Washington County

Department of Public Health & Environment

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Equal Employment Opportunity/Affirmative Action

Safe Swim Season

Naegleria and Primary Amebic Meningoencephalitis (PAM)

Frequently Asked Questions

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What is *Naegleria*?
Naegleria is an ameba commonly found in warm freshwater and soil. Only one type of *Naegleria* infects people called *Naegleria fowleri*. Infection with the ameba causes a very rare but severe brain inflammation, primary amebic meningoencephalitis or PAM. Most infections are fatal.

How does infection with *Naegleria fowleri* occur?
The ameba enters the body through the nose after swimming or diving in warm freshwater places like lakes and rivers. The *Naegleria fowleri* ameba then travels up the nose to the brain.

What are the symptoms of PAM?
Symptoms of PAM can start as quickly as 5 days (range of 1 to 7 days) after infection. Persons may have a headache, fever, nausea, vomiting, and stiff neck.
The disease moves to the brain very quickly causing swelling which leads to confusion, lack of attention, loss of balance, seizure, and hallucinations. After the start of symptoms, the disease progresses rapidly and usually causes death within about 5 days (or a range of 1 to 12 days).
Seek medical attention if you or someone you know develops any of these symptoms after swimming in freshwater.

Where is *Naegleria* found?
Naegleria is found in freshwater environments around the world. It grows when water temperatures are consistently warm. It can be found in lake or river sediment and sand. *Naegleria* can be found in many warm freshwater lakes and rivers in the United States, including Minnesota. Recreational water users should assume that there is a low level of risk when entering all warm freshwater. There is no reliable, easy method to detect *Naegleria* in area lakes and rivers.

Testing of Washington County area lakes has been conducted over the past five years (2010 – 2014), in cooperation with the Centers for Disease Control and Prevention (CDC) and Minnesota Department of Health – see chart below. The following are some key points from the test results:

- Multiple environmental samples were collected at public beach and boat launch sites each year from the same 10 area lakes.
- The *Naegleria fowleri* test results are inconsistent and do not provide reliable information to predict risk of infection or illness. It is not clear why *Naegleria* was detected in more lakes in 2011 than other years.

- Negative testing results are difficult to interpret since the results are based on relatively few samples. Locally and nationally there is limited test information on *Naegleria* in freshwater and sediment to demonstrate how sampling results change by lake location, time of day or season, rainfall or water sample locations.
- *Naegleria fowleri* is considered to be widespread in the US and other countries. It can likely be detected in many freshwater bodies, particularly when the ambient air and water temperatures are warm.
- Environmental test results are not sufficient on their own to justify some public health interventions such as closing a lake or beach to recreational water activities.
- CDC hopes to continue to conduct studies such as these to develop a data base that can help CDC better understand the relationship between environmental factors and the presence and concentration of *Naegleria fowleri* in lake environments.
- A complete copy of the 2014 CDC report titled Results of Naegleria fowleri testing for Washington County, Minnesota lakes and sediment, August 2014 is available for reference under the Safe Swim Season section on our webpage.

Naegleria fowleri Test Results from Select Lakes in Washington County, MN
Centers for Disease Control and Prevention (CDC), 2010 – 2014

Sample Site	Sample Type	2010*	2011**	2012***	2013****	2014****
Big Carnelian	Sediment	Not Tested	**Positive**	Negative	Negative	Negative
	Water	Not Tested	**Positive**	Negative	Negative	Negative
Big Marine	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	**Positive**	Negative	Negative	Negative
Bone Lake	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	Negative	Negative	Negative	Negative
Demontreville Lake	Sediment	Not Tested	**Positive**	Negative	Negative	Negative
	Water	Not Tested	Negative	Negative	Negative	Negative
Lake Elmo	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	**Positive**	Negative	Negative	Negative
Forest lake	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	Negative	Negative	Negative	Negative
Goose Lake	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	Negative	Negative	Negative	Negative
Little Carnelian	Sediment	Negative	**Positive**	Negative	Negative	Negative
	Water	Negative	Negative	Negative	Negative	Negative
Lily Lake	Sediment	**Positive**	**Positive**	**Positive**	Negative	Negative
	Water	**Positive**	Negative	Negative	Negative	Negative
Square Lake	Sediment	Not Tested	Negative	Negative	Negative	Negative
	Water	Not Tested	Negative	Negative	Negative	Negative

* Water and sediment samples were collected and tested in August 2010 from the two area lakes where the first PAM case had swum prior to their illness.

** Water and sediment samples were collected and tested in August 2011 from 10 area lakes in an effort to help the Centers for Disease Control and Prevention evaluate the effectiveness of their new environmental sample processing and testing methods for *Naegleria fowleri*.
*** The 2011 water and sediment sample processing and testing was repeated in mid July 2012 with the Centers for Disease Control and Prevention. Test results were finalized and reported in August 2012 after the second PAM case.
**** The 2013 and 2014 water and sediment sample processing and testing were conducted in August of each year.

How common are *Naegleria fowleri* infections and PAM deaths in the United States?
Infections are very rare, but the consequences of an infection are severe. There have been 132 reported infections in the United States from 1962 to 2012, despite hundreds of millions of recreational water activities each year.

Two confirmed cases have been reported in Washington County, Minnesota. Both *Naegleria* infections resulted from swimming in Lily Lake, Stillwater, Minnesota. One infection occurred in August, 2010 and the other August, 2012.

When do *Naegleria fowleri* infections most commonly occur?
According to the Centers for Disease Control and Prevention and Minnesota Department of Health, while infections are very rare, they more commonly occur when it is hot for prolonged periods of time, which results in higher water temperatures and lower water levels.

Can I get a *Naegleria fowleri* infection from a swimming pool?
No. You cannot get a *Naegleria fowleri* infection from a properly cleaned, maintained, and disinfected swimming pool.

Can infection be spread from one person to another?
No. *Naegleria fowleri* infection cannot be spread from one person to another.

How can I reduce the risk of infection with *Naegleria fowleri*?
A low risk of *Naegleria* infection will always exist from exposure to warm freshwater lakes, rivers, and hot springs. The only known way to prevent *Naegleria fowleri* infections is to refrain from recreational freshwater activity. According to the Centers for Disease Control and Prevention recreational water users should assume that there is always a low level of risk associated with entering all warm fresh water.

Precautions that might reduce risk of infection by lowering the chance of contaminated water going up the nose include:

- Avoid water-related activities in bodies of warm freshwater, hot springs, and thermally-polluted water such as water around power plants.

- Avoid water-related activities in stagnant warm freshwater during periods of high water temperature and low water volume. Bacteria, ameba, and other harmful organisms thrive in warm, standing water.

- Hold the nose shut or use nose clips or keep your head above water when engaging in recreational freshwater activities.

- Avoid digging in or stirring up the sediment while taking part in water-related activities in shallow, warm, freshwater lakes.

For more information:
Centers for Disease Control and Prevention, Healthy Swimming;
http://www.cdc.gov/parasites/naegleria/index.html

Consult local or city websites for swimming area and pool updates