
Eastern Equine Encephalitis

What is eastern equine encephalitis?

Eastern equine encephalitis (EEE) is an uncommon but serious disease caused by the EEE virus. EEE is an arbovirus (short for *arthropod-borne virus*, meaning spread by insects). This virus can be transmitted to horses, other animals, and, in rare cases, people.

How do people get eastern equine encephalitis?

The EEE virus grows in birds that live in freshwater swamps. The virus has a complex life cycle involving birds and a specific type of mosquito, called *Culiseta melanura*. This particular mosquito does not bite people. Sometimes though, the virus can escape from its marsh habitat by means of other mosquitoes that feed on both birds and mammals. These mosquitoes can then transmit the virus to animals and people.

What are the symptoms of EEE?

Infection can cause a range of illnesses. Most people have no symptoms; others get only a mild flu-like illness with fever, headache, and sore throat. For people with infection of the central nervous system, a sudden fever (103° to 106°), severe headache, and stiff neck can be followed quickly by seizures and coma. About one third of these patients die from the disease. Of those that survive, many suffer permanent brain damage and require lifetime institutional care.

When do symptoms appear?

Symptoms of EEE usually appear 4 to 10 days after the bite of an infected mosquito.

How is eastern equine encephalitis diagnosed?

Diagnosis is based on tests of blood or spinal fluid.

Who is at risk for eastern equine encephalitis?

Anyone can get EEE, but some people are at increased risk, such as people living in or visiting areas where the disease is common, people who work outside or participate in outdoor recreational activities in areas where the disease is common, and children and those over age 55 are more susceptible to serious illness. The risk of getting EEE is highest from late July through September.

What is the treatment for eastern equine encephalitis?

There is no specific treatment for eastern equine encephalitis. Antibiotics are not effective against viruses, and no effective anti-viral drugs have yet been discovered for this disease. Care of patients centers around treatment of symptoms and complications.

How common is eastern equine encephalitis?

EEE is a rare disease. Fewer than 5 cases are reported in the United States in most years. There is concern, however, that EEE is spreading. In 2004, there were 3 positive horses, 3 positive emus, and 19 positive mosquito pools found in New Hampshire. In 2005, there were 54 positive

birds, which included 2 emus, 9 positive horses, 4 positive apacas, 1 positive llama, 15 positive mosquito pools, and 7 positive human cases, which resulted in 2 deaths.

How can eastern equine encephalitis be prevented?

A vaccine is available for horses, but not for humans. Prevention centers around controlling mosquitoes and on individual action to avoid mosquito bites. To avoid being bitten by the mosquitoes that transmit EEE:

- If possible, stay inside between dusk and dark, when mosquitoes are most active.
- When outside between dusk and dark, wear long pants and long-sleeved shirts.
- Use an insect repellent with DEET according to manufacturer's directions when outside.
- Put screens on windows and make sure they do not have holes.
- Eliminate standing water from your property.

For more information about eastern equine encephalitis, call the New Hampshire Department of Health and Human Services, Communicable Disease Control Section at 603-271-4496 or 800-852-3345 x4496 or visit our website at www.dhhs.nh.gov or the Centers for Disease Control and Prevention website at www.cdc.gov.

Prevention Guidelines for West Nile Virus and Eastern Equine Encephalitis

1. Eliminate standing water and other mosquito breeding locations around your property. *Please do not attempt to drain or alter natural waterbodies for mosquito control, since the management of ponds and wetlands is regulated by the Department of Environmental Services and any planned alterations will require a permit before work may begin.* In warm weather, mosquitoes can breed in any puddle that lasts more than 4 days!

- Remove old tires from your property.
- Dispose of tin cans, plastic containers, ceramic pots, or other containers. Don't overlook containers that have become overgrown by aquatic vegetation.
- Drill holes in the bottom of recycling containers that are left outside.
- Make sure roof gutters are clean and draining properly.
- Clean and chlorinate swimming pools and hot tubs. If not in use, keep empty and covered and keep covers free of standing water.
- Aerate garden ponds or stock them with fish.
- Turn over wheelbarrows and change water in birdbaths at least twice weekly.
- Turn over plastic wading pools when not in use.
- Remind or help neighbors to eliminate breeding sites on their properties.

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2. Be aware of where mosquitoes live and breed and keep them from entering your home.

- Mosquitoes lay their eggs in standing water. Weeds, tall grass, and bushes provide an outdoor home for adult mosquitoes, including several species commonly associated with West Nile virus and Eastern Equine Encephalitis.
- Mosquitoes can enter homes through unscreened windows or doors or broken screens. Make sure that doors and windows have tight-fitting screens. Repair or replace all screens in your home that have tears or holes.
- Resting mosquitoes can often be flushed from indoor resting sites by using sweeping motions under beds, behind bedside tables etc. and once in flight, exterminated prior to sleeping at night.

3. Protect yourself from mosquito bites.

- If outside during evening, nighttime, and dawn hours when mosquitoes are most active and likely to bite, children and adults should wear protective clothing such as long pants, long-sleeved shirts, and socks.
- Consider the use of an effective insect repellent, such as one containing DEET. A repellent containing 30% or less DEET (N,N-diethyl-methyl-meta-toluamide) for children and adults.

Use DEET according to the manufacturer's directions. Children should not apply DEET to themselves. Repellents that contain Picaridin, oil of lemon eucalyptus, or IR3535 have also been determined to be effective.

- Vitamin B, ultrasonic devices, incense, and bug zappers have not been shown to be effective in preventing mosquito bites.

For more information on West Nile Virus or Eastern Equine Encephalitis, call the NH Department of Health and Human Services toll-free West Nile Virus Information Line at 866-273-NILE (6543), or visit the DHHS website at www.dhhs.nh.gov