

WATER

Primary Amoebic Meningoencephalitis

Primary Amoebic Meningoencephalitis (PAM) is a very rare disease characterized by inflammation of the brain. *Naegleria fowleri*, a free-living single-celled organism called an amoebae, causes PAM.

PAM occurs very rarely but is usually fatal. Since the disease was first identified in 1965, fewer than 100 cases have been identified in the United States. Treatment has been successful in some cases if administered immediately.



Most human victims of PAM are exposed to *N. fowleri* while swimming in warm, surface water. This may include ponds,

Symptoms of the disease generally appear three to seven days after exposure to *N. fowleri*. Symptoms may include:

- Severe headache,
- Vomiting,
- Neck stiffness.

lakes, streams, rivers, and improperly maintained swimming pools. The risk of acquiring PAM increases as water temperatures rise.

Transmission to humans occurs when the organism gains access to brain tissues through the nasal passages. The organism can enter the nasal passages when water containing the organism is forced up the nose through activities such as diving, jumping into water, and underwater swimming. PAM is not transmitted from person to person.

In cases where the disease is not successfully treated, death occurs within three to ten days.

PAM can affect people who are healthy prior to infection, and infection with *N. fowleri* has occurred mainly in young people.



Swimmers who swim only in cool, unpolluted, moving waters or properly maintained pools should be at little risk for acquiring PAM. Although PAM is rare, swimmers should take steps to protect themselves. These include:

- Avoid swimming in stagnant (unmoving) water.
- Avoid swimming in water with a temperature greater than approximately 80° F (If the water does not feel cool when you first enter, it is likely warmer than 80° F).
- Avoid underwater swimming except in properly maintained swimming pools.
- Hold your nose or use nose plugs when diving or jumping into water except in properly maintained pools.