Eastern Equine Encephalitis (EEE) in Pennsylvania

What is Eastern Equine Encephalitis (EEE)?

EEE is an extremely rare but serious and often fatal viral infection that causes encephalitis or inflammation of the brain. It is spread to humans, horses, and other mammals through the bite of an infected mosquito. It was first recognized in horses in Massachusetts in 1831, and the first human cases were documented in New England in 1938. Today, EEE is present in the Americas (North, Central, and South) and the Caribbean. In the US, there are about 7 cases documented annually.

How common is EEE in Pennsylvania?

EEE is more commonly found outside of Pennsylvania in the Atlantic and Gulf Coast states. Since surveillance began in 1964, only 3 human cases have been documented in Pennsylvania, one in 1968, 1979, and 2018. Additionally, horses, birds (domestic or wild), or mosquitoes are found carrying the disease. 2019 was atypical in that there were 4 horse and 6 avian positives throughout the state.

What are the symptoms of EEE?

EEE infection can result in either systemic illness or neurological disease.

Systemic Symptoms:

- Fever
- Chills
- Malaise
- Joint pain
- Muscle pain

Neurological Symptoms:

- Fever
- Headache
- Vomiting
- Diarrhea
- Seizures
- Behavioral changes
- Drowsiness
- Coma

Symptoms appear 2-10 days after infection. The age of the person among other factors determines symptom type. Some people can be infected with EEE but never show signs of symptoms.

How is EEE diagnosed?

A spinal fluid sample is obtained and tested to determine if EEE-specific antibodies are present. If those antibodies are found, a positive diagnosis is determined.

How is EEE treated?

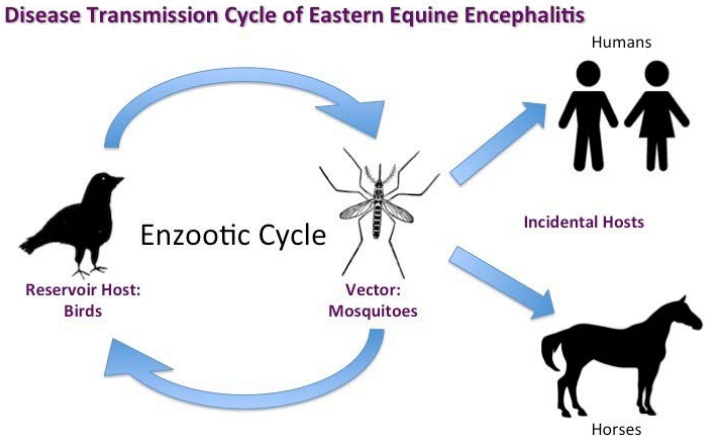
There is currently no cure for EEE. Treatment is to alleviate symptoms which includes supportive therapy and intravenous fluids.

How serious is it?

Although rare, EEE is fatal to 33% of people who are infected approximately 10 days after onset of symptoms. Of those who recover, many are left with physical or mental issues such as seizures, paralysis, and cranial nerve or brain dysfunction.

How is EEE spread?

EEE typically cycles between the *Culiseta melanura* mosquito and birds. *Cs. melanura* is not considered an important vector to humans because it exclusively feeds on birds. The mosquitoes responsible for transmission to humans are those that feed on both birds and people. These species include *Aedes cinereus, Coquillettidia perturbans,* and *Ochlerotatus canadensis.*



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These species are usually found around hardwood and freshwater swamps.

Unlike other viruses (i.e. the common cold), EEE is unable to transfer to humans through the air or from skin to skin contact. It also cannot be transferred from infected animals to humans.

Who is at risk to contract EEE?

Anyone who works or spends a lot of time outside in endemic areas is potentially at risk. Anyone can become infected, but people with underdeveloped or compromised immune systems and people under the age of 15 and over the age of 50 should especially take precautions.

What precautions can I take?

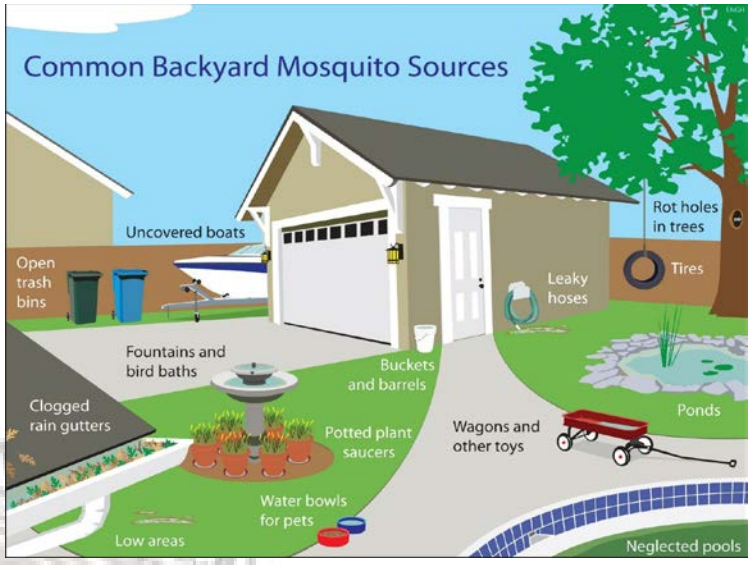
Because EEE is transmitted by mosquitoes, the best prevention method is to reduce the chance of getting bitten by one.

Wear long sleeves and tuck pants into socks and shirts into pants when outdoors at dusk or dawn. This is the time of day when mosquitoes are most active. The risk of contracting EEE is highest from late July through September.

People who spend time outdoors in mosquito-infested areas can use insect repellents containing DEET. Repellent should especially be applied to those who live in areas with hardwood and freshwater swamps or boggy areas nearby.

Install screens on doors and windows to keep mosquitoes out of your house.

Reduce mosquito breeding habitat wherever possible. This involves eliminating standing or stagnant water in areas such as gutters, flower pots, pool covers, bird baths, etc.



Horse owners can have their horses vaccinated and protected. Be sure to change out watering troughs daily to ensure they don't become breeding habitat for mosquitoes.

What else is being done for protection against mosquitoes?

The Pennsylvania Department of Environmental Protection and participating counties implement various tools and strategies to control mosquito populations. This reduces the transmission of mosquito-borne disease and allows the public to enjoy outdoor spaces. Our integrated pest management plan (IPM) incorporates mosquito surveillance, public outreach and education, source reduction, and larval and adult control.

Please visit our website at www.dep.pa.gov/westnile. There, you can learn more about mosquito control in your area and see what efforts are made to combat other mosquito-borne diseases such as West Nile Virus. You can also find your county contact should you have any mosquito concerns.

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