

***BASP***

***British Association of Stroke Physicians***

**STROKE SERVICE STANDARDS**

**CLINICAL STANDARDS COMMITTEE**

**April 2010**

Dr Tim Cassidy, Chairman

Dr Christine Roffe

Dr Sarah Keir

Dr Geoff Cloud

Dr David Collas

Dr Michael Power

Professor Pradeep Khanna

## **BASP STROKE SERVICE STANDARDS**

*“You cannot treat a hole in the brain” John Hughlings Jackson (1835 –1911)*

Over one hundred years ago, the father of British Neurology held a pessimistic view about the management of patients with a stroke. Such a view cannot be allowed to prevail now.

1993 saw the publication of Peter Langhorne’s paper showing that organised stroke care saves lives and reduces morbidity [1,2], and the last 15 years have seen significant advances in many aspects of the management of stroke. The key drivers of these changes have been the development of organised stroke care, stroke thrombolysis and national comparative audits. The first successful trial of thrombolysis was published in 1995, and systematic review showed that treatment with alteplase given intravenously within three hours of symptom onset was effective in the reduction of disability and handicap in ischaemic stroke [3]. Further studies have shown that the time window for effective treatment is greater than this [4].

The National Sentinel Stroke Audit set up over ten years ago has helped raise the standards of stroke care across England, Wales and Northern Ireland, in much the same way as national audit in Scotland. Units are now able to rate themselves against colleagues elsewhere in the country and have used the results to develop and invest in local stroke services.

The English National Stroke Strategy [5], together with guidance from the National Institute for Health and Clinical Excellence [NICE; 6], the Scottish Intercollegiate Guidelines Network [SIGN; 7-9] and the Royal College of Physicians of London [10] have recommended what services should be provided. The Clinical Standards Committee of the British Association of Stroke Physicians collated this guidance to describe in detail what needs to be in place to provide a service that achieves clinical excellence in the treatment of stroke.

## 1. Pre-admission and Emergency Care Standards

	Standard	Description
1.1	<b>The Ambulance Paramedic service links with the receiving Emergency Department/ Stroke Service when they have a suspected stroke patient</b>	Alert the Stroke team and Emergency Department (ED) to potential admission through the use of a predictive instrument such as FAST test. Immediate assessment by acute stroke service on arrival, allowing timely expert triage of acute stroke patients and the potential for thrombolysis.
1.2	<b>The Emergency Department has a process in place for the triage and initial assessment of patients with an acute neurological presentation</b>	Early identification of the acute stroke patient allows prompt referral to the stroke team and identification of potential thrombolysis cases.  A validated screening instrument to be used in assessment of patients with suspected acute stroke (such as ROSIER).
1.3	<b>The Hyperacute Stroke Service provides rapid assessment of patients in the Emergency Department</b>	Identification of potential thrombolysis cases and other intracranial emergencies, with direct admission of all stroke patients to the Acute Stroke Unit from the ED or from home.
1.4	<b>The Hyperacute Stroke Service has an established thrombolysis pathway. Time from hospital arrival to treatment is within 30 minutes of arrival during office hours and no more than 60 minutes outside office hours</b>	Pathway to be in operation 24/7. Evidence of protocols to underpin and support pathway. The earlier that thrombolytic treatment is delivered the better the outcome, particularly if delivered within 90 minutes of symptom onset.  Stroke specialist input to thrombolysis decision making and other aspects of hyperacute assessment and treatment is required.

1.5	<b>The Hyperacute Stroke Service has agreed protocols for neurosurgical/neuroradiological referral for management of stroke emergencies: malignant middle cerebral artery infarction, intracranial haemorrhage, intra-arterial thrombolysis and clot retrieval</b>	Although rare, the need for neurosurgical or neuroradiological intervention in such stroke emergencies needs to be clarified in advance through agreement with local/regional providers of neuroscience services, to avoid ambiguity and inconsistencies in the management of individual emergency cases.
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## 2. Neuroradiology Service Standards

	Standard	Description
2.1	<b>The Acute Stroke Service has 24/7 access to CT imaging, with appropriate prioritisation for patients with suspected acute stroke</b>	<p>All suspected stroke patients to have immediate brain imaging. Audit standard of 50% of all stroke patients to have imaging within one hour of admission.</p> <p>Immediate CT scanning is the most cost effective policy [11], allowing rapid initiation of appropriate treatment. Early identification of stroke pathology allows early intervention such as thrombolysis in acute ischaemic stroke or reversal of anticoagulation in warfarin-induced intracerebral haemorrhage.</p>
2.2	<b>All patients with acute stroke have access to urgent Carotid Imaging (usually duplex ultrasound but MRA or CTA according to local protocol)</b>	Carotid imaging should be carried out within 24 hours in patients with TIA or non-disabling stroke. Information from carotid imaging allows the clinician to review the aetiology of an ischaemic stroke and plan further investigations if appropriate. Symptomatic severe internal carotid artery (ICA) stenosis carries a high risk of early recurrence and early surgery (within 2 weeks) yields the greatest benefit in those patients who are neurologically stable.

2.3	<b>The Acute Stroke Service has access to MRI and MR angiography for further investigation of stroke patients. MR investigations to be done as soon as possible within 24 hours of request (CTA to be available for when MR contraindicated)</b>	MRI/MR angiography will be useful where the radiological diagnosis is unclear or uncertain, and to confirm the presence of symptomatic tight ICA disease prior to surgery and to assess the state of the intracranial circulation.
2.4	<b>the Acute Stroke Service holds regular meetings between stroke physicians and expert radiologists/ neuroradiologists</b>	Allows the stroke physician to review brain imaging with an expert radiologist and interpret appearances with clinical information, and to discuss the most appropriate secondary or follow up imaging. Also providing an educational forum for all staff.  Access to specialist neuroradiology opinion should be available if needed.

### 3. Hyperacute/Acute Stroke Standards

	Standard	Description
3.1	<b>All patients with suspected acute stroke are admitted directly to an Acute Stroke Unit under the care of a stroke specialist multidisciplinary team (MDT)</b>	All stroke patients benefit from immediate admission to a Stroke Unit. The target is > 90% of patients with stroke to be admitted directly to the Stroke Unit from the ED or home, and to spend 90% of their length of stay in specialist stroke bed.  Patients to be admitted to the Stroke Unit within 4 hours of hospital arrival.  The Stroke Unit MDT holds at least weekly structured meetings to discuss progress and plan goals for acute stroke patients as well as timely and appropriate transfers of care.

3.2	<b>The Acute Stroke Unit provides facilities for continuous physiological monitoring during acute illness</b>	Regular (at least 4 hourly) monitoring of physiological parameters and neurological status with a protocol for managing abnormal findings. Continuous monitoring available for unstable patients. Length of time to be determined by clinical status of patient.
3.3	<b>The Acute Stroke Unit has a daily senior medical ward round (Consultant or Specialist Registrar) for diagnosis, assessment and management of patients with suspected acute stroke</b>	Acute stroke patients require daily assessment and review by the stroke medical team. Senior Medical Ward rounds should be conducted every day including weekends.
3.4	<b>The Acute Stroke Unit provides sufficient trained nursing staff to provide high quality nursing care</b>	In the first 72 hours of an acute stroke patient's admission, they will require more intensive monitoring and nursing input, requiring Level 2 nursing staff numbers to manage the acute stroke patient (2.9 WTE nurses per bed; 80:20% trained to untrained staffing ratio) is recommended. Thereafter a level of 1.2 WTE nurses per bed is appropriate.
3.5	<b>All patients admitted with suspected acute stroke have a swallow screening assessment performed on admission by appropriately trained and competent staff</b>	Screening to be performed within 4 hours of admission and before any food, fluids or medication are administered. Further full assessment at 24 hours where dysphagia is confirmed or in uncertain cases. An algorithm to be followed for patients with swallowing problems is recommended [8].
3.6	<b>All stroke patients should have a nutritional screening assessment performed within 24 hours of admission</b>	Swallowing problems are common after stroke. Stroke patients who are nil by mouth, on a modified-texture diet, or are identified as being at nutritional risk, are referred to and seen by a dietician for an individualised nutritional assessment and management plan and reviewed weekly.

3.7	<b>All conscious patients admitted with suspected acute stroke are mobilised out of bed on the day of admission</b>	Acute stroke units should have policies and staffing levels for very early mobilisation out of bed on admission unless contraindicated (reduced consciousness, unstable blood pressure or other unstable clinical state)[7].
3.8	<b>The Acute Stroke Unit has a protocol for the promotion of bladder and bowel continence including a policy to avoid urinary catheters</b>	Urinary catheters should be avoided except under specific circumstances (e.g. urinary retention). The use of a urinary catheter requires clear justification and documented management plans. Stroke unit staff should be trained in continence promotion and bladder scanning.
3.9	<b>All stroke patients with any new neurological impairment at 24 hours receive a full multidisciplinary assessment within the next working day</b>	Allows comprehensive and early assessment of a patient's problems and facilitates early intervention by the therapy team.
3.10	<b>All appropriate patients receive a minimum of 45 minutes of physiotherapy per day</b>	Provision of 1 WTE physiotherapist per 5 beds [12]. Able to deliver a service 7 days a week.
3.11	<b>All appropriate patients receive a minimum of 45 minutes of occupational therapy per day</b>	Provision of 1 WTE occupational therapist per 5 beds [12]. Able to deliver a service 7 days a week.
3.12	<b>All appropriate patients receive a minimum of 45 minutes of Speech and Language Therapy per day</b>	Provision of 1 WTE Speech and Language Therapist (SALT) / 10 beds [10]. Able to deliver a service 7 days a week.
3.13	<b>The Acute Stroke Unit has regular support from a pharmacist</b>	Regular input for Acute Stroke Unit; reviewing drug interactions and helping improve patient concordance on discharge.

3.14	<b>All patients with acute stroke have access to specialist Clinical Psychology input and emotional support</b>	Provide for expert assessment of stroke patient's mood, cognition and adjustment issues as well as offering support for their families and guidance to the MDT.
3.15	<b>The Acute Stroke Unit has support available from a Nutrition Team/dietician for the management of patients with dysphagia and/or malnutrition</b>	Nutritional assessments on admission (using a validated tool e.g. MUST tool) and weekly during patient's stay. Nutritional advice and tube-feeding interventions are readily available. Decisions about insertion of PEG tube should only be made following appropriate MDT discussion.
3.16	<b>The Acute Stroke Unit has a protocol in place for urgent vascular surgical referral</b>	Aim is early surgery (as soon as possible on a planned surgical list, but no later than 2 weeks post stroke symptoms) for patients with non-disabling stroke/TIA and severe ipsilateral ICA stenosis. Patients should be neurologically stable prior to surgery. Stroke Physician review post surgery – to identify any operative problems, supervise medical secondary prevention and provide gold standard for audit purposes.
3.17	<b>Acute stroke management is based upon protocols for the prevention and treatment of common complications</b>	Stroke units to have protocols / guidelines for prevention and treatment of common complications after stroke and secondary stroke prevention. These should be evidence based where possible, with regular audit to assess implementation and updated regularly.



#### 4. Stroke Rehabilitation Standards

	Standard	Description
4.1	<b>All patients with stroke have access to a designated Stroke Rehabilitation Unit</b>	The Stroke Rehabilitation Unit occupies a defined geographical area with suitable facilities, with clinical practice showing evidence of MDT working (structured team meetings at least weekly, regular programmes of stroke education tailored to the needs of staff and patients, multidisciplinary notes, involvement of family and carers in treatment programmes).
4.2	<b>All medically stable patients with stroke are transferred from the Acute Stroke Unit without delay</b>	Protocols are in place to ensure the smooth transfer of patients from the acute unit to stroke rehabilitation unit. Where this involves units at differing sites, repatriation should occur directly between the units without delay as soon as medically stable.
4.3	<b>The Rehabilitation Unit has regular Stroke Physician input into the review and medical management of patients</b>	The rehabilitation unit may be clinically-led by a senior non-medical clinician (usually at consultant nurse or therapist grade). At least twice weekly consultant-led ward rounds include senior medical input.
4.4	<b>All appropriate patients receive a minimum of 45 minutes of physiotherapy per day</b>	Provision of 1 WTE physiotherapist per 5 beds [12]. Able to deliver a service 7 days a week.
4.5	<b>All appropriate patients receive a minimum of 45 minutes of occupational therapy per day</b>	Provision of 1 WTE occupational therapist per 5 beds [12]. Able to deliver a service 7 days a week.
4.6	<b>All appropriate patients receive a minimum of 45 minutes of Speech and Language Therapy per day</b>	Provision of 1 WTE SALT / 10 beds [10]. Able to deliver a service 7 days a week.

4.7	<b>All patients undergoing stroke rehabilitation have access to specialist Clinical Psychology input</b>	Cognitive and emotional problems are common in stroke patients, and screening for these problems should occur at entry to rehabilitation or the soonest appropriate point thereafter. Carers of stroke patients suffer from emotional problems both during the rehabilitation process and following discharge. The ability to support both patient and their family becomes increasingly important during their stroke journey. Psychological support can be a mixture of self help groups and formal psychologist assessment and treatment.
4.8	<b>Staff on the Stroke Rehabilitation Unit are trained in the promotion of urinary and bowel continence</b>	The promotion of continence is a key aspect of rehabilitation. Stroke units should have a range of resources and policies to promote continence and staff should be skilled in their use.
4.9	<b>Stroke patients with an abnormal swallow who are on a modified-texture diet should have weekly nutritional assessments by a dietician with an interest in stroke</b>	To ensure that stroke patients have adequate nutrition and ensure that their rehabilitation is not compromised by undernutrition.
4.10	<b>All patients have access to specialised neuro-rehabilitation services</b>	Arrangements in place for access to specialised neurorehabilitation services e.g. spasticity, orthotics, continence, driving, wheelchairs, vocational rehabilitation, sex after stroke. These services can be either provided locally or through the Regional neuro-rehabilitation service.
4.11	<b>The Stroke Rehabilitation Unit actively involves families and carers in day to day care and rehabilitation</b>	Evidence of the active involvement of patients and families in goal planning. This will help communication, goal setting and prepare patients and family for discharge home.

4.12	<b>No patient with stroke is discharged to permanent institutional care without a comprehensive assessment of their potential for rehabilitation</b>	All patients with stroke should be assessed by a specialist MDT to maximise their opportunity to respond to rehabilitation and avoid institutionalisation. Discharge to institutional placement should be reserved for those patients objectively assessed as failing to respond to a tailored programme of stroke rehabilitation (through for example, a failure to identify or achieve any rehabilitation goals) over an appropriate period of time. Early selection of patients for institutionalisation without a trial of rehabilitation should be reserved for exceptional circumstances e.g. where the prognosis from other co-morbidities does not allow time for a trial of rehabilitation.
4.13	<b>All eligible patients have access to an Early Supported Discharge (ESD) scheme</b>	ESD schemes vary in their capability to take patients at differing levels of disability from mild-moderate to severe, with varying impact on length of stay. Regardless of the level of support available, an ESD should be available to all eligible patients.
4.14	<b>All patients discharged from hospital with a feeding tube receive regular follow up</b>	Specialist follow up (specialist nurse / nutrition team) will assess swallowing and nutritional status, and review the need for long-term feeding tubes.
4.15	<b>The Stroke Rehabilitation Service has established links with the voluntary sector</b>	Formal links with patient and carer organisations e.g. local users forum, Stroke Association group, community stroke clubs.
4.16	<b>The Stroke Rehabilitation Service has processes in place for the training and education of carers</b>	Enable better patient care in the community and reduce carer stress. Carers should have a named contact for information provision.
4.17	<b>The Stroke Rehabilitation Service provides comprehensive secondary prevention advice and treatment</b>	Medical secondary prevention to be commenced prior to discharge from hospital. Comprehensive secondary prevention guidelines to be available to primary care clinicians. Lifestyle modifications to be discussed with the patient, supported by accessible written material.

4.18	<b>The Stroke Rehabilitation Service provides comprehensive information to community services and primary care</b>	In agreement with the community health care team, including transfer of care documentation and follow up information, and information regarding secondary prevention.
4.19	<b>All patients have follow up by a community rehabilitation team after discharge</b>	All patients should have access to specialist community rehabilitation after discharge either from an in-patient stay or from an ESD scheme. This access should be available lifelong, with the ability to reaccess community rehabilitation at any time following stroke.
4.20	<b>All patients receive follow-up six months after hospital (or ESD scheme) discharge</b>	Clear protocols for follow up assessment at end of initial rehabilitation should be in place and 6 month assessments by stroke MDT for those with persisting disability. Review process in place to identify late problems in stroke patients and those who may benefit from late rehabilitation input with sign-posting for appropriate referral e.g. directory of services.
4.21	<b>All patients receive advice regarding a return to driving</b>	Written and verbal information should be available advising on DVLA regulations. Services in place to enable eligible patients to be offered assessment / rehabilitation to enable them to return to driving.
4.22	<b>All eligible patients receive appropriate support and treatment to enable a return to work</b>	Services in place to enable vocational training and retraining. Links with social / voluntary organisations specialising in enabling return to work.

## 5. Neurovascular Service Standards

	Standard	Description
5.1	<b>All patients with a suspected non-disabling stroke or TIA have urgent access to a comprehensive Neurovascular Service</b>	The Neurovascular Service should meet the standards set out by NICE [6] and the National Clinical Guidelines for Stroke [10]. High risk TIA patients (ABCD2 score= >4, those in atrial fibrillation, taking anticoagulant medication or those with recurrent episodes) and those with non-disabling stroke should be assessed and diagnosed within 24 hours of symptoms. Low risk TIA patients should be assessed within one week. Patients should be assessed by a Stroke Physician or other medical specialist trained in the assessment of stroke/TIA.
5.2	<b>The Neurovascular Service has access to the full range of diagnostic facilities</b>	Access to all necessary investigations within the time interval determined by the level of risk i.e. all relevant diagnostic tests to be accessible within 24 hours for high-risk TIA and non-disabling stroke, within one week for low-risk TIA.
5.3	<b>The Neurovascular Service has access to carotid imaging with appropriate urgency</b>	A same day carotid imaging service should be available. Essential to identify those patients with symptomatic severe ICA disease who have a high risk of stroke and benefit most from early surgical intervention.
5.4	<b>The Neurovascular Service has access to MRI scanning including MR angiography with appropriate urgency</b>	A same day service to identify arterial territory where not clear from clinical assessment or where the diagnosis is unclear [6]. MR angiography may be required to provide confirmatory evidence of degree of stenosis post carotid Doppler.
5.5	<b>The Neurovascular Service has access to CT scanning including CT angiography with appropriate urgency</b>	A same day service where appropriate. Non-contrast CT and CT angiography to be used when MR imaging is contraindicated, or not tolerated.

5.6	<b>The Neurovascular Service provides comprehensive and prompt secondary prevention advice and treatment</b>	Medical secondary prevention to be commenced without delay. Comprehensive secondary prevention guidelines to be available to primary care clinicians. Lifestyle modifications to be discussed with the patient, supported by accessible written material.
5.7	<b>The vascular surgeons are integrated within the Neurovascular Service</b>	Surgical candidates to be assessed by the next working day, with surgery on a scheduled surgical list as soon as possible within 14 days of symptom onset [6]. Stroke Physician review post surgery – to identify any operative problems, supervise medical secondary prevention and provide gold standard for audit purposes.
5.8	<b>The Neurovascular Service holds regular multidisciplinary neurovascular meetings</b>	Regular minuted meetings held between stroke physicians, vascular surgeons, vascular technologists and radiologists to monitor service performance, discuss clinical cases and provide feedback and education.
5.9	<b>The Neurovascular Service participates in regular audit</b>	Participation in local and National Audits of clinical practice e.g. RCP carotid endarterectomy audit, National Vascular Database.

## 6. Managerial and Audit Standards

	Standard	Description
6.1	<b>The Stroke Service has a Clinical Lead for Stroke</b>	A specific clinical lead for stroke will demonstrate that a Hospital/Trust recognises the importance of stroke in its portfolio. The Clinical Lead will represent the Hospital/Trust within the local Cardiac and Stroke Network/Managed Care Network.

6.2	<b>The Stroke Service has an implementation plan for the relevant National Stroke Strategy</b>	Regular minuted meetings, with action points documented. Senior manager / Business manager to take responsibility for attending and helping implement strategy. Representatives from Primary care, ambulance services, the voluntary sector and patients and carers to be included in these meetings.
6.3	<b>The Stroke Service participates in National Stroke Audit</b>	Evidence of participation in national comparative audit (e.g. RCP National Sentinel Audit, Scottish Stroke Care Audit, SITS-MOST, SINAP) and action planning following publication of results.
6.4	<b>The Stroke Service holds regular clinical governance meetings</b>	Evidence of the review of pathways and protocols, critical incidents and patient and carer feedback. Regular review of thrombolysis decisions and outcomes (including those not treated). Morbidity and mortality reviews to be part of clinical governance meetings.
6.5	<b>The Stroke Service participates in local audit</b>	Completed quarterly by medical, nursing or therapy staff examining an aspect of clinical practice on the ward. At least one audit annually from each of the above three groups, presented at a multidisciplinary clinical governance meeting.
6.6	<b>The Stroke Service maintains an in-patient stroke register</b>	All hospital admissions with stroke are captured, to ensure the accuracy of hospital episode statistics.
6.7	<b>The Stroke Service participates in Clinical Research</b>	Active involvement in stroke research networks, with Good Clinical Practice (GCP) training for research-active clinicians.
6.8	<b>The Stroke Service provides a programme of education and training for all staff</b>	Evidence that all staff (qualified and unqualified) have a portfolio of evidence of educational activities relevant to the stroke-specific competencies required for their clinical practice.

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