

PUBLIC HEALTH FACT SHEET

Eastern Equine Encephalitis

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What is Eastern Equine Encephalitis?

Eastern Equine Encephalitis (EEE) is a rare but serious disease caused by a virus. The virus infects birds that live in freshwater swamps and is spread from bird to bird by infected mosquitoes. If a mosquito infected with the virus bites a horse or human, the animal or person can become sick. The risk of getting EEE is highest from late July through September.

What are the symptoms of EEE?

The first symptoms of EEE are high fever (103° to 106°F), stiff neck, headache, and lack of energy. These symptoms show up three to ten days after someone is bitten by an infected mosquito. Inflammation and swelling of the brain, called encephalitis, is the most dangerous symptom. 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 cure for EEE, and three of every ten people who get the disease die from it. All doctors can do is lower the fever and ease the pressure on the brain. Some people who survive this disease will be permanently disabled. Few people recover completely.

How is EEE spread?

The virus that causes EEE is spread only by mosquitoes. People and horses with EEE do not spread the disease.

How common is EEE in Massachusetts?

EEE is very rare. Since it was first described in 1938, through 2005, 84 cases have been reported in Massachusetts. Fifty one of the cases occurred during outbreaks in 1938-39 and 1955-56. Over half of the cases have been from Plymouth or Norfolk counties in southeastern Massachusetts. Rare cases have occurred outside of eastern Massachusetts.

What can you do to protect yourself from EEE?

There is an EEE vaccine for horses, but not for people. The best way to protect yourself is to keep mosquitoes from biting you. Follow these steps every summer to reduce your risk of being bitten by mosquitoes, particularly if you live near natural wetlands.

- If you must be outdoors at dusk or dawn, when mosquitoes that carry EEE are most active, wear a long-sleeved shirt and long pants. Take special care to cover up the arms and legs of children playing outdoors.
- Repair any holes in your screens and make sure they are tightly attached to all your doors and windows.
- Use a repellent containing DEET (N,N-diethyl-m-toluamide) or Picaridin (KBR 3023). Oil of lemon eucalyptus [p-menthane 3,8-diol (PMD)] has been found to provide protection similar to repellents with low concentrations of DEET. In addition, products that contain permethrin are recommended for use only on clothing, shoes, bed nets, and camping gear. Note that the label for products containing oil of lemon eucalyptus specifies that they should not be used on children under the age of three years. Also, the American Academy of Pediatrics does not recommend any repellent use on children younger than two months of age.

The following precautions are recommended when using insect repellents:

- Always apply repellents according to the instructions on the product label.

- Apply repellents only to exposed skin and/or clothing as indicated on the label. Do not use repellents under clothing.
- Never use repellents over cuts, wounds or irritated skin.
- Do not apply repellents to the eyes or mouth, and apply them sparingly around the ears. When using repellent sprays, do not spray directly on the face—spray the product on your hands first and then apply it to the face.
- Do not allow children to handle the product. When using repellents on children, apply to your hands first and then put it on the child. You should not apply repellent to children's hands.
- Use just enough repellent to cover exposed skin and/or clothing. Heavy application and saturation are generally unnecessary for effectiveness. If biting insects do not respond to a thin film of repellent, then apply a bit more.
- After returning indoors, wash treated skin with soap and water. Also, wash treated clothing before wearing it again.
- If you or your child get a rash or other bad reaction from an insect repellent, stop using the repellent, wash the repellent off with mild soap and water, and call a local poison control center for further guidance. If you go to a doctor because of the repellent, take the repellent with you to show the doctor.

What can you do to reduce the number of mosquitoes around your home and neighborhood?

To reduce mosquito populations around your home and neighborhood, get rid of any standing water that is available for mosquito breeding. Mosquitoes will begin to breed in any puddle or standing water that lasts for more than four days. Here are some simple steps you can take:

- Dispose of or regularly empty any metal cans, plastic containers, ceramic pots, and other water holding containers (including trash cans) on your property.
- Pay special attention to discarded tires that may have collected on your property. Stagnant water in tires is a common place for mosquitoes to breed.
- 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.
- Do not allow water to stagnate in birdbaths; 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.

What does the state do to protect people from EEE?

Massachusetts developed a Surveillance and Response Plan that coordinates efforts of local officials and state agencies to reduce the risk of EEE. The plan involves checking for the virus in mosquitoes, reducing the number of mosquitoes in the environment, and educating people on ways to avoid mosquito bites. Every year from May until the first hard frost, the MDPH and local mosquito control projects collect mosquitoes from various locations around the state and send them to the State Laboratory for testing. If the virus that causes EEE is found in mosquitoes, MDPH will tell local boards of health and mosquito control projects and ask them to increase their education and mosquito control activities. MDPH provides educational materials for physicians, veterinarians, local public health officials, and the public along with updates on EEE activity in mosquitoes, horses and humans online.

For more information:

- **For general questions about EEE:** MDPH, Division of Epidemiology and Immunization at 617-983-6800 or toll free at 1-888-658-2850 or online at www.mass.gov/dph/wnv/wnv1.htm. You may also contact your local board of health (listed in the telephone directory under "government")
- **For questions about health effects of pesticides:** MDPH, Center for Environmental Health at (617) 624-5757
- **For general information about mosquito control:** visit the following webpage www.mass.gov/agr/mosquito/index.htm or contact the State Reclamation and Mosquito Control Board within the Massachusetts Department of Agricultural Resources at (617) 626-1777.
- **For questions about mosquito control in your city or town:** Contact your local board of health (listed in the telephone directory under "government")