Meningitis and Encephalitis

Investigation in Adult Hospital Patients

Infection Quick Reference Guide

This flowchart is intended as a general resource for the care of adults with brain infections. It should be used in conjunction with current UK guidance on the management of meningitis and encephalitis, which it does not replace (see references).

Please note this reference guide does not cover the investigation of individuals with brain abscesses or meningococcal sepsis (see sepsis IQRG).

Consider **meningitis** in individuals presenting with at least 2 of headache, neck stiffness, altered mental status or fever.

Consider **encephalitis** in individuals with a new or recent fever and a change in cognition, personality, behaviour or consciousness **OR** new seizures/focal neurology

Consider **meningococcal sepsis** in individuals presenting with a sepsis syndrome and a rash – classically purpuric/petechial. See sepsis IQRG.

Considerations when doing a Lumbar Puncture (LP)

An LP is the single most important investigation in individuals with suspected meningitis or encephalitis.

An LP should be done within 1 hour of arrival to hospital provided it is safe to do so.

Neuroimaging is required prior to an LP **only** if:

- GCS ≤ 9 (or progressive, sustained drop in GCS)
- Uncontrolled/recurrent seizures
- Papilloedema
- Focal neurology

An LP may also need to be deferred if any of the following are present:

- Coagulopathy
- A petechial rash
- Sepsis with shock (please use NEWS 2 to monitor all individuals)

Criteria for critical care review:

- Uncontrolled seizures
- GCS <12 or drop in 2 points in GCS score
- Rapidly evolving rash
- Requirement of specific organ support
- Individuals with sepsis (use NEWS 2 to screen all individuals and instigate investigations for sepsis if NEWS is ≥5)

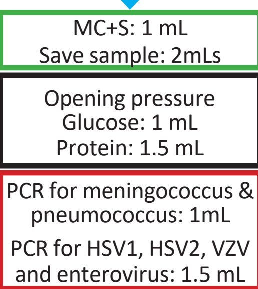
Key to flowchart

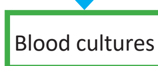
Considerations during clinical assessment

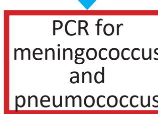
- Use ABCDE approach to clinically stabilise the patient
- Establish if an LP can be done safely now
- Consider if they need referral to critical care
- Instigate immediate treatment [see table below]

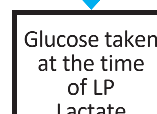
Sample type

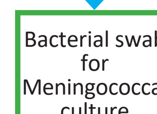
First line tests: To be taken in all patients within 1 hour of presentation



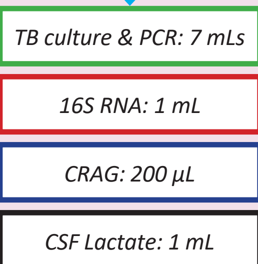


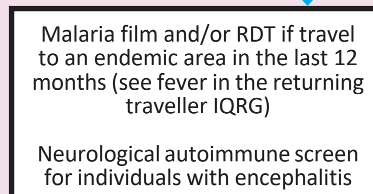




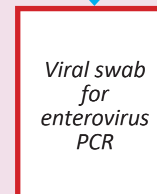


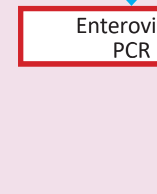
Second line tests: To be considered for selected patients

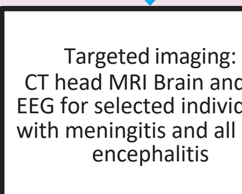




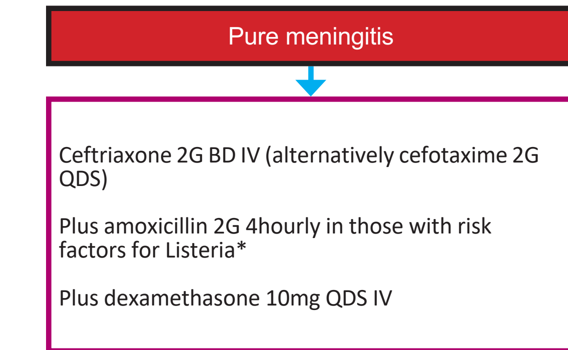
CRAG

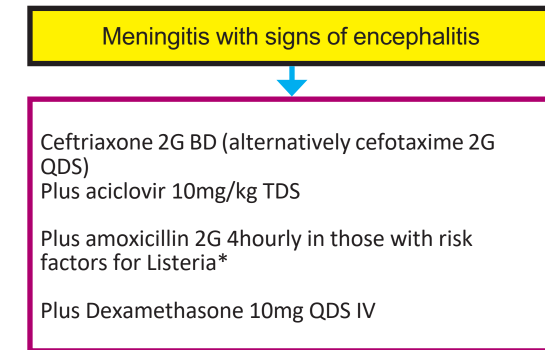


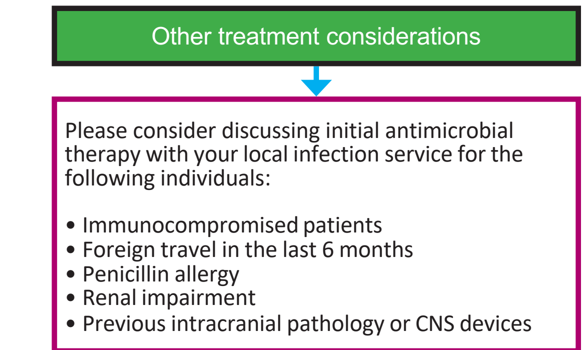




Immediate treatment considerations







Additional considerations

- *Risk factors for Listeria: patients > 60 and those that are immunocompromised (including those with alcohol dependency, diabetes and malignancy) should be covered empirically for listeria meningitis. Co-trimoxazole can be considered as a second agent for the first 7 days in addition to Amoxicillin.
- Tuberculosis (TB): Onset may be more insidious and be associated with systemic symptoms. Consider TB in those who have lived in areas of high incidence of TB, in immunocompromised patients and in those who have been in contact with positive cases.
- Travel: Atypical organisms such as Toscana Virus (Mediterranean), Tick Borne Encephalitis Virus (Central and Eastern Europe), other meningococcus (meningitis belt in Africa), West Nile Virus (USA), Lyme disease (appropriate exposure in Europe or USA) and parasitic meningitis may be the causative organism. Please discuss with your local infection service or the imported fever service (https://www.gov.uk/guidance/imported-fever-service-ifs) prior to sampling. Also refer to the Fever in the Returning Traveller IQRG.
- Immunocompromise: Atypical bacterial, fungal or parasitic infections may be the causative organism in immunocompromised individuals. Please discuss with your local infection service prior to sampling and for management considerations.
- Patient isolation precautions: All individuals should be placed in a side room with barrier precautions. In those with airborne infections such as TB use droplet PPE precautions.

All confirmed infections should be discussed with infection specialist.

References

- UK joint specialist societies meningitis guideline: https://www.journalofinfection.com/article/S0163-4453(16)00024-4/pdf
- BIA and ABN encephalitis guidelines: https://www.journalofinfection.com/article/S0163-4453(11)00563-9/pdf
- LP antithrombotic management: https://pn.bmj.com/content/practneurol/early/2018/08/28/practneurol-2017-001820.full.pdf
- NICE guidelines: https://cks.nice.org.uk/topics/meningitis-bacterial-meningitis-meningococcal-disease/

Abbreviations

BD	twice daily
CNS	central nervous system
CRAG	Cryptococcal antigen
CSF	cerebrospinal fluid
EEG	electroencephalogram
GCS	Glasgow coma score
HSV	herpes simplex virus
IV	intravenous
LP	lumbar puncture
VZV	varicella zoster virus
MC+S	microscopy, culture and sensitivity
MRI	magnetic resonance imaging
PCR	polymerase chain reaction
PPE	Personal protective equipment
QDS	four times a day
RDT	Rapid diagnostic test
RNA	ribonucleic acid
TB	Tuberculosis
TDS	three times a day

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