



# Primary Amebic Meningoencephalitis Fact Sheet

## **What is Primary Amebic Meningoencephalitis (PAM)?**

PAM is a very rare disease resulting in inflammation of the lining of the brain and spinal cord caused by a single celled organism called an amoeba. *Naegleria fowleri* as well as other amoebae (*Balamuthia mandrillaris*, and *Acanthamoeba* species) may cause this disease.

## **What are the symptoms of PAM?**

Symptoms of PAM begin abruptly and can include fever, headache, nausea and vomiting. Stiff neck and coma can occur as the condition worsens.

## **How do you get PAM?**

*N. fowleri* is distributed widely around the world. It is present in soil and in virtually all natural surface waters such as lakes, ponds and rivers. Warm water temperatures caused by the hot summer months allow the amoebae to multiply because their food source (bacteria) increases during hot weather. Thus, the risk may be greater in very warm and particularly shallow waters.

## **PAM infection can only occur when a number of conditions occur at the same time:**

1. The amoebae must be present in the water.
2. The amoebae must be able to multiply to large numbers.
3. Water containing the amoebae must get up your nose.
4. Once in the nose, the amoebae moves up the nasal passages to the brain, where it multiplies and causes the symptoms associated with infection. PAM cannot be transmitted from person to person.

## **Who is at risk for contracting PAM?**

Since the disease was recognized 25 years ago, fewer than 100 cases have been recorded in the United States. The Centers for Disease Control and Prevention (CDC) states that 1 to 3 infections occur in the nation each year. In all cases, victims are described as primarily young, healthy individuals who have actively participated in a recreational water activity 1 to 7 days prior to onset of symptoms.

## **What is the treatment for PAM?**

Treatment with an antibiotic or other drugs must be started immediately in order to be effective. Very few of those persons infected are treated successfully. Death occurs from 3 to 10 days following infection with the amoebae.

## **How can PAM infection be prevented?**

Remember a few common sense precautions:

1. Never swim in stagnant or polluted water.
2. Avoid under water swimming and hold your nose or use nose plugs when jumping or diving into natural waters.
3. Swim in properly maintained pools.

**REMEMBER:** PAM is extremely rare. Every year many more deaths and injuries result from diving into shallow waters or natural waters that hide rocks and debris, from using alcohol and or drugs while boating or swimming, and from leaving children unattended in water even for short periods of time. Remember to always use a personal flotation device.

*For further information, contact the Oklahoma City-County Health Department  
(405) 425-4437*