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# Fungal Meningitis

## Causes

Fungal meningitis is rare and usually the result of spread of a fungus through blood to the spinal cord. Although anyone can get fungal meningitis, people with weak immune systems, like those with AIDS or cancer, are at higher risk.

The most common cause of fungal meningitis for people with weak immune systems is *Cryptococcus*. This disease is one of the most common causes of adult meningitis in Africa.

## Transmission

Fungal meningitis is not contagious, which means it is not transmitted from person to person. Fungal meningitis can develop after a [fungus](#) spreads through the bloodstream from somewhere else in the body, as a result of the fungus being introduced directly into the central nervous system, or from an infected body site infection next to the central nervous system.

## Investigation of Fungal Meningitis, October 2012

CDC with state and local health departments and the [Food and Drug Administration \(FDA\)](#) are investigating a multistate fungal meningitis outbreak among patients who have received a steroid injection of a potentially contaminated product into the spinal area. This form of meningitis is not contagious. The investigation also includes fungal infections associated with injections in a peripheral joint space, such as a knee, shoulder or ankle. CDC and public health officials are referring any patients who have symptoms that suggest possible meningitis or a possible peripheral joint infection to their physicians who can evaluate them further. Those patients injected in peripheral joints only are not believed to be at risk for fungal meningitis but could be at risk for joint infection.

You may also get fungal meningitis after taking medications that weaken your immune system. Examples of these medications include steroids (such as prednisone), medications given after organ transplantation, or anti-TNF medications, which are sometimes given for treatment of rheumatoid arthritis or other autoimmune conditions.

Different types of fungus are transmitted in several ways. *Cryptococcus* is thought to be acquired through inhaling soil contaminated with bird droppings, and *Histoplasma* is found in environments with heavy contamination of bird or bat droppings, particularly in the Midwest near the Ohio and Mississippi Rivers. *Blastomyces* is thought to exist in soil rich in decaying organic matter in the Midwest United States, particularly the northern Midwest. *Coccidioides* is found in the soil of endemic areas (Southwestern US and parts of Central and South America). When these environments are disturbed, the fungal spores can be inhaled. Meningitis results from the fungal infection spreading to the spinal cord. *Candida* is usually acquired in a hospital setting.

## Risk Factors

Certain diseases, medications, and surgical procedures may weaken the immune system and increase your risk of getting fungal infection, which can lead to fungal meningitis. Premature babies with very low birth weights are also at increased risk for getting *Candida* blood stream infection, which may spread to the brain.

Living in certain areas of the United States may increase your risk for fungal lung infections, which can also spread to the brain. For example, bird and bat droppings in the Midwestern United States may contain *Histoplasma*, and soil in the Southwestern United States may contain *Coccidioides*.

African Americans, Filipinos, pregnant women in the third trimester, and people with weak immune systems are more likely to get *Coccidioides* infection, which is also called valley fever.

## Signs & Symptoms

Signs and symptoms of fungal meningitis may include the following:

- Fever
- Headache
- Stiff neck
- Nausea and vomiting
- Photophobia (sensitivity to light)
- Altered mental status

## Diagnosis

If meningitis is suspected, samples of blood or cerebrospinal fluid (near the spinal cord) are collected and sent to a laboratory for testing. Knowing the specific cause of meningitis is important because the severity of illness and the treatment will differ depending on the cause.

To confirm fungal meningitis, specific lab tests can be performed, depending on the type of fungus suspected.

## **Treatment**

Fungal meningitis is treated with long courses of high dose antifungal medications, usually given through an IV line in the hospital. The length of treatment depends on the status of the immune system and the type of fungus that caused the infection. For people with immune systems that do not function well because of other conditions, like AIDS, diabetes, or cancer, treatment is often longer.

## **Prevention**

No specific activities are known to cause fungal meningitis. Avoid soil and other environments that are likely to contain fungus. People with weak immune systems (for example, those with HIV infection) should try to avoid bird droppings and avoid digging and dusty activities, particularly if they live in a geographic region where fungi like *Histoplasma*, *Coccidioides*, or *Blastomyces* species exist. HIV-infected people cannot completely avoid exposure.