

Objective

At the end of the class the students will be able to

- Define meningitis
- Difference between *pachymeningitis*, leptomeningitis
- Discuss the etiology, pathogenesis and clinical **Acute Pyogenic Meningitis**, Chronic (Tuberculous and Cryptococcal) Meningitis,

Content

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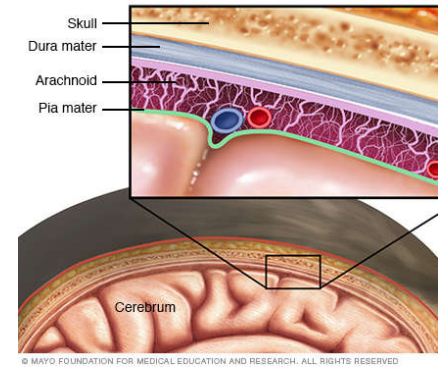
- Meningitis
- Etiopathogenesis
- Clinical features
- Diagnosis

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Meningitis

It is inflammatory involvement of the meninges.

- Meningitis may involve the dura called *pachymeningitis*,
- leptomeninges (pia-arachnoid) termed *leptomeningitis*
- **Pachymeningitis:** inflammation from chronic suppurative otitis media or from fracture of the skull.
- *Extradural abscess* may form by suppuration between the bone and dura- penetrate the dura and form a *subdural abscess*.

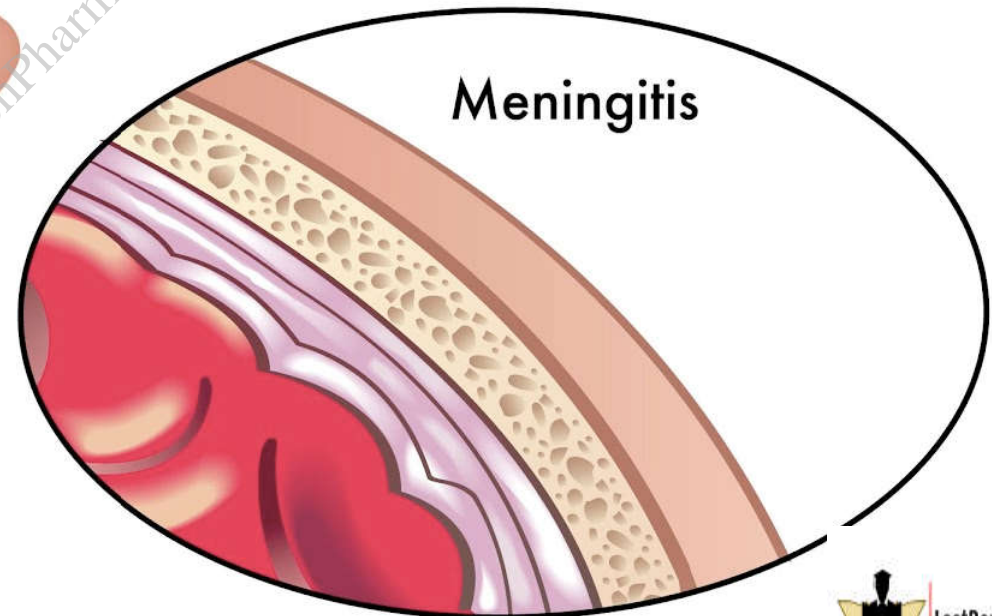
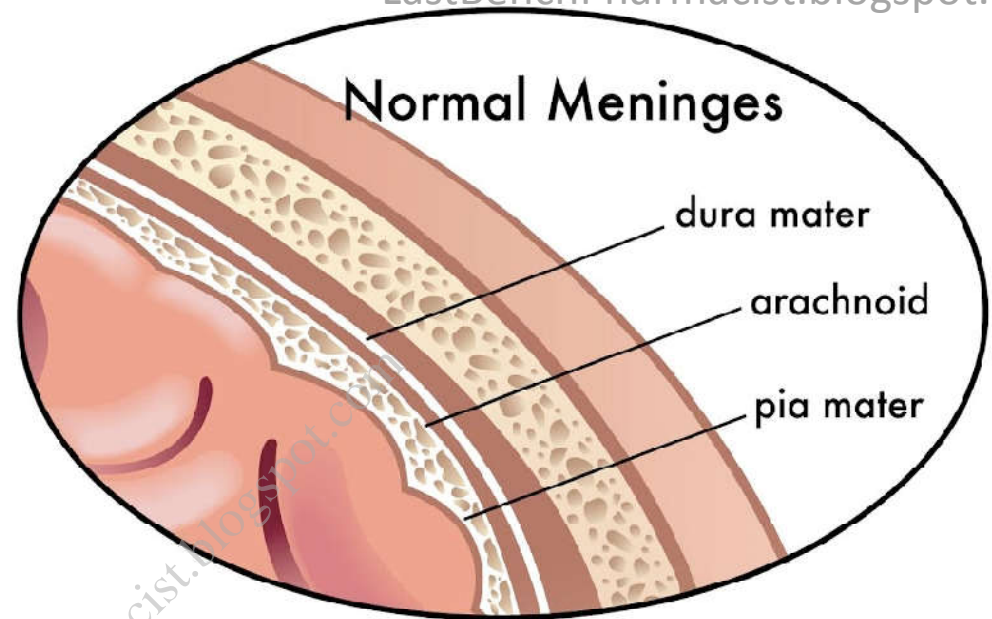
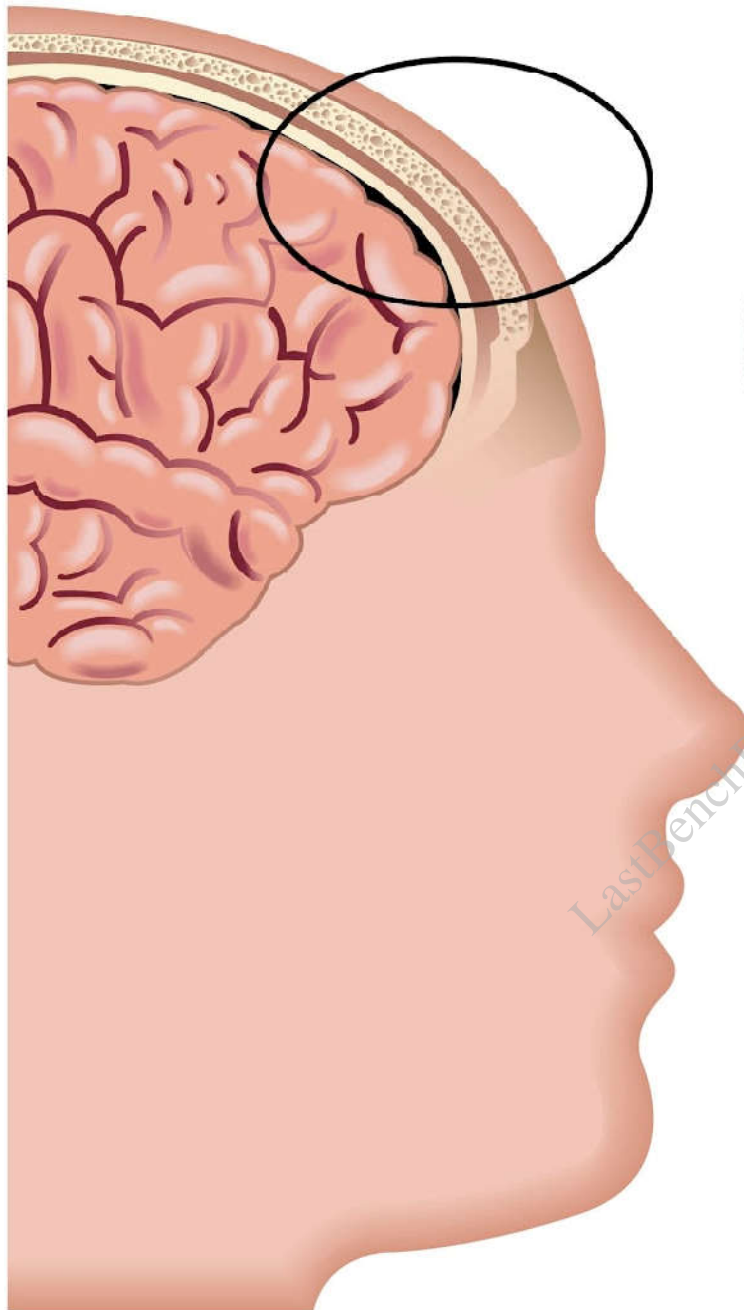


Leptomeningitis, commonly called meningitis- infection

- Infectious meningitis is broadly classified into 3 types:
 1. acute pyogenic,
 2. acute lymphocytic (viral, aseptic)
 3. chronic (bacterial or fungal)

Acute Pyogenic Meningitis

- Acute pyogenic or acute purulent meningitis is acute infection of the pia-arachnoid and of the CSF enclosed in the subarachnoid space.



ETIOPATHOGENESIS-Acute Pyogenic Meningitis

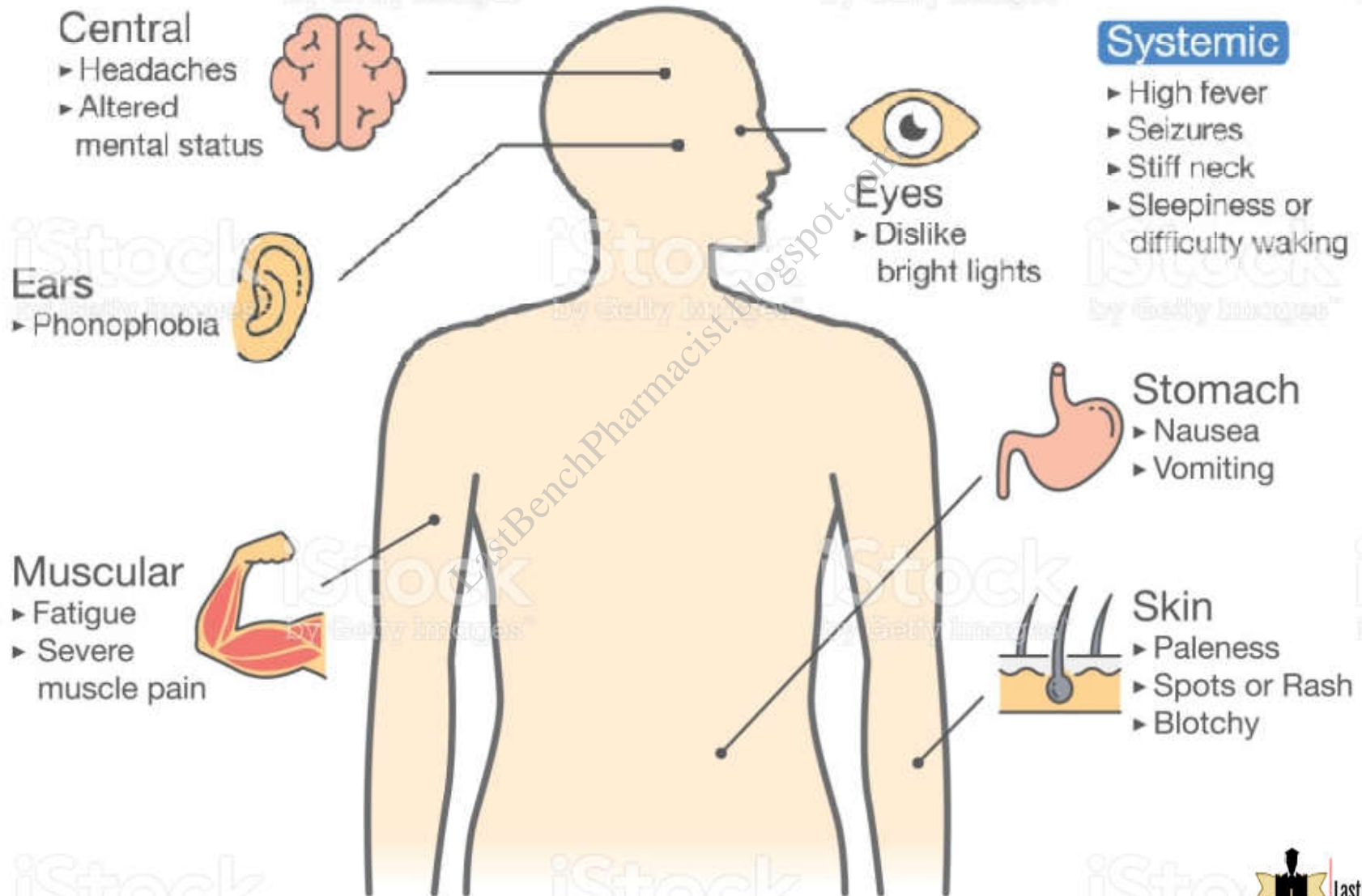
Causative organisms vary with age of the patient

1. *Escherichia coli*
2. *Haemophilus influenzae*
3. *Neisseria meningitidis*
4. *Streptococcus pneumoniae*

- **routes** of infection as follows:

1. Most commonly by the blood stream.
2. From an adjacent focus of infection.
3. By iatrogenic infection such as introduction of microorganisms at operation or during lumbar puncture.

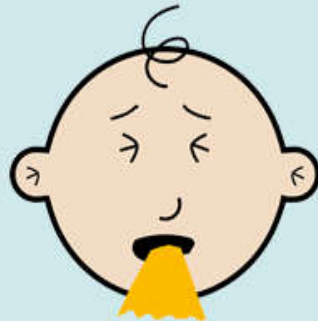
Symptoms of Meningitis



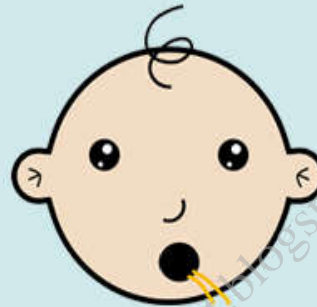
MENINGITIS - signs and symptoms



fever,
cold hands/feet



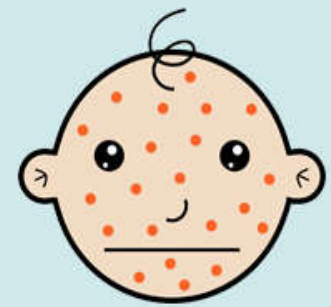
vomiting,
refusing food



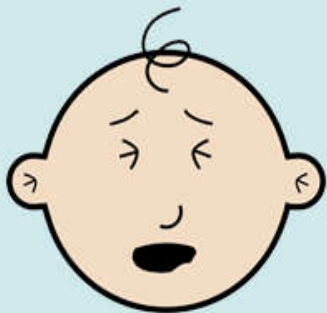
rapid breathing



drowsy
unresponsive



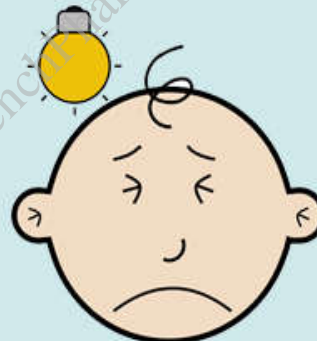
spots/rash
pale blotchy skin



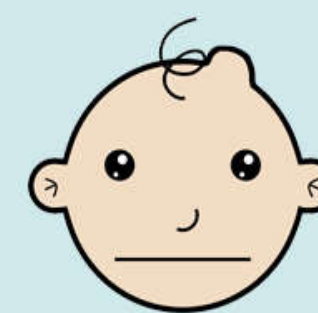
fretful, dislike
being handled



crying, moaning



dislike of bright
lights, stiff neck



bulging
fontanelle



convulsions/seizures

CLINICAL FEATURES AND DIAGNOSIS

Acute bacterial meningitis is a medical emergency.

- The immediate clinical manifestations are fever, severe headache, vomiting, drowsiness, stupor, coma, and occasionally, convulsions
- The *diagnosis* is confirmed by examining CSF
 1. Naked eye appearance of cloudy or frankly purulent CSF.
 2. Elevated CSF pressure (above 180 mm water).
 3. Polymorphonuclear neutrophilic leucocytosis in CSF (between 10-10,000/ μ l).
 4. Raised CSF protein level (higher than 50 mg/dl).
 5. Decreased CSF sugar concentration (lower than 40 mg/dl)
 6. Bacteriologic examination by Gram's stain

Acute Lymphocytic (Viral, Aseptic) Meningitis

- Acute lymphocytic meningitis is a viral or aseptic meningitis, especially common in children and young adults.
- Etiologic agents are numerous viruses such as enteroviruses, mumps, ECHO viruses, coxsackie virus, Epstein-Barr virus, herpes simplex virus-2, arthropode-borne viruses and HIV
- viral meningitis has a benign and self-limiting clinical course of short duration and is invariably followed by complete recovery

Chronic (Tuberculous and Cryptococcal) Meningitis

- There are two principal types of chronic meningitis—bacterial (tuberculous meningitis) and fungal (cryptococcal meningitis)
- *Tuberculous meningitis* occurs in children and adults through haematogenous spread of infection from tuberculosis
- *Cryptococcal meningitis* develops particularly in debilitated or immunocompromised persons, usually as a result of haematogenous dissemination from a pulmonary lesion

CLINICAL FEATURES AND DIAGNOSIS

- Tuberculous meningitis manifests clinically as headache, confusion, malaise and vomiting

| Feature | Normal | Acute Pyogenic (Bacterial) Meningitis | Acute Lymphocytic (Viral) Meningitis | Chronic (Tuberculous) Meningitis |
|-------------------------|--------------------------|---------------------------------------|--------------------------------------|---|
| 1. Naked eye appearance | Clear and colourless | Cloudy or frankly purulent | Clear or slightly turbid | Clear or slightly turbid, forms fibrin coagulum on standing |
| 2. CSF pressure | 60-150 mm water | Elevated (above 180 mm water) | Elevated (above 250 mm water) | Elevated (above 300 mm water) |
| 3. Cells | 0-4 lymphocytes/ μ l | 10-10,000 neutrophils/ μ l | 10-100 lymphocytes/ μ l | 100-1000 lymphocytes/ μ l |
| 4. Proteins | 15-45 mg/dl | Markedly raised | Raised | Raised |
| 5. Glucose | 50-80 mg/dl | Markedly reduced | Normal | Reduced |
| 6. Bacteriology | Sterile | Causative organisms present | Sterile | Tubercle bacilli present |

Summary

- Meningitis is inflammatory involvement of the meninges
- Acute pyogenic or acute purulent meningitis is acute infection of the pia-arachnoid and of the CSF enclosed in the subarachnoid space
- Acute lymphocytic meningitis is a viral or aseptic meningitis, especially common in children and young adults.
- There are two principal types of chronic meningitis—bacterial (tuberculous meningitis) and fungal (cryptococcal meningitis)

Thank you

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