



Laboratory and Other Studies for Meningitis

Test	Notes
CSF Gram stain and culture	A negative Gram stain and culture do not exclude bacterial meningitis. Antibiotic treatment before obtaining CSF may reduce the sensitivity of Gram stain and culture by 20%-30%.
CSF WBC and differential	Bacterial meningitis: $>1180 \times 10^6$ cells/L, predominantly polymorphonucleocytes. Aseptic meningitis: $<1180 \times 10^6$ cells/L, predominantly lymphocytes.
CSF glucose to blood glucose ratio	Bacterial meningitis: <0.23 . Aseptic meningitis: >0.23 .
CSF protein	Bacterial meningitis: >220 mg/L. Aseptic meningitis: <220 mg/L
CSF PCR for enterovirus	Consider enterovirus PCR on CSF in patients with CSF evaluation consistent with aseptic meningitis, encephalitis, or both when no bacterial pathogens are identified on Gram stain.
CSF PCR for herpes simplex virus	Consider HSV PCR in patients with CSF evaluation consistent with aseptic meningitis, encephalitis, or both and when no bacterial pathogens are identified on Gram stain.
CBC with differential	In aseptic meningitis, the WBC should be slightly elevated with a predominance of lymphocytes and an absence of a left shift. In bacterial meningitis there is usually a profound leukocytosis and left shift.
Serum chemistries	Look for evidence of electrolyte imbalances, especially hyponatremia, because SIADH may develop as a complication of acute meningitis.
Blood culture	Routine blood cultures should be done (two cultures at two different sites is preferred) in all patients with suspected meningitis before the initiation of antibiotic therapy.
Computed tomography	Useful in excluding increased intracranial pressure or mass.

Table adapted from *Physicians Information and Education Resource (PIER), Aseptic (Viral) Meningitis* module.