The Psychiatrist’s Guide to TIA and Stroke

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Key Learning Outcomes

• understand recent advances and current practice in the diagnosis, investigation, and management of medical illnesses relevant to psychiatry
• know when to refer your patients to medical physician colleagues
• be more confident in liaising effectively with physicians over the medical care of your patients
Stroke: epidemiology

- Third most common cause of death worldwide
- The most common cause of adult neurological disability
- 6% of annual NHS and SS expenditure

- Stroke incidence 240/100,000/year
  - 1/3 are recurrent events
  - 25% aged <65 years
  - 50% aged >75 years

- TIA incidence 50/100,000/year
Outcome of Stroke at 1 Year

- Dead: 31%
- Dependant: 24%
- Independent: 45%
• OHCM – 1985
• Sit them up
• Aspirin may help
• Likely to die or require long term care

• Thankfully, things have changed!
A Medical Emergency
Advances

- (Hyper)Acute Care
- Rehabilitation
- TIA
- IV and IA thrombolysis
- Mechanical Clot Retrieval
- Medical therapies
- Investigations
- National Stroke Strategy and CQUINS targets
- RCP audit
- NICE guidelines
- Publicity Campaigns
FACE.
Has their face fallen on one side? Can they smile?

ARMS.
Can they raise both arms and keep them there?

SPEECH.
Is their speech slurred?

TIME.
Time to call 999 if you see any single one of these signs.
Stroke: Pathophysiology

- 5% subarachnoid haemorrhage
- 15% primary intracerebral haemorrhage
- 80% ischaemic stroke

Cardiac source of embolism: 20%
Intracranial small-vessel disease: 25%
Atherothromboembolism: 50%
Rare causes: 5%
Stroke: General management

To reduce mortality, disability and prevent complications

- **Admit to a Stroke Unit**
  - BP control
  - Oxygen supplementation if < 92%
  - Glycaemic control
  - Fever
  - Fluid balance
  - Swallowing reflex and Nutrition
  - Early mobilisation and rehabilitation
  - DVT prophylaxis

- **NNT to prevent one serious disability or death is ~8**
Stroke: **hyperacute** therapy (cerebral infarction)

- **Thrombolysis**
  
  RCT evidence: NINDS, ECASS I, II & III, ATLANTIS A+B
  
  IV rt-PA
  
  Time to stroke onset decreases (maximal benefit < 90 mins)
Risk of death dependency and good functional outcome in randomised trials of rt-PA given within 3 hours of acute stroke
Cost savings of reduced disability

<table>
<thead>
<tr>
<th>Service</th>
<th>mRS 0-2</th>
<th>mRS 3-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulatory rehabilitation</td>
<td>£38</td>
<td>£718</td>
</tr>
<tr>
<td>Long term care (three months)</td>
<td>£206</td>
<td>£2658</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£244</strong></td>
<td><strong>£3376</strong></td>
</tr>
</tbody>
</table>

Every patient in mRS 0-2 instead of mRS 3-5 saves money -£3132 at 90 days
Definitions

**Stroke** is a clinical syndrome characterised by rapid onset of focal neurological signs that lasts *more than 24 hours* or leads to death, with no apparent cause other than a vascular one.

**TIA** definition is identical to that of stroke except the *symptoms* last less than 24 hours.

**Cerebrovascular disease** includes stroke in addition to other diseases of the blood vessels of the brain.
• Cerebrovascular accident (CVA)
Modern Concepts

COMPLETED STROKE

TIA

BRAIN ATTACK
NIHSS


- Clinical assessment Tool
- Predictor of both short and long term outcome
- Strong inter and intra user validity for stroke severity
- Common language worldwide
Clinical features - Constellation

**Anterior (carotid) territory**

- TMB / Amaurosis fugax
- Hemi motor / sensory loss
- Hemianopia
- Dysphasia
- Sensory inattention
- Visual inattention
- Hemi neglect

**Posterior (vertebrobasilar)**

- Hemi motor / sensory loss
- Hemianopia
- Ataxia
- Diplopia
- Facial sensory loss
- Dysphagia
- Vertigo
- Vomiting
- Dysarthria
Neurological symptoms during TIA (OCSP)

- Unilateral weakness / heaviness / clumsy 50%
- Unilateral sensory symptoms 35%
- Dysarthria 23%
- TMB 18%
- Speech / language disturbance 18%
- Unsteadiness (ataxia)* 12%
- Dizziness (vertigo)* 5%
- HH 5%
- Double vision (diplopia)* 5%
- Dysphagia* 1%

N=184, most had > 1 symptom. No patients with isolated*
Duration of longest TIA (OCSP)

<table>
<thead>
<tr>
<th>Minutes</th>
<th>A Fugax</th>
<th>Cerebral</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 - 120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>121 - 720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 720</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Distribution of time from preceding transient ischaemic attack to stroke for patients who reported a transient ischaemic attack (TIA) within the previous 14 days of a stroke.
Decision to Admit: ABCD2

Age >60 years 1
BP >140/90 1
Clinical features: unilateral weakness 2
speech disturbance alone 1
Duration of symptoms: >60 mins 2
10-59 mins 1
<10mins 0
Diabetes 1
Stroke Risk

Stroke risks at 2, 7 and 90 days after transient ischaemic attack in patients at low, moderate and high risk according to the ABCD2 score. Data are from a total of 4799 patients in the California and Oxfordshire derivation cohorts and four California and Oxfordshire validation cohorts.

<table>
<thead>
<tr>
<th>Risk level</th>
<th>ABCD(^2) score</th>
<th>Patients (n)</th>
<th>Risk at 2 days (no. strokes)</th>
<th>Risk at 7 days (no. strokes)</th>
<th>Risk at 90 days (no. strokes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0–3</td>
<td>1628</td>
<td>1.0% (17)</td>
<td>1.2% (19)</td>
<td>3.1% (50)</td>
</tr>
<tr>
<td>Moderate</td>
<td>4–5</td>
<td>2159</td>
<td>4.1% (89)</td>
<td>5.9% (128)</td>
<td>9.8% (211)</td>
</tr>
<tr>
<td>High</td>
<td>6–7</td>
<td>1012</td>
<td>8.1% (82)</td>
<td>11.7% (118)</td>
<td>17.8% (180)</td>
</tr>
</tbody>
</table>
Current LTHT pathway

http://nww.lhp.leedsth.nhs.uk/referral_forms/183

RBS 0113 2064508
- SPOC: 8-8 Mon to Fri; 8-2 Sat-Sun
- SPOC on 07500 817985
- 24/7 Thrombolysis via telemedicine
- Stroke Nurse Specialist on 07786 250793 9am-5pm
- The future in Leeds……IA mechanical clot retrieval
Stroke mimic: When is a TIA not a TIA

TABLE 3. Number of Nonstrokes and Diagnoses, Admitted by Rapid Ambulance Protocol, Primary Care Doctors, and Emergency Room Doctors

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>RAP</th>
<th>PCDs</th>
<th>ER</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total nonstrokes (% of admissions)</td>
<td>41 (23)</td>
<td>63 (29)</td>
<td>27 (29)</td>
<td>131 (27)</td>
</tr>
<tr>
<td>Seizures</td>
<td>15 (37)</td>
<td>6 (10)</td>
<td>6 (22)</td>
<td>27 (21)</td>
</tr>
<tr>
<td>Infections/sepsis and confusion</td>
<td>5 (12)</td>
<td>9 (14)</td>
<td>6 (22)</td>
<td>20 (15)</td>
</tr>
<tr>
<td>Cardiovascular collapses</td>
<td>6 (15)</td>
<td>5 (8)</td>
<td>1 (4)</td>
<td>15 (11)</td>
</tr>
<tr>
<td>Malignant tumor</td>
<td>5 (12)</td>
<td>7 (11)</td>
<td>1 (4)</td>
<td>13 (10)</td>
</tr>
<tr>
<td>Psychiatric causes</td>
<td>3 (7)</td>
<td>3 (5)</td>
<td>4 (15)</td>
<td>10 (8)</td>
</tr>
<tr>
<td>Deteriorating dementia</td>
<td>6 (10)</td>
<td>1 (4)</td>
<td>7 (5)</td>
<td></td>
</tr>
<tr>
<td>Subdural hemorrhage</td>
<td>2 (5)</td>
<td>5 (8)</td>
<td>7 (5)</td>
<td></td>
</tr>
<tr>
<td>Alcohol/drugs</td>
<td>1 (2)</td>
<td>3 (5)</td>
<td>2 (7)</td>
<td>6 (5)</td>
</tr>
<tr>
<td>Hyponatremia and collapse</td>
<td>3 (5)</td>
<td>1 (4)</td>
<td>4 (3)</td>
<td></td>
</tr>
<tr>
<td>Peripheral neuropathy</td>
<td>3 (5)</td>
<td>3 (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migraine</td>
<td>1 (2)</td>
<td>2 (3)</td>
<td>3 (2)</td>
<td></td>
</tr>
<tr>
<td>Deteriorating Parkinson’s disease</td>
<td>1 (2)</td>
<td>2 (3)</td>
<td>3 (2)</td>
<td></td>
</tr>
<tr>
<td>Labyrinthine disorders</td>
<td>3 (5)</td>
<td>3 (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>2 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Tension headache</td>
<td>2 (3)</td>
<td>2 (1.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transient global amnesia</td>
<td>1 (2)</td>
<td>1 (4)</td>
<td>2 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Hypoglycemic collapse</td>
<td>1 (2)</td>
<td>1 (4)</td>
<td>2 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Cervical spondylotic myelopathy</td>
<td>1 (2)</td>
<td>1 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal meningitis</td>
<td>1 (2)</td>
<td>1 (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values in parentheses for total nonstrokes are percentage of admissions. All other values in parentheses are percentage of nonstrokes.

THINK
Seizures
Sugar
Sepsis
Syncope
Somatisation (sorry!)
Stroke (previous) with intercurrent illness
What do we do in clinic?
Consultation…

• “Blurred vision”

• What else do you need to know?
• …..Tell the story
• If you cant relay the story, you’ve not taken a good enough history
• 64 year old woman.
• 20 attacks of pins and needles in her right arm and leg over 6 weeks.
• “Been having TIAs for weeks”
• Sensation started in foot and over 1 minute spread “like water running up her leg”. Each attack was the same.
• CT head showed glioma in the left parietal lobe.
• Diagnosis: partial sensory seizures.
10 minute consultation: ‘…? TIA or Stroke…’

**Key areas:**

1. Is it sudden (and maximal at onset)?
2. Is it focal (can it be localised and lateralised)?
3. Has it resolved?
4. Is there impairment of consciousness?

If 1 + 2 + 3 are correct, ABCD2 score and ‘triage’
If 1 + 2 incorrect OR 4 correct could this be stroke mimic

5. What is their driving status?
Clinical Cases

Case 1

- 65 year old man. Voluntary in-patient. Due for discharge in two days
- Right UL clumsiness
- Expressive dysphasia
- Duration 2 hours
- BP 170/90
- Type 2 DM, IHD, smoker
- SR
- Driver
- Is it sudden?
- Is it focal?
- Is there impairment of consciousness?
- Has it resolved?
Case 1 cont

- TIA
- L hemisphere and involves speech / language centre plus motor fibres
- What do you do?

- ABCD2 score 7
<table>
<thead>
<tr>
<th>RISK</th>
<th>ABCD² Score</th>
<th>2 Day risk</th>
<th>7 Day risk</th>
<th>90 day risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>0 - 3</td>
<td>1%</td>
<td>1.2%</td>
<td>3.1%</td>
</tr>
<tr>
<td>MODERATE</td>
<td>4 - 5</td>
<td>4.1%</td>
<td>5.9%</td>
<td>9.8%</td>
</tr>
<tr>
<td>HIGH</td>
<td>6 - 7</td>
<td>8.1%</td>
<td>11.7%</td>
<td>17.8%</td>
</tr>
</tbody>
</table>
Now what?

- Admitted LGI CDU
- Aspirin 300mg
- Simvastatin 40mg
- FBC, U&E, Cr, Glu, Chol, PV, Clotting
- 12 lead ECG

- USCD ASAP if fit and willing for surgery
Successful Left CEA

Carotid Endarterectomy

Home after 72 hours
Effect of carotid endarterectomy stratified by time from last event to randomisation. Ipsilateral ischaemic stroke and operative stroke or death.

ARR (%), 95% CI

Weeks between symptomatic event and randomisation

Lancet 2004; 363: 915-24
Advice

• Healthy lifestyle
• Non-pharmacological treatment BP (with / without drug treatment)
• Aspirin (plus DP-MR) or Clopidigrel
• Simvastatin

• Driving
God makes the snake

Boy... These things are a cinch!
But what if....

• Not admitted
• Next day wife finds him collapsed after breakfast. Dials 999.
• Attends ED after 1 hour
• Drowsy but rousable
• Dense R hemiparesis
• Aphasic
• R HH

• What do you do?
I think I have had a stroke

- Is it sudden? Yes
- Is it focal? Yes
- Is there impairment of consciousness? Yes, Left hemisphere
- Has it resolved? Yes

No, therefore Brain attack or stroke

No, drowsiness
• ABC (DE)
• Blood tests
• ECG
• Neuroimaging

• What treatment(s) do you consider?
‘Not for thrombolysis’

- Assess swallow (?NBM)
- ASA 300 oral / 600 rectum
- Simvastatin 40
- ?NGT and feed
- IVI (saline)
- Admit to stroke unit
- Physiological monitoring
- Early PT / OT / SLT
- (DVT prophylaxis)
Progress

• Admitted to ASU
• Aspiration pneumonitis
• Dies
OR Progress 2

- Recovers from aspiration pneumonitis
- PE
- Prolonged rehabilitation (5 months)
- Swallowing does not return
- PEG

- Discharged to Nursing Home care

- Dies 7 months after his stroke
Case 2

76 year old female RH resident seen in your Clinic (with daughter) for depression.

PMH: ‘previous stroke’

That morning, developed ‘confusion’ over a 20 minute period while eating breakfast then left limb weakness then becomes vacant. Similar previous episode(s).

Daughter – “she’s been having more of these TIAs””
• Is it sudden?
• Is it focal?
• Is there impairment of consciousness?
• Has it resolved?

• What do you do?

Yes

Yes (ish!)

Yes. Right hemisphere.

Hell Yes
Stroke mimic – Localisation Related Epilepsy

Old notes and information from carers
5 admissions since stroke with left hemianopia, left hemiparesis and ‘confusion’
5 CT head scans ‘no change….established Infarct’

Secondary prevention
Antiepileptic drugs
Case 3

• 82 year old male
• Seen in clinic with mood disturbance, cognitive slowing
• Intermittent (but progressively worsening) SLD: Global dysphasia
• No motor deficit
• Vision ‘worsening’
• PMH: IHD, BP+
I think I have had a stroke!

- Is it sudden? NO, fluctuating
- Is it focal? Yes. Left hemisphere
- Is there impairment of consciousness? No
- Has it resolved? No
Case 4

- 67 year old (retired) merchant banker
- In clinic for anxiety
- Clumsiness right hand
- 2mins 12 seconds
- On Warfarin for AF
- INR yesterday 1.8
- BP 120/70

?
Outcome

- TIA: ABCD2 score 3 – refer to TIA clinic
  OR
- Sent to ED
- INR 1.9
- “probably a TIA – refer to TIA clinic”

- 2 hours later collapses in office
What if one split second sent your life in two completely different directions? Helen is about to find out that romance was never this much fun.
Outcome 2

- Sent to ED
- INR 1.9

- Discussed with “Neurovascular team”
- Urgent (next slot CT head)
• Warfarin reversed with PCC (Beriplex) and Vitamin K
• No further episodes
• Discharged next day
• Repeat 6/52 MRI/MRA normal
• Started on aspirin 75mg in clinic

• Learning
Factor activity vs INR
(Vit K-dependent Coagulation factors II, VII, IX, X,)

Case 5

- 45 year old lady
- Sudden delirium and agitation while out shopping with husband
- Aggressive and agitated
- Usually fit and well
- Married with two children
- Psychiatric assessment requested for sectioning under MHA
Case 5
Case 6

• 78 year old woman. At the theatre. Friends brought her up to ED because they think she is confused.

• Makes perfect sense when you talk to her, but then she keeps asking “why are we here”, “were we not going to the theatre tonight”. Says to her friend - “when did you dye your hair blond”. Doesn’t remember your name, but otherwise has a normal neurological examination.

• What would you do?

• Diagnosis? Transient global amnesia.
TGA - Clinical features

• Sudden onset
• Anterograde amnesia
• Repetitive questioning
• Retrograde amnesia
  (variable, often spotty)
• Normal alertness, behavior, & cognition
• Non-focal neuro exam
• Resolution within 24 hrs
Reported triggers

- Emotional upset
- Cold water exposure
- Sexual activity
- Vigorous exercise
- Valsalva
TGA -- Criteria for Dx

- Witnessed onset
- Anterograde amnesia following the attack
- No clouding of consciousness or loss of personal identity
- No cognitive impairment
- No focal findings
- No epileptic features
- No recent head trauma, no seizure within 2 yrs
- Resolution within 24 hrs
Differentiating features

• Repetitive questioning
• Complex acts and instructions
• Memory gap for the event
• Rapid onset
• Duration <24hrs
Case 7

- 85 year old man
- 11am - coming out of the kitchen
- couldn’t recall recent events
- crossword partially completed
- memories of the day slowly returning
- felt very tired and “fuzzy headed”
- three previous episodes in two years
- Further episode with preceding anxiety, agitation and complaining of burning smell reported by friend
Transient epileptic amnesia

- Short attacks, multiple attacks
- No repetitive questioning
- Anterograde amnesia may be only partial
- Altered behavior
- Alteration in consciousness
- Other features of epilepsy
  (eg, automatisms, other seizures, EEG, response to anticonvulsants)
Summary

• TIA is a diagnosis obtained by the History
• <5 minutes
• The history will never be easier than on the first time you obtain it from a patient.
• Never skip the details.
• Get your patient to describe the symptoms explicitly.
• The risk of a recurrent stroke is high after TIA (5-20%)
• Start antiplatelets ASAP if TIA
• Driving advice
• Time window for prevention is short.
• High risk patients need to be seen emergently.
• TIA and Stroke: Mimics are much more common than you think!

• The rest is easy!
• If in doubt – give us a call! Get what YOU need from us
Atypical antipsychotics – avoid whenever possible especially in patients with dementia

Consider careful switch in patients with acute stroke

ECT – no clear contraindication in acute stroke if patient’s best interests
Risk of Death League Table

- parachuting
- rock climbing
- motorbiking
- space flight
- bungee jumping
- cycling
- scuba diving
- trains
- nuclear power

1:100 1:1000 1:10,000 1:100,000 1:1000,000 (safe)
Root Causes of Sentinel Events (All categories; 1995-2002)

- Communication
- Orientation/training
- Patient assessment
- Availability of info
- Staffing levels
- Physical environment
- Continuum of care
- Competency/credentialing
- Procedural compliance
- Alarm systems
- Organization culture

Percent of events: 0 10 20 30 40 50 60 70

- Joint Commission of American Healthcare Organisations
**Situation:**
I am (name), a nurse on ward (X)
I am calling about (child X)
I am calling because I am concerned that...
(e.g. BP is low/high, pulse is XXX temperature is XX,
Early Warning Score is XX)

**Background:**
Child (X) was admitted on (XX date) with
(e.g. respiratory infection)
They have had (X operation/procedure/investigation)
Child (X)’s condition has changed in the last (XX mins)
Their last set of obs were (XXX)
The child’s normal condition is...
(e.g. alert/drowsy/confused, pain free)

**Assessment:**
I think the problem is (XXX)
and I have...
(e.g. given O₂/analgesia, stopped the infusion)
OR
I am not sure what the problem is but child (X)
is deteriorating
OR
I don’t know what’s wrong but I am really worried

**Recommendation:**
I need you to...
Come to see the child in the next (XX mins)
AND
Is there anything I need to do in the meantime?
(e.g. stop the fluid/repeat the obs)

Ask receiver to repeat key information to ensure understanding

The SBAR tool originated from the US Navy and was adapted for use in healthcare by Dr M Leonard and colleagues from Kaiser Permanente, Colorado, USA
If you require further copies quote SC043
Anatidaephobia: The fear that somewhere, somehow, a duck is watching you.