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## What is *Naegleria fowleri*?

*Naegleria fowleri* (*N. fowleri*) is an environmental protozoan parasite with worldwide distribution. They are not well adapted to parasitism and do not require a vector for transmission to humans or animals. *N. fowleri* is commonly referred to as the “brain-eating amoeba”. It can cause a rare and devastating infection of the brain called primary amoebic meningoencephalitis (PAM).

## Who gets *N. fowleri* infections?

*N. fowleri* infections are uncommon. Infection primarily occurs in healthy children and young adults who come into contact with water contaminated by the parasite.

## How is *N. fowleri* infection spread?

*N. fowleri* can cause an infection in people when contaminated water enters the body through the nose while the person is swimming or diving in warm, stagnant fresh water. Amoeba can attach to the olfactory nerve inside the nose, where it may travel to the brain and cause a PAM infection. In uncommon instances, *N. fowleri* infections may also occur when contaminated water from other sources, such as inadequately chlorinated swimming pool water or warm, contaminated tap water, enters the nose. A few cases have been associated with the use of nettie-pots, after using household tap water to irrigate the sinuses.

## What are the symptoms of *N. fowleri* infection?

Symptoms for stage 1 of the disease include severe frontal headache, fever, nausea and vomiting. Symptoms for stage 2 of the disease include stiff neck, seizures, altered mental status, hallucinations and coma.

## How soon after exposure do symptoms appear?

In the case of *N. fowleri*, symptoms typically appear within 1-14 days after infection. The disease progresses rapidly and infection usually results in death within 3-7 days after the onset of symptoms.

## How is *N. fowleri* infection diagnosed?

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

- Organisms in cerebrospinal fluid (CSF), biopsy, or tissue specimens, or
- Nucleic acid in CSF, biopsy, or tissue specimens, or
- Antigen in CSF, biopsy, or tissue specimens.

## What is the treatment for *N. fowleri* infection?

Disease caused by *N. fowleri* is generally fatal. There are five known survivors of *N. fowleri* PAM infections in North America. The medication miltefosine has shown ameba-killing activity against free-living amebae, including *N. fowleri*, in the laboratory.

## How can *N. fowleri* infection be prevented?

*N. fowleri* are naturally occurring organisms in lakes and rivers. Because of this, swimmers and other recreational water users should assume that there is a low-level risk of exposure whenever they enter warm freshwater lakes, rivers, and hot springs. Activities such as swimming, diving, or waterskiing, or participating in activities where water might be forced up the nose, may increase the risk of exposure. Wearing nose plugs when participating in these activities may help reduce the risk of exposure.

## How can I get more information about *N. fowleri*?

- If you have concerns about free-living ameba exposure, contact your health care provider.
- Call your local health department. A directory of local health departments is located at the [VDH Local Health Districts page](#).
- For information on *N. fowleri* and PAM infections, visit the Centers for Disease Control and Prevention (CDC) website at [the CDC page on \*N. fowleri\*](#).

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