

The recognition and emergency management of suspected stroke and transient ischaemic attack

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ABSTRACT – In April 2006, the National Pre-hospital Guidelines Group produced suspected stroke and transient ischaemic attack guidelines¹ to complement the *National clinical guidelines for stroke*.² These concise guidelines contain recommendations from the group and the Intercollegiate Working Party for Stroke. This article serves as an introduction to the guidelines for healthcare staff working in emergency care.

KEY WORDS: management, medical emergency, recognition, stroke, transient ischaemic attack

Background

Stroke outcomes can be improved by timely care, it is therefore vitally important that front line staff (from emergency medical services, NHS Direct and accident and emergency (A&E)) are able to recognise the symptoms of suspected stroke and initiate a rapid response. People with suspected stroke should be taken immediately to hospital. Early presentation provides greater opportunity for time-dependent stroke treatment, such as thrombolysis.³ Patients will subsequently have more immediate access to organised stroke care, which is known to have a positive impact on survival and dependency.⁴ Furthermore, early neurological monitoring and care is related to better functional outcome and shorter hospitalisation.⁵

Acute stroke should be treated as a time-dependent medical emergency that requires priority emergency medical service transportation to a hospital with a stroke unit. Guidelines for diagnosis and treatment are therefore important and should be widely disseminated. A guideline supplement has now also been published.⁶

The guideline development process

The guidelines were developed in accordance with the principles laid down by the Appraisal of Guidelines Research and Evaluation Collaboration.

*For membership of the National Pre-hospital Guidelines Group, please see the end of the paper.

Scope and purpose

Overall objective of the guidelines

The overall objective was to provide explicit recommendations for practising clinicians, managers, patients and carers about the recognition and emergency management of suspected stroke and transient ischaemic attack (TIA), from the onset of symptoms to acute intervention in A&E departments.

Clinical areas covered

These guidelines cover the recognition and emergency management of suspected stroke and TIA. This does not include the management of subarachnoid haemorrhage, and there is a separate guideline for the management of stroke in childhood.⁷ Thrombolysis and longer-term management issues are covered in the *National clinical guidelines for stroke*.²

Stakeholder involvement

The guidelines were developed by the National Pre-hospital Guidelines Group (for members of the group, see end of paper). Members were nominated by professional organisations and societies to give wide representation from all disciplines, including the views of patients and their families. The guidelines were developed through consensus meetings of the National Pre-hospital Guidelines Group and feedback from the Intercollegiate Working Party for Stroke (IWPS). Guideline development was funded by Cumbria and Lancashire Strategic Health Authority (now part of NHS North West). Members of the guideline development group were asked to declare any relevant conflicts.

Searching the scientific literature

The guidelines were based on research evidence when available. A research fellow (SJ) and research assistant (MJ) conducted formal searches of the literature around stroke and TIA in relation to public awareness, delays, diagnosis, blood pressure, blood glucose, positioning, oxygen therapy and body

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temperature (details available from the author). The searches included the period from 1966 to 2005. Electronic databases, Medline, AMED, CINAHL, EMBASE, Zetoc and the Cochrane Collaboration were systematically searched. Other national guidelines were also searched, including the *National clinical guidelines for stroke*.²

Evidence and lack of evidence

There is currently a lack of high quality evidence regarding the recognition and emergency management of stroke in the pre-hospital setting. Due to the lack of research in some areas guidelines have been developed based on consensus opinion (Level D). This does not mean that the area of recognition and management is any less important than those areas where the guidelines are based on empirical research.

Assessing the quality of research and writing the guidelines

A simplified version of the Scottish Intercollegiate Guidelines Network appraisal checklists were used by members of the Rapid Emergency Stroke Pathways: Organised Systems and Education (RESPONSE) Working Group to assess the quality of published articles. All articles were reviewed by two raters to check for consistency.

Levels of evidence

Where evidence existed from meta-analyses or randomised controlled trials (RCTs) this was used (Level A). Where there was limited or no evidence from RCTs, then evidence from observational group studies or small group studies was used (Level B). Evidence from single case studies was not used. We did not use expert committee reports or opinions (Level C). Where no experimental data were available, recommended good practice based on the clinical experience of the guideline development group was used (Level D). The quality and strength of evidence supporting each guideline uses the same format that is used in the *National clinical guidelines for stroke*.²

Patient and carer views and preferences

Relevant quotations from interviews conducted with patients, carers and the general public provided views and experiences about stroke services, and were used to inform the guidelines. A report from the IWPS,⁸ the *Picker Survey*,⁹ as well as representation from the London Ambulance Patient and Public Involvement Forum provided additional patient and carer views.

Updating the guidelines

The IWPS, coordinated by the Clinical Effectiveness and Evaluation Unit at the Royal College of Physicians, will review future evidence. It is envisaged that the guidelines will be

updated and amendments incorporated in the third edition of the *National clinical guidelines for stroke* to be published in 2008.

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Competing interests

Dr Rudd has given lectures paid for by Gen Re Insurance, Boehringer Ingelheim and Sanofi-Aventis. Professor Ford received honoraria for lectures and/or consultancy from Astra Zeneca, Boehringer Ingelheim, Pfizer and Sanofi Aventis.

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Concise guideline recommendations	Grade
1 Recognition and emergency management of suspected stroke and TIA	
<p>Treating stroke and TIA as a medical emergency will save lives and prevent long-term disability. While much of the responsibility for initial pre-hospital care falls to the ambulance service and primary care, these guidelines are also relevant to NHS Direct, A&E staff and acute medical services. These guidelines apply to the care of all patients with suspected stroke or TIA, irrespective of whether it is a first or recurrent event. This concise guide contains recommendations from the Pre-Hospital Stroke Guidelines Group and the IWPS. Longer-term management issues are covered by the <i>National clinical guidelines for stroke</i>.²</p>	
2 Recognition of stroke/TIA symptoms	
<ul style="list-style-type: none"> • Every opportunity should be taken to raise awareness of stroke symptoms, particularly in high-risk groups, eg people with hypertension, atrial fibrillation, previous vascular events, and diabetes¹⁰ 	B
<ul style="list-style-type: none"> • For suspected stroke call an emergency ambulance¹¹ 	B
<ul style="list-style-type: none"> • Stroke classically presents with the sudden onset of neurological loss eg one or more of limb weakness, difficulty speaking or understanding speech, loss of vision, clumsiness or numbness of arms or legs. For suspected stroke, use the FAST test:¹² <ul style="list-style-type: none"> – Facial movements: Ask the patient to smile or show teeth. Look for new lack of symmetry. – Arm movements: Ask the patient to lift their arms together and hold. Does one arm drift or fall down? – Speech: If the patient attempts a conversation. Look for new disturbance of speech. – Test all three. If one or more abnormal, suspect stroke. 	B
3 Pre-hospital management of stroke	
<ul style="list-style-type: none"> • Assess Airway, Breathing, Circulation, and Disability 	D
<ul style="list-style-type: none"> • If conscious sit up 	D
<ul style="list-style-type: none"> • Patients should be kept nil by mouth 	D
<ul style="list-style-type: none"> • An informant should be encouraged to accompany the patient 	D
<ul style="list-style-type: none"> • All medication should be brought with the patient 	D
<ul style="list-style-type: none"> • Give oxygen to maintain saturation over 95% 	D
<ul style="list-style-type: none"> • Blood glucose should be measured, and if <3 mmol/l, 100 ml 10% glucose (dextrose) should be administered via intravenous cannula 	D
<ul style="list-style-type: none"> • Repeat FAST 	D
<ul style="list-style-type: none"> • Actively manage hypotension by giving saline and/or raising the foot of the trolley 	D
<ul style="list-style-type: none"> • Perform 12-lead ECG 	D
<ul style="list-style-type: none"> • History of event, including time of onset, signs and symptoms and previous medical, drug, and social history, should be taken from patient and/or informant 	D
<ul style="list-style-type: none"> • If patient suitable for thrombolysis, pre-alert the nearest specialist centre 	D
4 Arrival at hospital	
<p>With active management in the initial hours after stroke onset ischaemic brain may be saved from infarction.</p>	
<ul style="list-style-type: none"> • Immediate assessment and differential diagnosis should be made 	D
<ul style="list-style-type: none"> • Patients suitable for thrombolysis should be identified and treatment pathways instigated 	D
<ul style="list-style-type: none"> • Repeated assessments of blood glucose, and oxygen saturation level, hydration, and temperature should be performed, and parameters maintained within normal limits. Infection should be actively managed unless the patient is receiving palliative care^{4,13,14,15} 	B
<ul style="list-style-type: none"> • Repeated assessments of blood pressure should be performed. Blood pressure should only be lowered in the acute phase where there are likely to be complications from hypertension, eg hypertensive encephalopathy, aortic aneurysm^{16,17} 	B

Concise guideline recommendations**Grade**

- A 12-lead ECG should be performed, and arrhythmias managed D
- Neurological assessments should be performed frequently by trained staff using a standardised scale. Neurological deterioration should elicit medical review D
- The patient should be assessed on admission for their risk of aspiration, using a validated swallowing screening tool, administered by an appropriately trained professional^{18,19} B
- All patients should be transferred to an acute stroke unit⁴ A

5 Brain imaging

- Brain imaging should be undertaken immediately if the patient has:^{20,21} B
 - indications for thrombolysis or early anticoagulation
 - been taking anticoagulant treatment
 - a known bleeding tendency
 - a depressed level of consciousness
 - unexplained progressive or fluctuating symptoms
 - papilloedema, neck stiffness or fever
 - severe headache at onset
- Brain imaging should be undertaken as soon as possible in all other patients within at most 24 hours of onset, unless there are good clinical reasons for not doing so^{22,23,24,25,26,27} B

6 Information and support needs

Information for patients and their families following stroke can be offered in a variety of formats. Patients' organisations have a variety of leaflets and web-based materials on stroke. Research demonstrates however, how difficult it is to give information effectively²⁸ and failure to provide sufficient information is one of the most common causes of patients' complaints.

- Patients' and carers' information and support needs should be considered from the outset D
- Health and social services professionals should ensure that patients and their families have information about the likely diagnosis and expected care pathways D
- Information should take into account the needs of each individual D
- Information should be freely available to patients and their families in a variety of languages and formats specific to patient impairments D

7 Investigation and management of patients with suspected TIA

The risk of developing a stroke after a hemispheric TIA can be as high as 30% within the first month, with the greatest risk being within the first 72 hours.

- Patients first seen in the community with TIA, or with a stroke but having made a good recovery when seen, should be assessed and investigated in a specialist service (eg neurovascular clinic), as soon as possible and certainly within seven days of the incident^{29,30} B
- Patients likely to have a diagnosis of TIA should be prescribed an antiplatelet regimen immediately^{22,23} B
- Patients likely to have a diagnosis of TIA should be advised not to drive until assessed by a specialist D
- Patients should be advised to go to hospital immediately should the symptoms return D
- *Immediate admission* to a specialist stroke service is vital for those with a greater than 20% risk of developing a completed stroke. These are patients with more than one TIA in seven days or who have three or more of the following characteristics:
 - blood pressure greater than 140/90 mmHg
 - unilateral weakness or speech disturbance
 - symptoms lasting 60 minutes or more
 - those who have diabetes³¹ B