

Stroke rehabilitation

Long-term rehabilitation after stroke

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Introduction

Stroke is a major health problem in the UK. Each year, approximately 110,000 people in England, 11,000 people in Wales and 4,000 people in Northern Ireland have a first or recurrent stroke. Most people survive a first stroke but often have significant morbidity. More than 900,000 people in England are living with the effects of stroke.

Stroke mortality rates in the UK have been falling steadily since the late 1960s. The development of stroke units following the publication of the Stroke Unit Trialists' Collaboration meta-analysis of stroke unit care^[1], and the further reorganisation of services following the advent of thrombolysis, have resulted in further significant improvements in mortality and morbidity from stroke (as documented in the National sentinel stroke audit^[2]). However, the burden of stroke may increase in the future as a consequence of the ageing population.

Despite improvements in mortality and morbidity, people with stroke need access to effective rehabilitation services. Stroke rehabilitation is a multidimensional process, which is designed to facilitate restoration of, or adaptation to the loss of, physiological or psychological function when reversal of the underlying pathological process is incomplete. Rehabilitation aims to enhance functional activities and participation in society and thus improve quality of life.

Key aspects of rehabilitation care include multidisciplinary assessment, identification of functional difficulties and their measurement, treatment planning through goal setting, delivery of interventions which may either effect change or support the person in managing persisting change, and evaluation of effectiveness.

Current guidelines

Clear standards exist for stroke rehabilitation, for instance as described by the 'National clinical guideline for stroke'^[3] and reflected in the NICE quality standard and the 'National stroke strategy'^[4]. Overall there is little doubt that the rehabilitation approach described by the standards is effective; what individual interventions should take place within this structure is less clear.

Why this guideline was developed

The aim of this Guideline Development Group was to review the structure, processes and interventions currently used in rehabilitation care, and to evaluate whether they improve

outcomes for people with stroke. A modified Delphi survey was conducted (see the [full guideline](#) for more information) to obtain formal consensus around areas such as service delivery and care planning. This guideline reviews some of the available interventions that can be used in stroke rehabilitation.

^[1] Stroke Unit Trialists' Collaboration (1997) Collaborative systematic review of the randomised trials of organised inpatient (stroke unit) care after stroke. British Medical Journal (Clinical Research Ed) 314:1151–9

^[2] Intercollegiate Stroke Working Party (2011) National sentinel stroke clinical audit 2010 (round 7): public report for England, Wales and Northern Ireland. London: Royal College of Physicians.

^[3] Intercollegiate Stroke Working Party (2008) National clinical guideline for stroke: third edition. London: Royal College of Physicians.

^[4] Department of Health (2007) National stroke strategy. London: Department of Health.

Patient-centred care

This guideline offers evidence-based advice on the care of adults and young people aged 16 years and older who have had a stroke with continuing impairment, activity limitation or participation restriction.

Patients and healthcare professionals have rights and responsibilities as set out in the [NHS Constitution for England](#) – all NICE guidance is written to reflect these. Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If the patient is under 16, their family or carers should also be given information and support to help the child or young person to make decisions about their treatment. Healthcare professionals should follow the [Department of Health's advice on consent](#). If someone does not have capacity to make decisions, healthcare professionals should follow the [code of practice that accompanies the Mental Capacity Act](#) and the supplementary [code of practice on deprivation of liberty safeguards](#). In Wales, healthcare professionals should follow [advice on consent from the Welsh Government](#).

NICE has produced guidance on the components of good patient experience in adult NHS services. All healthcare professionals should follow the recommendations in [Patient experience in adult NHS services](#).

If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care. Families and carers should also be given the information and support they need.

Terms used in this guideline

Aphasia Loss or impairment of the ability to use and comprehend language, usually resulting from brain damage.

Apraxia (of speech) Difficulty in initiating and executing the voluntary movement needed to produce speech when there is no weakness of speech muscles. It may cause difficulty producing the correct speech or changes in the rhythm or rate of speaking.

Assessment A detailed process which aims to define the nature and impact of an impairment and devise a treatment plan.

Dysarthria Difficulty in articulating words.

Dysphagia Difficulty in swallowing.

Dyspraxia Difficulty in planning and executing movement.

Early supported discharge A service for people after stroke which allows transfer of care from an inpatient environment to a primary care setting to continue rehabilitation, at the same level of intensity and expertise that they would have received in the inpatient setting.

Hemianopia Blindness in one half of the visual field of one or both eyes.

Neglect An inability to orient towards and attend to stimuli, including body parts, on the side of the body affected by the stroke.

Orthosis A device that supports or corrects the function of a limb or the torso.

Screening A process of identifying people with particular impairments. People can then be offered information, further assessment and appropriate treatment. Screening may be performed as a precursor to more detailed assessment.

Stroke rehabilitation service A stroke service designed to deliver stroke rehabilitation either in hospital or in the community.

Stroke unit An environment in which multidisciplinary stroke teams deliver stroke care in a dedicated ward which has a bed area, dining area, gym, and access to assessment kitchens.

Key priorities for implementation

The following recommendations have been identified as priorities for implementation.

Stroke units

- People with disability after stroke should receive rehabilitation in a dedicated stroke inpatient unit and subsequently from a specialist stroke team within the community.

The core multidisciplinary stroke team

- A core multidisciplinary stroke rehabilitation team should comprise the following professionals with expertise in stroke rehabilitation:
 - consultant physicians
 - nurses
 - physiotherapists
 - occupational therapists
 - speech and language therapists
 - clinical psychologists
 - rehabilitation assistants
 - social workers.

Health and social care interface

- Health and social care professionals should work collaboratively to ensure a social care assessment is carried out promptly, where needed, before the person with stroke is transferred from hospital to the community. The assessment should:
 - identify any ongoing needs of the person and their family or carer, for example, access to benefits, care needs, housing, community participation, return to work, transport and access to voluntary services

- be documented and all needs recorded in the person's health and social care plan, with a copy provided to the person with stroke.

Transfer of care from hospital to community

- Offer early supported discharge to people with stroke who are able to transfer from bed to chair independently or with assistance, as long as a safe and secure environment can be provided.

Setting goals for rehabilitation

- Ensure that goal-setting meetings during stroke rehabilitation:
 - are timetabled into the working week
 - involve the person with stroke and, where appropriate, their family or carer in the discussion.

Intensity of stroke rehabilitation

- Offer initially at least 45 minutes of each relevant stroke rehabilitation therapy for a minimum of 5 days per week to people who have the ability to participate, and where functional goals can be achieved. If more rehabilitation is needed at a later stage, tailor the intensity to the person's needs at that time^[5].

Cognitive functioning

- Screen people after stroke for cognitive deficits. Where a cognitive deficit is identified, carry out a detailed assessment using valid, reliable and responsive tools before designing a treatment programme.

Emotional functioning

- Assess emotional functioning in the context of cognitive difficulties in people after stroke. Any intervention chosen should take into consideration the type or complexity of the person's neuropsychological presentation and relevant personal history.

Swallowing

- Offer swallowing therapy at least 3 times a week to people with [dysphagia](#) after stroke who are able to participate, for as long as they continue to make functional gains. Swallowing therapy could include compensatory strategies, exercises and postural advice.

Return to work

- Return-to-work issues should be identified as soon as possible after the person's stroke, reviewed regularly and managed actively. Active management should include:
 - identifying the physical, cognitive, communication and psychological demands of the job (for example, multi-tasking by answering emails and telephone calls in a busy office)
 - identifying any impairments on work performance (for example, physical limitations, anxiety, fatigue preventing attendance for a full day at work, cognitive impairments preventing multi-tasking, and communication deficits)
 - tailoring an intervention (for example, teaching strategies to support multi-tasking or memory difficulties, teaching the use of voice-activated software for people with difficulty typing, and delivery of work simulations)
 - educating about the [Equality Act 2010](#) and support available (for example, an access to work scheme)
 - workplace visits and liaison with employers to establish reasonable accommodations, such as provision of equipment and graded return to work.

Long-term health and social support

- Review the health and social care needs of people after stroke and the needs of their carers at 6 months and annually thereafter. These reviews should cover participation and community roles to ensure that people's goals are addressed.

^[5] Intensity of therapy for dysphagia, provided as part of speech and language therapy, is addressed in [recommendation 1.7.2](#).

1 Recommendations

The following guidance is based on the best available evidence. The [full guideline](#) gives details of the methods and the evidence used to develop the guidance.

The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation). See [About this guideline](#) for details.

1.1 *Organising health and social care for people needing rehabilitation after stroke*

Stroke units

- 1.1.1 People with disability after stroke should receive rehabilitation in a dedicated [stroke inpatient unit](#) and subsequently from a specialist stroke team within the community.
- 1.1.2 An inpatient [stroke rehabilitation service](#) should consist of the following:
- a dedicated stroke rehabilitation environment
 - a core multidisciplinary team (see [recommendation 1.1.3](#)) who have the knowledge, skills and behaviours to work in partnership with people with stroke and their families and carers to manage the changes experienced as a result of a stroke
 - access to other services that may be needed, for example:
 - continence advice
 - dietetics
 - electronic aids (for example, remote controls for doors, lights and heating, and communication aids)
 - liaison psychiatry
 - orthoptics

- orthotics
 - pharmacy
 - podiatry
 - wheelchair services
- a multidisciplinary education programme.

The core multidisciplinary stroke team

1.1.3 A core multidisciplinary stroke rehabilitation team should comprise the following professionals with expertise in stroke rehabilitation:

- consultant physicians
- nurses
- physiotherapists
- occupational therapists
- speech and language therapists
- clinical psychologists
- rehabilitation assistants
- social workers.

1.1.4 Throughout the care pathway, the roles and responsibilities of the core multidisciplinary stroke rehabilitation team should be clearly documented and communicated to the person and their family or carer.

1.1.5 Members of the core multidisciplinary stroke team should screen the person with stroke for a range of impairments and disabilities, in order to inform and direct further assessment and treatment.

Health and social care interface

- 1.1.6 Health and social care professionals should work collaboratively to ensure a social care assessment is carried out promptly, where needed, before the person with stroke is transferred from hospital to the community. The assessment should:
- identify any ongoing needs of the person and their family or carer, for example, access to benefits, care needs, housing, community participation, return to work, transport and access to voluntary services
 - be documented and all needs recorded in the person's health and social care plan, with a copy provided to the person with stroke.
- 1.1.7 Offer training in care (for example, in moving and handling and helping with dressing) to family members or carers who are willing and able to be involved in supporting the person after their stroke.
- Review family members' and carers' training and support needs regularly (as a minimum at the person's 6-month and annual reviews), acknowledging that these needs may change over time.

Transfer of care from hospital to community

- 1.1.8 Offer early supported discharge to people with stroke who are able to transfer from bed to chair independently or with assistance, as long as a safe and secure environment can be provided.
- 1.1.9 Early supported discharge should be part of a skilled stroke rehabilitation service and should consist of the same intensity of therapy and range of multidisciplinary skills available in hospital. It should not result in a delay in delivery of care.
- 1.1.10 Hospitals should have systems in place to ensure that:
- people after stroke and their families and carers (as appropriate) are involved in planning for transfer of care, and carers receive training in care (for example, in moving and handling and helping with dressing)

- people after stroke and their families and carers feel adequately informed, prepared and supported
- GPs and other appropriate people are informed before transfer of care
- an agreed health and social care plan is in place, and the person knows whom to contact if difficulties arise
- appropriate equipment (including specialist seating and a wheelchair if needed) is in place at the person's residence, regardless of setting.

1.1.11 Before transfer from hospital to home or to a care setting, discuss and agree a health and social care plan with the person with stroke and their family or carer (as appropriate), and provide this to all relevant health and social care providers.

1.1.12 Before transfer of care from hospital to home for people with stroke:

- establish that they have a safe and enabling home environment, for example, check that appropriate equipment and adaptations have been provided and that carers are supported to facilitate independence, **and**
- undertake a home visit with them unless their abilities and needs can be identified in other ways, for example, by demonstrating independence in all self-care activities, including meal preparation, while in the rehabilitation unit.

1.1.13 On transfer of care from hospital to the community, provide information to all relevant health and social care professionals and the person with stroke. This should include:

- a summary of rehabilitation progress and current goals
- diagnosis and health status
- functional abilities (including communication needs)
- care needs, including washing, dressing, help with going to the toilet and eating
- psychological (cognitive and emotional) needs

- medication needs (including the person's ability to manage their prescribed medications and any support they need to do so)
- social circumstances, including carers' needs
- mental capacity regarding the transfer decision
- management of risk, including the needs of vulnerable adults
- plans for follow-up, rehabilitation and access to health and social care and voluntary sector services.

- 1.1.14 Ensure that people with stroke who are transferred from hospital to care homes receive assessment and treatment from stroke rehabilitation and social care services to the same standards as they would receive in their own homes.
- 1.1.15 Local health and social care providers should have standard operating procedures to ensure the safe transfer and long-term care of people after stroke, including those in care homes. This should include timely exchange of information between different providers using local protocols.
- 1.1.16 After transfer of care from hospital, people with disabilities after stroke (including people in care homes) should be followed up within 72 hours by the specialist stroke rehabilitation team for assessment of patient-identified needs and the development of shared management plans.
- 1.1.17 Provide advice on prescribed medications for people after stroke in line with recommendations in [Medicines adherence](#) (NICE clinical guideline 76).

1.2 Planning and delivering stroke rehabilitation

Screening and assessment

- 1.2.1 On admission to hospital, to ensure the immediate safety and comfort of the person with stroke, screen them for the following and, if problems are identified, start management as soon as possible:
- orientation

- positioning, moving and handling
- swallowing
- transfers (for example, from bed to chair)
- pressure area risk
- continence
- communication, including the ability to understand and follow instructions and to convey needs and wishes
- nutritional status and hydration (follow the recommendations in [Stroke](#) [NICE clinical guideline 68] and [Nutrition support in adults](#) [NICE clinical guideline 32]).

1.2.2 Perform a full medical assessment of the person with stroke, including cognition (attention, memory, spatial awareness, [apraxia](#), perception), vision, hearing, tone, strength, sensation and balance.

1.2.3 A comprehensive assessment of a person with stroke should take into account:

- their previous functional abilities
- impairment of psychological functioning (cognitive, emotional and communication)
- impairment of body functions, including pain
- activity limitations and participation restrictions
- environmental factors (social, physical and cultural).

1.2.4 Information collected routinely from people with stroke using valid, reliable and responsive tools should include the following on admission and discharge:

- National Institutes of Health Stroke Scale
- Barthel Index.

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- 1.2.5 Information collected from people with stroke using valid, reliable and responsive tools should be fed back to the multidisciplinary team regularly.
- 1.2.6 Take into consideration the impact of the stroke on the person's family, friends and/or carers and, if appropriate, identify sources of support.
- 1.2.7 Inform the family members and carers of people with stroke about their right to have a carer's needs assessment.

Setting goals for rehabilitation

- 1.2.8 Ensure that people with stroke have goals for their rehabilitation that:
- are meaningful and relevant to them
 - focus on activity and participation
 - are challenging but achievable
 - include both short-term and long-term elements.
- 1.2.9 Ensure that goal-setting meetings during stroke rehabilitation:
- are timetabled into the working week
 - involve the person with stroke and, where appropriate, their family or carer in the discussion.
- 1.2.10 Ensure that during goal-setting meetings, people with stroke are provided with:
- an explanation of the goal-setting process
 - the information they need in a format that is accessible to them
 - the support they need to make decisions and take an active part in setting goals.
- 1.2.11 Give people copies of their agreed goals for stroke rehabilitation after each goal-setting meeting.
- 1.2.12 Review people's goals at regular intervals during their stroke rehabilitation.

Planning rehabilitation

- 1.2.13 Provide information and support to enable the person with stroke and their family or carer (as appropriate) to actively participate in the development of their stroke rehabilitation plan.
- 1.2.14 Stroke rehabilitation plans should be reviewed regularly by the multidisciplinary team. Time these reviews according to the stage of rehabilitation and the person's needs.
- 1.2.15 Documentation about the person's stroke rehabilitation should be individualised, and should include the following information as a minimum:
- basic demographics, including contact details and next of kin
 - diagnosis and relevant medical information
 - list of current medications, including allergies
 - standardised [screening](#) assessments (see [recommendation 1.2.1](#))
 - the person's rehabilitation goals
 - multidisciplinary progress notes
 - a key contact from the stroke rehabilitation team (including their contact details) to coordinate the person's health and social care needs
 - discharge planning information (including accommodation needs, aids and adaptations)
 - joint health and social care plans, if developed
 - follow-up appointments.

Intensity of stroke rehabilitation

- 1.2.16 Offer initially at least 45 minutes of each relevant stroke rehabilitation therapy for a minimum of 5 days per week to people who have the ability to participate,

and where functional goals can be achieved. If more rehabilitation is needed at a later stage, tailor the intensity to the person's needs at that time^[6].

- 1.2.17 Consider more than 45 minutes of each relevant stroke rehabilitation therapy 5 days per week for people who have the ability to participate and continue to make functional gains, and where functional goals can be achieved.
- 1.2.18 If people with stroke are unable to participate in 45 minutes of each rehabilitation therapy, ensure that therapy is still offered 5 days per week for a shorter time at an intensity that allows them to actively participate.

1.3 *Providing support and information*

- 1.3.1 Working with the person with stroke and their family or carer, identify their information needs and how to deliver them, taking into account specific impairments such as [aphasia](#) and cognitive impairments. Pace the information to the person's emotional adjustment.
- 1.3.2 Provide information about local resources (for example, leisure, housing, social services and the voluntary sector) that can help to support the needs and priorities of the person with stroke and their family or carer.
- 1.3.3 Review information needs at the person's 6-month and annual stroke reviews and at the start and completion of any intervention period.
- 1.3.4 NICE has produced guidance on the components of good patient experience in adult NHS services. Follow the recommendations in [Patient experience in adult NHS services](#) (NICE clinical guidance 138)^[7].

1.4 *Cognitive functioning*

- 1.4.1 Screen people after stroke for cognitive deficits. Where a cognitive deficit is identified, carry out a detailed assessment using valid, reliable and responsive tools before designing a treatment programme.

- 1.4.2 Provide education and support for people with stroke and their families and carers to help them understand the extent and impact of cognitive deficits after stroke, recognising that these may vary over time and in different settings.

Visual neglect

- 1.4.3 Assess the effect of visual neglect after stroke on functional tasks such as mobility, dressing, eating and using a wheelchair, using standardised assessments and behavioural observation.
- 1.4.4 Use interventions for visual neglect after stroke that focus on the relevant functional tasks, taking into account the underlying impairment. For example:
- interventions to help people scan to the neglected side, such as brightly coloured lines or highlighter on the edge of the page
 - alerting techniques such as auditory cues
 - repetitive task performance such as dressing
 - altering the perceptual input using prism glasses.

Memory function

- 1.4.5 Assess memory and other relevant domains of cognitive functioning (such as executive functions) in people after stroke, particularly where impairments in memory affect everyday activity.
- 1.4.6 Use interventions for memory and cognitive functions after stroke that focus on the relevant functional tasks, taking into account the underlying impairment. Interventions could include:
- increasing awareness of the memory deficit
 - enhancing learning using errorless learning and elaborative techniques (making associations, use of mnemonics, internal strategies related to encoding information such as 'preview, question, read, state, test')
 - external aids (for example, diaries, lists, calendars and alarms)

- environmental strategies (routines and environmental prompts).

Attention function

- 1.4.7 Assess attention and cognitive functions in people after stroke using standardised assessments. Use behavioural observation to evaluate the impact of the impairment on functional tasks.
- 1.4.8 Consider attention training for people with attention deficits after stroke.
- 1.4.9 Use interventions for attention and cognitive functions after stroke that focus on the relevant functional tasks. For example, use generic techniques such as managing the environment and providing prompts relevant to the functional task.

1.5 Emotional functioning

- 1.5.1 Assess emotional functioning in the context of cognitive difficulties in people after stroke. Any intervention chosen should take into consideration the type or complexity of the person's neuropsychological presentation and relevant personal history.
- 1.5.2 Support and educate people after stroke and their families and carers, in relation to emotional adjustment to stroke, recognising that psychological needs may change over time and in different settings.
- 1.5.3 When new or persisting emotional difficulties are identified at the person's 6-month or annual stroke reviews, refer them to appropriate services for detailed assessment and treatment.
- 1.5.4 Manage depression or anxiety in people after stroke who have no cognitive impairment in line with recommendations in [Depression in adults with a chronic physical health problem](#) (NICE clinical guideline 91) and [Generalised anxiety disorder](#) (NICE clinical guideline 113).

1.6 Vision

- 1.6.1 Screen people after stroke for visual difficulties.
- 1.6.2 Refer people with persisting double vision after stroke for formal orthoptic assessment.
- 1.6.3 Offer eye movement therapy to people who have persisting [hemianopia](#) after stroke and who are aware of the condition.
- 1.6.4 When advising people with visual problems after stroke about driving, consult the [Driver and Vehicle Licensing Agency](#) (DVLA) regulations.

1.7 Swallowing

- 1.7.1 Assess swallowing in people after stroke in line with recommendations in [Stroke](#) (NICE clinical guideline 68).
- 1.7.2 Offer swallowing therapy at least 3 times a week to people with [dysphagia](#) after stroke who are able to participate, for as long as they continue to make functional gains. Swallowing therapy could include compensatory strategies, exercises and postural advice.
- 1.7.3 Ensure that effective mouth care is given to people with difficulty swallowing after stroke, in order to decrease the risk of aspiration pneumonia.
- 1.7.4 Healthcare professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders should regularly monitor and reassess people with dysphagia after stroke who are having modified food and liquid until they are stable (this recommendation is from [Nutrition support in adults](#) [NICE clinical guideline 32]).
- 1.7.5 Provide nutrition support to people with dysphagia in line with recommendations in [Nutrition support in adults](#) (NICE clinical guideline 32) and [Stroke](#) (NICE clinical guideline 68).

1.8 Communication

- 1.8.1 Screen people after stroke for communication difficulties within 72 hours of onset of stroke symptoms.
- 1.8.2 Each stroke rehabilitation service should devise a standardised protocol for screening for communication difficulties in people after stroke.
- 1.8.3 Refer people with suspected communication difficulties after stroke to a speech and language therapist for detailed analysis of speech and language impairments and assessment of their impact.
- 1.8.4 Provide appropriate information, education and training to the multidisciplinary stroke team to enable them to support and communicate effectively with the person with communication difficulties and their family or carer.
- 1.8.5 Speech and language therapy for people with stroke should be led and supervised by a specialist speech and language therapist working collaboratively with other appropriately trained people – for example, speech and language therapy assistants, carers and friends, and members of the voluntary sector.
- 1.8.6 Provide opportunities for people with communication difficulties after stroke to have conversation and social enrichment with people who have the training, knowledge, skills and behaviours to support communication. This should be in addition to the opportunities provided by families, carers and friends.
- 1.8.7 Speech and language therapists should assess people with limited functional communication after stroke for their potential to benefit from using a communication aid or other technologies (for example, home-based computer therapies or smartphone applications).
- 1.8.8 Provide communication aids for those people after stroke who have the potential to benefit, and offer training in how to use them.

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- 1.8.9 Tell the person with communication difficulties after stroke about community-based communication and support groups (such as those provided by the voluntary sector) and encourage them to participate.
- 1.8.10 Speech and language therapists should:
- provide direct impairment-based therapy for communication impairments (for example, aphasia or dysarthria)
 - help the person with stroke to use and enhance their remaining language and communication abilities
 - teach other methods of communicating, such as gestures, writing and using communication props
 - coach people around the person with stroke (including family members, carers and health and social care staff) to develop supportive communication skills to maximise the person's communication potential
 - help the person with aphasia or dysarthria and their family or carer to adjust to a communication impairment
 - support the person with communication difficulties to rebuild their identity
 - support the person to access information that enables decision-making.
- 1.8.11 When persisting communication difficulties are identified at the person's 6-month or annual stroke reviews, refer them back to a speech and language therapist for detailed assessment, and offer treatment if there is potential for functional improvement.
- 1.8.12 Help and enable people with communication difficulties after stroke to communicate their everyday needs and wishes, and support them to understand and participate in both everyday and major life decisions.
- 1.8.13 Ensure that environmental barriers to communication are minimised for people after stroke. For example, make sure signage is clear and background noise is minimised.

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- 1.8.14 Make sure that all written information (including that relating to medical conditions and treatment) is adapted for people with aphasia after stroke. This should include, for example, appointment letters, rehabilitation timetables and menus.
- 1.8.15 Offer training in communication skills (such as slowing down, not interrupting, using communication props, gestures, drawing) to the conversation partners of people with aphasia after stroke.

1.9 Movement

- 1.9.1 Provide physiotherapy for people who have weakness in their trunk or upper or lower limb, sensory disturbance or balance difficulties after stroke that have an effect on function.
- 1.9.2 People with movement difficulties after stroke should be treated by physiotherapists who have the relevant skills and training in the diagnosis, assessment and management of movement in people with stroke.
- 1.9.3 Treatment for people with movement difficulties after stroke should continue until the person is able to maintain or progress function either independently or with assistance from others (for example, rehabilitation assistants, family members, carers or fitness instructors).

Strength training

- 1.9.4 Consider strength training for people with muscle weakness after stroke. This could include progressive strength building through increasing repetitions of body weight activities (for example, sit-to-stand repetitions), weights (for example, progressive resistance exercise), or resistance exercise on machines such as stationary cycles.

Fitness training

- 1.9.5 Encourage people to participate in physical activity after stroke.

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- 1.9.6 Assess people who are able to walk and are medically stable after their stroke for cardiorespiratory and resistance training appropriate to their individual goals.
- 1.9.7 Cardiorespiratory and resistance training for people with stroke should be started by a physiotherapist with the aim that the person continues the programme independently based on the physiotherapist's instructions (see recommendation 1.9.8).
- 1.9.8 For people with stroke who are continuing an exercise programme independently, physiotherapists should supply any necessary information about interventions and adaptations so that where the person is using an exercise provider, the provider can ensure their programme is safe and tailored to their needs and goals. This information may take the form of written instructions, telephone conversations or a joint visit with the provider and the person with stroke, depending on the needs and abilities of the exercise provider and the person with stroke.
- 1.9.9 Tell people who are participating in fitness activities after stroke about common potential problems, such as shoulder pain, and advise them to seek advice from their GP or therapist if these occur.

Hand and arm therapies – orthoses for the upper limb

- 1.9.10 Do not routinely offer wrist and hand splints to people with upper limb weakness after stroke.
- 1.9.11 Consider wrist and hand splints in people at risk after stroke (for example, people who have immobile hands due to weakness, and people with high tone), to:
- maintain joint range, soft tissue length and alignment
 - increase soft tissue length and passive range of movement
 - facilitate function (for example, a hand splint to assist grip or function)
 - aid care or hygiene (for example, by enabling access to the palm)

- increase comfort (for example, using a sheepskin palm protector to keep fingernails away from the palm of the hand).

1.9.12 Where wrist and hand splints are used in people after stroke, they should be assessed and fitted by appropriately trained healthcare professionals and a review plan should be established.

1.9.13 Teach the person with stroke and their family or carer how to put the splint on and take it off, care for the splint and monitor for signs of redness and skin breakdown. Provide a point of contact for the person if concerned.

Electrical stimulation: upper limb

1.9.14 Do not routinely offer people with stroke electrical stimulation for their hand and arm.

1.9.15 Consider a trial of electrical stimulation in people who have evidence of muscle contraction after stroke but cannot move their arm against resistance.

1.9.16 If a trial of treatment is considered appropriate, ensure that electrical stimulation therapy is guided by a qualified rehabilitation professional.

1.9.17 The aim of electrical stimulation should be to improve strength while practising functional tasks in the context of a comprehensive stroke rehabilitation programme.

1.9.18 Continue electrical stimulation if progress towards clear functional goals has been demonstrated (for example, maintaining range of movement, or improving grasp and release).

Constraint-induced movement therapy

1.9.19 Consider constraint-induced movement therapy for people with stroke who have movement of 20 degrees of wrist extension and 10 degrees of finger extension. Be aware of potential adverse events (such as falls, low mood and fatigue).

Shoulder pain

- 1.9.20 Provide information for people with stroke and their families and carers on how to prevent pain or trauma to the shoulder if they are at risk of developing shoulder pain (for example, if they have upper limb weakness and spasticity).
- 1.9.21 Manage shoulder pain after stroke using appropriate positioning and other treatments according to each person's need.
- 1.9.22 For guidance on managing neuropathic pain follow [Neuropathic pain](#) (NICE clinical guideline 96).

Repetitive task training

- 1.9.23 Offer people repetitive task training after stroke on a range of tasks for upper limb weakness (such as reaching, grasping, pointing, moving and manipulating objects in functional tasks) and lower limb weakness (such as sit-to-stand transfers, walking and using stairs).

Walking therapies: treadmill with or without body weight support

- 1.9.24 Offer walking training to people after stroke who are able to walk, with or without assistance, to help them build endurance and move more quickly.
- 1.9.25 Consider treadmill training, with or without body weight support, as one option of walking training for people after stroke who are able to walk with or without assistance.

Electromechanical gait training

- 1.9.26 Offer electromechanical gait training to people after stroke only in the context of a research study.

Ankle-foot orthoses

- 1.9.27 Consider ankle-foot orthoses for people who have difficulty with swing-phase foot clearance after stroke (for example, tripping and falling) and/or stance-

phase control (for example, knee and ankle collapse or knee hyper-extensions) that affects walking.

- 1.9.28 Assess the ability of the person with stroke to put on the ankle–foot orthosis or ensure they have the support needed to do so.
- 1.9.29 Assess the effectiveness of the ankle–foot orthosis for the person with stroke, in terms of comfort, speed and ease of walking.
- 1.9.30 Assessment for and treatment with ankle–foot orthoses should only be carried out as part of a stroke rehabilitation programme and performed by qualified professionals.

Electrical stimulation: lower limb

- 1.9.31 For guidance on functional electrical stimulation for the lower limb see Functional electrical stimulation for drop foot of central neurological origin (NICE interventional procedure guidance 278).

1.10 Self-care

- 1.10.1 Provide occupational therapy for people after stroke who are likely to benefit, to address difficulties with personal activities of daily living. Therapy may consist of restorative or compensatory strategies.
 - Restorative strategies may include:
 - encouraging people with neglect to attend to the neglected side
 - encouraging people with arm weakness to incorporate both arms
 - establishing a dressing routine for people with difficulties such as poor concentration, neglect or dyspraxia which make dressing problematic.
 - Compensatory strategies may include:
 - teaching people to dress one-handed

- teaching people to use devices such as bathing and dressing aids.

- 1.10.2 People who have difficulties in activities of daily living after stroke should have regular monitoring and treatment by occupational therapists with core skills and training in the analysis and management of activities of daily living. Treatment should continue until the person is stable or able to progress independently.
- 1.10.3 Assess people after stroke for their equipment needs and whether their family or carers need training to use the equipment. This assessment should be carried out by an appropriately qualified professional. Equipment may include hoists, chair raisers and small aids such as long-handled sponges.
- 1.10.4 Ensure that appropriate equipment is provided and available for use by people after stroke when they are transferred from hospital, whatever the setting (including care homes).

Return to work

- 1.10.5 Return-to-work issues should be identified as soon as possible after the person's stroke, reviewed regularly and managed actively. Active management should include:
- identifying the physical, cognitive, communication and psychological demands of the job (for example, multi-tasking by answering emails and telephone calls in a busy office)
 - identifying any impairments on work performance (for example, physical limitations, anxiety, fatigue preventing attendance for a full day at work, cognitive impairments preventing multi-tasking, and communication deficits)
 - tailoring an intervention (for example, teaching strategies to support multi-tasking or memory difficulties, teaching the use of voice-activated software for people with difficulty typing, and delivery of work simulations)
 - educating about the [Equality Act](#) 2010 and support available (for example, an access to work scheme)

- workplace visits and liaison with employers to establish reasonable accommodations, such as provision of equipment and graded return to work.

1.10.6 Manage return to work or long-term absence from work for people after stroke in line with recommendations in [Managing long-term sickness and incapacity for work](#) (NICE public health guidance 19).

1.11 Long-term health and social support

1.11.1 Inform people after stroke that they can self-refer, usually with the support of a GP or named contact, if they need further stroke rehabilitation services.

1.11.2 Provide information so that people after stroke are able to recognise the development of complications of stroke, including frequent falls, spasticity, shoulder pain and incontinence.

1.11.3 Encourage people to focus on life after stroke and help them to achieve their goals. This may include:

- facilitating their participation in community activities, such as shopping, civic engagement, sports and leisure pursuits, visiting their place of worship and stroke support groups
- supporting their social roles, for example, work, education, volunteering, leisure, family and sexual relationships
- providing information about transport and driving (including DVLA requirements; see www.dft.gov.uk/dvla/medical/aag).

1.11.4 Manage incontinence after stroke in line with recommendations in [Urinary incontinence in neurological disease](#) (NICE clinical guideline 148) and [Faecal incontinence](#) (NICE clinical guideline 49).

1.11.5 Review the health and social care needs of people after stroke and the needs of their carers at 6 months and annually thereafter. These reviews should cover participation and community roles to ensure that people's goals are addressed.

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- 1.11.6 For guidance on secondary prevention of stroke, follow recommendations in [Lipid modification](#) (NICE clinical guideline 67), [Hypertension](#) (NICE clinical guideline 127), [Type 2 diabetes](#) (NICE clinical guideline 87) and [Atrial fibrillation](#) (NICE clinical guideline 36).
- 1.11.7 Provide advice on prescribed medications in line with recommendations in [Medicines adherence](#) (NICE clinical guideline 76).

^[6] Intensity of therapy for dysphagia, provided as part of speech and language therapy, is addressed in [recommendation 1.7.2](#).

^[7] For recommendations on continuity of care and relationships see section 1.4 and for recommendations on enabling patients to actively participate in their care see section 1.5.

2 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future.

2.1 Upper limb electrical stimulation

What is the clinical and cost effectiveness of electrical stimulation (ES) as an adjunct to rehabilitation to improve hand and arm function in people after stroke, from early rehabilitation through to use in the community?

Why this is important

After stroke an estimated 30–70% of people have reduced or no use of one arm and hand. ES has long been thought to be a possible useful adjunct to rehabilitation to improve arm and hand function. ES is believed to enhance the training effect of active, task-specific and strengthening rehabilitation programmes. However, the evidence to date does not inform clinicians or people with stroke whether ES will be an effective addition to rehabilitation for them. A linked-series of studies are needed to:

1. Identify the dose, practice parameters and rehabilitation programme content needed to effect change in hand and arm function with ES.
2. Characterise the clinical profiles of people who will benefit from ES in early, middle and late stages of the stroke pathway.

The primary outcome measure should be the person's assessment of improvement in function. Secondary outcomes should include measures of impairment, function and quality of life and these should reflect people with low-, middle- and high-functioning upper limbs.

2.2 Intensive rehabilitation after stroke

In people after stroke what is the clinical and cost effectiveness of intensive rehabilitation (6 hours per day) versus moderate rehabilitation (2 hours per day) on activity, participation and quality of life outcomes?

Why this is important

Rehabilitation aims to maximise activity and participation and minimise distress for people with stroke and their families and carers. The physical and mental capacity to participate in rehabilitation possessed by people with stroke varies widely. Some people who are unwell may not be able to participate at all, whereas others may be able to tolerate 6 hours of therapy a day. The potential long-term cost benefits of even small changes in function may be significant.

Evidence suggests that increasing rehabilitation intensity early after stroke results in improved outcomes, but the evidence for this is not robust. Previous studies comparing different levels of intensity have used rehabilitation inputs that are lower than the current levels recommended by the NICE stroke quality standard.

If it were shown that increasing the intensity of rehabilitation in people who are able to participate results in functional and cost benefits, stroke rehabilitation services and funding tariffs should be reviewed.

2.3 Neuropsychological therapies

Which cognitive and which emotional interventions provide better outcomes for identified subgroups of people with stroke and their families and carers at different stages of the stroke pathway?

Why this is important

There are many well-established studies showing that mood disorders such as depression and anxiety occur frequently after stroke and may occur at any point along the rehabilitation pathway, causing distress to people with stroke and their families and carers and adversely affecting outcomes.

Cognitive and communication impairments interact with mood and often compound difficulties by compromising people's abilities to participate in standard evidence-based psychological therapies. The need for psychological input for people with stroke is well recognised (for example, by the 'National service framework for long-term neurological conditions'). However, the literature does not provide robust evidence about which psychological interventions will be most effective for different subgroups of people.

2.4 *Shoulder pain*

Which people with a weak arm after stroke are at risk of developing shoulder pain? What management strategies are effective in the prevention or management of shoulder pain of different aetiologies?

Why this is important

Shoulder pain after stroke is a common problem, with some prevalence estimates as high as 84%. Onset has been reported to occur from 2 weeks to several months after the stroke.

Most experts agree that prevention of shoulder pain after stroke is an important goal and should be prioritised as an aim of rehabilitation from the first day after a stroke. However, the means of preventing hemiplegic shoulder pain (HSP) is not universally agreed. This may be due, in part, to the large array of identified causes of HSP.

Because of this, there is little agreement on which treatment is best. Treatments include positioning, upper limb support (including slings and orthotics), strapping of the shoulder, range-of-motion exercises, ultrasound, oral non-steroidal anti-inflammatory medications, electrical stimulation for muscle contraction, electrical stimulation for pain relief (TENS), surgery, intra-articular steroid injection, and intramuscular botulinum toxin injections.

3 Other information

3.1 Scope and how this guideline was developed

NICE guidelines are developed in accordance with a [scope](#) that defines what the guideline will and will not cover.

How this guideline was developed

NICE commissioned the National Clinical Guideline Centre to develop this guideline. The Centre established a Guideline Development Group (see [section 4](#)), which reviewed the evidence and developed the recommendations.

The methods and processes for developing NICE clinical guidelines are described in [The guidelines manual](#).

3.2 Related NICE guidance

Further information is available on the [NICE website](#).

Published

General

- [Patient experience in adult NHS services](#). NICE clinical guidance 138 (2012).
- [Medicines adherence](#). NICE clinical guidance 76 (2011).

Condition-specific

- [Falls](#). NICE clinical guideline 161 (2013).
- [Urinary incontinence in neurological disease](#). NICE clinical guideline 148 (2012).
- [Hypertension](#). NICE clinical guideline 127 (2011).
- [Generalised anxiety disorder](#). NICE clinical guideline 113 (2011).
- [Neuropathic pain](#). NICE clinical guideline 96 (2010).

- [Depression in adults](#). NICE clinical guideline 90 (2009).
- [Depression with a chronic physical health problem](#). NICE clinical guideline 91 (2009).
- [Management of long-term sickness and incapacity for work](#). NICE public health guidance 19 (2009).
- [Stroke](#). NICE clinical guideline 68 (2008).
- [Lipid modification](#). NICE clinical guideline 67 (2008).
- [Type 2 diabetes](#). NICE clinical guideline 87 (2009).
- [Faecal incontinence](#). NICE clinical guideline 49 (2007).
- [Atrial fibrillation](#). NICE clinical guideline 36 (2006).
- [Nutrition support in adults](#). NICE clinical guideline 32 (2006).

Under development

NICE is developing the following guidance (details available from [the NICE website](#)):

- Neuropathic pain (update). NICE clinical guideline (publication expected October 2013)
- Lipid modification (update) NICE clinical guideline (publication date to be confirmed)
- Type 2 diabetes (update). NICE clinical guideline (publication date to be confirmed)
- Oral health – in nursing and residential care. NICE public health guidance (publication date to be confirmed)
- Workplace health – employees with chronic diseases and long-term conditions. NICE public health guidance (publication date to be confirmed)

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About this guideline

NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

NICE guidelines are developed in accordance with a [scope](#) that defines what the guideline will and will not cover.

This guideline was developed by the National Clinical Guideline Centre, which is based at the Royal College of Physicians. The Centre worked with a Guideline Development Group, comprising healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, which reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

The methods and processes for developing NICE clinical guidelines are described in [The guidelines manual](#).

Strength of recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the Guideline Development Group is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

For all recommendations, NICE expects that there is discussion with the service user about the risks and benefits of the interventions, and their values and preferences. This discussion aims to help them to reach a fully informed decision (see also [Person-centred care](#)).

Interventions that must (or must not) be used

We usually use 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally we use 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions that should (or should not) be used – a 'strong' recommendation

We use 'offer' (and similar words such as 'refer' or 'advise') when we are confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. We use similar forms of words (for example, 'Do not offer...') when we are confident that an intervention will not be of benefit for most patients.

Interventions that could be used

We use 'consider' when we are confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Other versions of this guideline

The [full guideline](#), 'Stroke rehabilitation: Long-term rehabilitation after stroke' contains details of the methods and evidence used to develop the guideline. It is published by the National Clinical Guideline Centre.

The recommendations from this guideline have been incorporated into a [NICE Pathway](#).

We have produced [information for the public](#) about this guideline.

Implementation

[Implementation tools and resources](#) to help you put the guideline into practice are also available.

Your responsibility

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of

the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summaries of product characteristics of any drugs.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

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