



## **Eastern Equine Encephalitis (EEE)**

- Eastern equine encephalitis is a rare viral disease that is spread by infected mosquitoes.
- It is one of several mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and death.
- Eastern equine encephalitis is found mainly along the eastern seaboard of the United States and on the eastern Gulf coast.
- There is no specific treatment for eastern equine encephalitis.
- Prevention centers on controlling mosquitoes and avoiding mosquito bites.

### **What is Eastern equine encephalitis?**

Eastern equine encephalitis is a rare disease that is spread to horses and humans by infected mosquitoes. It is among the most serious of a group of mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and even death. Other similar diseases are western equine encephalitis, St. Louis encephalitis, and LaCrosse encephalitis.

### **What is the infectious agent that causes eastern equine encephalitis?**

Eastern equine encephalitis is caused by the eastern equine encephalitis virus, an arbovirus. Arbovirus is short for arthropod-borne virus. Arboviruses are a large group of viruses that are spread by certain invertebrate animals (arthropods), most commonly blood-sucking insects. In the United States, arboviruses are spread mainly by infected mosquitoes. Birds are the source of infection for mosquitoes, which can sometimes transmit the infection to horses, other animals, and, in rare cases, people.

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### **Where is eastern equine encephalitis found?**

Eastern equine encephalitis is found in North America, Central and South America, and the Caribbean. In the United States, most cases have been reported from the eastern seaboard states, the Gulf Coast, and some inland Midwestern areas.

### **How do people get eastern equine encephalitis?**

The eastern equine encephalitis virus has a complex life cycle involving birds and a specific type of mosquito, *Culiseta melanura*, that lives in marshes and swamps. These mosquitoes feed only on birds; they do not feed on humans and other mammals. In rare cases, however, the virus can escape from its marsh habitat in other mosquitoes that feed on both birds and mammals (including horses and humans). These mosquitoes can transmit the virus to animals and people. After infection, the virus invades the central nervous system, including the spinal cord and brain.

### **What are the signs and symptoms of eastern equine encephalitis?**

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 and severe headache can be followed quickly by seizures and coma. About half of these patients die from the disease. Of those who survive, many suffer permanent brain damage and require lifetime institutional care.

### **How soon after exposure do symptoms appear?**

Symptoms 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 eastern equine encephalitis, but some people are at increased risk:

- 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.
- Eastern equine encephalitis occurs mainly in young children and in persons over age 55.

### **What complications can result from eastern equine encephalitis?**

The disease is fatal to about half of those who develop severe symptoms. Of those who survive, many suffer permanent brain damage.

### **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 been discovered. Care of patients centers on treatment of symptoms and complications.

### **How common is eastern equine encephalitis?**

Eastern equine encephalitis is a rare disease. Since 1964, 163 cases have been confirmed in the United States. Fewer than 5 cases are reported in most years. Although small outbreaks of human disease have occurred in the United States, epidemics in horses can be common during the summer and fall.

### **Is eastern equine encephalitis an emerging infectious disease?**

Yes. Eastern equine encephalitis virus was first isolated in the United States in 1933. The risk of exposure has been increasing as people move into previously undeveloped areas where the virus lives. Deaths in horses are a sign of increased spread of the virus in a community.

### **How can eastern equine encephalitis be prevented?**

A vaccine is available for horses, but not for humans. Prevention centers on public health action to control mosquitoes and on individual action to avoid mosquito bites. To avoid being bitten by the mosquitoes that cause eastern equine encephalitis:

- If possible, stay inside between dusk and dark. This is when mosquitoes are most active.
- When outside between dusk and dark, wear long pants and long-sleeved shirts.
- Spray exposed skin with an insect repellent.