Whittington Health NHS

CT Brain and Lumbar Puncture in Suspected Acute Meningitis Guideline

Subject:	CT Brain and Lumbar Puncture in Suspected Acute Meningitis
Guideline Number	IPC/Micro 33
Ratified By:	Clinical Guidelines Committee
Date Ratified:	July 2015
Version:	2
Policy Executive Owner:	Dr Richard Jennings Medical Director
Designation of Author:	Dr Ben Killingley Acute Medicine Consultant
Name of Assurance Committee:	Infection Prevention & Control Committee
Date Issued:	July 2015
Review Date:	3 years hence
Target Audience:	All Physicians, Radiologists and Microbiologists
Key Words:	Meningitis, CT, Lumbar Puncture, Herniation, Coning, CSF

Version Control Sheet

Version	Date	Author	Status	Comment
1	January 2009	Dr Richard Jennings	In-active	
1	March 2012	Dr Richard Jennings	In-active	Reviewed – no changes made.
2	June 2015	Dr Ben Killingley	Active	Reviewed – minor changes made. Placed on new template.

➢ Criteria for use

This guideline is applicable to all adult patients with suspected acute meningitis **(see inclusion criteria below).**

This guideline should **NOT** be applied to patients in whom **alternative diagnoses are more likely than acute meningitis** – such diagnoses include subarachnoid haemorrhage, venous sinus thrombosis, space occupying lesion and chronic (eg. tuberculosis) meningitis **(see exclusion criteria below).**

➢ Background/ introduction

In cases of meningitis, unnecessary delay in performing lumbar puncture (LP) can lead to serious harm, delaying or preventing a correct or complete diagnosis. Lumbar puncture can be associated, however, with a risk of fatal cerebral herniation if there is unequal pressure between intracranial compartments. In such instances, computerised tomography (CT) of the brain can show appearances indicative of such pressures. This had led to varying practice in deciding when CT brain should be performed before proceeding to LP. Unnecessary CT scans can both delay correct diagnosis and treatment and expose the patient to unnecessary radiation. There is good evidence that clinical observations can be used to safely distinguish between these patients who should have a CT brain before LP and those who should not. A study of 301 patients with suspected meningitis, the absence of certain defined clinical signs and circumstances had a negative predictive value of 97% for normal CT[1].

Evidence-based consensus best-practice guidelines that address this issue exist both nationally[2] and internationally[3], although there is evidence that in the UK, at least, these guidelines are poorly adhered to[4.5]. The purpose of this guideline is to clarify the circumstances under which CT brain should precede LP in cases of suspected meningitis.

➢ Inclusion/ exclusion criteria

INCLUSION CRITERIA:

Acute meningitis should be suspected, and this guideline use, if:

1. Onset of symptoms within the previous 72 hours **AND either**

A. Fever, plus at least one out of the three symptoms of neck stiffness, headache and altered mental state, **OR:**

B. Neck stiffness, plus at least one out of the three symptoms of fever, headache and altered mental state.

EXCLUSION CRITERIA:

This guideline should **NOT** be applied to patients in whom **alternative diagnoses are more likely than acute meningitis** – this guideline should **NOT** therefore be used in patients who have either of the following:

1. Duration of symptoms over 72 hours
2. Very abrupt onset (ie. thunderclap) headache.

➢ Clinical management

Patients with suspected meningitis should have a CT brain prior to LP if one of the following is present:

- Age >60 years
- Focal neurological signs
- Reduced conscious level
- Fits
- Papilloedema
- Bradycardia and hypertension
- A known history of intracranial space-occupying lesion
- A known history of cancer
- A known immunocompromised state
- A known or high risk of HIV disease (which includes originating from a country with high HIV prevalence).

If all these signs and circumstances are absent, it is safe to proceed with LP without prior CT brain. If all these signs and circumstances are absent but the fundi cannot be clearly seen, it is still safe to proceed with LP.

Patients suspected of having bacterial meningitis who fulfil these criteria, and are going to have a CT brain, should be **treated immediately with antibiotics,** before the CT brain is undertaken. This treatment is described in the Whittington Intranet Clinical Guideline "Antimicrobials in Bacterial Infections in Adults."

Please see Whittington Health Guideline:

"Antimicrobials in Bacterial Infections in Adults."

➢ Further information

None.

➢ Contacts (inside and outside the Trust including out-of-hours contacts)

Radiology SpR – Extension 5888

Microbiology SpR – Extension 5085 or Bleep 3069. Out of hours call switchboard and ask for the on-call Microbiologist

Acute Medicine Consultant – via switchboard

➢ References (evidence upon which the guideline is based)

1. Computed tomography of the head before lumbar puncture in adults with suspected meningitis. Hasburn R, Abrahams J, Jekel J, Quagliarello VJ. *New Engl J Med. 2001Dec 13; 345(24):1727-33.*

2. Early management of suspected bacterial meningitis and meningococcal septicaemia in immunocompetent adults – second edition. Heyderman RS; British Infection Society. *J Infect. 2005 Jun; 50(5): 373-4.*

3. Clinical policy: critical issues in the evaluation and management of adult patients presenting to the Emergency Department with acute headache. Edlow JA, Panagos PD, Godwin SA, Thomas TL, Decker WW; American College of Emergency Physicians. *Ann Emerg Med. 2008 Oct; 52(4): 407-36.*

4. Quality of in-hospital care for adults with acute bacterial meningitis: a national retrospective survey. Gjini AB, Stuart JM, Cartwright K, Cohen J, Jacobs M, Nichols T, Ninis N. *QJM. 2006 Nov; 99(11): 761-9.*

5. Lumbar puncture in the management of adults with suspected bacterial meningitis – a survey of practice. Clark T, Duffell E, Stuart JM, Heyderman RS. *J Infect. 2006 May; 52(5): 315-9. Epub 2005 Oct 4.*

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		

	Title of document being reviewed:	Yes/No	Comments
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes	
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
Adherence	**Dr Ben Killingley**	**Audit tool/methods used previously**	**Once every 3 years**	**Audit Committee**