

***Naegleria fowleri* Facts**

- *Naegleria fowleri* is a commonly found amoeba in warm bodies of freshwater world wide
 - Lakes, rivers, hot springs, under chlorinated swimming pools, and soil
 - Infections most common in summer months of July, August, and September
- In rare cases it can travel up the nose and into the brain, causing primary amebic meningoencephalitis, which is often fatal
 - Usually from underwater submersion or other activities that force water up the nose
- It very rarely causes infections; fewer than 10 cases reported annually for the past 53 years
- Symptoms begin 1 to 9 days after swimming or nasal exposure to warm freshwater
 - *Symptoms:* headache, fever, nausea, vomiting, stiff neck; in later disease stages – confusion, lack of attention to surroundings or people, loss of balance and bodily control, seizures, hallucinations, and death
 - Death usually within 5 days after symptoms appear
- According to the Centers for Disease Control and Prevention (CDC), the only known way to prevent *Naegleria* infections is to refrain from water-related activities. However, some measures that might reduce risk by limiting the chance of contaminated water going up the nose include:
 - Avoid water-related activities in warm freshwater during periods of high water temperature and low water levels.
 - Hold the nose shut or use nose clips when taking part in water-related activities in bodies of warm freshwater.
 - Avoid digging in or stirring up the sediment while taking part in water-related activities in shallow, warm freshwater areas.
 - If you are irrigating, flushing, or rinsing your sinuses (for example, by using a neti pot), use water that has been:
 - distilled;
 - sterilized;
 - previously boiled for 1 minute (at elevations above 6,500 feet, boil for 3 minutes) and left to cool;
 - or filtered, using a filter with an absolute pore size of 1 micron or smaller.
 - Rinse the irrigation device after each use with water that has been distilled, sterilized, filtered, or previously boiled and leave the device open to air dry completely.

Frequently Asked Questions

What is Naegleria?

Naegleria fowleri is a microscopic amoeba found in warm bodies of water worldwide. These freshwater bodies of water include lakes, rivers, and hot springs. It can also be found in soil, industrial water waste, and underchlorinated swimming pools. *N. fowleri* cannot live in salt water. It very rarely infects humans.

What temperatures put water at risk for Naegleria?

Naegleria fowleri enjoys warm temperatures. It grows best at high temperatures up to 115°F (46°C) and is less likely to be found in the water as temperatures decline below 77°F (25°C). Waters with total chlorine levels above 0.5mg/L also have decreased *N. fowleri* risk. Infection is most common during the summer months of July, August, and September.

How common are Naegleria infections?

Naegleria fowleri infections are extremely rare. There have been 37 cases reported during the past 10 years.

From 2005 to 2014, 35 infections were reported in the U.S. Of those cases, 31 people were infected by exposure to recreational water, three people were infected after performing nasal irrigation using tap water and one person was infected by tap water used on a backyard slip-n-slide.

How does Naegleria cause disease?

Naegleria fowleri causes disease in humans when it enters the body through the nose. This occurs when water is forced up the nose usually during warm freshwater activities such as swimming or diving. The amoeba travels from the nose to the brain, where it feeds on brain tissue and can cause primary amebic meningoencephalitis (PAM). The infection cannot be spread from person-to-person. One cannot be infected from drinking water.

What are the symptoms of Naegleria fowleri infection?

Symptoms generally start 1 to 9 days after swimming or nasal exposure to the amoeba in warm water. Initial signs include headache, fever, nausea, and stiff neck. Later signs include confusion, lack of attention to surroundings, loss of balance, loss of bodily control, seizures, hallucinations, and death. The disease progresses rapidly and usually results in death within 5 days once symptoms begin. Unfortunately, infection is almost always fatal.

How is Naegleria treated?

Treatment is aimed at reducing brain swelling and other supportive care. There are no approved drugs although several are being tested in laboratories. There have been reported survivals after treatment with miltefosine. A clear treatment plan is still unclear.

Where are people most at risk?

People are most at risk in the southern United States during summer months if they swim or dive in freshwater sites (such as lakes, rivers, or hot springs). Infections do occur worldwide. Bodies of water are most at risk when temperatures are hot and water levels are low.

How can people protect themselves?

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For more information: <http://www.cdc.gov/parasites/naegleria/>