MENINGITIS

WHAT IS IT?
Meningitis refers to inflammation and swelling of the tissues surrounding the brain and spinal cord. Most cases are due to infection, and consequences can be serious. If meningitis is suspected, early evaluation and treatment is critical. However, most people recover from meningitis without long-term complications.

WHAT CAUSES IT?
Meningitis can be divided into infectious and noninfectious types:
- Infections may be caused by bacteria, viruses, fungi, or parasites. In the university setting the most worrisome type is bacterial meningitis. Fortunately, viral meningitis, which tends to be less severe, is more common.
- Noninfectious causes include cancer, head injury, medications, and conditions like systemic lupus erythematosus (lupus).

■ Bacterial Meningitis
  - There are about 1.2 million cases of bacterial meningitis worldwide annually.
  - The major causes of community-acquired bacterial meningitis in adults living in developed countries are Streptococcus pneumoniae and Neisseria meningitidis (meningococcus).

■ Viral Meningitis
  - Enteroviruses are the most common cause of meningitis. They are responsible for 85-95% of all meningitis cases. Infections by enteroviruses most frequently occur in the summer and fall.
  - Less common causes of viral meningitis include the herpes simplex virus (HSV), varicella (chickenpox), measles, mumps, influenza, HIV, and arboviruses.
  - Arboviruses can be transmitted by mosquitoes, ticks, and fleas. Examples include the West Nile virus and viruses that cause Yellow Fever and Dengue Fever.

HOW IS IT TRANSMITTED?
■ Bacterial Meningitis
  - Transmission can occur via infected respiratory droplets from the nose and throat. These droplets become airborne when an infected person coughs, sneezes, laughs, or talks. Infection can also be spread by kissing or sharing food, eating utensils, tissues, and towels.
  - Fortunately, the chance of getting bacterial meningitis after a possible exposure is actually quite low. Most of the bacteria that cause meningitis are not as contagious as viruses that cause the common cold or flu. Bacterial meningitis cannot be spread by casual contact or by simply breathing the air where a person with meningitis has been.

■ Viral Meningitis
  - Enteroviruses are most commonly spread through fecal contamination. This can occur from lack of hand-washing after using the toilet or changing a soiled diaper.
  - Enteroviruses and other less common viruses can also be spread through infected respiratory secretions.
  - Exposure to viral meningitis is more likely to lead to other types of infection caused by that virus (eg. cold symptoms) than to the development of meningitis.

WHAT ARE THE SYMPTOMS?
The severity of symptoms will vary depending on the cause:
- **Bacterial meningitis is a life-threatening condition that requires immediate treatment!**
  - It is a serious illness that can lead to permanent complications (such as brain damage, seizures, hearing loss, or learning disabilities) or death.
- Viral meningitis is a serious illness but rarely fatal in people with normal immune systems.

Symptoms may develop over several hours (as in bacterial meningitis) or more slowly over 1-2 days. Common symptoms include:
- High fever (101°F or higher)
- Headache
- Neck stiffness
- Photophobia (sensitivity to light)
- Nausea/vomiting
- Confusion
- Extreme sleepiness
- Seizure
Bacterial meningitis due to *Neisseria meningitides*

- Symptoms can progress very rapidly, within a few hours of infection.
- A history of a mild sore throat or flu-like illness may precede initial symptoms.
- 70% of patients present with a triad of fever, neck stiffness, and altered mental status.
- A characteristic red, blotchy rash can develop on the trunk and legs if the infection enters the bloodstream. The rash can progress rapidly to large areas of deep purple bruising and blackened skin.
- Coma can occur 24 hours after infection.

Viral meningitis

- Early symptoms may be similar to that of bacterial meningitis. Therefore, it is important to seek medical care as soon as possible.
- Symptoms usually last 7-10 days and resolve without specific treatment.
- Patients with normal immune systems usually recover completely without complications.

**HOW IS IT DIAGNOSED?**

Early diagnosis and treatment are critical. If symptoms occur, the patient should seek medical attention immediately. A lumbar puncture (or spinal tap) is usually performed in the emergency room to confirm the diagnosis. This procedure involves inserting a needle into the lower back to remove a small amount of spinal fluid for testing.

**WHAT IS THE TREATMENT?**

- **Bacterial meningitis** with its 10-15% fatality rate, requires hospitalization and treatment with intravenous (IV) antibiotics. It is important to start treatment early to prevent complications.

- **Viral meningitis** usually responds to supportive care with rest, hydration, and medications to treat fevers and headaches. Hospitalization is required in severe cases and in people with weakened immune systems. Antiviral medications can improve recovery in cases caused by the herpes or varicella virus.

**HOW CAN IT BE PREVENTED?**

- Good respiratory hygiene is important! Wash your hands well, cough or sneeze into a tissue or your elbow, and avoid individuals who are sick.

- Immunize yourself against bacterial meningitis. The meningococcal vaccine is 85-100% effective against four strains of *Neisseria meningitides*. Two-thirds of bacterial meningitis infections in college students are caused by one of these four meningococcal strains.

- Immunize yourself against vaccine-preventable viruses, such as chickenpox, mumps, measles, and influenza.

- Use insect repellents (28%-35% DEET or non-DEET) in high-risk areas.

**WHAT IF I AM EXPOSED TO BACTERIAL MENINGITIS?**

Casual contact with an infected individual is not usually high risk.

- The *Neisseria meningitidis* bacterium is not easily transmitted.

- Up to 25% of the U.S. population harbors the *Neisseria meningitides* bacteria in their nose or throat.

- During outbreaks of bacterial meningitis, up to 95% of the population can carry the bacteria, but only 1% will become ill.

However, because of the severity of the illness, close contacts and people in the same household of a person with meningococcal meningitis are advised to take antibiotics for preventive purposes.

- Prophylaxis reduces the chance of infection even in people who have received the meningitis vaccine.

- Students enrolled in the Health Sciences programs who have contact with a hospitalized patient with meningococcal meningitis may also be offered an antibiotic to prevent infection.

**RECOMMENDED WEBSITES:** www.cdc.gov, www.musa.org

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**THE BOTTOM LINE:**

SEEK IMMEDIATE MEDICAL ATTENTION IF YOU SUSPECT MENINGITIS!