Mosquito-borne Diseases

What are mosquito-borne diseases?

- Diseases spread by infected mosquitoes—in the United States, most are caused by viruses.
- Examples of viruses spread by mosquitoes include West Nile virus, eastern equine encephalomyelitis (EEE), St Louis encephalitis (SLE), La Crosse encephalitis, western equine encephalomyelitis (WEE), dengue, chikungunya, and Zika virus.
- In children, most of these infections produce no signs or symptoms or mild headache and fever. More severe illness (including central nervous system involvement) can occur, especially among adults.
- Malaria is a mosquito-borne disease caused by a parasite that occurs commonly in tropical areas of the world. It is extremely uncommon in the United States, except among international travelers.
- Dengue and chikungunya are mosquito-borne viruses that have recently been introduced into the United States. Dengue has caused illness in certain southern states in recent years and is common in Puerto Rico, the Virgin Islands, and American Samoa, where children may vacation with parents. Chikungunya is another recent virus spread by mosquitos that has come to the United States. Hundreds of cases are reported in the United States each year, nearly all from international travelers.
- Zika is a mosquito-borne disease that usually causes mild illness that lasts from several days to a week. Outbreaks of Zika have occurred in Africa, Southeast Asia, the Pacific Islands, and the Americas but have been spreading to new areas of the world. Zika infection can be transmitted from mosquito bites, sexual contact, and an infected pregnant mother to her fetus. Most cases in the United States occur from travelers returning from affected areas, but small numbers of locally acquired infection from mosquitoes in the United States began in 2016 in Florida and Texas. For the most recent information, visit the Centers for Disease Control and Prevention (CDC) Zika website at https://www.cdc.gov/zika. When Zika virus infects a pregnant woman, it can spread to her fetus and cause microcephaly and other brain defects. The CDC recommends pregnant women consider putting off travel to areas where Zika virus is spreading, use repellents and other measures to avoid mosquito bites if they do travel to these areas, and use condoms for sexual activity of any type while pregnant.

What are the signs or symptoms?

- Many people have few signs or symptoms.
- Fever.
- Headache.
- Body aches.
- Nausea.
- Vomiting.
- Rash.
- Convulsions.
- Coma.
- Paralysis (in West Nile disease, paralysis of the facial muscles [Bell palsy] has been noted).
- Joint pain and conjunctivitis (pinkeye or red eyes) for Zika.

What are the incubation and contagious periods?

- Incubation periods

– West Nile virus	2 to 14 days
– EEE	3 to 10 days
– SLE	4 to 14 days
– La Crosse encephalitis	5 to 15 days
– WEE	2 to 10 days
– Zika	2 to 14 days

- Contagious period: These infections are not contagious except Zika virus, which can be transmitted from person to person; the virus has been detected in blood, urine, saliva, and semen for weeks after initial infection.

How are they spread?

Through the bite of an infected mosquito. West Nile and Zika virus may also be spread by blood transfusion and organ donation. Zika virus can also be transmitted from a pregnant mother to a fetus and through sexual contact with an infected individual.

How do you control them?

- By avoiding mosquito bites and getting rid of standing water where mosquitoes lay their eggs.
- Do not wear products that have an odor. They attract mosquitoes.
- Protect the skin by wearing clothing that puts a barrier over the skin, like long sleeves, long pants, socks, shoes, and hats.
- Use insect repellents containing diethyltoluamide (DEET). Repellents make the user unattractive to mosquitoes. They do not kill the insects.

  - DEET is safe and is the most studied and effective mosquito repellent. Generally, higher concentrations of DEET provide longer protection times, but concentrations of more than 50% provide minimal additional benefit. The CDC recommends 20% to 30% DEET concentrations, which provide at least 3 hours of protection.
  - DEET should not be used in a product that combines the repellent with a sunscreen. Sunscreens are often applied repeatedly because they can be washed off. DEET is not water-soluble and will last up to 8 hours. Repeated application of this combination product may increase the potential toxic effects of DEET.
  - DEET may be applied to exposed intact skin according to CDC instructions (www.cdc.gov/westnile/faq/repellent.html) and the US Environmental Protection Agency (EPA) (www.epa.gov/insect-repellents/deet).
  - Apply DEET sparingly on exposed skin; do not use under clothing. If repellent is applied to clothing, wash or dry-clean treated clothing before wearing again.
  - Do not use DEET on the hands of young children; avoid getting DEET in the eyes and mouth, as DEET irritates these tissues. According to the EPA, there is no age restriction for DEET use. However, it is prudent to carefully comply with the precautions listed herein when using DEET in this age-group.
  - Do not use DEET over cuts, wounds, or irritated skin. Wash treated skin with soap and water after returning indoors; wash treated clothing.
  - Avoid spraying in enclosed areas; do not use DEET near food.
- Non-DEET products containing picaridin or icaridin and IR3535 have been shown to be effective mosquito repellents, although less so than DEET. Some plant-based products, such as oil of lemon, eucalyptus, and citronella, show some benefit, although they are not as effective as DEET.
- Many other products claim they prevent mosquito bites, but objective evaluation of them finds they are of little or no value. Among the products that have been found to be ineffective in objective tests are catnip oil, essential plant oils, garlic, vitamin B_1, wearing sound-producing devices, or wearing impregnated wristbands.
- Mosquito traps, bug zappers, ultrasonic repellers, and other devices to prevent mosquito bites are not very effective. Spatial repellent devices that release a repellent material into an area in the form of a vapor are becoming widely available. These products release volatile active ingredients, such as pest repellents metofluthrin and allethrin, and are approved by the EPA for use outdoors. Although many of these products have documented repellent activity, their ability to provide protection from mosquito bites has not been evaluated thoroughly.
- If possible, stay inside during dusk and dawn, when mosquitoes are most active. When outside at these times, wear long sleeves and long pants.
- Check windows to make sure there are no holes in the screens to allow mosquitoes to get indoors.
- Empty or remove standing water from wading pools, buckets, pet dishes, flowerpots, areas where gutter drains leave standing water, and other sources that can attract mosquitoes.
- Some mosquitoes that spread certain viral diseases are active during the day (eg, Zika virus, which can damage a pregnant woman's fetus). Where Zika is known to be spreading, pregnant women should use the measures described herein to prevent mosquito bites at any time of day.

What are the roles of the educator and the family?

- Follow public health recommendations about preventing mosquito bites.
- Share information about the disease.

Exclude from educational setting?

No, unless

- The child is unable to participate and staff members determine they cannot care for the child without compromising their ability to care for the health and safety of the other children in the group.
- The child meets other exclusion criteria (see Conditions Requiring Temporary Exclusion in Chapter 4).

Readmit to educational setting?

Yes, when all the following criteria are met:

When exclusion criteria are resolved, the child is able to participate, and staff members determine they can care for the child without compromising their ability to care for the health and safety of the other children in the group

Comments

- Mosquitoes become infected with West Nile virus after biting infected birds. If you find a dead bird (especially blue jays, crows, or wrens), report it to your local health department and ask for instructions on disposing of the bird's body. Do not handle the body with your bare hands.
- Most cases of mosquito-borne infection are caused by West Nile virus. West Nile virus infections in children are usually mild.
- Resources
  - AAP Family Readiness Kit: https://www.aap.org/en-us/Documents/disasters_family_readiness_kit.pdf
  - Zika Virus: What Parents Need to Know: https://www.healthychildren.org/English/ages-stages/prenatal/Pages/Zika-Virus.aspx
  - Zika Virus: Pediatrician Advice for Families: https://downloads.aap.org/HC/ZIKA_FAMILY_HANDOUT_Infographic_2017.pdf

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