

AMOEBA FACTS

WHAT IS PRIMARY AMOEBIC MENINGOENCEPHALITIS (PAM)?

Primary Amoebic Meningoencephalitis (PAM) is a very rare disease characterized by inflammation of the brain caused by pathogenic, free-living amoebae, *Naegleria fowleri*, a single-celled organism. These organisms are ubiquitous in the environment, in soil, water, and air. Infections in humans are rare and are acquired through water entering the nasal passages (usually during swimming) and by inhalation. PAM is usually fatal, but treatment has been successful in some cases if administered immediately.

Most human victims of PAM are exposed to the amoeba while swimming in warm, surface water. This may include ponds, lakes, canals, streams, rivers, and improperly maintained swimming pools. The risk of acquiring PAM increases as water temperatures rise. In Maitland's lakes, the water temperature in near shore areas typically exceeds 85 degrees between Mid June and early October. The amoeba lives in the bottom sediments where it feeds on detritus such as decomposing plant material. Infections can occur when bottom sediments are stirred up, and swimmers put their heads under water near the bottom, or jump into stirred up waters (causing water to be forced up the nose or ears).

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.

Symptoms of the disease generally appear three to seven days after exposure to *N. fowleri*. Symptoms may include: Severe headache, high fever, nausea, vomiting, neck stiffness, and seizures and hallucinations as the condition worsens. Anyone who has been swimming in freshwater who exhibits some or all of these symptoms should see a doctor as soon as possible. Successful treatment of this infection requires early diagnosis, and administration of appropriate antibiotics.

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.