

# CSF AND XANTHOCHROMIA PROTOCOL

## 1. PRINCIPLE

Subarachnoid haemorrhage (SAH) should be considered in any patient presenting with sudden-onset (“thunder-clap”), severe and unusual headache with or without associated alteration in consciousness.

If SAH is suspected:

- CT brain scan should be undertaken immediately if the patient has an impaired level of consciousness and **within 12 hours** in all patients.
- If the CT scan is negative or equivocal, take a cerebral Spinal Fluid (CSF) sample **12 or more hours after** onset of symptoms.
- Bilirubin in CSF may be consistent with a bleed into the CSF. Its formation after haemorrhage is a time-dependent process that can be detected by spectrophotometric scan.
- Bilirubin will not be detectable soon after the event (e.g. onset of severe headache)
- CSF for Xanthochromia screening must therefore be collected **12 hours or more** after a suspected event to prevent a misleading (false) negative result
- CSF should not be collected more than two weeks after a suspected event as Bilirubin may no longer be detectable.

**Please note:** lumbar puncture cannot be repeated within two weeks for analysis of Xanthochromia.

## 2. SAMPLE REQUIREMENTS

**Avoid contamination of the sample with iodine based skin disinfectants which may cause in vitro’ methaemoglobin formation**










**Please note: 1.0ml is approximately 20 drops from the luer connector on a needle**

- Please contact the laboratory prior to sending a CSF specimen for analysis.
- See Table 1 for container and volume requirements
- Tubes must be sequentially numbered.

Label all samples with:

- Patient’s full name
- Hospital number
- Date of birth
- Ward
- Time CSF was collected
- Bottle number

Table 1: Sample Requirements for CSF including Xanthochromia.

Bottle Number	Test required	Sample / tube	Minimum volume	Special Requirements
1	Microbiology	CSF in plain universal 	0.5mL	<b>Do NOT send via the 'POD'</b>
2	CSF protein (Biochemistry)	CSF in plain universal 	0.5 mL	CSF contaminated with blood is unsuitable for Protein analysis. <b>Do NOT send via the 'POD'</b>
2	CSF Oligoclonal Bands	CSF in plain universal 	0.1mL CSF Protein and Oligo = 0.6mL	<b>Do NOT send via the 'POD'</b> Must be paired with a serum Oligoclonal band request 
3	Microbiology	CSF in plain universal 	0.5mL	<b>Do NOT send via the 'POD'</b>
4	CSF Xanthochromia (Biochemistry)	CSF in plain universal 	Protein and XAN =650 µl XAN only = 450 µl	<b>Protect from Light</b> Specimen MUST arrive in Biochemistry within one hour of Lumbar Puncture <b>DO NOT send via the 'POD'</b>
5	CSF glucose (Biochemistry)	Fluoride Oxalate (Grey).  Paediatric grey topped specimen tube may be used for small volumes.	0.4mL	<b>Do NOT send via the 'POD'</b>
<b>PLASMA</b>	Plasma Glucose (Biochemistry)	Fluoride Oxalate (Grey) 	1.0mL	
<b>SERUM</b>	Bilirubin and Total Protein or Oligoclonal if required (Biochemistry)	Gold top gel tube 	1.0mL	

### 3. REQUEST

Please give the following information on the request via Sunrise. This is essential for the interpretation of Xanthochromia results.

- Result of the CT scan
- Time of suspected event/ onset of symptoms
- Time of lumbar puncture (must be >12 hours post event)
- Clinical indication for request.
- If only one Universal specimen is received and no order of priority is stated on the request form, CSF Protein will be measured first.
- If there is then insufficient sample for Xanthochromia, this will be reported as 'Insufficient'.

### 4. TRANSPORTING THE SAMPLE TO THE LABORATORY

Samples for Xanthochromia **MUST** be protected from light

Samples for Xanthochromia **MUST** reach the laboratory within 1 hour of lumbar puncture. This is to ensure specimens are preserved for analysis.

The 'POD' system **MUST NOT** be used to transport any CSF specimen to the laboratory- in particular Xanthochromia.

### 5. SERVICE

CSF protein and glucose are available 24 hours a day 365 days a year.

Contact the Biomedical Scientist out of hours if a sample needs processing.

#### Xanthochromia analysis

- Available 09:00 to 17:30, 7 days a week.
- Is not performed out of these hours, but samples can be prepared out of hours to preserve them for analysis on the next working day.
- Is performed in Biochemistry at the Tunbridge Wells Hospital only.
- Xanthochromia samples received by Maidstone Hospital Biochemistry will be sent to the Tunbridge Wells Hospital on the next routine transport for analysis.
- All samples received before 16h30 on weekdays by the Biochemistry department at the Tunbridge Wells Hospital will be analysed the same day, with a result available by 17:30.

### 6. ENQUIRIES

Please contact Biochemistry:

- At Tunbridge Wells Hospital on ext. 35221 or Biomedical Scientist if out-of-hours (bleep 2367).
- At Maidstone ext. 24461 or bleep 1365.

This protocol is based upon the 'Revised National Guidelines for Analysis of CSF for Bilirubin in Suspected Subarachnoid Haemorrhage' (produced by UK National External Quality Assessment Scheme (NEQAS) Specialist Advisory Group for EQA of CSF Proteins and Biochemistry). Ann Clin Biochem 2008; 45: 238-244)