

## 1. INTRODUCTION

Stroke is a major health problem in the UK. Improving care for patients with stroke and transient ischaemic attack (TIA) is a key national priority, with a National Stroke Strategy published by the Department of Health in 2007,<sup>1</sup> and guidelines published by the National Institute for Health and Clinical Excellence (NICE) in 2008.<sup>2</sup>

### 1.1 Acute Stroke

Acute stroke is a medical emergency. For patients with thrombotic stroke, treatment with thrombolytic therapy (alteplase) is highly time-dependent. In order to determine suitability for treatment, patients must undergo a brain scan, therefore, patients need to be transferred to an appropriate hospital as rapidly as possible once the diagnosis is suspected.

It is important to remember that thrombolysis is not the only management proven to benefit stroke patients. Admission to a stroke unit for early specialist care is known to be life saving and to reduce disability, even if thrombolysis is not indicated.

Symptoms of stroke include:<sup>2</sup>

- numbness
- weakness or paralysis
- slurred speech
- blurred vision
- confusion
- severe headache.

The most sensitive features associated with diagnosing stroke in the pre-hospital setting are facial weakness, arm and leg weakness, and speech disturbance.<sup>3,4</sup>

### 1.2 Transient ischaemic attack (TIA)

Transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours. However, there are limitations to these definitions. For example, they do not include retinal symptoms

(sudden onset of monocular visual loss), which should be considered as part of the definition of stroke and TIA. The symptoms of a TIA usually resolve within minutes or a few hours at most, and **anyone with continuing neurological signs when first assessed should be assumed to have had a stroke.**<sup>2</sup>

The risk of a patient with TIA developing a stroke is high and symptoms should always be taken seriously.

## 2. INCIDENCE

Each year in England, approximately 110,000 people have a first or recurrent stroke and a further 20,000 people have a TIA.<sup>1</sup>

## 3. SEVERITY AND OUTCOME

Stroke accounted for over 56,000 deaths in England and Wales in 1999, which represents 11% of all deaths. Most people survive a first stroke, but often have significant morbidity.<sup>2</sup>

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.<sup>2</sup>

## 4. PATHOPHYSIOLOGY

The majority (85%) of strokes are thrombotic (cerebral infarction) and 15% intracranial haemorrhage. Distinguishing between the two is not currently feasible in the pre-hospital setting.

A TIA occurs when blood supply to part of the brain is temporarily interrupted.

## 5. ASSESSMENT

Assess **ABCDs**

- May have airway and breathing problems (*refer to dyspnoea guideline*).
- Level of consciousness may vary (*refer to decreased level of consciousness guideline*).

Evaluate if the patient has any **TIME CRITICAL** features – these may include:

- any major ABC problem
- positive FAST test
- altered level of consciousness.

If any of these features are present, start **correcting A and B problems then transport to the nearest suitable receiving hospital. Local arrangements will determine pathways (e.g. bypassing a local hospital for the nearest ‘hyperacute’ stroke centre).**

- Provide a **Hospital Alert Message / Information Call** stating clearly that the patient is FAST positive/suspected acute stroke.
- En-route – continue patient **management (see below)**.
- Assess blood glucose level, as **hypoglycaemia** may mimic a stroke.

**Suspected acute stroke – a positive FAST test should be considered a TIME CRITICAL condition. Perform a brief secondary survey but do not allow this to delay transport to hospital:**

- assess blood pressure to provide a baseline for hospital assessment
- assess Glasgow Coma Scale (GCS) on **unaffected side** – eye and motor assessments may be more readily assessed if speech is badly affected.

**Table 1 – FAST Test<sup>3,4</sup>**

<b>Facial Weakness</b>	Ask the patient to smile or show teeth. Look for <b>NEW</b> lack of symmetry
<b>Arm Weakness</b>	Ask the patient to lift their arms together and hold for 5 seconds. Does one arm drift or fall down? The arm with motor weakness will drift downwards compared to the unaffected limb
<b>Speech</b>	Ask the patient to repeat a phrase. Assess for slurring or difficulty with the words or sentence

These components make up the **FAST** (face, arms, speech test) assessment that should be carried out on **ALL** patients with suspected stroke/TIA. A deficit in any one of the three domains is sufficient for the patient to be identified as ‘FAST positive’.

## 6. MANAGEMENT

Follow **medical emergencies guideline**, remembering to:

Start correcting:

- **AIRWAY**
- **BREATHING**
- **CIRCULATION**
- **DISABILITY** (mini neurological examination)
- Oxygen therapy is not recommended unless the patient is hypoxic. (*refer to oxygen guideline*).

Consider recording 12-lead ECG en route to hospital, but **do not delay transport** for this test.

Intravenous access is not essential unless the patient requires specific interventions, and may delay transport to hospital.

### Specifically:

- check blood glucose level (**refer to glycaemic emergencies guideline**)
- conscious patients should be conveyed in the semi recumbent position
- patients should be nil by mouth.

**NOTE:** Local policies will determine whether paramedics should use a risk score for suspected TIA patients and/or administer aspirin. In the absence of clear evidence relating to pre-hospital use of these interventions JRCALC are unable to make a firm recommendation.

### 7. REFERRAL PATHWAY

This will depend on locally commissioning arrangements. For example, bypassing local hospitals for a 'hyperacute' centre may require patients in some networks to meet specific criteria based on a positive FAST test and onset within the preceding 2 hours, so that the patient is within the 'time window' for thrombolysis.

Where possible, a witness should be asked to accompany the patient to hospital.

It is important to remember that thrombolysis is not the only management proven to benefit stroke patients. Admission to a stroke unit for early specialist care is known to be life saving and to reduce disability, even if thrombolysis is not indicated.

### 8. AUDIT INFORMATION

Ambulance services are required to monitor the use of the FAST test in patients with suspected stroke, and agree local pathways for patients with suspected stroke. Careful documentation of your assessment and management, including accurate timings are

essential to improving care for this group of patients.

### Key Points – STROKE/Transient Ischaemic Attack (TIA)

- **Time is of the essence** in suspected acute stroke.
- Stroke is common and may be due to either cerebral infarction or haemorrhage.
- The most sensitive features associated with diagnosing stroke in the pre-hospital setting are facial weakness, arm and leg weakness, and speech disturbance – the FAST test.
- FAST test should be carried out on **ALL** patients with suspected stroke/TIA.
- Patients with TIA may be at high risk of stroke and should be taken to hospital for further assessment.

### REFERENCES

1. Department of Health. National Stroke Strategy. London: Department of Health, 2007.
2. National Institute for Health and Clinical Excellence. Stroke: the diagnosis and initial management of acute stroke and transient ischaemic attack. London: National Institute for Health and Clinical Excellence, 2008.
3. Harbison J, Hossain O, Jenkinson D, Davis J, Louw SJ, Ford GA. Diagnostic Accuracy of Stroke Referrals From Primary Care, Emergency Room Physicians, and Ambulance Staff Using the Face Arm Speech Test. *Stroke* 2003;34(1):71-76.
4. Nor AM, McAllister C, Louw SJ, Dyker AG, Davis M, Jenkinson D, et al. Agreement Between Ambulance Paramedic- and Physician-Recorded Neurological Signs With Face Arm Speech Test (FAST) in Acute Stroke Patients. *Stroke* 2004;35(6):1355-1359.

### FURTHER READING

Comprehensive, high quality information on stroke is available at:

- **NHS Evidence – stroke**  
[www.evidence.nhs.uk/specialistcollections](http://www.evidence.nhs.uk/specialistcollections)
- **NHS Stroke Improvement**  
<http://www.improvement.nhs.uk/stroke>
- **The Stroke Association**  
<http://www.stroke.org.uk>