Trust Guideline for Urgent Brain Imaging and Management of Suspected Subarachnoid Haemorrhage

A Clinical Guideline recommended

For use in:	Accident & Emergency, Acute Medical Unit, Medical wards
By:	Medical staff
For:	Adult patients presenting with suspected subarachnoid haemorrhage
Division responsible for document:	Medical
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Assessed and approved by the:	Clinical Guidelines Assessment Panel (CGAP) If approved by committee or Governance Lead Chair's Action; tick here ☑
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Compliance links: *(is there any NICE related to guidance)*	None
If Yes - does the strategy/policy deviate from the recommendations of NICE? If so why?	N/A

This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

Version and Document Control:

Version Number	Date of Update	Change Description	Author
2.2	22/03/2022	Reviewed with no clinical changes.	Godwin Mamutse

This is a Controlled Document

Printed copies of this document may not be up to date. Please check the hospital intranet for the latest version and destroy all previous versions.

Quick reference guideline/s

Objective/s

To outline the investigations (imaging and CSF analysis) and initial management of suspected subarachnoid haemorrhage (SAH) at the Norfolk and Norwich University Hospital (NNUH)

Rationale

Subarachnoid haemorrhage (SAH) from a ruptured aneurysm carries a significant risk of disability or death (around 30% mortality) and the diagnosis is easily missed if appropriate investigation does not take place. Since there is a 20-40% risk of early re bleed, which carries a 75% chance of death or disability, prompt diagnosis and treatment is required.

CT brain scan will be performed urgently, with an aspirational target of within 1 hour of request, once SAH is suspected. CT brain scan, without contrast, is highly sensitive for the detection of subarachnoid blood but the sensitivity declines over time, from 95-100% in the first 24 hours to around 50% after 5-7 days.

Where CT brain imaging does not demonstrate subarachnoid blood, CSF bilirubin spectrophotometry is required as confirmatory evidence of a subarachnoid haemorrhage. As the formation of bilirubin in CSF may be delayed by 12 hours from symptom onset, lumbar puncture (LP) should be performed **at least 12 hours after symptom onset**.

CSF bilirubin spectrophotometry may remain positive for up to 2 weeks after headache onset. If the CT brain scan and CSF examination within 14 days of initial symptoms are both negative, SAH has been ruled out. Beyond this time period blood products may have been reabsorbed, so consideration should be given to performing CT angiography (CTA) of intracranial vessels to look for an aneurysm, usually in consultation with the regional vascular neurosurgery service at Addenbrooke's Hospital.

Broad recommendations

Subarachnoid haemorrhage (SAH) presents with sudden onset severe headache. It is estimated that the diagnosis is missed in 20-50% of cases at first presentation and the incidence of approximately 7 per 100 000 person years means that a GP will see about one patient with SAH every 7 years. In order not to miss the diagnosis, it must be suspected much more often than the diagnosis is actually confirmed. Therefore, all "first or worst" headaches arising within a few minutes require investigation.

The algorithm above outlines the expected investigation of patients presenting to the NNUH with symptoms suggestive of SAH. Further angiographic investigation of acute SAH to detect an aneurysm takes place at the regional neurosurgery centre in Cambridge, where the aneurysm can be treated by coiling or clipping. This requires transfer of the (often critically ill) patient following confirmation of the diagnosis, adding delay to the management of patients with SAH presenting to the NNUH. Given the significant risk of re-bleeding, which may be fatal or disabling, and the improved outcome with early definitive treatment of an aneurysm, prompt transfer must take place. This document intends to aid decision making so that delay can be kept to a minimum. The following sections summarise initial investigations and management of patients with suspected or confirmed SAH.

Investigations

- Urgent CT brain scan, within an aspirational target of 1 hr from request (**ensure ICE request is completed before contacting duty radiologist with request for scan**)
- If CT brain scan is normal, SAH should be excluded by performing a lumbar puncture (LP) **between 12 hrs and 14 days** after symptom onset, measuring opening pressure and submitting CSF for:
    - Xanthochromia (bilirubin spectrophotometry)
        - submit the least blood stained specimen, usually the last collected, **covered in tin-foil** to prevent bilirubin breakdown
        - submit paired serum blood sample for bilirubin measurement
        - record date and time of headache onset and the date and time of the LP on the request card
        - clearly state the date and time of any LP that has been performed recently- the result may be **falsely** consistent with SAH if the LP was performed within the previous 14 days
        - avoid using the pneumatic tube system to transport the sample
    - MC&S, glucose (with paired blood glucose sample) and protein
- When lumbar puncture performed, **immediately send sample to Clinical Biochemistry, ensuring technologist is informed by telephone**, for centrifugation before bilirubin spectrophotometry. This is especially important if tap was traumatic.

Immediate management of confirmed subarachnoid haemorrhage

- If consciousness impaired, check and maintain airway
- 1-2 hourly BP, Pulse, Respiration, Oxygen saturations, Temperature and neurological observations
- Bed rest with maximum 30 degree elevation
    - Patient can get up for commode use only
    - Apply TED stockings
- Keep nil by mouth
- Analgesia: Paracetamol 1g QDS ± Codeine Phosphate 30-60mg QDS
- Nimodipine 60mgs 4 hourly, orally or via nasogastric tube (tablets may be crushed)
- If no contraindication, give sodium chloride 0.9%, at least 3 L every 24 hr
    - Do not use Gelofusine or Dextrose or Dextrose Saline

- Control hypertension by maintaining systolic BP between 120 and 150mmHg
- Contact on call Neurosurgical Registrar at Addenbrooke's Hospital to arrange urgent transfer for CTA or digital subtraction angiography to rule out or treat aneurysm (recommendation within 24 – 48 hours from ictus)

    - An anti-emetic should be given prior to journey

Clinical audit standards

This guideline will be audited periodically to ensure that the standards laid out are being met.

The audit results will be sent to the Clinical Directors of Radiology and Neurology who will review the results and make recommendations for further action.

Summary of development and consultation process undertaken before registration and dissemination

Recommendations from an audit on the management of subarachnoid haemorrhage included a requirement for a guideline on subarachnoid haemorrhage. The first edition of this guideline was circulated for comment to consultants in A&E, Critical Care, Radiology and Neurology. Comment regarding CSF analysis has been sought from Dr Javier Gomez, Consultant Clinical in Clinical Biochemistry.

This version has been endorsed by the Clinical Guidelines Assessment Panel.

Distribution list/ dissemination method

This guideline should be disseminated to Governance Leads and Clinical Directors within the NNUH.

References

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