MENINGITIS

Meningitis is inflammation of the meninges, which is the lining that covers the brain and spinal cord. Many things can cause it:

- Bacterial
- Viral
- Fungal
- Parasitic
- Non-infectious, thus not contracted from someone else

MENINGITIS VERSUS MENINGOCOCCAL DISEASE: THERE IS A DIFFERENCE

Having meningitis doesn't always mean you have meningococcal disease. And having meningococcal disease doesn’t necessarily mean you have meningitis. Meningococcal disease is any infection caused by the bacterium NEISSERIA MENINGITIDIS, or meningococcus. Any infection caused by that bacteria is known as meningococcal disease. One serious infection it can cause is meningococcal meningitis.

INCIDENCE

The number of meningococcal disease cases changes from year to year. From 1998 to 2007, about 1,500 Americans were infected each year, with a range of 900 to 3,000 cases. 11% of those infected will die. Adolescents and young adults have an increased incidence of meningococcal disease, accounting for 15 percent of all cases. One out of seven cases among adolescents will result in death.

Among those who survive meningococcal disease, approximately 20 percent suffer long-term consequences, such as brain damage, kidney disease, hearing loss or limb amputations.

WHO IS AT RISK?

Adolescents and young adults have an increased incidence of meningococcal disease compared to the general population, accounting for nearly 15 percent of all U.S. cases annually. However, the majority of cases among adolescents may be vaccine-preventable.

The disease is especially significant among college students, since studies show freshmen living in dorms are particularly vulnerable to meningococcal disease. Adolescents and young adults may be at increased risk for infection due to certain lifestyle factors, such as:
• Crowded living conditions (such as dormitories, boarding schools and sleep-away camps)
• Moving to a new residence
• Attendance at a new school with students from geographically diverse areas
• Going to bars
• Active or passive smoking
• Irregular sleeping patterns

Other risk groups include infants and young children, refugees, household contacts of case patients and military personnel.

MENINGITIS – SYMPTOMS IN CHILDREN & ADULTS

Symptoms of bacterial meningitis usually appear suddenly. Symptoms of viral meningitis may appear suddenly or develop gradually over a period of days. For example, the symptoms of viral meningitis after mumps may take several days or weeks to develop.

The most common symptoms of either form of meningitis include:
• Fever.
• Severe and persistent headache.
• Stiff and painful neck, especially when trying to touch the chin to the chest.
• Vomiting.
• Confusion and decreased level of consciousness.
• Seizures.

Other symptoms of meningitis include:
• Sluggishness, muscle aches and weakness, and strange feelings (such as tingling) or weakness throughout the body.
• Eye sensitivity and eye pain from bright lights.
• Skin rash.
• Dizzy spells.

The incubation period -- the time from exposure to the infection to when the first symptoms develop, depends on the type of organism causing the infection.

Babies, young children, older adults, and people with other medical conditions may not have the usual symptoms of meningitis.

In babies, the signs of meningitis may be a fever, irritability that is difficult to calm, decreased appetite, rash, vomiting, and a shrill cry. Babies also may have a stiff body and bulging soft spots on their heads that are not caused by crying. Babies with meningitis may cry when handled.
Young children with meningitis may act like they have the flu (influenza), cough, or have trouble breathing.

Older adults and people with other medical conditions may have only a slight headache and fever. They may not feel well and may have little energy.

Article Link: [http://children.webmd.com/vaccines/tc/meningitis-symptoms](http://children.webmd.com/vaccines/tc/meningitis-symptoms)

Meningitis Symptoms in Children and Adults: Viral and Bacterial

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**ADULT BACTERIAL MENINGITIS**

**Typical Presentations**

- Fever (75-85%), headache (87%), objective neck stiffness or meningismus (70-83%), signs of cerebral dysfunction such as confusion (69%), delirium or declining consciousness.
- Triad of fever, neck stiffness and altered mental status in 44%; but at least two of possible tetrad of headache, fever, neck stiffness and altered mental status occur in 95%.
- Vomiting (35%), seizures (15-30%), cranial nerve palsies or focal neurological signs (23-33%), Kernig’s (9%) or Brudzinski’s signs of meningismus, papilloedema (1%).
- Jolt accentuation of headache (100% – see Attia paper)!


Attia J, Hatala R, Cook DJ et al. Does this adult patient have acute meningitis? *JAMA* 1999; 282:175-81. [Reference] (NB The authors’ suggestion in this meta-analysis that absence of jolt accentuation of headache in patients with fever essentially excludes meningitis is flawed, as was based on one 1991 Japanese paper, which had just one actual meningitis case studied!)

**Atypical presentations**

- Elderly: lethargy, obtundation, absence of fever and minimal signs meningismus.
- Neutropenia / immunocompromise: subtle signs due to impaired ability to mount inflammatory response.
- Neonates, infants and young children: poor feeding, irritability, N&V, fever

“a sick looking child with fever has bacterial meningitis / menigococcaemia until proven otherwise.”
MENINGOCOCCAL MENINGITIS

- Active infection is almost always due to spread from colonization of nasopharynx
- Progresses rapidly over 24 hours
- Classic triad: fever, nuchal rigidity, AMS; but headache is also common
- Petechiae and palpable purpura (not always)

DEFINITIONS

nuchal rigidity (nū'kāl ri-jid‘i-tē) Impaired neck flexion resulting from muscle spasm (not actual rigidity) of the extensor muscles of the neck; usually attributed to meningeal irritation.

petechiae [pētē'kē-ē] sing. petechia numerous tiny purple or red spots appearing on the skin as a result of tiny hemorrhages within the dermal or submucosal layers. Petechiae range from pinpoint to pinhead size and are flush with the surface. petechial, adj.
purpura (pur´pu-rah) A large, purplish-red circle on the skin. Caused by the leakage of blood out of a vessel and under the skin.
The examiner can perform some simple tests to evaluate the possibility of meningitis.

- **Brudzinski’s Sign**
  - **Technique**
    - Place patient supine
    - Keep the trunk against the stretcher
    - Touch the chin to the chest (Flex neck)
  - **Positive**
    - Suggests irritation of meninges
    - The patient involuntarily flexes hip

- **Kernig’s Sign**
  - **Technique**
    - Place Patient supine
    - Flex the hip and knee 90°
    - Keep the hip immobile while extending the knee
  - **Positive**
    - Suggests irritation of meninges
    - The patient resists extending the knee
    - Patient has pain in the hamstrings