Getting the patient to thrombolysis- Pre-hospital and Emergency Department triage and assessment

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Emergency Stroke Care and the Chain of Survival

Patient Knowledge  Calling 999  Pre-hospital System  ED Staff  Stroke Team  Stroke Unit
Stroke is an Emergency!

- Stroke is a “Brain Attack”
- Brain Attack is an emergency
- “Time is Brain”
But so is……

- Acute myocardial infarction
- Severe sepsis
- Ectopic pregnancy rupture
- Aortic aneurysm rupture
- Major trauma
- Severe asthma attack
- Anaphylaxis
- 4 hr access target!........... So what to do?
Triage system Principles

- We have to prioritise - ambulances and Emergency Departments
- A,B,C - life threatening problems
- Time critical treatments – AMI, sepsis, Stroke, ruptured ectopic, extra dural
Blue light calls to Emergency patients

- Cat A calls – very rapid response but there are lots and lots of these calls.
- We have asked the ambulance service to prioritise stroke – that does not mean above all other calls – just means yet another blue light call category to add to what they are already doing.
A key but not sole reason for prioritising strike - Thrombolysis - different service models

- Local provision
- Ambulance bypass
  - eligible for thrombolysis
  - All strokes
- Telemedicine
Emergency Stroke Care and the Chain of Survival

- Patient Knowledge
- Calling 999
- Pre-hospital System
- ED Staff
- Stroke Team
- Stroke Unit
Impact of February FAST campaign

- 9 in 10 have seen/heard at least 1 part of the campaign.
- An increase in respondents claiming they would call 999 if they saw a ‘slumped face’ (64% pre to 87% post); ‘somebody unable to lift both arms’ (46% pre to 72% post) and ‘slurred speech’ (46% pre to 74% post)
The Face, Arm, Speech Test (FAST) can help you recognise the symptoms of a stroke

FAST

Facial weakness
Can the person smile? Has their mouth or eye drooped?

Arm weakness
Can the person raise both arms?

Speech problems
Can the person speak clearly and understand what you say?

Test all three symptoms

What are the symptoms of stroke?

- Sudden weakness or numbness of the face, arm or leg on one side of the body
- Sudden loss or blurring of vision, in one or both eyes
- Sudden difficulty speaking or understanding spoken language
- Sudden confusion
- Sudden or severe headache with no apparent cause
- Dizziness, unsteadiness or a sudden fall, especially with any of the other signs

Why act FAST?

Stroke is a medical emergency. By calling 999, you can help someone reach hospital quickly and receive the early treatment they need. Prompt action can prevent further damage to the brain and help someone make a full recovery. Delay can result in death or major long-term disabilities, such as paralysis, severe memory loss and communication problems. Ambulance crews use FAST and with hospital staff can act fast to identify and diagnose a stroke quickly.

If you suspect a stroke, act FAST and call 999
FAST- the evidence

- Developed 1998 for UK paramedics starting with those in Newcastle
  - Used Cincinnati Prehospital Stroke Scale and Los Angeles Prehospital Stroke Screen to inform development.

- Main publication
The study

- Comparison of paramedics using FAST, GPs and ED doctors
- 487 pts (92% of total referrals)
  - 356 stroke 131 non stroke
  - Paramedics diagnosis correct 79%
  - GPs 71%
    - ED difficult as most came by ambulance many with pre label of ?stroke.
    - Paramedics saw patients with more severe strokes and less lacunar strokes.
Rapid identification

- Can be more difficult than you hope.
- Delay or failure to make the correct stroke diagnosis may have serious adverse consequences.
- Delay or failure to make the correct non-stroke diagnosis may have serious adverse consequences.
  - Issue of patient being taken quite long distances to stroke hospitals. C.f. Bells palsy and sorting out follow up.
Emergency Stroke Care and the Chain of Survival
Emergency Department- key features

- Awareness- rapid screening and mimic exclusion
- Systems in place to deliver rapid care- alert triage for self presenters, standardised response to ambulances, radiology buy in, access to a scanner, access to both Stroke Team and Stroke bed.
Critical - The mindset for the Emergency services- ambulance and department!

- Stroke is a medical emergency and the stroke team will be the right team to look after a stroke patient in hospital
- There are time critical interventions for both stroke and TIA
- There are interventions which can reduce the mortality and morbidity of stroke.
- There is evidence that the identification of and intervention in high risk patients who have had a TIA, can prevent stroke
- A team approach is essential- Ambulance Service, EM, Radiology and Stroke
Improvement

- Raising awareness of treatment options—there are some!
- Raising awareness of getting the basics right and that admission directly to the Stroke Unit is the correct option
- Education about stroke signs and common mimics
- Feedback to ambulance crews and ED staff from stroke teams.
Acute Assessment Scales

- ROSIER
- Canadian Neurological Scale (CNS)
- European Stroke Scale
- Glasgow Coma Scale (GCS)
- Hemispheric Stroke Scale
- Hunt & Hess Scale
- Mathew Stroke Scale
- NIH Stroke Scale (NIHSS)
- Orgogozo Stroke Scale
- Oxfordshire Community Stroke Project Classification (Bamford)
- Scandinavian Stroke Scale
ROSIER- The evidence

- ROSIER Scale- Stroke Assessment
  - The aim of this assessment tool is to enable medical and nursing staff to differentiate patients with stroke and stroke mimics.
ROSIER - how developed

- 342 suspected stroke patients
  - 159 strokes, 167 non stroke, 32 TIAs
- Common stroke mimics
  - seizure 23%, syncope 23%, sepsis 10%
- Scoring system developed
- Prospective development 173 patients
<table>
<thead>
<tr>
<th>Question</th>
<th>Y (+1)</th>
<th>N (0)</th>
</tr>
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<tbody>
<tr>
<td>Has there been loss of consciousness or syncope?</td>
<td></td>
<td></td>
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<tr>
<td>Has there been seizure activity?</td>
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<tr>
<td>Is there NEW ACUTE onset – or on waking from sleep?</td>
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<td></td>
</tr>
<tr>
<td>1. Asymmetric facial weakness</td>
<td>Y (+1)</td>
<td>N (0)</td>
</tr>
<tr>
<td>2. Asymmetric hand weakness</td>
<td>Y (+1)</td>
<td>N (0)</td>
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<tr>
<td>3. Asymmetric arm weakness</td>
<td>Y (+1)</td>
<td>N (0)</td>
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<tr>
<td>4. Asymmetric leg weakness</td>
<td>Y (+1)</td>
<td>N (0)</td>
</tr>
<tr>
<td>5. Speech disturbance</td>
<td>Y (+1)</td>
<td>N (0)</td>
</tr>
<tr>
<td>6. Visual field defect</td>
<td>Y (+1)</td>
<td>N (0)</td>
</tr>
</tbody>
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ONSET TIME:______________________

If score totals > 0 assume diagnosis of Stroke

If score 0, -1 or -2 stroke diagnosis is unlikely but not excluded.
ROSIER - results

- ROSIER
  - 92% sensitivity (FAST 54% in same study)
  - 96% specificity (FAST 91% in same study)
    - 96% Positive predictive value
    - 92% Negative predictive value
1.1.1.1 In people with sudden onset of neurological symptoms a validated tool, such as FAST (Face Arm Speech Test), should be used outside hospital to screen for a diagnosis of stroke or TIA.

1.1.1.2 In people with sudden onset of neurological symptoms, hypoglycaemia should be excluded as the cause of these symptoms.

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

What are the problems?

- **Focal signs**
  - Sudden numbness, weakness or paralysis of the face, arm or leg
  - Difficulty in speaking or understanding simple statements
  - Decreased vision or transient blindness in one eye
  - An episode of double vision
  - Unexplained dizziness, loss of balance or sudden falls
  - Sudden, severe headaches with no apparent cause

- **Non focal signs** - Lots of ED patients have these symptoms!
  - Dizziness, vertigo
  - Localized headache
  - Blurred vision of both eyes
  - Dysarthria (slurred speech)
  - Impaired cognitive function (including confusion)
  - Impaired consciousness
  - Seizures
Examination

- The neurological examination is the cornerstone of determining whether a focal neurological deficit in a characteristic vascular distribution exists.
The History: exclude mimics

- Transient loss of consciousness suggests seizure or cardiac disease
- Dementia makes all diagnoses difficult
- Have you got a source of history from another person?
NON FOCAL Neurological Symptoms, therefore not a stroke or TIA

- Generalised weakness and/or sensory disturbance
- Light headedness / Faintness
- ‘Blackouts’ with altered or loss of consciousness or fainting, with or without impaired vision in both eyes
- Incontinence of urine or faeces
- Confusion
- Intermittent diplopia
- Any of the following symptoms if isolated: vertigo/tinnitus/ dysphagia/dysarthria /diplopia /ataxia
- Consider alternatives such as hypoglycaemia, migraine, focal epilepsy, syncope, cerebral hypoperfusion
Conditions that Mimic Stroke in the Emergency Department

Of 411 patients with an initial diagnosis of stroke, 78 (19%) were eventually found to have other conditions, the majority consisting of:

- Postictal states
- Systemic infections
- Tumors
- Toxic-metabolic disturbances
Appropriate diagnosis

● Actions needed from the ED community
● Clear pathways through care with delays minimised, clear access to the Stroke team (not via Med team)
  ● Improve our diagnostic skills esp self presenters
    ● Triage/ stream/respond to call appropriately
      ▪ FAST, ROSIER, 999 response plan
    ● understanding of cerebrovascular pathophysiology and anatomy
    ● neuro exam skills,
  ● Understand stroke mimics
  ● Build relationships with radiology so scanning protocolised
  ● Know who to call when!
Thank you!

Questions?