

Bacterial Meningitis

Pathogens by age group:

- Neonates (highest incidence) = Group B strep (*S. agalactiae*)
- 1-23 months = *Streptococcus pneumoniae*, *Neisseria meningitidis*; group B strep
- 2-5 years = *Haemophilus influenzae* type b
- 2-18 years = *N. meningitidis*, *S. pneumoniae*
- 18-60 years = *S. pneumoniae*, *N. meningitidis*
- >60 years = *S. pneumoniae*, *L. monocytogenes*

Diagnosis

Clinical Features – Fever, Headache (severe, generalized), photophobia, nuchal rigidity

Changes in mentation, seizures, focal neurologic signs are later in disease.

Brudzinski sign – spontaneous flexion of the hips when neck is passively flexed

Kernig sign – inability to allow full extension of the knee when the hip is flexed 90°

CSF	Glucose		Protein		Total WBC	
	<10	10-45	>500	50-500	>1000	5-1000
More Common	Bacterial Meningitis	Bacterial Meningitis	Bacterial Meningitis	Viral Meningitis Syphilis	Bacterial Meningitis	Early Bacterial Meningitis Viral Meningitis
Less Common	Tuberculous Meningitis Fungal Meningitis	Syphilis Some Viral Meningitis	Tuberculous Meningitis			Encephalitis

Therapy

Immunocompetent adults < 50 years old

Pathogens: *S. pneumoniae* and *N. meningitidis*

Empiric Tx: a 3rd generation cephalosporin (**Ceftriaxone** or **Cefotaxime**)

Immunocompetent adults > 50 years old

Pathogens: *Listeria monocytogenes* and group B streptococcus (GBS)

Empiric Tx: **Ampicillin** + 3rd generation cephalosporin

If >3% resistance of *S. pneumoniae* to cephalosporin, then add **Vancomycin**

Immunocompromised: **Ampicillin** + **Ceftazidime** (Gram negative + pseudomonas)

Indwelling CSF shunt, recent head trauma/surgery: **Ceftazidime** + **Vancomycin**

Results of Gram Stain:

Gram + cocci (*S. pneumoniae*) – **Vancomycin** + **Ceftriaxone** or **Cefotaxime** (2 weeks)

Gram – cocci (*N. meningitidis*) – Penicillin G (5 days)

Gram + bacilli (*Listeria*) – **Ampicillin** + aminoglycoside (3-6 weeks)

Gram – bacilli (*Klebsiella*, *E. Coli*) – **Ceftriaxone** + aminoglycoside (3 weeks)

H. influenzae – **Cefotaxime** or **Ceftriaxone** (5-7 days)

Adjunctive therapy – dexamethasone (0.15 mg/kg Q6h for four days) can be considered in patients with two of three (hypotension, seizures, reduced level of consciousness); controversial treatment, no good data.