EEE (Eastern Equine Encephalitis)

What is Eastern Equine Encephalitis?

Eastern equine encephalitis (EEE) is a rare but serious disease caused by a virus.

How is the EEE virus spread?

The virus that causes EEE is spread through the bite of an infected mosquito. In Massachusetts, the virus is most often identified in mosquitoes found in and around freshwater, hardwood swamps. More information about different types of mosquitoes that can spread the virus can be found on the MDPH website at www.mass.gov/dph/mosquito.

EEE virus particularly infects birds, often with no evidence of illness in the bird. Mosquitoes become infected when they bite infected birds. Although humans and several other types of mammals, particularly horses and llamas, can become infected, they do not spread disease.

How common is EEE in Massachusetts?

EEE is a very rare disease. Since the virus was first identified in Massachusetts in 1938, fewer than 100 cases have occurred. Over 60% of those cases have been from Plymouth and Norfolk counties.

Outbreaks of EEE usually occur in Massachusetts every 10-20 years. These outbreaks will typically last two to three years. The most recent outbreak of EEE in Massachusetts began in 2010 and included nine cases with four fatalities through 2012.

What are the symptoms of EEE?

The first symptoms of EEE are fever (often 103° to 106°F), stiff neck, headache, and lack of energy. These symptoms show up three to ten days after a bite from an infected mosquito. Inflammation and swelling of the brain, called encephalitis, is the most dangerous and frequent serious complication. The disease gets worse quickly and some patients may go into a coma within a week.

What is the treatment for EEE?

There is no treatment for EEE. In Massachusetts, about half of the people identified with EEE died from the infection. People who survive this disease will often be permanently disabled. Few people recover completely.

What can you do to protect yourself from EEE?

Since the virus that causes EEE is spread by mosquitoes, here are some things you can do to reduce your chances of being bitten:

- Schedule outdoor events to avoid the hours between dusk and dawn, when mosquitoes are most active.
- When you are outdoors, wear long pants, a long-sleeved shirt and socks. This may be difficult to do when the weather is hot, but it will help keep mosquitoes away from your skin.
- Use a repellent with **DEET** (N, N-diethyl-m-toluamide), **permethrin, picaridin** (KBR 3023), **IR3535** (3-[N-butyl-N-acetyl]-aminopropionic acid) or **oil of lemon eucalyptus** [p-menthane 3, 8-diol (PMD)] according to the instructions given on the product label. DEET products should not be used on infants under two months of age and should be used in

concentrations of 30% or less on older children. Oil of lemon eucalyptus should not be used on children under three years of age. Permethrin products are intended for use on items such as clothing, shoes, bed nets and camping gear and should not be applied to skin.

- Keep mosquitoes out of your house by repairing any holes in your screens and making sure they are tightly attached to all your doors and windows.
- Remove areas of standing water around your home. Here are some suggestions:
  - Look around outside your house for containers and other things that might collect water and turn them over, regularly empty them, or dispose of them.
  - Drill holes in the bottom of recycling containers that are left outdoors so that water can drain out.
  - Clean clogged roof gutters; remove leaves and debris that may prevent drainage of rainwater.
  - Turn over plastic wading pools and wheelbarrows when not in use.
  - Change the water in birdbaths every few days; aerate ornamental ponds or stock them with fish.
  - Keep swimming pools clean and properly chlorinated; remove standing water from pool covers.
  - Use landscaping to eliminate standing water that collects on your property.
- More information on choosing and using repellents safely is included in the MDPH Mosquito Repellents fact sheet which can be viewed online at www.mass.gov/dph/mosquito. If you can't go online, contact the MDPH at (617) 983-6800 for a hard copy.

Did you know?

Mosquitoes can begin to multiply in any puddle or standing water that lasts for more than four days! Mosquito breeding sites can be anywhere. **Take action** to reduce the number of mosquitoes around your home and neighborhood. Organize a neighborhood clean up day to pick up containers from vacant lots and parks and to encourage people to keep their yards free of standing water. Mosquitoes don't care about fences, so it's important to remove areas of standing water throughout the neighborhood.

Where can I get more information?

- Your doctor, nurse, or health care clinic, or your local board of health (listed in the telephone directory under local government).
- The Massachusetts Department of Public Health (MDPH), Division of Epidemiology and Immunization at (617) 983-6800 or on the MDPH Arbovirus website (www.mass.gov/dph/mosquito).
- **Health effects of pesticides,** MDPH, Bureau of Environmental Health at 617-624-5757.
- **Mosquito control in your city or town:** Mosquito control in Massachusetts is conducted through nine mosquito control districts. The State Reclamation and Mosquito Control Board (SRMCB) oversees all districts. Contact information for each district can be found online at https://www.mass.gov/state-reclamation-and-mosquito-control-board-srmcb. You may also contact the SRMCB within the Massachusetts Department of Agricultural Resources at 617-626-1777 or your local board of health.