**Main Stroke Protocol**

*Use for all suspected stroke / TIA patients*

**Suspected stroke or TIA (see Box 1)**

- **Ongoing symptoms and less than 3 hours** from symptom onset?
  - **YES**
    - **STOP HERE, DO NOT GIVE ASPIRIN, and start THROMBOLYSIS PROTOCOL**
  - **NO**
    - **If not considering thrombolysis give aspirin 300 mg (po/pr). DO NOT WAIT FOR CT SCAN TO EXCLUDE BLEED**

**If symptoms completely resolved and lasted < 24 hours?**

- **YES**
  - **STOP HERE and start TIA PROTOCOL**
    - **[N.B. if not fully resolved treat as stroke]**
- **NO**
  - **Arrange urgent CT head (within 30 minutes)**
    - **[If any of Box 2 apply, must be next available slot]**
  - **Perform immediate investigations:**
    - FBC, U&E, glucose, cholesterol, LFTs, clotting.
    - ECG, Chest X-Ray. Plasma viscosity if >60 yrs old.
  - **MMASA swallow screen if trained (not bedside swallow)**
    - If not trained, or MMASA failed, keep patient NBM
  - **Intracranial haemorrhage (ICH) on CT head? (See Box 3)**
    - **YES**
      - **Acute Management of Intracranial Haemorrhage**
        - Stop statin, aspirin and other antiplatelets
        - Do not treat BP acutely unless signs of accelerated hypertension (BP>185/110 +papilloedema +/-coma)
        - If on warfarin, reverse (guideline on warfarin chart).
        - Consider neurosurgery referral (Box 4)
    - **NO**
      - **Minor stroke (NIHSS* <= 4) and < 48 hrs from onset of symptoms?**
        - **[see web site; if in doubt, don’t give]**
          - **YES**
            - **Aspirin intolerant?**
              - **YES**
                - **Clopidogrel 300 mg single dose (in addition to aspirin already given)**
              - **NO**
                - **Clopidogrel 75 mg single dose**
            - **NO**
          - **Acute management**
            - **Inform stroke team** (stroke co-ordinator (bleep 1464) if available, otherwise call registrar) and admit direct to Ward 106.
            - Avoid anticoagulants acutely including prophylactic low molecular weight heparin (risk of haemorrhagic transformation).
            - **Stop warfarin** if risk not too great (e.g. mechanical mitral valve). Seek specialist advice if in doubt.
            - Nil by mouth until swallow screen (MMASA) performed by trained staff or SALT review if unavailable / inappropriate
            - Consider early NG tube placement if nil by mouth (avoid for 24 hours following thrombolysis)
            - IV fluids 2-3 litres / 24h (0.9% saline, **avoid glucose**) even if NG tube inserted (until NG feed established)
            - If SaO₂ < 95%, give 24-35% oxygen to maintain SaO₂ > 95%
            - Sliding scale insulin for 24 hours if glucose > 11 mmol/l (target 4-11 mmol/l)
            - Continue previous antihypertensives. No new BP drugs for 7 days
            - Do not start statin before 72 hours from onset. Avoid in ICH.
            - Antibiotics for infection.
            - Avoid urinary catheterization (high risk of sepsis and death).
            - Consider in/out catheter for retention.
            - Monitor: Neurological status (Glasgow Coma Scale).
              - Oxygen sats, BP, pulse, temperature, respiratory status
            - **Look out for:** UTI, constipation, DVT, aspiration pneumonia

**Indications for urgent repeat CT head:**

- New or worsening severe headache
- Clearly deteriorating consciousness
- Clinical signs of mass effect (**see web site**)
- Sustained (>1 hr) significant increase in BP
- Clearly worsening stroke signs

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**Box 1 – Features of stroke / TIA**

- Sudden onset of focal neurological deficit
- If subacute onset, look for typical syndrome
- Seizure (e.g. limb twitching) at onset makes ischaemic stroke less likely but does occur. It is more common in intracerebral haemorrhage.
- Loss of consciousness is unusual in stroke. Look for signs of brainstem dysfunction.
- For diagnostic scores e.g. ROSIER, **see web site**

**Box 2 – Indications for immediate CT scan**

- Known bleeding tendency
- Depressed / deteriorating level of consciousness
- Unexplained progressive / fluctuating symptoms
- Papilloedema, neck stiffness, or fever
- Severe headache at onset of stroke symptoms
- Head injury (risk of subdural haematoma)

**Box 3 – Mimics of haemorrhage on plain CT**

- Calcification of pineal gland, choroid plexus, and basal ganglia (**see web site images**)

**Box 4 – Indications for neurosurgical referral**

- Seek specialist stroke advice first if possible
- Discuss with neurosurgical registrar on call if declining conscious level and:
  - MCA stroke >50% MCA territory if age ≤ 60
  - Large MCA stroke (haemorrhage or infarct) with significant midline shift
  - Cerebellar stroke (haemorrhage or infarct) with effaced 4th ventricle (**see web site images**)

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**For supporting information e.g. images & documents, refer to:**

Other investigations (not performed on every patient)
- Plasma viscosity. Do in all over 60s with suspected stroke.
- Carotid Dopplers. Patients ≤ 85 years (seek specialist advice if older but biologically young), AND TIA or good neurological recovery from stroke, AND No life-threatening co-morbidity
- CT angio. aortic arch + carotids. Seek specialist advice. Useful when carotid dopplers not diagnostic, e.g. calcified plaque, stenosis 50-70%, or suggest carotid occlusion. Note risk of contrast nephropathy.
- Echo is not a routine investigation for all strokes. If indicated, can usually be done as outpatient.
  - Not for simple AF.
  - Consider if cardioembolic source possible and cardiac murmur or abnormal cardiac silhouette
- MRI brain (e.g. DWI, MRA) is a specialist investigation when used in the diagnosis of stroke. It should be only be ordered on the advice of the stroke team.

SECONDARY PREVENTION

Antiplaletots / anticoagulants

Atrial fibrillation, mild / moderate stroke (not severe stroke)
Aspirin 75mg od + clopidogrel 75 mg od 2 weeks. If warfarin considered repeat CT head 2 weeks post stroke to exclude bleed, then start warfarin (target INR 2.5). If patient unsuitable for warfarin give aspirin 75mg + clopidogrel 75mg indefinitely.

Atrial fibrillation, severe stroke
Aspirin 300 mg daily (po / pr) for 2 weeks then treat as above.

No atrial fibrillation, minor stroke (NIHSS 4 or below)
Aspirin 75 mg daily + clopidogrel 75mg daily for 1 month, then change to Asasantin 1 tab. bd for 2 yrs, then aspirin 75 mg od.

No AF, NIHSS 5 or more, or presenting > 48 hrs from onset
Aspirin 300 mg daily (po / pr) for 2 weeks then change to Asasantin 1 tab. bd for 2 years, then aspirin 75 mg od.

Notes:
Always prescribe aspirin po / ng / pr, even if patient is not nil by mouth.
Asasantin and modified release dipyridamole cannot be given NG. Instead use clopidogrel 75 mg od if nil by mouth with NG tube, or tablets need crushing e.g. dysphagia (in preference to immediate release dipyridamole).

Use clopidogrel 75 mg od in place of Asasantin or aspirin if patient intolerant of either drug.

DVT / PE prophylaxis:
- Avoid TED stockings. Avoid LMWH in the acute phase of both ischaemic and haemorrhagic stroke. In ischaemic stroke, after 14 days from symptom onset, LMWH may be appropriate in selected patients with low bleeding risk and high risk of venous thromboembolism (e.g. major restriction of mobility; previous history of VTE; dehydration; malignant disease). This should be a consultant led decision.

Antihypertensives:
- In the absence of accelerated hypertension, do not treat blood pressure until day 7 after stroke. Then treat if SBP ≥ 110 mmHg and no symptoms of postural hypotension. Start perindopril 2 mg od; 7 days later increase to 4 mg; 7 days later add indapamide MR 1.5 mg od. Subsequent Increases if hypertensive. Monitor U&Es

Cholesterol lowering drugs:
- Simvastatin 40 mg od if chol. ≥ 3.6 and not on statin (or on pravastatin). If on treatment & cholesterol ≥ 3.6, increase according to cholesterol lowering effect: Simvastatin 40 mg → Atorvastatin 40 mg → Rosuvastatin 10 mg. Add other agents if required. Note: It may be appropriate to start a statin after a period in patients with raised cholesterol and haemorrhagic infarction rather than primary ICH. Seek specialist advice.

Other measures:
- Good diabetic control
- Lifestyle advice: Smoking cessation, diet, exercise, alcohol

Driving (see http://www.dft.gov.uk/dvla/medical/ataglance.aspx)
- All TIA and stroke patients must not drive for 1 month after single event.
- Patients with >1 event in 1 month should not drive for 3 months and should contact the DVLA.
- All patients may resume driving after this time if clinical recovery is complete.
- All patients must notify DVLA if there is a focal neurological deficit after 1 month.
- Vocational license / Group 2 (e.g. HGV) drivers should contact DVLA and not drive for 12 months.

Useful telephone numbers:
- Acute stroke unit. Frenchay Ward 106, ext 03106 / 03934
- Stroke rehab unit. Southmead Ward 1, ext 35064
- Stroke co-ordinators: Frenchay: Jo Upton, Mon - Fri, 9am - 5pm, bleep 1464
  - Southmead: Jane Wroath. Tue - Fri bleep 9325. Or message via ext 35064
- Stroke consultant: Dr Neil Baldwin, sec Frenchay ext 06636, sec Southmead ext 35368
- Useful websites:
  - Stroke information and patient support: Stroke Association: www.stroke.org.uk
  - Bristol Area Stroke Foundation: www.stroke-bristol.org/
  - NICE acute stroke and TIA guidelines: http://guidance.nice.org.uk/CG68