Ashford and St. Peter's Hospitals
NHS Foundation Trust

Meningitis guideline

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Guideline History		
Date	**Comments**	**Approved By**
22/01/2025	Re- write of guideline in line with NICE.	Paediatric guideline committee
11/2/26	Review of Guideline with addition of flow chart. Clarification around advice for Dexamethasone	Paediatric guideline Committee.

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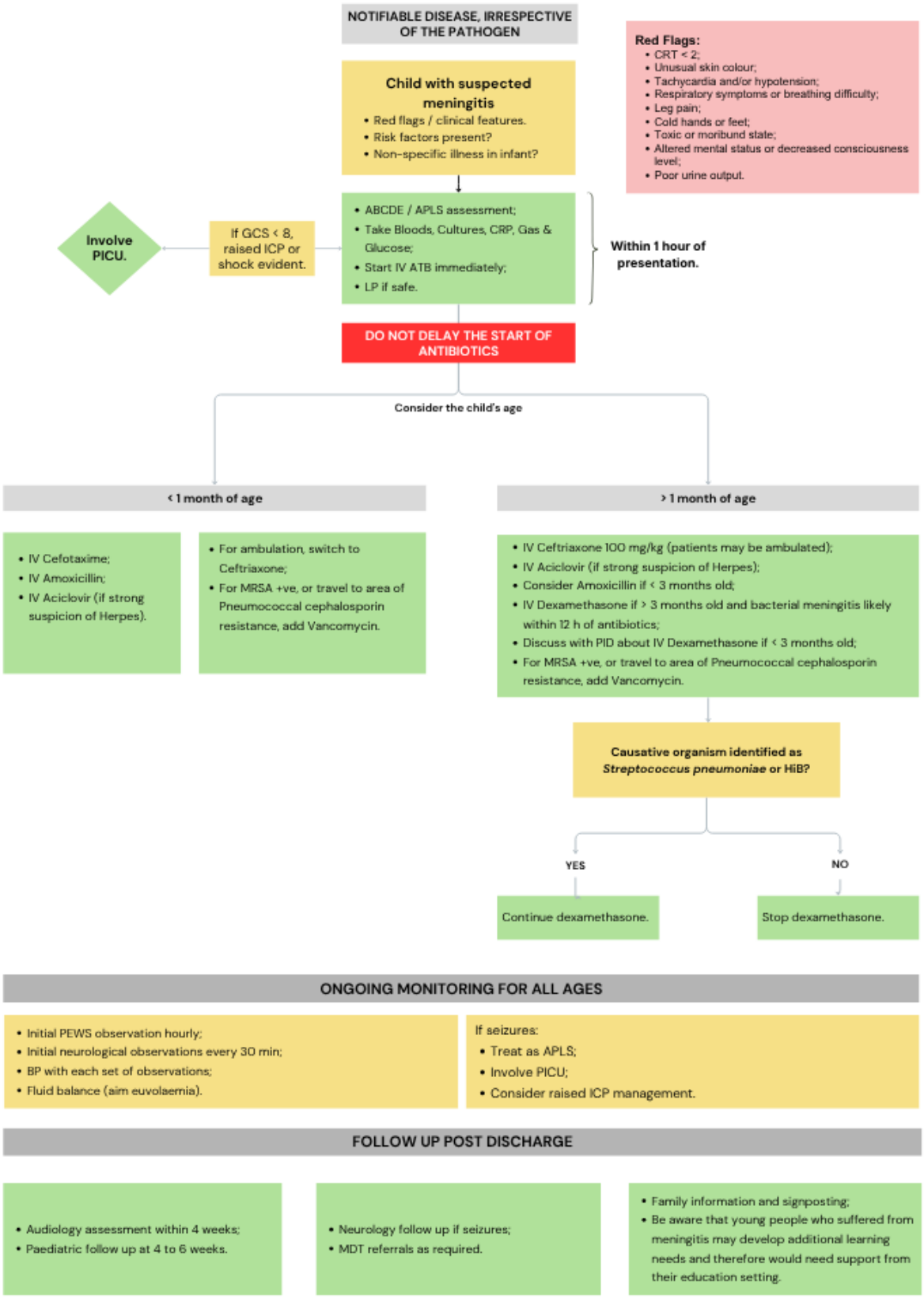
Meningitis


NOTIFIABLE DISEASE, IRRESPECTIVE OF THE PATHOGEN
Red Flags:
• CRT < 2;
• Unusual skin colour;
• Tachycardia and/or hypotension;
• Respiratory symptoms or breathing difficulty;
• Leg pain;
• Cold hands or feet;
• Toxic or moribund state;
• Altered mental status or decreased consciousness level;
• Poor urine output.
Child with suspected meningitis
• Red flags / clinical features.
• Risk factors present?
• Non-specific illness in infant?
• ABCDE / APLS assessment;
• Take Bloods, Cultures, CRP, Gas & Glucose;
• Start IV ATB immediately;
• LP if safe.
Within 1 hour of presentation.
If GCS < 8, raised ICP or shock evident.
Involve PICU.
DO NOT DELAY THE START OF ANTIBIOTICS
Consider the child's age
< 1 month of age
• IV Cefotaxime;
• IV Amoxicillin;
• IV Aciclovir (if strong suspicion of Herpes).
• For ambulation, switch to Ceftriaxone;
• For MRSA +ve, or travel to area of Pneumococcal cephalosporin resistance, add Vancomycin.
> 1 month of age
• IV Ceftriaxone 100 mg/kg (patients may be ambulated);
• IV Aciclovir (if strong suspicion of Herpes);
• Consider Amoxicillin if < 3 months old;
• IV Dexamethasone if > 3 months old and bacterial meningitis likely within 12 h of antibiotics;
• Discuss with PID about IV Dexamethasone if < 3 months old;
• For MRSA +ve, or travel to area of Pneumococcal cephalosporin resistance, add Vancomycin.
Causative organism identified as Streptococcus pneumoniae or HiB?
YES
NO
Continue dexamethasone.
Stop dexamethasone.
ONGOING MONITORING FOR ALL AGES
• Initial PEWS observation hourly;
• Initial neurological observations every 30 min;
• BP with each set of observations;
• Fluid balance (aim euvolaemia).
If seizures:
• Treat as APLS;
• Involve PICU;
• Consider raised ICP management.
FOLLOW UP POST DISCHARGE
• Audiology assessment within 4 weeks;
• Paediatric follow up at 4 to 6 weeks.
• Neurology follow up if seizures;
• MDT referrals as required.
• Family information and signposting;
• Be aware that young people who suffered from meningitis may develop additional learning needs and therefore would need support from their education setting.

Meningitis Guideline

Introduction

Meningitis is an inflammation of the meninges that can occur due to infection with viruses or bacteria that usually have travelled to the bloodstream from mucosal surfaces and have crossed the blood-brain barrier. The epidemiology of bacterial meningitis has reduced in the recent few decades due to inclusion of vaccines against some of the organisms in the routine vaccination schedule. However, with the increasing number of unvaccinated children there is a real risk that more children will start presenting unwell with meningitis.

Bacterial meningitis is a relatively common and potentially fatal condition. If the recognition and diagnosis and therefore the treatment is delayed it can lead to severe long-term morbidity and reduced life expectancy. Optimising of recognition of the signs, prompt investigation and appropriate treatment is essential to aid recovery and avoid or minimise long term sequelae.

The organisms that cause meningitis vary depending on the age of the child and are presented in Table 1 below. They are often organisms that colonise the respiratory tract and cause an invasive infection in susceptible individuals.

Age of the child	Causative organism
<2 months	*Streptococcus agalactiae* (Group B Streptococcus) *Escherichia coli* & other Gram negative organisms *Streptococcus pneumoniae* (pneumococcus) *Listeria monocytogens*
>2 months	*Neisseria meningiditis* (meningococcus) *Streptococcus pneumoniae* (pneumococcus) *Haemophilus influenza* type B (HiB) Tuberculosis (very rare)

Table 1. Infective causes of meningitis

Risk factors for meningitis:

- Maternal GBS colonisation in under 3 month old infant
- Unimmunised
- Immunocompromised
- History of neurosurgery or penetrating head injury
- VP shunt or reservoir
- Cochlear implant
- Under 5 years old

Presentation:

It is important to know that meningococcal disease commonly presents as meningitis (15%) or septicaemia (25%) or a combination of both (60%) and it is a leading infectious cause of death among young children.

The signs and symptoms of meningitis are shown in Table 2 below and signs and symptoms of shock are outlined in Table 3. When assessing infants and very young children for suspected meningitis it is important to remember that many of these signs will not be present and infants may appear only non-specifically unwell. It is also important to remember that very young infants suffering from meningitis may not show any neck stiffness, bulging fontanelle, nor have a high-pitched cry.

Specificity	Clinical feature	
Specific symptoms	Non-blanching rash Capillary refill time >2sec Unusual skin colour Shock Hypotension Leg pain Cold hands and feet Unconscious Toxic or moribound state Paresis	Stiff neck Altered mental state Back rigidity Bulging fontanelle Photophobia Kernig's sign Brudzinski's sign Focal neurological deficit Seizures
Common and non-specific	Fever Vomiting or nausea Lethargy Irritable or unsettled Ill appearance Refusing food or drink Headache Muscle ache or joint pain Respiratory symptoms	

Less common and non-specific	Chills or shivering Diarrhoea Abdominal pain or distension Sore throat Coryza Other ENT complaint
Other	Parental concern Quickly progressing/evolving symptoms Clinical judgement on the severity of illness

Table 2. Presenting features of meningitis.

Signs of shock
• Capillary refill time more than 2 seconds • Unusual skin colour • Tachycardia and/or hypotension • Respiratory symptoms or breathing difficulty • Leg pain • Cold hands or feet • Toxic or moribound state • Altered mental status or decreased consciousness level • Poor urine output

Table 3. Signs of shock

It is imperative that a child with suspected meningitis is treated as per APLS protocol. Once the child is stable and initial treatment has been commenced it is important that history of the presenting complaints' and child's overall health is sought to establish most likely differential diagnoses and therefore investigate appropriately.

Information to gather in the history from the parent/carer:

- Questions specific to the presenting complaint:
  - Onset and duration of the symptoms
  - Any intercurrent illness, particularly headaches, nausea, vomiting, coryzal
  - Frequency of symptoms and their progression
  - Any alleviating or exacerbating factors
- Features of meningitis (as per Table 2) and duration of symptoms, in particular
  - Altered/fluctuating consciousness
  - Seizures

  - Photophobia
- Birth history
  - In particular Group B Strep colonisation/infection in pregnancy or around the time of birth
  - E. coli UTI in mother around the time of birth
  - Evidence of chorioamnionitis
  - Genital herpes infection/cold sores
- Immunisation history
- Previous medical history
  - Underlying conditions that might predispose child to meningitis such as immunodeficiency, immunodeficiency, CNS abnormality, or presence of a ventricular shunt
- Child's baseline neurological and developmental status
- Allergies
- Regular medication
- Family history and contacts with anyone unwell
- History of travel, especially to TB-endemic areas
- Social history, always consider NAI as a differential diagnosis especially if delayed presentation or history unclear

Examination should be thorough and include full neurological examination, including documentation of paediatric Glasgow Coma Scale score, appropriate to the developmental stage of the child. Child should also be frequently re-assessed especially once therapeutic interventions have been initiated. It is particularly important to closely monitor neurological status for any signs of deterioration.

Investigation

Investigations undertaken for children presenting with suspected meningitis need to be done in a timely fashion, often alongside initial stabilisation. Those are described in Table 4.

Type of investigations	Tests to order
Blood	• **Capillary glucose within 15 minutes of presentation + lab glucose if <2.6 (then also send hypoglycaemia screen and correct the blood glucose)** • **FBC &film** • U&E LFT Bone profile • **CRP** • **Coagulation screen** • **Blood gas** • **Blood culture** • **Whole-blood PCR for *N meningitidis**** • Plasma and serum save if possible • **Glucose again with LP**

CSF **(including 12 drops in virology bottle)** **CSF samples taken within 96h of admission may give useful results** **Repeat LP may be needed in neonates with persistent or re-emerging fever, clinical deterioration, new neurological findings, or persistently abnormal inflammatory markers**	• Opening pressure (but don't let it delay LP or treatment) • **Cell count. Gram stain and culture, glucose, protein, lactate**** • **Viral PCR** Lab to save sample and test *for N meningitidis* and *S pneumoniae* if CSF culture negative
Urine	• Dipstick • Microscopy and culture
NPA	PCR for respiratory viruses, enteroviruses and adenoviruses
Stool/Rectal swab	Enterovirus RNA PCR
Radiology	CT head is not diagnostic in meningitis, however it is a useful tool in a child with reduced consciousness to rule out other causes/raised ICP prior to LP
*beware: negative PCR does not exclude meningococcal disease ** CSF white blood cell count, total protein, and glucose should be available within 4h	

Table 4. Investigations in a child with suspected meningitis

Interpretation of CSF sample results can be difficult at times, especially if the sample was traumatic. The are varying correction ratios of white to red cells in a traumatic CSF tap that are deemed acceptable quoted in literature, 1:500 to 1:1000 range, common practice uses ratio of 1:800. In neonates, WBC of up to 20 is considered normal. Predominance of polymorphs suggests bacterial cause, predominance of lymphocytes suggests viral cause for meningitis. CSF glucose should be greater than 50% of the serum blood glucose. Raised protein level is suggestive of bacterial or TB meningitis, but also tumours, intracranial injury and haemorrhage, and CNS inflammation.

Assessment of a child with suspected meningitis

1. Initial steps are an ABCDE approach in any child with reduced consciousness. Establish airway protection, respiratory adequacy and circulatory sufficiency before moving on.
2. History taking particularly to include/exclude salient signs and symptoms (Tables 2 and 3).
3. Examination
    - Observations: Respiratory Rate, O2 saturation (continuous) Heart rate/ECG (continuous), Blood Pressure, Temperature
    - GCS
    - Physical appearance/state
    - Bedside blood glucose (with blood gas)
    - Neurological examination – *appropriate to developmental age but as a minimum should include GCS, tone, deep tendon reflexes and assessment of the pupils*
    - Examine for skin lesions and respiratory signs
    - Involve PICU if GCS <8, raised ICP, or shock evident.

Signs of raised intracranial pressure	Other features
Reduced or fluctuating level of consciousness (GSC <9 or drop of 3+) Relative bradycardia and hypertension Focal neurological signs Abnormal posture or posturing Unequal, dilated, or poorly responsive pupils Papilloedema Abnormal "doll's eye" movements	Shock Extensive or spreading purpura After convulsions until stabilised Coagulation abnormalities: • Results outside of normal range • Platelet count <100×10^9/L • Receiving anticoagulant therapy Local superficial infection at the lumbar puncture site Respiratory insufficiency

Table 5. Contraindication to performing a lumbar puncture during initial acute management

Management

Immediate management initiated should be in line with APLS protocol. Antibiotic treatment should be given promptly within first hour of arrival after blood has been taken for blood culture and meningococcal PCR***. Performing lumbar puncture should not delay starting of antibiotics but ideally should be performed within first hour after arrival.*** If it is not possible or safe to do that, lumbar puncture should be performed as soon as it is safe and possible to do so.

Treatment should be started empirically (Table 6) and Paediatric Infectious Diseases advice should be sought in all cases of bacterial meningitis, particularly if:

- Recent foreign travel
- At risk of multiresistant organisms
- Colonised with cephalosporin-resistant coliforms
- Severe allergic reaction to cephalosporins

Age	Treatment
< 1 month of age	Cefotaxime IV Amoxicillin IV (stop once listeria excluded by negative cultures at 48 hours) Aciclovir IV only if evidence or strong suspicion of heroes infection If severe allergic reaction to amoxicillin and cefotaxime then use co-trimoxazole (for Listeria) and chloramphenicol
>1 month of age	Ceftriaxone IV Aciclovir IV only if evidence or strong suspicion of heroes infection If severe allergic reaction to ceftriaxone then use chloramphenicol

Table 6. Empirical treatment for suspected meningitis

Children and young people over the age of 3 months with confirmed or strongly suspected bacterial meningitis should be given intravenous dexamethasone at same time or before first dose of IV antibiotics. Do not delay antibiotics to give dexamethasone. (0.15mg/kg QDS, maximum 10mg)

If delay less than 12 hours from first dose IV antibiotics give as soon as possible.

Dexamethasone should be continued if Pneumococcus or Haemophilus influenza type B identified, otherwise can be stopped.

Discuss use of steroids with infectious diseases if:

- For infants between 28 days and 3 months old
- No causative organism found
- Dexamethasone delayed over 12h from first dose of antibiotics being administered

Do not delay antibiotics for dexamethasone to be started.

Any seizures should be treated as per APLS protocol.

Monitoring the child admitted with meningitis:

Infants under the age of 2 years should have occipital-frontal circumference of the head plotted at presentation and then repeated if any concerns arise.

Record vital signs on the age appropriate PEWS chart, initially hourly, then may be able to increase interval between them as clinical state improves. Particularly important is measurement of blood pressure and this should be performed with every set of observations initially.

Neurological observations alongside, initially every 15min, then every 30min, and then every 1h, then every 4h for first 48h provided the status remains stable or improving. If there is any sign of deterioration the frequency of observations needs to be increased and medical team alerted. ***Repeated neurological assessment by a member of the medical team should be done every 6-12h for the first 48h.***

Careful input and output monitoring to ensure euvolaemia.

Frequency of haematology and biochemistry investigations should be guided by the overall clinical and biochemical state of the child.

Treatment

Continue empirical management until such time that either alternative diagnosis is established and microbiology blood and CSF samples are negative, or an organism has been isolated and treatment can be rationalised.

If the results of the blood and CSF samples are negative but clinical diagnosis of bacterial meningitis remains strongly suspected then empirical treatment should continue and advice should be sought from infectious diseases specialist.

If CSF results are indicative of meningitis but culture and PCR on whole blood sampling is negative then empirical treatment should continue for 10 days. After 10 days it can be stopped, but if the symptoms persist advice should be sought from infectious diseases colleagues.

Organism	Treatment
Streptococcus pneumoniae	ceftriaxone (if contraindicated then cefotaxime) for 10 days
Haemophilus influenzae type B	ceftriaxone (if contraindicated then cefotaxime) for 7 days if fully recovered or 10 days if not fully recovered at 7 days Discuss with PID
Group B Streptococcus meningitis	ceftriaxone (if contraindicated use cefotaxime) for 14 days if fully recovered Discuss with PID once results known If not recovered at 14 days seek further advice from PID
Enterobacterales (coliforms)	ceftriaxone (or cefotaxime if contraindicated) for 21 days if fully recovered Consider meropenem while awaiting sensitivities Discuss with PID If not fully recovered at the end of 21 days then re-discuss with PID
Listeria monocytogenes	amoxicillin IV for 21 days Discuss with PID re: additional co-trimoxazole for first 7 days If not recovered after 21 days then re-discuss with PID
Neisseria meningitidis	ceftriaxone (or cefotaxime if contraindicated) for 5 days If not fully recovered after 5 days then discuss with PID
Tuberculosis	Discuss with PID

Supportive treatments

Continue maintenance fluids, either IV or enterally if tolerated and do not restrict intake.

Do not routinely use osmotic agents such as mannitol or hypertonic saline but if there are concerns over raised intracranial pressure consider using hypertonic saline or mannitol (not glycerol) and seek advice from PICU promptly.

If seizures occur discuss with local Epilepsy Team and tertiary neurology team about commencement and duration of anticonvulsant treatment.

Follow up post discharge

Audiology assessment within 4 weeks of diagnosis, and once well to undertake it.

Urgent paediatric outpatient follow up appointment within 4 - 6 weeks of admission. For infants under 12 months, further appointment at 1 year to assess for any late-onset developmental complications.

Consider referral for psychological support for young people.

Signposting to meningitis charities.

If there are concerns about long term cognitive, neurological and developmental complications then referral to One Stop Community Developmental Paediatrician is required.

If anticonvulsant medication has been started then ensure there is follow up arranged with neurology team.

Refer for added support to allied professionals as required (physiotherapy, speech and language, OT etc.)

Be aware that young people who suffered from meningitis may develop additional learning needs and therefore would need support from their education setting.

2. Supporting References

Useful information for parents:

1) Meningitis Now (www.meningitisnow.org)
2) Meningitis Trust (www.meningitis-trust.org.uk)
3) The Brain Charity (www.thebraincharity.org.uk)

References:

1) Meningitis (bacterial) and meningococcal septicaemia in under 16s: recognition, diagnosis, and management, NICE March 2024 Overview | Meningitis (bacterial) and meningococcal disease: recognition, diagnosis and management | Guidance | NICE

2) Suspected sepsis in under 16s: recognition, diagnosis and early management Nov 2025 https://www.nice.org.uk/guidance/ng254

3) Sheffield Children's Hospital Bacterial Meningitis Guideline. www.sheffieldchildrens.nhs.uk

4) Clinical Practice Guidelines: Meningitis and encephalitis (rch.org.au)

5) Guideline for the assessment and management of meningitis and encephalitis in children and young people, Nottingham Children's Hospital, Nottingham University Hospital NHS Trust Short Title: (koha-ptfs.co.uk)

6) Lessons from research for doctors in training – Recognition and early management of meningococcal disease in children and young people – RCPCH DOC_HANDBOOK_07_for_pdf (rcpch.ac.uk)

3. Supporting relevant trust guidelines

- Encephalitis guideline

2. Guideline Governance

a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background ● Who was involved in the Equality Impact Assessment
Author and the supervising consultants.
Methodology ● A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) ● The data sources and any other information used ● The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings ● Describe the results of the assessment ● Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion ● Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations ● State recommended changes to the proposed policy as a result of the impact assessment ● Where it has not been possible to amend the policy, provide the detail of any actions that have been identified ● Describe the plans for reviewing the assessment
This guideline is appropriate for use.

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document: Meningitis Guideline

Policy (document) Author: Magdalena Fuller/ Alexandra Jones

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Y**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Y**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Y**	
	Is the purpose of the document clear?	**Y**	
	Are the intended outcomes described?	**Y**	
	Are the statements clear and unambiguous?	**Y**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**Y**	**NICE**
	Who was engaged in a review of the document (list committees/ individuals)?	**Y**	**Paediatric Guideline Committee**
	Has the policy template been followed (i.e. is the format correct)?	**Y**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Y**	

		Yes/No/ Unsure/NA	Comments
	Are local/organisational supporting documents referenced?	**Y**	
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?	**Y**	
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?	**N/A**	
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**Y**	
	Does the plan include the necessary training/support to ensure compliance?	**Y**	
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**No**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**Y**	
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?	**Y**	
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	Y	

Committee Approval (Paediatric Guidelines Group)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Alexandra Jones**	**Date**	**04/04/2026**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			