

**Central Nervous System (CNS) Infection**

**Subarachnoid Haemorrhage (SAH)**

Severe headache  
Cognitive or behavioural change  
Reduced Glasgow Coma Score (GCS)  
Focal neurological weakness  
Seizures  
Meningism (neck stiffness, photophobia, vomiting, Kernig's sign)

**Fever or febrile prodromal illness**

- Rash
- Also consider additional pathogens if immune compromise

**Sudden-onset severe headache**

- Risk factors: cocaine, smoking, alcohol, female, hypertension, family history, postmenopausal, connective tissue disease

**Contraindications to immediate Lumbar Puncture (LP)**

Reduced GCS $\leq$ 13 or declining $>$ 2	Skin infection at LP site
Focal neurological weakness	Signs of brain shift: • Cushing's reflex (high BP and low heart rate) • Altered pupillary responses / ocular palsies • Flexor/extensor posturing • Abnormal respiratory pattern
New-onset seizures	
Systemic shock	
Coagulation disorder	
Known severe immune compromise	
<b>If strong suspicion of meningococcal septicaemia, the diagnosis may be made on blood culture alone</b>	

Yes

No

CT scan

No radiological contraindications to LP

Immediate: Lumbar Puncture including virology

CT scan









CT normal

CT demonstrates bleed

Angiography

Discuss with Neurosurgeons

At least 12 hours after symptom onset: Lumbar Puncture including xanthochromia  
(LP for xanthochromia cannot be repeated due to high likelihood of a false positive result)

Diagnostic Question					
? CNS infection <b>only</b>		Immediate lumbar puncture: collect samples 1 to 3 (CSF), 5 (CSF) , 6 (blood) and 8 (blood) only			
? SAH <b>and</b> CNS infection		Collect samples 1 to 5 (CSF) and 6 to 8 (blood)			
? SAH <b>only</b>		CT scan normal and $\geq 12$ hours after symptom onset: collect samples 1 to 4 (CSF) and 7 (blood) only			
Order	Sample	Container	Volume	Tests	Specimen Transport
1st	CSF	Conical tube 	2.5 mL	Microbiology	<p><b>Microbiology/Virology</b></p> <p>Make an electronic request <u>or</u> write tests required + clinical details on Microbiology form</p> <p><b>Pneumatic tube</b> (RLH only)</p> <p>Routine dial: 4410 (RLH) / 4900 (AUH) OOH: Microbiologist on-call via switch</p> <hr/> <p><b>Biochemistry</b></p> <p>Make an electronic request</p> <p>Insert labelled minicollect tube into labelled bilirubin carrier tube</p> <p><b>Protect from light (envelope)</b> <b>Hand deliver within 30 minutes</b> <b>Do not use pneumatic tube</b></p> <p>RLH lab: x4235 (24/7) AUH lab: x3241 (bleep 4663 OOH)</p>
2nd	CSF	Paediatric F/Oxalate 	0.5 mL	Glucose + Protein	
3rd	CSF	Conical tube 	2.5 mL	Microbiology	
4th	CSF	Minicollect and carrier 	1 mL (Fill to $\uparrow$ )	Xanthochromia	
5th	CSF	Conical tube 	2 mL	Virology	
6th	Blood	Serum Gel (mustard/gold) 	4 mL	Virology	
7th	Blood	Serum Gel (mustard/gold) 	4 mL	Liver Profile	
8th	Blood	Fluoride EDTA (grey) 	3 mL	Glucose	