Haringey Council

Briefing for: **Prevention Scrutiny Review Panel**

Meeting Date: **19th November 2008**

Title: Summary of main relevant points from the Stroke: National Clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA) guidelines.

Royal College of Physicians

Incidence and prevalence

Stroke is a major health problem in the UK. It accounted for over 56,000 deaths in England and Wales in 1999, which represent 11% of all deaths. Most people survive a first stroke, but often have significant morbidity. Each year in England, approximately 110,000 people have a first or recurrent stroke and a further 20,000 people have a TIA. More than 900,000 people in England are living with the effects of stroke, with half of these being dependent on other people for help with everyday activities.

Health and resource burden

In England, stroke is estimated to cost the economy around £7 billion per year. This comprises direct costs to the NHS of £2.8 billion, costs of informal care of £2.4 billion and costs because of lost productivity and disability of £1.8 billion. Until recently, stroke was not perceived as a high priority within the NHS. However, following the publication of the National Audit Office report in 2005, a National Stroke Strategy was developed by the DH in 2007. This outlines an ambition for the diagnosis, treatment and management of stroke, including all aspects of care from emergency response to life after stroke.

Key priorities for implementation

In people with sudden onset of neurological symptoms a validated tool, such as Face Arm Speech Test (FAST), should be used outside hospital to screen for a diagnosis of stroke or TIA.

People who have had a suspected TIA who are at high risk of stroke should have:

- aspirin (300 mg daily) started immediately
- specialist assessment and investigation within 24 hours of onset of symptoms
- measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.

People with crescendo TIA (two or more TIAs in a week) should be treated as being at high risk of stroke, even though they may have an ABCD2 score of 3 or below.

All people with suspected stroke should be admitted directly to a specialist acute stroke unit following initial assessment either from the community or accident & emergency (A&E) department.

Brain imaging should be performed immediately (defined as 'ideally the next slot and definitely within 1 hour, whichever is sooner') for people with acute stroke if any of the following apply:

- indications for thrombolysis or early anticoagulation treatment (see sections 8.1 and 8.2)
- on anticoagulant treatment
- a known bleeding tendency
- a depressed level of consciousness (Glasgow Coma Score (GCS) below 13)
- unexplained progressive or fluctuating symptoms
- papilloedema, neck stiffness or fever
- severe headache at onset of stroke symptoms.

On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.

The rapid recognition of symptoms and Diagnosis

Pre-hospital prompt recognition of symptoms of TIA and stroke symptoms

Clinical introduction

People who present with acute stroke or TIA need immediate clinical assessment and treatment.

Few people have much awareness of the symptoms of stroke, and may delay seeking help as a result; hence the need for the UK Stroke Association's Act FAST campaign. A number of tools have been designed to help paramedics and other healthcare professionals recognise symptoms in the community. Other tools have been developed to improve the speed of diagnosis on arrival in the A&E department to avoid delay in the delivery of specialist assessment and management. It should be noted that some strokes (e.g. those affecting purely balance or cognition) may not be picked up by clinical assessment tools.

The clinical question addressed is whether emergency health professionals are able to use a clinical assessment tool to accurately identify those patients who have had a suspected stroke or TIA.

R1 In people with sudden onset of neurological symptoms a validated tool, such as Face Arm Speech Test (FAST), should be used outside hospital to screen for a diagnosis of stroke or TIA.
R2 In people with sudden onset of neurological symptoms, hypoglycaemia should be excluded as the cause of these symptoms.

R3 People who are admitted to accident & emergency (A&E) with a suspected stroke or TIA should have the diagnosis established rapidly using a validated tool, such as Recognition of Stroke in the Emergency Room (ROSIER).

Early versus late assessment of people with TIA, and identifying those at high risk of stroke

Clinical introduction

Patients with transient neurological symptoms may underestimate their significance. They delay seeking specialist care or may wait days to see a general practitioner (GP). The Intercollegiate Working Party Guidelines set a standard for a time to specialist assessment in a rapid access TIA clinic of 14 days, a target that was widely seen at the time as difficult to achieve. By 2004, this target was 1 week. The National Sentinel Audit in 2006 showed that while 78% of Trusts had a designated neurovascular clinic, the average waiting time for a clinic appointment remained high at 12 days. Recent data from the Oxford Vascular Study (OXVASC) demonstrate that some patients are at high risk from completed stroke long before this time.

A systematic review of the risk of stroke within 7 days of TIA identified 18 independent cohorts. The outcomes of 15 people were reported at 2 days after TIA and 17 at 7 days. The pooled risk of stroke at 2 days was 3.1% and at 7 days 5.2%. Significant heterogeneity was reported between the studies reflecting the different study methodologies and clinical characteristics of the patient population.

Simple clinical scoring systems can identify patients at particularly high risk who require immediate investigation and management. Specialist assessment involves confirmation of the diagnosis of TIA (around 40–50% of all TIA clinic referrals may, after specialist assessment, be diagnosed as non-neurovascular) and its vascular territory, appropriate investigations (including brain and carotid imaging), and assessment and management of vascular risk factors. A number of models of specialist assessment have been developed including 'rapid access' TIA clinics, daily in some cases, a 24-hour clinic, and day-case admission to hospital. The clinical question addressed is whether scoring systems can accurately predict those patients with suspected TIA who need urgent referral for specialist assessment, and whether this early (immediate) assessment improves outcome.

R4 People who have had a suspected TIA (that is, they have no neurological symptoms at the time of assessment (within 24 hours)), should be assessed as soon as possible for their risk of subsequent stroke using a validated scoring system, such as ABCD2.
R5 People who have had a suspected TIA who are at high risk of stroke (that is, with an ABCD2 score of 4 or above) should have:

- aspirin (300 mg daily) started immediately
- specialist assessment and investigation within 24 hours of onset of symptoms
- measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.

R6 People with crescendo TIA (two or more TIAs in a week) should be treated as being at high risk of stroke (as described in recommendation 5), even though they may have an ABCD2 score of 3 or below.

R7 People who have had a suspected TIA who are at lower risk of stroke (that is, an ABCD2 score of 3 or below) should have:

- aspirin (300 mg daily) started immediately
- specialist assessment and investigation as soon as possible, but definitely within 1 week of onset of symptoms
- measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.

R8 People who have had a TIA but who present late (more than 1 week after their last symptom has resolved) should be treated as though they are at lower risk of stroke (see recommendation 7).

Imaging in TIA and non-disabling stroke

Suspected TIA – referral for urgent brain imaging

Clinical introduction

Recent evidence underlines the importance of immediate assessment and treatment of patients with TIA who are at high risk of completed stroke. Careful history taking and examination is essential to exclude other diagnoses (e.g. migraine, seizure, syncope, tumour) and to assess vascular risk factors including hypertension, diabetes and dyslipidaemia. Early carotid scanning is essential to exclude significant carotid stenosis in patients who would fulfil criteria for carotid endarterectomy . Not all patients with TIA need brain scanning. The selection of patients for urgent scanning is dependent on clinical features; it is important that brain scanning does not delay the institution of optimum secondary prevention or the detection and treatment of significant carotid stenosis. MR scanning is very much more sensitive than CT, particularly if performed early and using diffusion-weighted imaging (DWI); CT perfusion can also be used to detect small ischaemic lesions that might not be visible on standard CT.

The clinical question to be addressed is which patients with suspected TIA should undergo brain imaging.

R9 People who have had a suspected TIA (that is, whose symptoms and signs have completely resolved within 24 hours) should be assessed by a specialist (within 1 week of onset of symptoms) before a decision on brain imaging is made.

R10 People who have had a suspected TIA who are at high risk of stroke (for example, with an ABCD2 score of 4 or above, or with crescendo TIA) in whom the vascular territory or pathology is uncertain should undergo urgent brain imaging (preferably diffusion-weighted magnetic resonance imaging (MRI)).

R11 People who have had a suspected TIA who are at lower risk of stroke (for example, an ABCD2 score of less than 4) in whom the vascular territory or pathology is uncertain should undergo brain imaging (preferably diffusion-weighted MRI).

Cases where brain imaging is helpful in the management of TIA:

- people being considered for carotid endarterectomy (CEA) where it is uncertain whether the stroke is in the anterior or posterior circulation

- people with TIA where haemorrhage needs to be excluded, for example long duration symptoms or people on anticoagulants where alternative diagnosis (for example migraine, epilepsy or tumour) is being considered.

Type of brain imaging for people with suspected TIA

Clinical introduction

In 2006, 78% of hospitals had neurovascular clinics, with a median time between onset and review of 12 days. The key purpose of the clinic is to confirm the diagnosis of TIA (and manage those patients with an alternative diagnosis) and to ensure timely and appropriate secondary prevention. There has been little clarity over the need for brain scanning, with wide variations between clinics in the proportion of patients with TIA routinely scanned. Many clinicians have used CT because of lack of access to MR but availability of MR is now improving rapidly across the UK. Brain scanning may be used to detect stroke mimic (e.g. tumour) but diagnostic yields are low, unless there are suggestive clinical features. Although CT is very sensitive to haemorrhage early after the event, bleeds may be missed if scanning is delayed. Brain imaging is of value in determining the presence of vascular lesions (which may be helpful if there is diagnostic doubt)
and helping to establish vascular territory where this is not clear. MR scanning, especially with diffusion-weighted imaging/fluid-attenuated inversion recovery (DWI/FLAIR) performed early (ideally within 24 hours) has high sensitivity for the detection of small ischaemic lesions which may be missed on CT scan.

The clinical question to be addressed is in those patients with TIA who require brain imaging whether MR or CT provides the most information to guide treatment.

R12 People who have had a suspected TIA who need brain imaging (that is, those in whom vascular territory or pathology is uncertain) should undergo diffusion-weighted MRI except where contraindicated, in which case computed tomography (CT) scanning should be used.

Early carotid imaging in people with acute non-disabling stroke or TIA

Clinical introduction

Carotid imaging is required to determine the presence and severity of carotid stenosis in those individuals who may be appropriate for carotid endarterectomy, i.e. those with a TIA or minor or recovered stroke involving the anterior circulation who are fit and willing for surgery. Doppler ultrasound, MR angiography and CT angiography can be used in the screening for and assessment of carotid stenosis. The urgency of the carotid imaging depends on the individual's risk of stroke. Furthermore the value of carotid surgery decreases with time from the event, surgery ceases to be of value after 12 weeks of the event in trials for men and 2 weeks for women. Imaging should therefore be done rapidly if appropriate patients are to be assessed for surgery in a timely manner.

The clinical question to be addressed is which patients with suspected stroke/TIA should be referred for urgent carotid imaging.

R13 All people with suspected non-disabling stroke or TIA who after specialist assessment are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week of onset of symptoms. People who present more than 1 week after their last symptom of TIA has resolved should be managed using the lower-risk pathway.

Urgent carotid endarterectomy and carotid stenting in people with carotid stenosis

Clinical introduction

While the benefits of carotid intervention for symptomatic carotid stenosis of >50% according to the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria and >70% according to the European Carotid Surgery Trial (ECST) criteria have been clearly described elsewhere. The benefit of early surgery (within 2 weeks of symptoms) may be outweighed by the risk of adverse events in patients with recent cerebral infarction, particularly those with significant neurological disability following a stroke or who have a high anaesthetic risk. However, patients with clinically defined high-risk TIA are clearly at highest risk of stroke within 2 days of the incident, implying that for some patients, very early endarterectomy might be most beneficial. Similarly, a case-series study reported no perioperative complications associated with early carotid stenting (<14 days) in patients with symptomatic carotid artery stenosis. The non-randomised EXPRESS study suggests that patients with TIA and minor stroke benefit considerably from a package of early medical interventions including antiplatelet agents, a statin and blood pressure treatment.

The clinical question is which patients with symptomatic carotid stenosis should be referred for early interventional procedures. It is of note that the lack of standardisation of the definition of significant carotid stenosis can be confusing. It is important that those reporting carotid imaging studies clearly state which criteria for diagnosis are being used.

R14 People with stable neurological symptoms from acute non-disabling stroke or TIA who have symptomatic carotid stenosis of 50–99% according to the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, or 70–99% according to the European Carotid Surgery Trialists' (ECST) Collaborative Group criteria, should:

- be assessed and referred for carotid endarterectomy (CEA) within 1 week of onset of stroke or TIA symptoms
- undergo surgery within a maximum of 2 weeks of onset of stroke or TIA symptoms
- receive best medical treatment (control of blood pressure, antiplatelet agents, cholesterol lowering through diet and drugs, lifestyle advice).

R15 People with stable neurological symptoms from acute non-disabling stroke or TIA who have symptomatic carotid stenosis of less than 50% according to the NASCET criteria, or less than 70% according to the ECST criteria, should:

- not undergo surgery

- receive best medical treatment (control of blood pressure, antiplatelet agents, cholesterol lowering through diet and drugs, lifestyle advice).

R16 Carotid imaging reports should clearly state which criteria (ECST or NASCET) were used when measuring the extent of carotid stenosis.

Specialist care in acute stroke

Specialist stroke units

Clinical introduction

Patients with stroke admitted to organised stroke care (usually a stroke unit) are less likely to die and more likely to leave hospital independent than those who are cared for in general (usually medical and care of the elderly) wards. The evidence for this, documented in a systematic review initially in 1997, was the catalyst for a marked change in stroke service organisation across the NHS. The National Service Framework for the Elderly recommended that all stroke patients should be admitted to organised stroke units. The National Audit Office Report in 2005 noted that there had been no increase in stroke beds between 2001 and 2004 in the National Sentinel Audits; in 2004, half of eligible patients were treated in a stroke unit at some point and only 41% spent most of their hospital stay there.
However, by 2006, 91% of Trusts in the UK had a stroke unit, 62% of patients were treated in a stroke unit at some point and 54% spent most of their hospital stay on a stroke unit. The development of thrombolysis and other acute treatments has led to an increased emphasis on acute management of stroke in addition to rehabilitation. 52% of UK Trusts now have an acute stroke unit, characterised by access to brain imaging within 24 hours, specialist ward rounds at least 5 times a week, and acute stroke protocols and guidelines. A significant proportion also have access to CT scanning within 3 hours, continuous physiological monitoring and policies for direct admission from A&E. There is much less trial evidence available for the efficacy of acute stroke units than for rehabilitation units.

The clinical question to be addressed is whether patients who are rapidly admitted to a specialist stroke unit have better clinical outcomes than those admitted through a general ward.

R17 All people with suspected stroke should be admitted directly to a specialist acute stroke unit following initial assessment either from the community or accident & emergency (A&E) department.

Definition of a stroke unit:

- a discrete area in the hospital
- staffed by a specialist stroke multidisciplinary team
- access to equipment for monitoring and rehabilitating patients
- regular multidisciplinary meetings occur for goal setting.

Brain imaging for the early assessment of people with acute stroke

Clinical introduction

Brain imaging is essential in stroke to exclude haemorrhage and stroke mimics. The 'National clinical guidelines for stroke' (2004) recommended scanning within 24 hours of onset of symptoms to confirm diagnosis. Only 42% of patients in the 2006 Sentinel Audit achieved this standard. This is unacceptably low. It is recommended that by the time of the 2008 audit, 100% of patients should be scanned within a maximum of 24 hours after admission. Access to brain scanning has been difficult in the past because of a perceived lack of urgency for scanning, problems with access to scanning, or a lack of radiology or radiography support. Even though scanner availability has increased in recent years, systems are clearly not routinely in place to allow immediate or rapid access to scanning throughout the UK. Changes in clinical practice (increased availability, changes in scan request and reporting procedures) will be required to implement the new recommendation.

The clinical question to be addressed is how quickly brain imaging should be performed following an acute stroke.

R18 Brain imaging should be performed immediately for people with acute stroke if any of the following apply:

- indications for thrombolysis or early anticoagulation treatment _ on 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 of stroke symptoms.

R19 For all people with acute stroke without indications for immediate brain imaging, scanning should be performed as soon as possible.

Pharmacological treatments for people with acute stroke

Thrombolysis in people with acute ischaemic stroke

Clinical introduction

Thrombolysis with alteplase in acute ischaemic stroke has been shown to significantly improve outcome in selected patients treated within 3 hours of onset of symptoms. It has been reviewed in detail in NICE Technology Appraisal (TA) and thus the evidence has not been reviewed again here. However, the Guideline Development Group did discuss the clinical context in which alteplase should be administered, in particular the availability of appropriately trained staff in acute stroke units. Immediate access to acute stroke care, diagnosis (including brain imaging) and rapid treatment (including thrombolysis where appropriate) is a vital component of the very considerable changes in the delivery of effective acute stroke care outlined in the National Stroke Strategy. One series of 1,135 patients treated in centres across Canada showed that 37% had an excellent outcome with a symptomatic intracerebral haemorrhage rate that was lower than in the published trials (4.6%). 1.3% developed angio-oedema. Symptomatic intracerebral haemorrhage was higher in those patients where the protocol was violated, underlining the importance of treatment within guidelines. The NICE TA

concludes that alteplase in addition to best supportive care is effective and safe in acute ischaemic stroke, provided that alteplase is only used in accordance with the marketing authorisation. In particular, it should be administered within 3 hours of onset of symptoms and only after brain haemorrhage has been definitively excluded using brain scanning. Thrombolysis in acute stroke is associated with an increased risk of haemorrhage (up to 6% of patients) and is therefore a treatment not without hazard. It was felt that staff in A&E departments, if appropriately trained and supported, can administer thrombolysis in acute stroke provided that
patients can be managed within an acute stroke service with appropriate neuroradiological and stroke physician support.

R20 Alteplase is recommended for the treatment of acute ischaemic stroke when used by physicians trained and experienced in the management of acute stroke. It should only be administered in centres with facilities that enable it to be used in full accordance with its marketing authorisation.
R21 Alteplase should only be administered within a well-organised stroke service with:

- staff trained in delivering thrombolysis and in monitoring for any associated complications
- care up to level 1 and level 2 nursing staff trained in acute stroke and thrombolysis
- immediate access to imaging and re-imaging, and staff appropriately trained to interpret the images.

R22 Staff in A&E departments, if appropriately trained and supported, can administer alteplase for the treatment of acute ischaemic stroke provided that patients can be managed within an acute stroke service with appropriate neuroradiological and stroke physician support.
R23 Protocols should be in place for the delivery and management of thrombolysis, including post-thrombolysis complications.

Aspirin and anticoagulant treatment in people with acute ischaemic stroke

Clinical introduction

Acute ischaemic stroke is associated with mortality (up to 30% at 30 days) and morbidity (disability). It occurs secondary to thrombosis, usually from an atherothrombotic plaque, or to embolism, usually from the heart. Resultant blood clot or thrombus occludes an artery in the extra or intracranial cerebral vasculature to cause brain ischaemia. The size of the clot determines the diameter of the vessel occluded and thus the volume of brain affected. Ischaemic stroke, although initially not associated with haemorrhagic change on structural imaging at presentation, may undergo a process called haemorrhagic transformation, where blood becomes visible within the infarct on scanning. This may be asymptomatic and only detected by chance on subsequent scans, or symptomatic and associated with a clinical deterioration. Symptomatic haemorrhagic transformation is more commonly associated with larger infarcts, usually within the first 2 weeks after presentation. Antiplatelet agents and anticoagulants may increase the risk of haemorrhagic transformation of cerebral infarction.

Following a stroke, patients may be immobile and thus at increased risk of venous thromboembolism (deep venous thrombosis and pulmonary embolus), the incidence of

which is reduced by antiplatelet agents and anticoagulants. However, patients may also be at increased risk of bleeding complications (for example upper gastrointestinal bleeding) particularly on aspirin, and existing bleeding disorders (e.g. peptic ulceration) may be exacerbated by anticoagulants. There is a balance between the potential therapeutic effects of antiplatelet agents and anticoagulants in the treatment of patients with acute ischaemic stroke and the reduction in thromboembolic complications, against the risk of haemorrhagic transformation of infarction and exacerbation of extracranial bleeding.

The clinical questions to be addressed are how safe and effective are antiplatelet agents and anticoagulants after an acute ischaemic stroke.

R24 All people presenting with acute stroke who have had a diagnosis of primary intracerebra haemorrhage excluded by brain imaging should, as soon as possible but certainly within 24 hours, be given:

- aspirin 300 mg orally if they are not dysphagic, or
- aspirin 300 mg rectally or by enteral tube if they are dysphagic.

Thereafter aspirin 300 mg should be continued until 2 weeks after the onset of stroke symptoms, at which time definitive long-term antithrombotic treatment should be initiated. People being discharged before 2 weeks can be started on long-term treatment earlier.

R25 Any person with acute ischaemic stroke for whom previous dyspepsia associated with aspirin is reported should be given a proton pump inhibitor in addition to aspirin.

R26 Any person with acute ischaemic stroke who is allergic to or genuinely intolerant of aspirin should be given an alternative antiplatelet agent.

R27 Anticoagulation treatment should not be used routinely for the treatment of acute stroke.

Glossary

Dyslipidaemia - a disruption in the amount of lipids in the blood

Doppler Ultrasound – A form of ultrasound that can detect and measure blood flow

Cerebral infarction - blockage of the flow of blood to the cerebrum, causing or resulting in brain tissue death. Blockage may be caused by a thrombosis, an embolism, a vasospasm, or a rupture of a blood vessel. Type of stroke or cerebrovascular accident (CVA).

Diffusion-weighted imaging (DWI) - A form of Magnetic Resonance Imaging

Diffusion-weighted MRI **-** a magnetic resonance imaging (MRI) method that produces images of biological tissues weighted with the local microstructural characteristics of water diffusion

Papilloedema - swelling that is caused by increased intracranial pressure. The swelling is usually bilateral and can occur over a period of hours to weeks. Papilledema has many possible causes but is known to occur in approximately 50% of those with a brain tumor.

Angio-oedema - a condition that can cause swelling of:

- the deeper layers of the skin. That is, the dermis and subcutaneous tissues. Also,
- the tissues just under the lining of the airways, mouth and gut. That is, the submucosal tissues.

Embolism - when an object (the **embolus**, plural **emboli**) migrates from one part of the body (through circulation) and causes a blockage (occlusion) of a blood vessel in another part of the body.

Thromboembolism – the formation in a blood vessel of a clot (thrombus) that breaks loose and is carried by the blood stream to plug another vessel