

**Eastern Equine Encephalitis and Aerial Treatment**  
**Frequently Asked Questions**  
April 27, 2021

ABOUT EEE

**What is Eastern Equine Encephalitis (EEE)?**

EEE is a rare, but serious disease that is caused by a virus spread by infected mosquitoes. The EEE virus can cause inflammation of the brain (encephalitis). It is one of the most severe mosquito-borne diseases in the U.S. According to the Centers for Disease Control and Prevention (CDC), approximately one-third of the human cases of EEE are fatal. In the United States, approximately 5 to 10 EEE cases in humans are reported annually, however, in 2019 there were 38 cases reported.

**How many total cases of EEE are there in Michigan?**

The first confirmed human case was diagnosed in mid-September, and EEE had been identified in 29 animals already. For the most current information, visit [www.Michigan.gov/EEE](http://www.Michigan.gov/EEE).

**Should we be concerned about human EEE cases in Michigan?**

Michigan has had outbreaks of EEE about every decade since 1980 when the first human case was reported in the state. In 2019, the number of human cases of EEE in Michigan – 10 cases – were equal to the total number of cases in the previous 10 years combined. It is unknown exactly why some years are more severe than others, although weather, including temperature and rainfall, is thought to play a role. So far in 2020, there have been no diagnosed human cases in Michigan. However, humans can get EEE the same way horses do (from the bite of an infected mosquito), so a case in a horse means people in that area are also at risk. There have been identified human cases so far in Wisconsin and Massachusetts.

**How do people get infected with EEE?**

EEE is transmitted through the bite of an infected mosquito. You cannot get EEE directly from another person or from an animal such as a horse or deer.

**Who is at risk for infection with EEE?**

Anyone in an area where the virus is circulating in mosquitoes can get infected with EEE. The risk is highest for people who live in or visit woodland habitats, and people who work outside or participate in outdoor recreational activities because of greater exposure to potentially infected mosquitoes. Those who are over 50 years old and under 15 years old are at increased risk of infection.

**How soon do people get sick after getting bitten by an infected mosquito?**

It takes four to 10 days after the bite of an infected mosquito to develop symptoms of EEE.

**What are the symptoms of EEE disease?**

Severe cases of EEE infection begin with the sudden onset of headache, high fever, chills, and vomiting. The illness may then progress into disorientation, seizures, and coma. Approximately a third of patients who develop EEE die, and many of those who survive have mild to severe brain damage.

### **How do I get tested for EEE?**

People who have been bitten by mosquitoes can monitor their health and talk with their healthcare provider if they develop symptoms such as fever, malaise, headache, and confusion. Testing for EEE is not indicated in a person who is not showing signs suggestive of being infected with the virus.

### **How is EEE diagnosed?**

Diagnosis is based on tests of blood or spinal fluid. These tests typically look for antibodies that the body makes against the viral infection.

### **What is the treatment for EEE?**

There is no specific treatment for EEE. Antibiotics are not effective against viruses, and no effective anti-viral drugs have been discovered. Severe illnesses are treated by supportive therapy, which may include hospitalization, respiratory support, IV fluids and prevention of other infections.

### **How can people reduce the chance of getting infected with EEE?**

- Avoid being outdoors between dusk and dawn when mosquitoes carrying EEE virus are most active.
- Apply insect repellents containing the active ingredient DEET, or other U.S. Environmental Protection Agency-registered product to exposed skin or clothing. Always follow the manufacturer's directions for use.
- Wear long-sleeved shirts and long pants when outdoors. Apply insect repellent to clothing to help prevent bites.
- Maintain window and door screening to help keep mosquitoes outside.
- Empty water from mosquito breeding sites around the home, such as buckets, unused kiddie pools, old tires, or similar sites where mosquitoes may lay eggs.
- Use nets and/or fans over outdoor eating areas.

### **Can I get sick from eating deer meat if it is infected with EEE?**

If an animal appears ill, you should not consume the meat from that animal, as there are other illnesses that can be transmitted. To kill potential pathogens, wild game should always be thoroughly cooked to an internal temperature of 165 degrees F, measured with a meat thermometer.

### **Can my pet get EEE?**

EEE is rare in dogs and cats, however, when cases have been identified in dogs, they're typically less than six months old. Horses are very susceptible to EEE and approximately 90 percent of horses that show signs of EEE die from the disease. A vaccine is available for horses and is strongly encouraged.

### **How do I protect my pets from EEE?**

Keep pets indoors as much as possible between dusk and dawn when mosquitoes are most active. Mosquito repellents labeled for use on people should not be used on pets. There are some topical products that can be applied to dogs to protect them from mosquitoes; concerned pet owners should work with their veterinarian.

## ABOUT AERIAL MOSQUITO TREATMENT IN MICHIGAN

### **What is the purpose of aerial mosquito treatment?**

Aerial treatment can quickly reduce the number of mosquitoes in a large geographical area, which in turn can reduce the risk of exposure to the EEE virus. This is even more important this year as Michiganders are spending more time participating in outside activities during the pandemic. When conducted according to strict regulations, aerial treatment is safe for people, animals, and the environment, and has been successfully used in the United States for decades to reduce mosquito populations. In 2019, more than 557,000 acres in 14 counties had aerial treatment to help combat EEE.

### **How will the aerial treatment occur?**

Mosquito control professionals will apply approved insecticides as an ultra-low volume (ULV) spray from a twin-engine plane that flies at approximately 300 feet above the ground. The ULV sprayers dispense very fine aerosol droplets. The droplets, which are smaller than the head of a pin, drift through the air to kill adult mosquitoes on contact.

### **Where and when will the aerial treatment take place?**

Aerial treatment will take place in areas where there has been a case of EEE in humans and/or animals this year. On the day of the treatment, the application will begin after dusk, at approximately 8 p.m., and will continue through the night or until weather conditions are no longer favorable for application. Mosquito control is weather-dependent. Wind speeds, temperature, and precipitation on the ground and in the air may affect the treatment schedule. For up-to-date application area information, visit [www.michigan.gov/EEE](http://www.michigan.gov/EEE)

### **What will the treatment look like to me as a resident if I am outside when it occurs?**

Residents will likely not even notice the treatment when it occurs. A twin-engine plane flying at about 300 feet above ground will apply a very small amount of product, approximately 1-2 tablespoons per acre (about the size of a football field). You may not even see or hear the plane or feel anything in the air when it's being applied.

### **I saw a plane flying during the day, aren't they treating at night?**

Yes, the treatment begins after dusk and into the night, weather permitting. During the day, planes conduct surveillance of the areas they anticipate treating that evening. No insecticide is applied during daytime surveillance flights.

### **What insecticide is being used?**

The product being used is called Merus 3.0. It is an EPA-registered, botanical adult mosquito insecticide containing 5 percent pyrethrins which are naturally found in chrysanthemum flowers. Pyrethrins are commonly used to control mosquitoes, fleas, flies, moths, ants and many other pests, and have been registered for use in insecticides since the 1950s. Merus 3.0 is Organic Materials Review Institute (OMRI) listed and can be used around organic crops and gardens. Organic farms that are treated with Merus can still sell their products as "USDA Certified Organic". The application rate of pyrethrins for mosquito control is much lower than is commonly used in organic agriculture. In addition, Merus 3.0 is formulated to kill mosquitos on the wing, not leaving any residual product on plant foliage. This is the same product that was used successfully in areas of Michigan to reduce EEE risk in 2019.

OMRI certificate: <https://www.omri.org/mfg/cmc/certificate/10513>

### **Will Merus 3.0 cause any adverse health effects in people?**

Merus 3.0 is registered with the EPA and is labeled for public health use over residential areas. In general, no short-term or long-term risks to human health are expected during or after treatment. Monitoring of emergency rooms and poison control centers after aerial treatment in 2019 found no reported human illness associated with the treatment.

### **Should I avoid exposure to the treatment chemicals?**

In general, no special actions are necessary before, during, or after treatment. If you are concerned or have known sensitivities to insecticides, some steps everyone can take to reduce exposure are to:

- Remain inside during the hours treatment will occur (approximately 8 p.m. to the next morning).
- Close windows and doors. Turn off air conditioners and window fans that bring outdoor air inside.
- Bring outdoor items (laundry, outdoor furniture, and children toys) inside or cover them if possible.
- Keep pets indoors and cover swimming pools and fishponds, if possible.

### **Can residents opt out of the aerial treatment?**

No. In order to prevent additional human and animal illnesses and deaths, it is necessary to begin mosquito abatement as quickly as possible. Normally a community mosquito control program takes weeks to provide notification to residents and landowners in an impacted area, and additional time to establish a framework for individualized participation. Additionally, opt-out requests mean that areas that require treatment to reduce the burden of EEE are excluded when, because EEE is an especially deadly disease, it is necessary to treat all affected land based on the best evidence available. Due to the serious nature of the disease and the risk to human health, the Michigan Department of Agriculture and Rural Development, in consultation with MDHHS, found it necessary and appropriate to temporarily amend the rule on notification and participation for community pesticide applications for mosquito control.

### **What if I was outside when the treatment occurred, and I have concerns about exposure to the product?**

In general, no health effects are expected from being outside during or after the treatment occurs. Some actions to take if you are concerned include:

- Wash your skin and/or clothes with water and detergent soap.
- Rinse your eyes with water.
- Consult your health care provider if you are concerned about your health.

### **How long do these chemicals last in the environment?**

Merus 3.0 will break down over time, ranging from hours in the air to days in the soil. No special action needs to be taken the morning after treatment; however, if you are concerned about contact with leftover pesticide residue, you could rinse home-grown vegetables and fruits before cooking or eating.

### **Will the treatment contaminate my drinking water source?**

Merus 3.0 binds strongly to soil, so chances are low that it could get into the groundwater. Drinking water reservoirs will be excluded from the treatment areas. Merus 3.0 breaks down quickly in surface water. Because of these factors, Merus 3.0 is not expected in your drinking water.

### **What is being done about reports that certain mosquito-control products could contain PFAS?**

The [US EPA discovered PFAS in a certain type of container used to store and transport one brand of pesticide](#). The Michigan PFAS Action Response Team (MPART) is closely monitoring the EPA's investigation into PFAS-coated high density polyethylene (HDPE) plastic containers that may be leaching PFAS into the mosquito-control product Anvil 10+10 and assessing any potential state implications.

In addition to following the EPA's investigation, MPART is reviewing records for information about the use of fluorinated chemistry in the production and use of coated containers used by the agriculture and pesticide industries. MPART will also work with the Michigan pesticide manufacturers and material management industry to evaluate the disposal or recycling of any empty containers identified.

### **What if I think that I am experiencing an adverse reaction to insecticide treatment?**

If you believe you may be experiencing any health effects from insecticides, call your health care provider or the Michigan Poison Control Center 800-222-1222. If symptoms are severe, call 911 for assistance.

### **What should I do if I am concerned about my pet or farm animals being outside during or after the treatment?**

In general, no health effects to pets or farm animals are expected from being outside when the treatment occurs. If you are concerned, some ways to reduce exposure are to keep pets and farm animals indoors and shut barn windows to meet minimum ventilation requirements during the hours treatment will occur. Pet and livestock owners should always work their veterinarian regarding the overall health and wellness of their animals.

### **Can Merus 3.0 harm my bees?**

Like most insecticides, Merus 3.0 could be harmful to bees if they come in direct contact. The insecticide application will occur later in the evening after dusk when bees are expected to be in their hives. The amount of chemical being applied is low and breaks down quickly; the application is not expected to have an impact on bees. Concerned beekeepers can reduce exposure to their bees by covering the hive with wet burlap. There were no reported adverse effects to bees in Michigan after aerial treatment in 2019.

### **What about the next day when my bees are active again?**

Any insecticide residue on foliage from treatment the night before should be dry by the next morning. Dry residue is not toxic to pollinators, including bees.

### **I found dead bees outside – what killed them?**

This time of year, it is normal for honeybee colonies to decline in population and prepare for winter. Drone bees (males) are kicked out of the colony because they are not needed during the winter and older foraging summer bees die in the fall. Bees still living in the colonies have been reared for winter survival (winter bees). As a result, you will always find some dead honeybees in the landscape. Similarly, you will find dead wasps, hornets and yellow jackets every fall. Colonies infected with mites, a common problem for beekeepers, often begin to die out in the fall.

#### FOR MORE INFORMATION

**For the updated information on EEE in Michigan, including case count,** visit [www.Michigan.gov/EEE](http://www.Michigan.gov/EEE)

**For general health information related to EEE,** visit: [www.cdc.gov/EEE](http://www.cdc.gov/EEE)

**For information on aerial treatment in your county:** Updates will be provided via local media outlets, social media, [www.Michigan.gov/EEE](http://www.Michigan.gov/EEE) and other channels 48 hours before treatment occurs.

**For health-related questions, contact MDHHS** at: 888-535-6136.