

Naegleria fowleri

What is *Naegleria fowleri*?

Naegleria fowleri is a thermophilic (warmth loving) amoeba that occurs naturally in the environment worldwide. It is commonly found in warm bodies of fresh water, such as ponds, lakes, rivers, and hot springs. It may also be present in soil, in warm water discharges of industrial plants, and in swimming pools that have not been properly disinfected. It is not found in bodies of salt water like the ocean.

Can *Naegleria fowleri* infect humans?

Naegleria fowleri infections are very rare. Infection primarily occurs in healthy children and young adults when amoeba-containing water enters the nose while the person is swimming or diving in fresh water. Infections do not occur through drinking contaminated water. *Naegleria* infection can cause a brain infection that is almost always fatal. Prior to a recent *Naegleria* related death that occurred in 2011, the last documented case of *Naegleria* infection in Virginia occurred in 1969.

When is *Naegleria fowleri* infection most likely to occur?

Infection with *Naegleria fowleri* is most common during the dry, summer months when the air temperature is hot, the water is warm, and water levels are low. It is unknown at what levels *Naegleria fowleri* causes infection, however, it has been suggested that a density of 100 organisms per liter of water may present a high risk of infection.

Can *Naegleria fowleri* infection be spread from person to person?

No. *Naegleria fowleri* infection does not spread via person to person contact.

What are the symptoms of *Naegleria fowleri* infection?

Naegleria fowleri infection causes an acute, usually fatal, central nervous system disease commonly referred to as PAM (primary amoebic meningoencephalitis). PAM is an inflammation of the brain, the lining of the brain, and the spinal cord which leads to the destruction of brain tissue. Symptoms include fever, headache, stiff neck, nausea and vomiting, loss of appetite, lack of attention to people and surroundings, loss of balance and bodily control, hallucinations, seizures, and coma.

How soon after exposure do symptoms appear?

Symptoms typically appear within 1 to 14 days after infection. The disease progresses rapidly and infection usually results in death within 3 to 7 days after the onset of symptoms.

How is it diagnosed?

Laboratory-confirmed *N. fowleri* infection is defined as the detection of *N. fowleri*

- 1) Organisms in CSF, biopsy, or tissue specimens, or
- 2) Nucleic acid in CSF, biopsy, or tissue specimens, or
- 3) Antigen in CSF, biopsy, or tissue specimens.

What can be done to prevent infection?

To help prevent infection from *Naegleria fowleri*:

- Some studies have shown that the organism begins to proliferate at temperatures around 86° F and thrives especially well at temperatures of 95° F to 113° F.
- Avoid swimming, jumping, or diving into bodies of water when water temperatures are high, especially when the water levels are low.
- When diving or jumping into freshwater, hold your nose shut or use a nose plug or clip to prevent water from being forced up into the nasal passages.
- While swimming in warm freshwater, try to hold your head above the surface of the water.
- Avoid digging in or stirring up the sediment while swimming in shallow freshwater.

What if I own a business that takes clients to fresh water rivers, lakes, and ponds?

Swimming should not necessarily be avoided. Business owners may encourage concerned clients to use nose clips or hold their noses when participating in swimming or under water activities (such as kayaking) in warm fresh water when the water is hot and water levels are low.

Where can I find more information about *Naegleria fowleri*?

More information is available through the Centers for Disease Control and Prevention website at www.cdc.gov.