and particularly involving the hemiplegic shoulder (*see section 4.10*). Age-related co-pathologies resulting from joint changes due to osteoarthritis cause added discomfort, particularly during handling and positioning procedures.

Some two to six per cent of stroke patients experience Central Post Stroke Pain (CPSP) syndrome, with an annual incidence of between 2,000 and 6,000 in the UK, and a prevalence of as many as 20,000.[119] True CPSP, characterised by a partial or total deficit for thermal and/or sharpness sensations, is best treated initially with adrenergically active antidepressants[120] such as amitriptyline.[121] Intravenous naloxone is of no value in alleviating the pain of CPSP.[119] Stimulation of the motor cortex or spinal cord by implanted electrodes and the use of Hi–Lo Transcutaneous Electrical Stimulation may help patients resistant to medical treatment.[122,123] Positive relaxation, as an adjuvant therapy, should be used in most cases.[124] 1+ 2+

☑ The presence of pain in stroke patients should be identified early and treated appropriately.

B **Central Post Stroke Pain may respond to the use of tricyclic antidepressants, particularly amitriptyline.**

4.10 SHOULDER PAIN

Hemiplegic Shoulder Pain (HSP) is a problem which may contribute to poor upper limb recovery, depression, sleeplessness and may be associated with adverse overall functional outcome in patients following stroke.

There is no evidence to support any particular intervention in the management of HSP. High quality systematic reviews and a number of well-conducted, methodologically sound RCTs have not provided unequivocal evidence in support of a specific intervention.[125-131] Careful handling of the affected upper limb along with consistent, supportive positioning strategies should be practiced at all times. Education of staff, patients and carers should be provided by physiotherapists or occupational therapists as appropriate. New untested developments in the management of established HSP include Functional Electrical Stimulation, physical therapy, ultrasound, strapping and supports which reduce subluxation. 1+ 2+

C **The management and prevention of hemiplegic shoulder pain is an integral part of good quality physical care provided within the multidisciplinary environment of the stroke unit.**

4.11 FALLS

Falls are a common feature for patients undergoing rehabilitation after stroke. As some falls can lead to devastating complications, measures should be taken to minimise the risk of falling. Evidence from studies including older people support a multidisciplinary multi-factorial approach, a common feature of organised stroke unit care (*see section 2.1*).[132] Individually prescribed muscle strengthening and balance retraining programme, withdrawal of psychotropic medication and home hazard assessment and modification have been shown to be of benefit in reducing falls.[132] 1+
These interventions are likely to be a integral component of well organised stroke care. There is evidence that the use of hip protectors reduces hip fracture rate,[133-135] although compliance with treatment may be a problem. In a stroke unit setting, good compliance can be achieved and hip protectors have a role for patients at high risk of hip injury.

B **Hip protectors are recommended in men and women at high risk of hip fracture (particularly older people in care homes) although problems with compliance should be recognised.**

4.12 PRESSURE ULCER PREVENTION

With adequate nursing resources and expertise, pressure ulcers should not develop during immobility after stroke. Risk assessment for pressure sores is a generic nursing skill and should be a part of routine hospital nursing care and community care. Guidelines from the Department of Health *(England and Wales)* and Nursing and Midwifery Practice Development Unit are available.[136,137] 4

D
- **Hospital managers should ensure that nursing expertise, staffing and equipment levels are sufficient to prevent pressure ulcers.**
- **Hospitals should have up to date policies on risk assessment, pressure ulcer prevention and treatment.**

4.13 THERAPEUTIC POSITIONING

Therapeutic positioning of patients is practised by nurses and therapists to prevent complications such as contractures, pain, abnormal tone, respiratory problems and pressure sores or to assist functional recovery. To date there is no evidence from clinical trials to support or refute the practice of therapeutic positioning in the management of patients after stroke. Further work is necessary in the form of an RCT or controlled clinical trial to determine the efficacy of therapeutic positioning.

4.14 MOOD DISTURBANCE

Mood disturbance is a considerable problem after stroke. Despite this, there is little clear information on just how frequent different mood problems are. Little is known about the psychosocial and physical causes of mood disturbance after stroke. Diagnosis may be complicated by the similarity of symptoms of depression or anxiety to physical and cognitive changes associated with the stroke.

Depression is particularly common and has been associated with slower progress in rehabilitation and longer stay in hospital. Anxiety, with or without panic, may be generalised or may be associated with specific issues such as fears of falling or social embarrassment, which can lead to avoidance of certain situations.

Emotionalism or emotional lability is a lessening of control over emotions leading to a greater tendency to cry or laugh. These symptoms tend to get better with time. Some patients find this acutely embarrassing and it may interfere with their rehabilitation efforts. Emotionalism can be confirmed by clinical interview by appropriately trained staff.

In the first instance, standardised screening assessments of depression and anxiety offer some indication that these mood problems exist, and also form a standardised measure of progress. Members of staff with some knowledge of depression and stroke can use these after appropriate training. A number of different measures exist and it is not possible, on the basis of current evidence, to recommend any one measure above the others. Verbal scales will be contraindicated where aphasia is present and an alternative should be sought.[138] Visual and visuospatial problems will also affect the patient's ability to fill in forms.

☑ All stroke patients should be screened for mood disturbance. Some form of screening should occur initially and at three month intervals or key stages of the rehabilitation process and after rehabilitation support has been lost.

All screening measures have limitations (in specificity and sensitivity) so that some patients' problems will be missed or overestimated. Current measures may include items concerning, for example, activity or concentration, which may be directly affected by stroke. Screening does not constitute a diagnosis of depression and cannot provide insight into the complexity of the individual's problems.

☑ If an individual is suspected of having a mood disorder they should be referred on to an appropriately trained professional for a full assessment.

Different kinds of mood disturbance may coexist and therefore the presence of one problem should not exclude assessment for others.[139]

4.14.1 PSYCHOLOGICAL INTERVENTIONS FOR TREATING MOOD DISTURBANCE POST STROKE

Studies of psychosocial approaches to treating mood disturbance post stroke have focussed on depression. Almost all studies have methodological weaknesses. Interventions are diverse which adds to problems when evaluating efficacy. There is no evidence that general support or counselling has a proven beneficial effect for clinical levels of depression.[140,141]

There is no evidence that the provision of information alone helps resolve clinical depression in stroke patients.[142]

A systematic, evidence based review of counselling and psychological therapies has looked at the level of expertise which is required for working with patients with depression.[143] This concluded that:

- generic counselling should only be offered to those with minor degrees of psychological distress
- patients with complex psychological problems should be treated by staff with therapeutic expertise.

1+

4.14.2 PHARMACOLOGICAL INTERVENTIONS FOR **PREVENTING** POST-STROKE DEPRESSION

A systematic review of whether antidepressant therapy should be used to prevent depression in stroke survivors appears to include trials which have excluded patients with significant communication or cognitive problems. The trials were small and had high drop out rates. Clinical impact was difficult to assess as results were analysed as depression scores. In two cases, activities of daily living scores were worse relative to placebo.[144]

2+

Although pooled analysis suggested a reduction in depression scores with antidepressant treatment, major concerns exist about the small study size, uncertain trial quality, high drop out rates, and potential adverse effects.

C **Stroke patients should not routinely receive antidepressant drugs to prevent depression.**

4.14.3 PHARMACOLOGICAL INTERVENTIONS FOR **TREATING** POST-STROKE DEPRESSION

The clinical impact of using antidepressants for suspected depression in stroke survivors is potentially large. Four patients would need to be treated with anti-depressants to produce one recovery from depression and one patient in every ten would drop out because of drug side effects.[144] The information is much less complete on quality of life and other outcomes. Given the importance of post stroke depression, the potential benefits would appear to be cost effective.

1+
2+

One systematic review of six stroke trials reported a significant improvement in depression scores in antidepressant-treated patients, but there was significant heterogeneity between trials and high drop out rates.[144] These results (and problems) are broadly similar to those of a Cochrane review of treatment of depression in physical illness.[145] No changes in physical disease were observed and the impact on physical recovery is not known. 1+ 2+

B **Stroke patients with diagnosed depression should be offered a course of treatment with antidepressant drug therapy.**

4.14.4 PHARMACOLOGICAL INTERVENTIONS FOR EMOTIONALISM

For many patients with emotional lability education and advice on management may suffice. Where the problem is severe, or interferes with rehabilitation and maximum functioning, drug treatment has been shown to be beneficial.[146,147] 1+

B **Drug treatments may be used to treat emotionalism in stroke patients.**

4.15 RECURRENT STROKE

Recurrent stroke is outside the remit of this guideline as it is included in the SIGN guideline on the assessment, investigation, immediate management and secondary prevention of stroke.[5]

4.16 EPILEPTIC SEIZURES

For information on treating epileptic seizures, see the SIGN guideline on epilepsy (currently under review).[148]

4.17 VENOUS THROMBOEMBOLISM

Hospital care in an organised stroke unit (*see section 2.1*) is likely to reduce the incidence of thromboembolism due to:

- Early mobilisation rehabilitation policies (*see section 3.3*)
- Early hydration with normal saline
- Specialised nursing care (*see section 6.1*).

Whilst there is no direct evidence to show that early hydration prevented deep vein thrombosis (DVT), there was a non-significant reduction in DVT in an overview of haemodilution trials.[149]

4.17.1 EARLY MEDICAL TREATMENT

Heparin treatment in the first two weeks after ischaemic stroke can cause early recurrent haemorrhagic stroke and has no net benefit.[150] Low dose aspirin has been shown to be safe and effective in preventing DVT and pulmonary embolism.[5,151-153] 1++

A **Aspirin** *(initial starting dose 150-300mg/day and 75mg/day or more thereafter)* **should be given to all patients with acute ischaemic stroke in the first two weeks following stroke onset to help prevent deep vein thrombosis and pulmonary embolism** *(provided there are no known contraindications to aspirin therapy)***. Aspirin can be given by nasogastric tube or rectally** *(using 300mg/day suppositories)* **for those who are unable to swallow.**

Patients at a particularly high risk of early DVT (e.g. those with a history of previous DVT, known thrombophilia or active cancer) can be given prophylactic heparin, in a low dose regimen (e.g. 5,000 units of unfractionated heparin subcutaneously twice a day).

4.17.2 MEDICAL TREATMENT TWO WEEKS FROM STROKE ONSET

It is not known when the early risk of haemorrhagic transformation of cerebral infarction returns to normal pre-stroke levels (or acceptable levels). It may be wise to wait a few weeks before re-considering the use of heparin for patients at continued risk of DVT.[153,154] 4

D **Two weeks following acute ischaemic stroke, clinicians should reassess the patient's risk for DVT and consider starting additional prophylactic medical treatment** *(e.g. heparin)***.**

D **Physical methods** *(e.g. graduated elastic compression stockings)* **are preferred for patients recovering from haemorrhagic stroke.**

4.17.3 GRADUATED ELASTIC COMPRESSION STOCKINGS

A Cochrane review of the use of graduated elastic compression stockings (GECS) found little data on the risks and benefits of wearing GECS for many weeks in patients participating in stroke rehabilitation.[155] Whilst the benefits may be similar to those seen in the perioperative period, the risks are potentially greater due to an increased prevalence of peripheral vascular disease, potential discomfort for patients who are very immobile and redirection of scarce nursing resource on stroke units. Stockings have the advantage of being applicable to patients following ischaemic and haemorrhagic stroke. A large multicentre trial (CLOTS) is currently in progress to assess the efficacy of graduated elastic compression stockings in stroke patients (*see section 8.3*). 1+

C **Selected use of graduated elastic compression stockings may be justified for some high risk stroke patients.**

4.18 DRIVING AFTER A STROKE

The rules regarding driving after stroke are summarised in a guide published by the Driver and Vehicle Licensing Agency.[156] Stroke teams should be aware of this guide as these rules are governed by law. Doctors have a duty to inform patients of the rules regarding driving. Patients have a responsibility to act on this advice. Patients need to inform their insurance company.

☑ Patients with stroke who make a satisfactory recovery should be advised that they must not drive for at least one month after their stroke.

☑ Patients with residual disability at one month must inform the DVLA *(particularly if there are visual field defects, motor weakness or cognitive deficits)* and can only resume driving after formal assessment.

Readers are directed to the DVLA document for guidance for individual patients.[156] 4

D **If there is doubt about a patient's ability to drive, patients should be referred to the local Disabled Drivers' Assessment Centre** *(details available from the DVLA)***.**

4.19 SEXUALITY

Having a stroke does not mean an end to a sex life for the patient. The wider concept of sexuality encompasses expression of attractiveness and intimacy, as well as sexual relations. The effects of stroke, such as motor or sensory impairment, urinary problems, perceptual alterations, tiredness, anxiety, depression, and changes in self image, self confidence and self worth can cause sexually-related difficulties. Medication, particularly anti-hypertensives, can also interfere with sexual function. The most common fear is that resuming sex may bring on another stroke. The evidence indicates this is not true.[157-159] After a stroke sexual activity can be resumed as soon as the patient feels ready to do so. During sex, heart rate rises no more than in normal daily activity and blood pressure does not rise significantly. Patients with known hypertension, should be advised to take their medication as prescribed, and consult their doctor if they have any problems. 3

☑ It is important that health professionals talk to patients and partners about sexuality and sex after stroke, and provide advice and information to address any concerns.

4.20 ETHICAL DILEMMAS

4.20.1 CARDIOPULMONARY RESUSCITATION

Cardiopulmonary resuscitation (CPR) can be an extremely difficult ethical issue for patients with acute stroke. On one hand, some patients have a rapidly fatal course with no prospect of meaningful recovery and yet patients who were very unwell and disabled in the early phase of their stroke make remarkable recoveries. Many factors will influence the likely recovery for an individual and CPR recommendations need to take these into account, be assessed by a doctor experienced in stroke, and, as appropriate, discussed with families and patients. Recent guidelines have been produced to guide stroke unit staff.[160]

D **Hospitals** *(or stroke units)* **should have a local cardiopulmonary resuscitation policy.**

It is widely accepted that decisions about CPR should be confirmed by the doctor in charge of the patient at the earliest opportunity. This is likely to be the hospital consultant in most stroke units. CPR decisions should be regularly reviewed and discussed with patients as appropriate. The views of the family should be sought if the patient is mentally incompetent.

☑ CPR status should be confirmed at every weekly multidisciplinary meeting and changed according to the patients' progress and views.

4.20.2 FEEDING AFTER A STROKE

Dysphagia management is dealt with in the accompanying SIGN guideline on the "identification and management of post-stroke dysphagia"[7] (currently being reviewed).

4.20.3 ANTIBIOTICS FOR PATIENTS WHO ARE TERMINALLY ILL OR SEVERELY DISABLED

Severely disabled patients, and those in the terminal phase of their stroke are at high risk of infection e.g. chest or urinary tract infections. When these infections occur it can be difficult to know what treatment to offer. Discussion with the patient, their relatives and the stroke team can help in treatment decisions. It may be considered appropriate to treat the infection aggressively or palliate with antipyretics (e.g. paracetamol) and opiates.

4.20.4 METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA) INFECTION AND CARRIAGE

Many hospitals operate a strict isolation policy for patients who carry MRSA or have MRSA infections. If MRSA cannot be cleared using conventional methods and the patient is isolated for prolonged periods, there may be severe psychological consequences. Some hospitals have a less strict isolation policy which may provide a better rehabilitation setting for the MRSA affected patient but at the risk of spreading MRSA amongst the other rehabilitation patients.

☑ Hospital policies of isolating MRSA patients can have detrimental effects on patients undergoing prolonged rehabilitation and these consequences should be considered when MRSA policies are reviewed.

5 Discharge planning and transfer of care

As discussed in section 2.3, early assessment of discharge needs and the involvement of patients and carers are important in discharge planning. Discharge planning should be divided into three parts: pre-discharge, actual discharge and post-discharge.

5.1 PRE-DISCHARGE

For many stroke patients and their carers the transition between the protective environment of the hospital to independence at home can be an overwhelming and challenging experience.

☑ The pre-discharge process should involve the patient and carer(s), the primary care team, social services and allied health professionals (AHPs). It should take account of the domestic circumstances of the patient, or if the patient lives in residential or sheltered care, the facilities available there.

☑ A nominated key worker should be identified at this time.

☑ Essential alterations to the patient's home should be completed and necessary aids installed prior to discharge.

5.1.1 PRE-DISCHARGE HOME VISITS

Pre-discharge home visits are often considered a vital part of the discharge planning process.[161]

Pre-discharge home visits performed by various members of the multidisciplinary team aim to give staff (hospital and community), stroke patients and carers the opportunity to identify actual and likely problems, as well as to address any other needs that the stroke patient/ carer may have.

The UK College of Occupational Therapists defines a home visit as a visit to the home of a hospital inpatient which involves an occupational therapist in accompanying the consumer to assess his/ her ability to function independently within the home environment or to assess the potential for the consumer to be as independent as possible with the support of carers.[162]

4

To date there is no evidence to inform the practice of pre-discharge home-visit assessments.

D **Pre-discharge home visits should be available for patients that require them.**

5.2 DISCHARGE

5.2.1 DISCHARGE PLANNING AND TRANSFER OF CARE

Discharge planning should be documented in a discharge document *(example shown in Annex 2)*. Discharge documents may be paper or electronic (e.g. in Electronic Clinical Communications Implementation (ECCI) format).

The following information should be accurately and legibly displayed in the discharge documents:

- Diagnosis(es)
- Investigations and results
- Medication and duration of treatment if applicable
- Levels of achievement, ability and recovery
- Team care plan
- Further investigations needed at primary care level with dates
- Further investigations needed at hospital and dates
- Further hospital attendance with dates
- Transport arrangements

- The trust name, trust telephone number, ward name or number, ward telephone number, consultant's name, named nurse and key worker
- The date of admission and discharge.

Consideration should be given to such information being retained by the patient as a patient-held record, to allow all members of the primary care team, AHPs and care agencies to clearly see what the care plan for the patient should be. The wishes of the patient in respect of the confidentiality of this record should be paramount. There is evidence that patient-held records may enhance the patient's understanding and involvement in their care.[163] There is also evidence to show that discharge planning increases patient satisfaction.[164] 1+ 4

The discharge document should have a minimum font size of 12 or larger as appropriate for those with visual impairment. Medical terminology given to patients or their carers should be in plain English, and discussed with the patient. The form must be signed by the staff member giving the information, and by the patient or their relative/ carer. Any information that has been given to the patient or their carer(s) should be included in the information given to the General Practitioner (GP).

☑ At the time of discharge, the discharge document should be sent to all the relevant agencies and teams.

5.3 POST-DISCHARGE

Post-discharge, the members of the primary care team, AHPs, care agencies and the patient and carer(s), should continue to assess the progress of the patient. In the event that there is cause for concern, the key worker is responsible for the appropriate referral of the patient to the correct team member or agency for assessment or treatment of the problem. This may include referral for re-admission to hospital. Voluntary services or charities (e.g. CHSS) provide a variety of different support schemes including stroke clubs, day care and respite (*see section 7.5*).

5.3.1 RETURNING TO WORK

Patients planning to return to work should speak to the rehabilitation team who can advise them on such issues as when to return, how to gradually increase hours in order to cope with fatigue and what kinds of duties would be most and least suitable in the first instance.

The team may be able to help the patient to negotiate with employers or occupational health departments. Help is also available from disability employment advisers at local job centres and from learning support departments at some local colleges. In addition some areas have specialist organisations offering employment support (*see section 7.5*).

6 Roles of the multidisciplinary team

This section addresses the important components of multidisciplinary team care in terms of the roles of the team members as defined by stroke unit trials, observational studies or expert opinion.

6.1 NURSING CARE

Whilst nursing stroke patients in specialised units is becoming more commonplace there are many other contexts where stroke care is still carried out. Many of the factors identified in this section could be equally applied wherever stroke patients are cared for. Nursing people with stroke requires nurses with knowledge, skills and interest to deliver effective therapeutic care and rehabilitation, and requires education and training in stroke care. Stroke nurses focus on working in partnership with patients and their families, involving them in decision making and taking responsibility for their own recovery. Nurses take into account the holistic needs of the patient and family, involving the physical, psychological and social aspects of care. As each patient and family is unique, nurses consider the individual's needs. Stroke nursing is a continuous 24 hour process throughout the patient's journey of care, wherever the setting.

6.1.1 THE KEY ELEMENTS OF GOOD STROKE UNIT NURSING CARE

The key elements of good stroke unit nursing care are:[18]

- removing the competition for nursing time
- allowing specialisation, e.g. swallow screening
- empowering nurses to become facilitators of rehabilitation, therapeutic interventions and enabling independence
- knowledge, interest and enthusiasm
- multidisciplinary team participation
- enabling nurses to co-ordinate patient care
- nursing assessment of the care needs of the patient, including a formal scoring of pressure sore risk and swallow screening
- nursing management of the patient's care needs, maintaining the patient in a correct posture and position and regular observation of key characteristics, such as: airway, swallowing, nutritional status, continence and skin integrity
- active contact from nursing staff.

1+

B **Stroke patients should be treated 24 hours a day by nurses specialising in stroke and based in a stroke unit.**

6.1.2 LEVELS OF NURSING STAFF REQUIRED TO PROVIDE GOOD STROKE UNIT CARE

The levels of nursing staff relate directly to the provision of good stroke unit care. Nursing staffing levels and skill mix should be appropriate to the size of the stroke unit and dependency of the patients.[18]

Individual studies have defined and calculated staffing levels in different ways, with different degrees of cross-cover from other departments. The level of nursing staff also depends on the size of the stroke unit. An estimate for a hypothetical ten-bed stroke unit requires the input of 10 WTE nurses with a skill mix ratio of 2:1 trained/assistant staff.[18]

1+

B **A minimum nursing level of 10 whole time equivalents per 10 beds is recommended.**

6.2 PHYSICIAN CARE

The physician members of the stroke multidisciplinary team will comprise consultant(s) and other career grade physicians and trainees at various stages of training. Roles will vary depending on experience and responsibility.

The physician should have a background and training in general medicine, clinical pharmacology, geriatric medicine, neurology, or rehabilitation medicine, and would be able to call on skills of colleagues when referral is appropriate.

The general role of the physician is to carry out appropriate responsibilities (as defined by the British Association of Stroke Physicians[165]) and in many cases to lead, co-ordinate and develop the skills and decisions of the multidisciplinary team. Physicians will understand the concept of multidisciplinary working in stroke rehabilitation and the criteria for successful multidisciplinary working. There will be an appreciation of the roles of other professionals within stroke rehabilitation and an in-depth understanding of the role of the stroke physician within multidisciplinary stroke rehabilitation. 4

Particular skills and responsibilities will be appropriate to the nature and emphasis of the stroke unit (acute, rehabilitation).

D **Consultants with an interest in stroke, after adequate training and with appropriate continuing professional development, should be available to co-ordinate every stroke service or unit.**

6.3 GENERAL PRACTITIONER CARE

The GP also has an integral role in the multidisciplinary management of patients with stroke.[10] GPs working in a community setting have particular strengths in problem solving, treating co-morbidities in the patient and helping carers who may have illnesses of their own to cope with in addition to caring. GPs have a knowledge of services available both in the hospital and in the community, giving them a role in co-ordinating the various services including hospital-based services, social services and AHPs. The GP is responsible for key decisions at certain points in the patient journey, such as whether and where to admit the patient. The GP is responsible for and accountable for prescribing to patients in the community. The GP's role is critical at the time of first diagnosis when decisions regarding further investigation and possible admission have to be made with the patient and the carers. 4

D **If the patient is to be admitted, the GP should communicate with the hospital staff the basis of the diagnosis, the premorbid condition of the patient, any relevant social factors and past medical history.**

The GP also plays a pivotal role in the discharge of patients back to the community. These patients often have a complex treatment and rehabilitation strategy with multiple co-morbidities.

D **For successful discharge, the GPs and community staff should receive adequate information from the hospital prior to discharge.**

The GP plays a key part in ongoing medical care of the patient, and in reinforcing education, support, lifestyle alterations and secondary prevention and is well placed to identify deterioration in function which may occur post-discharge and arrange for referral for further therapy.

6.4 PHYSIOTHERAPY

Physiotherapists are experts in the assessment and treatment of movement disorders. Physiotherapy involves the skilled use of physical interventions in order to restore functional movement or reduce impairment, disability and handicap after injury or disease. These interventions commonly involve exercise, movement and the use of thermal or electrical treatments. Physiotherapists are generally involved in the care and rehabilitation of patients from the onset of the stroke, often daily and for many months and, in some cases, years.[10] Physiotherapists work with stroke patients in a variety of settings, including stroke units, acute admission wards, general medical wards, rehabilitation units, day hospitals, community day centres, outpatient clinics and their own homes *(see Box 2)*.

4

Box 2: Physiotherapy role

Key elements of physiotherapy assessment:	Communication between physiotherapists and other team members:
■ respiratory function ■ muscle tone ■ body alignment and range of joint motion ■ movement status ■ sensation ■ visuo-spatial awareness ■ undesirable compensatory activity ■ balance ■ mobility – walking, transfers, stair-climbing.	■ attending multidisciplinary meetings and case conferences ■ specific liaison with other professionals, teaching staff, patients and relatives ■ setting and meeting appropriate physical goals ■ supporting patients and families ■ liaison with other physiotherapists through networks and specific training in the physical management of stroke.

As stroke frequently results in physical deficits which impair the ability to move, a central aim of physiotherapy will be to work with other team members to promote the recovery of movement and mobility. Physiotherapists will plan and implement treatments for individual patients, based on the assessment of their unique problems. Key elements of these patient-specific treatment strategies may involve restoring balance, re-educating mobility, and promoting functional movement. Physiotherapists should set and meet relevant short and long term goals, which have been discussed, where appropriate, with patients, carers and other team members.

Physiotherapists work closely and intimately with stroke patients and should have the ability to empathise with patients in the most challenging of circumstances. Physiotherapists should aim to achieve an evidence-based approach to stroke management through regular training and updating; and should be involved in appropriate investigation, audit and research activity.

D **All patients who have difficulties with movement following stroke should have access to a physiotherapist specialising in stroke. Physiotherapy treatment should be based on an assessment of each patient's unique problems.**

6.5 SPEECH AND LANGUAGE THERAPY

SLTs are an integral part of the stroke care team. Their particular field of expertise lies in the assessment and management of communication disorders and dysphagia following stroke (dysphagia is the subject of a separate SIGN guideline[7]).

4

Fuller details of SLT practice are available for aphasia and dysarthria in two publications of the Royal College of Speech and Language Therapists *(see box 3 for a summary)*.[166,167]

Box 3: SLT role

Speech and language therapists' role	
Provision of a diagnostic service **Provision of information** to clients, carers and health care staff about impairments/ disabilities, related abilities, and the facilitation of communication. **Identification of an individualised speech and language therapy care programme, e.g.:** ■ support ■ regular therapy ■ intensive therapy.	**Facilitating access to information regarding:** ■ methods of coping ■ therapies available ■ support groups, such as Chest Heart and Stroke Scotland. **Assessment** for and provision of augmentative and alternative forms of communication. **Facilitating referral** to other professional support, particularly where this will enhance recovery of/ compensatory strategies for communication function.

D **Speech and language therapists should be involved in stroke management at all stages in the recovery process and should liaise closely with all related healthcare professionals, with outside agencies, both statutory and voluntary, with the individual who has suffered a stroke and with his/her carers.**

6.6 OCCUPATIONAL THERAPY

Occupational therapists treat people who have impairments, restricted activity levels and limited ability to participate as a result of injury or illness, in order to achieve the highest level of independence possible. The state registered occupational therapist works in partnership with the patient, carer and other healthcare and voluntary personnel at all stages from acute through to outpatient and community care.

The occupational therapist will identify the individual aspects, which make up a person's ability to carry out selected activities, (i.e. physical, cognitive, perceptual, psychological, social, environmental and spiritual) and will include jointly agreed goals and purposeful activity in their interventions *(see Box 4)*. They will use purposeful activity to promote the restoration of function and to maximise participation in meaningful activities i.e. occupations of self-care, domestic, social and work roles.[10]

4

Box 4: The key elements of occupational therapy with stroke patients

Assessment	Intervention
■ Using activity analysis, in which the components of an activity are identified, along with the individual's limitations in carrying it out. ■ Assessment of skills which impact on present activity (e.g. sensorimotor, cognitive, perceptual and psychosocial impairments). ■ Assessment of skills for the performance of self care (e.g. washing, dressing, feeding), domestic (e.g. shopping, cooking, cleaning), work and leisure occupations. ■ Assessment of social environment (e.g. family, friends, relationships). ■ Assessment of physical environment (e.g. home and workplace).	■ Help each patient achieve the highest level of independence possible. ■ Redevelop physical, sensory, cognitive, and perceptual skills through activity and practice. ■ Promote the use of purposeful, goal orientated activity. ■ Teach new strategies, and compensatory techniques to aid independence. ■ Assess and advise on appropriate equipment and adaptations to enhance independent function. ■ Assess for and provide appropriate seating and to advise on positioning. ■ To assess, advise and facilitate, transport and mobility issues such as driving. ■ To facilitate the transfer of care, from acute stages through rehabilitation and discharge. ■ Liaise, work with, and refer to other professionals as part of a multidisciplinary team. ■ Educate the patient and carer in all relevant aspects of stroke care. ■ Liaise with support groups, and voluntary bodies.

D **All patients who have problems with activities of daily living following stroke should have access to an occupational therapist with specific knowledge and expertise in neurological care. Occupational therapy treatment should be based on an assessment of each patient's unique problems.**

6.7 SOCIAL WORK

The social worker is a member of the multidisciplinary team delivering care to stroke patients.[10] The social worker, who is employed by the local authority, should have an understanding of the illness and its effect on the patient, the carers and family. As well as being aware of the physical problems of a stroke, the social worker should also be aware of the psychological and emotional effects of stroke illness so that he/she can best understand the patient's needs.

The social worker works closely with individual members of the multidisciplinary team and is especially aware of therapist's reports in thinking about the needs of the patient. Social workers become involved with patients at different stages of the rehabilitation process, depending on what problems the patient and his family may have. Some patients will need advice and information from the social worker early in their journey of care because of financial, relationship or housing problems. 4

The social worker requires to have a wide knowledge of resources in the community so that he/she is able to advise the team and the patient about what is available for the patient on discharge. It is the social worker's role to advise the team about the timescale for implementing care packages and for discussing alternative forms of care if that is required.

As the time for discharge approaches, the social worker will normally become more involved with patients, especially those who have complex needs. The social worker will complete community care assessments for patients in consultation with the multidisciplinary team, patient and the family. It is important for the social worker to be aware of the patient's own goals and expectations and to be able to assess any risk that the patient may be in. The social worker will then organise the appropriate care, either in the community or in residential homes as may be required. The social worker will then go on to work with the patient and family for a period of time after discharge to ensure that rehabilitation plans are meeting their needs in whatever setting and to support patients and families in organising and re-assessing any difficult situations that may arise.

D **A social worker should be a member of the multidisciplinary team and should have a key role in the discharge planning process.**

6.8 CLINICAL PSYCHOLOGY

Emotional and personality changes and some degree of cognitive impairment are present in many patients after a major stroke. These problems can be a significant concern for relatives and a source of stress related illness.

The role of the clinical psychologist working within this field is to define neuropsychological impairment, to alleviate psychological distress and promote well being and quality of life by developing, applying and promoting the proper application of psychological knowledge, skills and expertise *(see Box 5)*.[168] This is carried out through direct clinical work or indirect consultancy, as judged appropriate by the clinical psychologist. Indirect work may include supervision, teaching, research and audit. Clinical psychologists who are members of the division of Clinical Neuropsychology of the British Psychological Society have additional training and experience in neuropsychology, and are able to provide higher level specialist skills within this field. 4

Box 5: The key elements of a clinical psychcologists' work with stroke patients

<table>
<tr><th>Direct work with people after a stroke includes:</th><th>Services to carers and professionals include:</th></tr>
<tr><td rowspan="2">■ Detailed neuropsychological assessment of intellectual/cognitive impairment, behaviour, daily functioning, difficulties with interpersonal relationships and emotional problems.
■ Teaching of new skills and strategies to circumvent intellectual/cognitive impairments including difficulties with attention, memory and perception.
■ Using skilled therapeutic interventions to alleviate mental health problems such as depression, anxiety in patients and their carers and to manage changes such as mood disturbance if these become a problem (see section 4.14).
■ Using appropriate techniques to manage difficult behaviour which can result in reduced stress to the individual, their carers and health professionals.</td><td>■ Working within a multidisciplinary team to use the results of psychological assessments in order to develop appropriate individual care programmes.
■ Training, supervising or consulting with other professionals to aid them in their direct clinical work.
■ Working with families on adjusting and understanding the cognitive deficits experienced by their relatives.</td></tr>
<tr><td>Services to purchasers and planners include:</td></tr>
<tr><td></td><td>■ Designing service evaluation and audit projects to identify psychological needs within a service and to provide information about service use and outcome.
■ Undertaking research aimed at improving the understanding of psychological problems in this client group and the efficacy of assessment and treatment methods.</td></tr>
</table>

Other professionals are also qualified to work with patients with mood disorders or emotional changes after a stroke. For example psychiatrists have a role in working with complex mood and behavioural disorders while counselling may be generic or may be offered by a more highly trained professional using specific theoretical models.

D **Each multidisciplinary stroke team should have access to a clinical psychologist and psychiatrist.**

7 Patient issues

This section of the guideline is intended to highlight the main issues that healthcare professionals should discuss with patients and carers. It is based on the best available evidence of what is effective and has been adapted with permission from Chest, Heart & Stroke Scotland (CHSS) literature. Please refer to the other SIGN Stroke guidelines for full background.[5,7]

7.1 DIAGNOSIS AND ASSESSMENT – IDENTIFYING THE PROBLEMS AND ASSESSING WHAT THE PATIENT NEEDS

- Everyone should be made aware of the symptoms of a stroke; particularly those in high-risk groups - for example, with a family history of stroke, coronary heart disease or high blood pressure
- Patients with persisting symptoms should be admitted as an emergency to hospital. They should receive immediate medical assessment, with all relevant investigations, including CT scan, carried out within 48 hours
- Patients should be assessed for their nursing and other care needs, and have an immediate swallowing assessment. Patients and their carers need to be fully informed of the purpose and results of all investigations, and as far as possible of the likely outcomes
- An alternative to hospital admission for patients with minor symptoms (or those with symptoms that have completely resolved) is a neurovascular clinic review, ideally within a week (even if already seen in the Emergency Room). They should receive a full medical assessment and investigations, including a CT scan and (if appropriate) carotid doppler ultrasound and echocardiography
- Ideally, this should be a "one-stop" service. Patients should be given a full explanation of the purpose and results of all investigations, and of action to reduce the risk of future strokes. Appropriate dietary and therapy advice should also be provided.

7.2 ACUTE CARE AND REHABILITATION – HOSPITAL-BASED SERVICES

- Patients should ideally be cared for in a dedicated Stroke Unit. This should be staffed by medical, nursing and therapy staff with specialist interest and expertise in stroke care, operating as a multidisciplinary team. The stroke service should provide both acute care and specialist stroke rehabilitation
- In rural areas with small hospitals and dispersed populations, this may not be possible. In these circumstances, patients should still be treated using agreed protocols for stroke care, and rehabilitation should make use of generic rehabilitation facilities
- Care should be provided by staff with specialist knowledge and skills in stroke. There should be particular attention to potential problems such as swallowing and eating, communication, fluid balance and hydration, nutrition, mobility, everyday activities, continence, associated cardiovascular problems, infections, prevention of pressure sores and skin care problems. Patients may also have vision or cognitive problems. Staff should be aware of all of these issues and ensure that patients' dignity is respected at all times
- Patients are likely to be affected by emotional problems including anxiety and are at significant risk of depression, which can be treated
- Patients should be encouraged to move, walk and communicate as soon as possible
- The patient should be actively involved in setting and meeting rehabilitation goals. Patients and their carers need to be kept fully informed of the aim of rehabilitation and the probable course of recovery, and of action taken to reduce the risk of future strokes. Appropriate secondary prevention measures should be initiated as soon as possible
- Information provided in booklet, video and audiotape form is particularly useful for both patients and carers. Publications such as those provided by CHSS should be made available,

together with information about the CHSS Advice Line. The charity can also organise visits by trained volunteers to hospital stroke patients, which can be particularly helpful for those with limited family support.

7.3 DISCHARGE PLANNING – RETURNING HOME FROM HOSPITAL

- Discharge planning should begin well in advance, and be based on the individual needs and circumstances of the patient. Patients and carers need to be kept fully informed, and consulted at each stage in the process
- There needs to be full consultation and joint working with local authority and primary care services to ensure that the full community care package is available to patients and carers immediately on discharge. This includes all necessary assessments for OT aids, adaptations and equipment
- Initial appointments, for example with therapists, should be arranged before discharge. There must also be close co-ordination with the patient's GP
- Patients and carers who could potentially benefit should be made fully aware of the services provided by voluntary agencies such as CHSS, and appropriate referral procedures put in place
- Follow-up after hospital discharge is vital for both patients and carers. There should be a named telephone contact to deal with any immediate problems following discharge
- Ideally, a family support worker or CHSS stroke nurse should make contact with the patient and carer prior to discharge and follow-up regularly over the following six to twelve months, through home visits and telephone contact
- GPs need to be kept fully informed and undertake responsibility for monitoring patients' progress at home. In particular, GPs should ensure suitable secondary prevention measures are taken, including smoking cessation, and management of risk factors such as hypertension, diabetes and atrial fibrillation (please refer to the SIGN guideline on secondary prevention[5]). Problems associated with stroke, such as cognitive and behavioural problems, and depression, should also be monitored.

7.4 COMMUNITY SUPPORT – LONG TERM CARE AND SUPPORT AT HOME

- The Primary Care team should ensure that patients and carers are given information on statutory benefits such as Disability Living Allowance and Attendance Allowance, for which they may qualify, if not addressed by hospital services. They should be referred to the National Benefits Agency Enquiry Line, local Benefits Agency, Citizens' Advice Bureau, Welfare Rights Office, or any other agency that might be able to help
- Patients who drive should be advised on when it is appropriate to return to driving
- SLTs and GPs should make patients with communication problems aware of the CHSS Volunteer Stroke Service, and where appropriate, discuss referral with the patient
- CHSS also provides a network of local stroke clubs, run on a voluntary basis and offering social support, activities and companionship. Patients and families should be made aware of these clubs and the means of accessing the services they offer
- In some parts of the country, there are also separate groups for younger stroke patients operated by both CHSS and Different Strokes. Patients under 65 should be given information on these groups if their services are available locally
- At every stage in the process, from admission to long term support in the community, patients and carers need to be provided with the fullest possible information, and encouraged to take the maximum responsibility for their own recovery.

7.5 SOURCES OF FURTHER INFORMATION/SUPPORT

The following organisations provide support and information for stroke patients and their carers:

Carers Scotland
91 Mitchell Street, Glasgow G1 3LN
Tel: 0141 221 9141 CarersLine: 0808 808 7777
Email: info@carerscotland.org
Web: www.carersonline.org.uk

Chest, Heart & Stroke Scotland
65 North Castle Street, Edinburgh EH2 3LT
Advice Line: 0845 077 6000 Tel 0131 225 6963 Fax 0131 220 6313
E-mail: admin@chss.org.uk
Web: www.chss.org.uk
Other local groups include stroke groups and the Volunteer Stroke Service as administered by Chest, Heart & Stroke Scotland.

Different Strokes
Sir Walter Scott House, PO Box 5082, Milton Keynes, MK5 7HZ
Tel: 01908 236 033 Fax: 01908 236 032
Email: info@differentstrokes.co.uk
Web: www.differentstrokes.co.uk

Fife Assessment Centre for Communication through Technology (FACCT)
ASDARC, Woodend Road, Cardenden, Fife KY5 0NE
Tel: 01592 414 730 Fax: 01592 414 737
Email: facct@itasdarc.demon.co.uk

KEYCOMM
Lothian Communication Technology Service, St. Giles Centre, 40 Broomhouse Crescent, Edinburgh, EH11 3UB
Tel: 0131 443 6775 Fax: 0131 443 5121
Email: djans@keycomm.demon.co.uk

Moving Into Work (Employment consultancy and support for people after acquired brain injury):
- Norton Park, 57 Albion Road, Edinburgh EH7 5QY
- Braid House, Labrador Avenue, Howden, Livingston EH54 6AU

Princess Royal Trust for Carers (Glasgow Office) Campbell House, 215 West Campbell Street, Glasgow G2 4TT
Tel: 0141 221 5066 Fax: 0141 221 4623
Email: infoscotland@carers.org
Web: www.carers.org

Rehab Scotland (Provide rehabilitation and training services, empowering people with disabilities to gain greater independence and access to employment)
Head Office, 1650 London Road, Glasgow, G31 4QF.
Tel: 0141-554-8822
Email: headoffice@rehab-scotland.co.uk
Web: www.rehab.ie/scotland/index.htm

Scottish Centre of Technology for the Communication Impaired
SCTCI, WESTMARC, Southern General Hospital, 1345 Govan Road, Glasgow G51 4TF
Tel: 0141 201 2619 Fax: 0141 201 2618
Email: sctci@waacis.edex.co.uk

Speakability (Information for people with aphasia, their families and healthcare professionals)
1 Royal Street London, SE1 7LL
Helpline: 080 8808 9572 Tel: 020 7261 9522 Fax: 020 7928 9542

In England and Wales: **The Stroke Association**
Stroke House, Whitecross Street, London EC1Y 8JJ
Tel: 020 7566 0300 Fax: 020 7490 2686
Web: www.stroke.org.uk

8 Implementation and audit

8.1 LOCAL IMPLEMENTATION

Implementation of national clinical guidelines is the responsibility of each NHS Trust and is an essential part of clinical governance. It is acknowledged that every Trust cannot implement every guideline immediately on publication, but mechanisms should be in place to ensure that the care provided is reviewed against the guideline recommendations and the reasons for any differences assessed and, where appropriate, addressed. These discussions should involve both clinical staff and management. Local arrangements may then be made to implement the national guideline in individual hospitals, units and practices, and to monitor compliance. This may be done by a variety of means including patient-specific reminders, continuing education and training, and clinical audit.

8.2 KEY POINTS FOR AUDIT

- Was the patient managed in an acute Stroke Unit or a Rehabilitation Unit?
- Was the patient under the care of a physician with an interest in stroke?
- Has discharge information been sent to the GP including details of the stroke, functional abilities and services (or care package) set up for home?
- Was the patient and/or carer given information about their stroke?
- What was the patient's perspective of the treatment and information they received?
- What were the levels of stroke specialist education available to the various disciplines?

Example audit forms are given at the end of this section.

8.3 RECOMMENDATIONS FOR RESEARCH

Further research should be of high methodological quality, relying on randomised controlled trials whenever possible.

Key components of the Stroke Unit

Further research is required into which components of the multidisciplinary team stroke unit care are effective, cost-effective and the most beneficial to patient outcome (unpacking the black box of rehabilitation). Primary research should investigate different therapy interventions, different therapy approaches, the optimum intensity of therapy, the optimum timing of such interventions and attempt to identify which patients benefit most from which interventions.

In addition, research is required in the following specific areas:

Therapy (covering all disciplines)

Further research is required into therapy provided out-with stroke units, for example community and domiciliary services as well as their long term effects following stroke.

Additionally, specific interventions such as **therapeutic positioning**, **continence management**, **treatments for shoulder pain and pre-discharge home visits** need to be evaluated.

Standardised methods to describe and define interventions need to be developed in order to facilitate the interpretation and implementation of research findings.

Stroke Liaison Nurse/Co-ordinator

Further research is required to review and define the optimum role and service characteristics of the Stroke Liaison Nurse/Co-ordinator, and to demonstrate their effectiveness.

Aphasia

Future research into the treatment of aphasia should employ larger subject groups and evaluate outcome in terms of functional communication and quality of life. Evaluation of the benefits of management approaches such as augmentative communication, counselling and carer training should be undertaken, employing suitably robust methodology.

Dysarthria

There is an urgent need for large-scale funded research into the effectiveness of interventions for dysarthria following stroke.

Mood disturbance

Research is required to identify a standardised screening measure for mood disturbance in stroke patients. There has been some indication from other areas of neurological rehabilitation that 'illness' specific mood scales might add to sensitivity and specificity. Further research may clarify this.

Further research is required to assess the impact of psychosocial interventions to treat anxiety and depression in stroke patients.

Cognitive rehabilitation

High quality trials are required to assess the efficacy of cognitive rehabilitation. Controlled comparisons with placebo or no treatment are required.

Outcome trials should include tests of both cognition and broader functioning in daily life. However, it is unlikely that current activity of daily living tests will be sensitive enough to assess the functional effects of cognitive rehabilitation/training. Cognitive disability measures will need to be validated for reliability. It should be noted that self-report of functioning in daily life may not be accurate if the patient has difficulties such as severe memory problems or poor awareness of their deficits.

Graduated elastic compression stockings

Clinicians are encouraged to participate in RCTs for patients participating in prolonged stroke rehabilitation in order to assess the efficacy of graduated compression stockings. One such trial is currently ongoing (more information is available on the internet at http://www.dcn.ed.ac.uk/CLOTS).

Feeding after stroke

The dilemmas of feeding patients after a stroke are currently the focus of a major international multicentre trial, the FOOD trial, co-ordinated in Scotland. At the time of writing the FOOD trial is still recruiting patients (and centres) and results from this research will help guide future advice. The evidence relating to artificial feeding after stroke is reviewed in the FOOD trial protocol (available on the internet at http://www.dcn.ed.ac.uk/food/).

Incontinence

There is a dearth of good quality research into improving continence after stroke.

Lothian Stroke Care Audit Form - Inpatients

Address label
Chi No. Sex
Unit No.
Name Title
Address
Dob
Postcode
Telephone

Next of kin: _____
NOK phone:_____ Relationship:_____
GP Initials:_____ GP Surname:_____
GP Postcode:_____ GP Phone:_____

Date of assessment: ___/___/___ Time: ___:___ Responsible consultant:_____
Seen as: _____ Unit:_____
If Admitted, Date: ___/___/___ Time: ___:___ Admitted from:_____
Discharge Date: ___/___/___ Discharged to:_____

Final diagnosis and status

Cerebral: Stroke [__] Transient ischaemic attack: [__] Sub-arachnoid haemorrhage: [__]
Eye: Retinal artery occlusion [__] Transient monocular blindness [__]
Non-cerebrovascular: [__] Details of non cv diagnosis: _____
End data collection: Reason _____ Date (e.g. died) : ___/___/___

Initial assessment

Date of first symptoms : ___/___/___
Was the patient independent in ADL before event? [__]
Was the patient living alone at the time of event? [__]
Can the patient talk? [__]
Are they oriented in time, place and person? [__]
Can the patient lift both arms off the bed? [__]
Able to walk without help from another person? [__]
Current AF confirmed on ECG ? [__]
On Warfarin at onset? [__]

Inpatient management

Was the patient managed in an acute SU? [__] Admission to acute SU: ___/___/___ Unit: _____
(SU = Stroke Unit) Discharge from acute SU: ___/___/___

Was the patient managed in a rehab SU? [__] Admission to rehab SU: ___/___/___ Unit: _____
Discharge from rehab SU: ___/___/___
Whether Aspirin given in hospital [__] Date Aspirin started ___/___/___
Final Discharge from hospital on Aspirin [__] Barthel 1 ___ Date: ___/___/___
Final Discharge on Clopidogrel (Plavix) [__] Barthel 2 ___ Date: ___/___/___
Final Discharge on Dipyridamole (Persantin)[__] *or* FIM 1 ___ Date: ___/___/___
Final Discharge on Warfarin [__] FIM 2 ___ Date: ___/___/___
Final Discharge on Simvastatin [__]

Final Classification

CT done ? [__] Date : ___/___/___ Evidence of new haemorrhage on scan [__]
MRI done ? [__] Date : ___/___/___
Post-mortem performed [__] Evidence of new haemorrhage on PM [__]
Classification of Stroke Syndrome *(Please circle)* LACS / PACS / POCS / TACS / Uncertain
ICD 10 final diagnosis: _____
Comments on diagnosis _____

Codes to be used for inpatient form

[_]	Boxes
Y	YES
N	NO
?	NOT KNOWN
=	UNASSESSABLE

End data collection

	Patient Deceased
	Patient cannot be traced
	Patient has refused further contact
	Patient Removed

Seen As

	Inpatient
	Outpatient
	GP surgery

Unit

AAH	Astlie Ainslie
LIB	Liberton
RIE	Royal Infirmary
RVH	Royal Victoria
STJ	St. Johns
WGH	Western General
Oth	Other

ICD 10

G45	General Class - TRANSIENT ISCHAEMIC ATTACK
G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome
G45.2	Multiple and bilateral precerebral artery syndrome
G45.3	Transient Monocular Blindness (Amaurosis fugax)
G45.8	Other TIAs and related syndromes
G45.9	Transient Ischaemic Attack, unspecified
H34.0	Transient Retinal Artery Occlusion
H34.1	Central Retinal Artery Occlusion
H34.2	Other Retinal Artery Occlusions
I61	General Class - INTRACEREBRAL HAEMORRHAGE
I610	ICH in hemisphere, subcortical
I611	ICH in hemisphere, cortical
I612	ICH in hemisphere, unspecified
I613	ICH in brain stem
I614	ICH in cerebellum
I615	ICH intraventricular
I616	ICH multiple localised
I618	Other Intracerebral haemorrhage
I619	Intracerebral haemorrhage, unspecified
I63	General Class - CEREBRAL INFARCTION
I630	CI due to thrombosis of precerebral arteries
I631	CI due to embolism of precerebral arteries
I632	CI due to unsp occlusion/stenosis of precerebral a
I633	CI due to thrombosis of cerebral arteries
I634	CI due to embolism of cerebral arteries
I635	CI due to unsp occlusion/stenosis of cerebral arts
I636	CI due to cerebral venous thrombosis, nonpyogenic
I638	Other Cerebral Infarction
I639	Cerebral Infarction, unspecified
I64X	Stroke, not specified as haemorrhage or infarction
I65	Occlusion/stenosis precerebral arteries, not result of Cerebral Infarction
I66	Occlusion/stenosis cerebral arteries, not result of Cerebral Infarction
I67	General Class - OTHER CEREBROVASCULAR DISEASES
I670	Dissection of cerebral arteries, nonruptured
I672	Cerebral atherosclerosis
I675	Moyamoya disease
I677	Cerebral arteritis, not elsewhere classified
I678	Other specified cerebrovascular diseases
I679	Cerebrovascular disease, unspecified
I68	Cerebrovascular disorders in diseases classified elsewhere
I69	Sequelae of cerebrovascular disease

Admitted from

Private Residence: no additional detail added
Usual place of residence: institution, no additional detail added
Usual: NHS - Nursing/Residential/Hostel/Group Home
Usual: Local Authority/Voluntary - Nursing/Residential/Hostel/Group Home
Usual: Private - Nursing/Residential/Hostel/Group Home
Temporary place of residence: no additional detail added
Transfer from the same Provider Unit: no additional detail added
Transfer from other NHS Provider unit: no additional detail added
Admission from Private Hospital or Hospice etc.: no additional detail

Discharged to

Patient died
Private Residence: no additional detail added
Private Residence: living alone
Private Residence: living with friends/relatives
Usual place of residence: institution, no additional detail added
Usual: NHS - Nursing/Residential/Hostel/Group Home
Usual: Local Authority/Voluntary - Nursing/Residential/Hostel/Group Home
Usual: Private - Nursing/Residential/Hostel/Group Home
Temporary place of residence: no additional detail added
Transfer within the same Provider Unit: no additional detail added
Transfer to other NHS Provider unit: no additional detail added
Discharge to Private Hospital or Hospice etc.: no additional detail

Lothian Stroke Care Audit Form - Outpatients

Address label
Chi No. Sex
Unit No.
Name Title
Address
Dob
Postcode
Telephone

GP Initials:_____ GP Surname:_____
GP Postcode:_____ GP Phone:_____
Date of assessment: ____/____/____ Time: ____:____
Responsible consultant: _____ Unit:
Date of referral: ____/____/____ From GP? [__]
Date referral received: ____/____/____
Date of first appointment given ____/____/____

Final diagnosis and status (Please tick all that apply)

Cerebral: Stroke [__] Transient cerebral ischaemic attack: [__] Sub-arachnoid haemorrhage: [__]
Eye: Retinal artery occlusion [__] Transient monocular blindness [__]
Non-cerebrovascular: [__] Details of non cv diagnosis: _____

Casemix assessment (for stroke patients only) (Please use codes/numbered definitions overleaf)

Was the patient independent in ADL[1] before event? [__] Are they oriented in time, place and person? [__]
Was the patient living alone at the time of event? [__] Can the patient lift both arms off the bed? [__]
Can the patient talk? [__] Able to walk without help from another person? [__]

Remaining sections of form apply to all patients with any cerebrovascular diagnosis

Clinical assessment

Date of last TIA / Stroke : ____/____/____ Previous stroke? [__]
Number of TIAS in the last 3 months? [_____] Previous Myocardial Infarction? [__]
Stroke Symptoms lasting *more than 7* days[2] ? [__] Previous Angina? [__]
Side of brain / eye lesion? (**L**eft / **R**ight / **B**oth / **M**idline) [__] Previous CABG? [__]
Have there been Carotid *and* Vertebral events? [__] History of treated Hypertension? [__]
Can you still detect Residual Neurological Signs? [__] History of Diabetes Mellitus? [__]
Any symptomatic neck bruit? [__] Peripheral Vascular Disease? [__]
Blood pressure? [_____/_____] Cardiac Failure? [__]

Data to audit use of 2^{ary} preventative drugs (Please tick all that apply or confirm NONE at foot)

Use of following drugs :	At time of event for which referred	At time of first assessment assessment	Recommended following NV	**But** record if patient known not to tolerate
Aspirin	☐	☐	☐	☐
Dipyridamole (Persantin/Asasantin)	☐	☐	☐	☐
Clopidogrel (Plavix)	☐	☐	☐	☐
Warfarin	☐	☐	☐	☐
ACE inhibitor	☐	☐	☐	☐
Other Antihypertensive	☐	☐	☐	n/a
Statin / lipid lowering agent	☐	☐	☐	n/a
NONE	☐	☐	☐	n/a

Brain Imaging and Final Classification

CT done? [__] Date : ____/____/____ Evidence of new haemorrhage on scan? [__]

MRI done? [__] Date : ____/____/____

Classification of clinical Stroke/TIA Syndrome *(Please circle)* LACS / PACS / POCS / TACS / Uncertain

ICD 10 final diagnosis : _____ Comments : _____

comments may include *(Please circle)* : Tumour / Epilepsy / Migraine / Sub-dural haematoma

---

Other Investigations

Echocardiogram performed? TOE + contrast / TOE no contrast / TTE + contrast / TTE no contrast / None

(please circle)

Date of first echocardiogram ____/____/____

LVH on ECG or echo? [__]

Left ICA % stenosis on Duplex? [____-____]

Current AF confirmed on ECG? [__]

Right ICA % stenosis on Duplex? [____-____]

Visible infarct on CT / MRI? [__]

Post-stenotic collapse (equivalent on Duplex)? [__]

Plaque instability/irregularity (on Duplex or MRA)? [__]

Data to audit carotid intervention service

Carotid Duplex examination performed? [__] Date of 1st Duplex ____/____/____

2nd Carotid Duplex performed? [__] Date of 2nd Duplex ____/____/____

MR Angiography performed? [__] Date of MRA ____/____/____

CT Angiography performed? [__] Date of CTA ____/____/____

Conventional Angiography performed? [__] Date of angiography ____/____/____

Referred to vascular surgeons / radiologist? [__] Date referred ____/____/____

If not referred (please circle reason) patient choice / clinically not worthwhile (doctors decision)

mutual agreement / not appropriate (no severe stenosis)

If referred – intervention considered *(please circle)*

surgery / angioplasty + stent Date seen by surgeon / radiologist ____/____/____

Intervention performed? [__] Date of procedure ____/____/____

If yes Side *(L, R, or Both)* [__] Stroke within 30 days of intervention? [__]

Other complication(s) of intervention? [__] *(please specify)* _____

Reviewed in NV clinic after intervention? [__] Date reviewed ____/____/____

Codes to be used

[__]	**Boxes**
Y	**YES**
N	**NO**
?	**NOT KNOWN**
=	**UNASSESSABLE**

Wider boxes are for numbers.

Code % ICA stenosis as a discrete figure or a range, as appropriate.

Definitions

1. Independent in ADL (Activities of Daily Living): is the patient independent in **walking, dressing, washing, feeding** and **toileting**, *not necessarily* bathing, shopping or climbing stairs.
2. Stroke symptoms last more than 7 days – if too soon to be sure, please code as unassessable (=).

This page should be completed once all information is known – which will be some time after the clinic.

9 Development of the guideline

9.1 INTRODUCTION

SIGN is a collaborative network of clinicians, other health care professionals and patient representatives, funded by the Clinical Resource and Audit Group (CRAG) of the Scottish Executive Health Department. SIGN guidelines are developed by multidisciplinary groups using a standard methodology, based on a systematic review of the evidence. Further details about SIGN and the guideline development methodology are contained in *SIGN 50; A Guideline developer's handbook* available at **www.sign.ac.uk**.

9.2 THE GUIDELINE DEVELOPMENT GROUP

Dr Richard Lindley *(Chairman)*	*Consultant Physician & Geriatrician, Western General Hospital, Edinburgh*
Mr John Brown	*Patient Representative, North Berwick*
Mr Campbell Chalmers	*Director of Advice & Support, Chest, Heart & Stroke Scotland*
Mrs Ursula Corker	*Carer representative, Dumfries*
Mrs Marion Dawson	*Senior Social Worker, Astley Ainslie Hospital, Edinburgh*
Dr Ali El-Ghorr	*Programme Manager, SIGN*
Professor Peter Langhorne	*Professor of Stroke Care, Glasgow Royal Infirmary*
Ms Lynn Legg	*Research Therapist, Stroke Therapy Evaluation Programme, Glasgow*
Mrs Flora MacGillivray	*Staff Nurse, Southern General Hospital, Glasgow*
Ms Therese Jackson	*Clinical Specialist/Head Occupational Therapist, Aberdeen Royal Infirmary*
Dr Catherine Mackenzie	*Reader, Department of Speech and Language Therapy, University of Strathclyde, Glasgow*
Dr Ron MacWalter	*Consultant Physician, Ninewells Hospital, Dundee*
Dr Jacqueline McDonald	*General Practitioner, Penicuik*
Dr Grant McHattie	*General Practitioner, Troon*
Dr Alex Pollock	*Research Physiotherapist, Stroke Therapy Evaluation Programme, Glasgow*
Mr Cameron Sellars	*Speech & Language Therapist, Stroke Therapy Evaluation Programme, Glasgow*
Mr Mark Smith *(Secretary)*	*Superintendent Physiotherapist, Royal Victoria Hospital, Edinburgh*
Dr Jacqueline Taylor	*Consultant Physician, Glasgow Royal Infirmary*
Dr Deborah Tinson	*Chartered Clinical Psychologist, Astley Ainslie Hospital, Edinburgh*
Mr Ian Wellwood	*Physiotherapist, Glasgow Royal Infirmary*

The membership of the guideline development group was confirmed following consultation with the member organisations of SIGN. Declarations of interests were made by all members of the guideline development group. Further details are available from the SIGN Executive. Guideline development and literature review expertise, support, and facilitation were provided by the SIGN Executive.

9.3 SYSTEMATIC LITERATURE REVIEW

The majority of the questions addressed in this guideline were answered by evidence identified from a series of Cochrane Reviews. These reviews were supplemented by searches of the Cochrane Stroke Group's specialised trials register, carried out by members of the guideline development group. Details are available from the SIGN Executive.

9.4 CONSULTATION AND PEER REVIEW

9.4.1 NATIONAL OPEN MEETING

A national open meeting is the main consultative phase of SIGN guideline development, at which the guideline development group present their draft recommendations for the first time. The national open meeting for this guideline was held on 14 May 2001 and was attended by 180 representatives of all the key specialties relevant to the guideline. The draft guideline was also available on the SIGN web site for a limited period at this stage to allow those unable to attend the meeting to contribute to the development of the guideline.

9.4.2 SPECIALIST REVIEWERS INVITED TO COMMENT ON THE DRAFT

Dr Alan Begg	*General Practitioner, Montrose*
Mr David Clark	*Chief Executive, Chest, Heart & Stroke Scotland*
Ms Helen Clinkscale	*Clinical Co-ordinator, Borders General Hospital, Melrose*
Dr Pamela Crawford	*Consultant Geriatrician, Southern General Hospital, Glasgow*
Ms Yvonne Currie	*Stroke Co-ordinator Nurse, Southern General Hospital, Glasgow*
Ms Patricia Dawson	*Head of Policy, Royal College of Nursing, Scotland*
Dr Martin Dennis	*Consultant Stroke Physician, Western General Hospital, Edinburgh*
Ms Margaret Goose	*Chief Executive, The Stroke Association, London*
Dr Gert Kwakkel	*Department of Physical Therapy, Institute of Fundamental & Clinical Human Movement Sciences, Amsterdam, The Netherlands*
Dr Nick Miller	*Department of Speech, University of Newcastle Upon Tyne*
Professor Bo Norrving	*Professor in Neurology, Lund University, Sweden*
Dr Anthony Rudd	*Associate Director (Stroke) Clinical Effectiveness & Evaluation Unit, Royal College of Physicians, London*
Dr Morag Thow	*Lecturer in Physiotherapy, Glasgow Caledonian University*
Dr Marion Walker	*Lecturer in Stroke Rehabilitation, University of Nottingham*
Dr Maggie Whyte	*Consultant Clinical Neuropsychologist, Aberdeen Royal Infirmary*
Ms Jane Williams	*Consultant Nurse in Stroke Care, Portsmouth*

9.4.3 SIGN EDITORIAL GROUP

As a final quality control check, the guideline was reviewed by an Editorial Group comprising the relevant specialty representatives on SIGN Council:

Dr David Alexander	*British Medical Association Scottish General Practice Committee*
Professor Gordon Lowe	*Chairman of SIGN; Co-Editor*
Dr Lesley MacDonald	*Faculty of Public Health Medicine*
Ms Juliet Miller	*Editor*
Dr Safia Qureshi	*Programme Director, SIGN; Co-Editor*
Dr Margaret Roberts	*Royal College of Physicians and Surgeons of Glasgow*
Dr Peter Wimpenny	*School of Nursing and Midwifery, The Robert Gordon University*

9.5 ACKNOWLEDGEMENTS

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Ms Kim Thompson	*Head of Service, Occupational Therapy, Aberdeen Royal Infirmary*
Dr Moray Nairn	*Programme Manager, SIGN*
Mr Robin Harbour	*Quality and Information Director, SIGN*

Annex 1: A pragmatic expert led approach to incontinence after stroke

Simple management strategies targeted on the common underlying diagnoses (e.g. faecal impaction, urinary tract infection, vaginal prolapse) are surprisingly effective and include: stimulatory laxatives and enemas for faecal impaction or loading; treatment of urinary tract infection; changing medication (e.g. adjusting loop diuretic medication) and appropriate treatment of urinary retention. Painful urinary retention requires immediate catheterisation. Urinary retention may be helped by other strategies including stopping anticholinergic medication (e.g. tricyclic antidepressants) and changing posture for voiding (e.g. using a toilet rather than a bedpan).

If these simple and universally available management strategies fail to achieve full urinary continence then further investigation is required.

The next assessment stage requires accurate volume and frequency urine charts to be recorded by the nursing staff and post-micturition bladder scanning.

The main causes of urinary incontinence after stroke are bladder instability secondary to the stroke, bladder hypomobility (often due to diabetic neuropathy or drugs) and prostatic hypertrophy or cancer in men. As the treatment of bladder instability can involve drugs which cause urinary retention it is vital to exclude post micturition urine residual by either: a one off urinary catheterisation to measure urine residual; bladder scanning (using a portable machine on the ward performed by a trained stroke nurse) or an abdominal ultrasound examination. If the bladder is empty after micturition and the bladder charts and history suggest unstable bladder then a care plan of regular toileting and possibly anticholinergic medication would be appropriate. If prostatic obstruction is suspected men should be appropriately treated and referred. If patients still have urinary incontinence, consideration should be given to appropriate referral or urodynamic studies. Patients requiring continence aids (e.g. pads, waterproof bedding or special laundry service) must have an agreed future source of supplies prior to transfer of care (e.g. discharge from hospital stroke unit).

Annex 2: Example Discharge/Team Care Plan

Trust name: _____

Trust address: _____

Trust telephone number: _____

Patient details

Patient name	
CHI number	
Patient address	
Date of birth	

Hospital details

Hospital name	
Ward name or number	
Ward direct dial telephone number	
Patient's named nurse	
Patient's key worker	
Date of admission	
Date of discharge	

Diagnosis(es)

Drug Name	**Strength**	**Dosage**	**Duration**	**Amount Supplied**	**Pharmacy**

In-patient investigations

Investigation	**Date**	**Result**

Current AHPs treatment

Allied Health Professionals	**Current treatment regime**
Occupational therapy	
Physiotherapy	
SLT	
Other:	

Special needs

Investigations to be arranged by primary care team

Primary care investigation needed	Date for which investigation is needed	Comments

Investigations arranged as out/in-patient

Hospital investigation needed	Date for which investigation arranged	Comments

Further hospital attendances

Hospital attendance date	Reason for attendance	Transport arranged?

For details of transport arrangements, or if they are to be changed contact:

Continuing care after discharge

Date	Comments

Record of level of achievement

Abbreviations

AAC	Alternative or augmentative communication
ADL	Activities of daily living
AFO	Ankle foot orthoses
AHPs	Allied health professionals
BF	Biofeedback
CHSS	Chest, Heart & Stroke Scotland
CI	Confidence interval
CPR	Cardiopulmonary resuscitation
CPSP	Central Post Stroke Pain
CT	Computed tomography
DVT	Deep vein thrombosis
ECCI	Electronic clinical communications implementation
ES	Electrical stimulation
ESD	Early supported discharge
EMG	Electromyographic
GP	General Practitioner
GECS	Graduated elastic compression stockings
HSP	Hemiplegic shoulder pain
ICF	International Classification of Functioning, Disability and Health
ICIDH	International Classification of Impairment, Disabilities and Handicaps
ICP	Integrated care pathway
MRSA	Methicillin resistant *Staphylococcus aureus*
RCT	Randomised controlled trial
SIGN	Scottish Intercollegiate Guidelines Network
SLT	Speech and language therapist
WHO	World Health Organisation
WTE	Whole time equivalent

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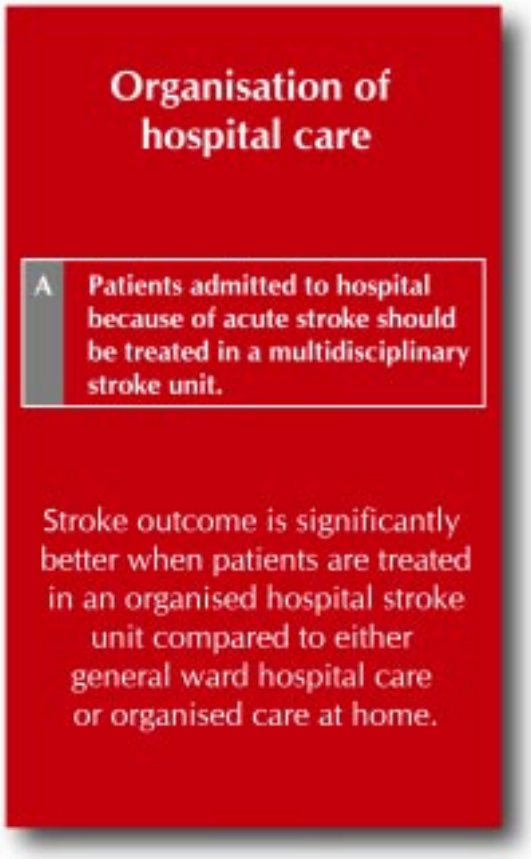
Management of Patients with Stroke:

Rehabilitation, Prevention and Management of Complications, and Discharge Planning

Stroke is the third commonest cause of death and the commonest cause of adult disability in Scotland.

70,000 individuals are living with stroke and its consequences and each year, there will be approximately 15,000 new stroke events.

Immediate mortality is high and approximately 20% of stroke patients die within 30 days.



MULTIDISCIPLINARY TEAM MEMBERSHIP AND ROLES

B **The core multidisciplinary team should consist of appropriate levels of nursing, medical, physiotherapy, occupational therapy, speech and language therapy, and social work staff.**

☑ Members of the core team should identify problems and invite allied health care professionals to contribute to the treatment and rehabilitation of their patients as appropriate.

MULTIDISCIPLINARY TEAM COMMUNICATION

B **Stroke unit teams should conduct at least one formal multidisciplinary meeting per week at which patient problems are identified, rehabilitation goals set, progress monitored and discharge is planned.**

PATIENT INVOLVEMENT

B **Patients and carers should have an early active involvement in the rehabilitation process.**

INFORMATION PROVISION

D **Stroke patients and their carers should be offered information about stroke and rehabilitation.**

EARLY SUPPORTED DISCHARGE AND POST-DISCHARGE

A **Early supported discharge services provided by a well resourced, co-ordinated specialist multidisciplinary team are an acceptable alternative to more prolonged hospital stroke unit care and can reduce the length of hospital stay for selected patients.**

DISCHARGE PLANNING AND TRANSFER OF CARE

☑ The pre-discharge process should involve the patient and carer(s), the primary care team, social services and allied health professionals. It should take account of the domestic circumstances of the patient, or if the patient lives in residential or sheltered care, the facilities available there. A nominated key worker should be identified at this time.

☑ At the time of discharge, the discharge document should be sent to all the relevant agencies and teams.

MANAGEMENT AND PREVENTION STRATEGIES

Refer to the full guideline for specific management strategies for:

DRIVING AFTER A STROKE

☑ Patients with stroke who make a satisfactory recovery should be advised that they must not drive for at least one month after their stroke.

Patients with residual disability at one month must inform the DVLA (particularly if there are visual field defects, motor weakness or cognitive deficits) and can only resume driving after formal assessment.

CHEST, HEART & STROKE SCOTLAND

Advice Line 0845 077 6000