



# Eastern Equine Encephalitis

## EEE

FACT SHEET 18-020-1115

*Just the Facts...* Eastern equine encephalitis (EEE) is a rare disease that is spread to humans and horses by infected mosquitoes. It is among the most serious in 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 West Nile virus (WNV), Western equine (WEE), St. Louis (SLE) and La Crosse encephalitis. EEE is an infection found in North, Central, 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 become infected with Eastern equine encephalitis?

People contract EEE through the bite of infected mosquitoes. *Aedes*, *Ochlerotatus*, *Coquillettidia* and *Culex* mosquitoes are responsible for transmitting the virus from birds to people. After a bite from an infected mosquito, the virus invades the central nervous system, including the spinal cord and brain. Small outbreaks of human disease have occurred in the United States, but epidemics in horses can be common during the summer and fall. EEE is a relatively rare disease, in the United States approximately 5-10 human cases of EEE are reported annually. Those who work in or around swamps or marshy areas are considered at higher risk for contracting this disease. EEE is NOT transmitted from person-to-person. For example, you cannot get the virus from touching or kissing a person who has the disease or from a health care worker who has treated someone with EEE.



Map: Denice Adams, USAPHC. Source USGS disease map

Distribution of EEE in the U.S. as of 2012  
States with a potential risk for contracting EEE are shaded in grey.



Photo: S. McCann

An adult female *Ochlerotatus sollicitans*, mosquito, one of the many mosquito species that transmits the EEE virus to humans

### Can you get Eastern equine encephalitis directly from birds or other animals?

There is no evidence that a person can get EEE from handling either live or dead infected animals. However as a general precaution, always wear gloves when handling dead animals, including dead birds and use double plastic bags when disposing of them.

### What are the symptoms of Eastern equine encephalitis?

Many people who are infected with EEE virus show no symptoms. In other people, symptoms range from mild flu-like illness, with fever, headache and sore throat, to encephalitis (inflammation of the brain) coma and death. Symptoms usually appear 4 to 10 days after the bite from an infected mosquito. The disease is fatal in about 35% of people who develop severe symptoms. Survivors of the disease can suffer permanent brain damage and some require lifetime institutional care.

### Is there a treatment for Eastern equine encephalitis?

There is no human vaccine available against EEE, but there is a vaccine for horses. There is no specific medical treatment for EEE infection. Therapy is supportive only, directed at relieving the symptoms and preventing complications. Diagnosis is based on tests of blood or spinal fluid.

### What should I do if I think I have Eastern equine encephalitis?

If you develop symptoms such as sudden high fever, unusually severe headaches, nausea or vomiting seek medical attention immediately. Individuals with suspected EEE illness should be evaluated by a healthcare provider.

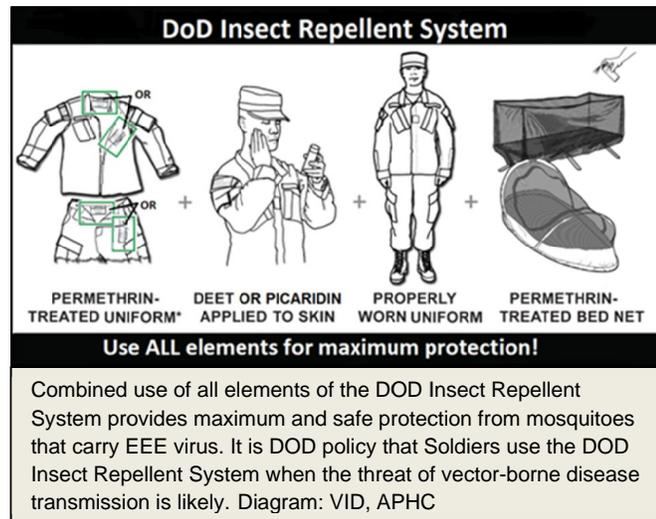
### How can Eastern equine encephalitis be prevented?

**AVOID MOSQUITO BITES!** The best method of protection from mosquitoes is the use of the DOD Insect Repellent System. It incorporates permethrin repellent on the uniform, DEET or picaridin repellent on exposed skin, a properly worn uniform and sleeping under a permethrin-treated bed net. Another important preventive measure is to eliminate mosquito breeding sites.

Empty water from old tires or any outdoor containers that can collect water. When indoors, stay in air-conditioned areas. Make sure door and window screens are in place and do not have holes. Minimize time outdoors when mosquitoes are most active.

### What can I use to treat my clothing with permethrin?

Army Combat Uniforms (ACUs) that are factory-treated with permethrin (ACU Permethrin) are now available to all Soldiers. Uniforms factory-treated with permethrin, have a sewn-in label on both the trouser and the blouse indicating the uniform has been factory-treated with permethrin (photo right). If not factory-treated, apply permethrin to uniforms in the field before wearing using either the IDA Kit (NSN 6840-01-345-0237), which can last up to 50 washings, or aerosol can (NSN 6840-01-278-1336), which lasts 5-6 washings. Other aerosol products containing 0.05% permethrin and permethrin-impregnated garments are also commercially available for civilian use.



### What are the standard military insect repellent products available for use on exposed skin?

Approved military insect repellents for use on exposed skin come in a variety of formulations. Always refer to the label to determine frequency of repellent application based on activity. **Do not apply repellent to eyes, lips, or to sensitive or damaged skin.** Available military repellents are:

- Ultrathon™ (NSN 6840-01-284-3982) 33% controlled-release DEET lotion; one application protects for 12 hours.
- Ultra 30 Insect Repellent Lotion (NSN 6840-01-584-8393) contains 30% Lipo DEET; one application protects for up to 12 hours.
- Cutter® pump spray (NSN 6840-01-584-8598) contains 23% DEET; one application protects for up to 8 hours.
- Sunsect combination sunscreen & repellent (6840-01-288-2188) contains 20% DEET and SPF 15 sun protection.
- Natrape!® pump spray (NSN 6840-01-619-4795) contains 20% picaridin; provides improved protection against Anopheles mosquitoes (carriers of malaria).



Standard military insect repellents for use on exposed skin come in a variety of formulations (left). All standard skin repellents contain the active ingredient DEET or picaridin and are registered by the USEPA. These products are safe to use and effective at repelling mosquitoes that carry the EEE virus. Photo: VID, APHC

### What is considered a “properly worn uniform”?

Worn properly, your uniform acts as a physical barrier against insects. Wear the sleeves rolled down. Close all openings in your clothing that might provide access to insects: tuck your pants into your boots and your undershirt into your pants. Wear your uniform loosely since mosquitoes can bite through fabric that is pulled tight against the skin.

### What are the standard bed nets available to help protect Soldiers from mosquito bites while sleeping?

Lightweight, Self-Supporting, Pop-Up Bed Nets factory-treated with permethrin are available in Coyote Brown (NSN 3740-01-518-7310) or OD Green (NSN 8415-01-516-4415). Untreated Mosquito Bed Nets (NSN 7210-00-266-9736) should be treated with permethrin aerosol before setting up to prevent mosquitoes from biting through the net.