pennsylvania
DEPARTMENT OF HEALTH

Tick and Mosquito Safety for Camps

Why is this important?

Ticks and mosquitoes are common in Pennsylvania. Participating in outdoor activities increases a person's risk of being bitten by ticks and mosquitoes. Ticks and mosquitoes may carry bacteria, viruses or parasites that can cause diseases in humans. However, there are a number of strategies that can be used to prevent tick and mosquito bites. The Pennsylvania Department of Health encourages camps to educate counselors and campers on how to best prevent tick and mosquito bites and what signs and symptoms of tick and mosquito borne diseases to watch out for and protect yourself.

Tickborne Diseases

Several tickborne diseases are transmitted in Pennsylvania, the most common being Lyme disease. Tickborne diseases to be aware of in Pennsylvania include the following.

- Lyme disease
  - Caused by the bacteria *Borrelia burgdorferi*
  - Transmitted by infected deer ticks
  - Very common in Pennsylvania, about 8,000-10,000 cases reported each year and estimates are that cases may be much higher than this
- Anaplasmosis
  - Caused by the bacteria *Anaplasma phagocytophilum*
  - Transmitted by infected deer ticks, the same tick that transmits Lyme disease
  - About 200-300 cases reported in Pennsylvania each year and increasing
- Babesiosis
  - Caused by the parasite *Babesia microti*
  - Transmitted by infected deer ticks, the same tick that transmits Lyme disease
  - About 70 cases reported each year in Pennsylvania
- Powassan virus
  - Caused by the Powassan virus
  - Transmitted by infected deer ticks, the same tick that transmits Lyme disease
  - Very rare, only about 1 case reported in Pennsylvania each year
- Ehrlichiosis
  - Caused by the bacteria *Ehrlichia chaffensis*
  - Transmitted by infected lone star ticks
  - About 20-30 cases reported in Pennsylvania each year
- Rocky Mountain spotted fever
  - Caused by the bacteria *Rickettsia rickettsii*
  - Transmitted by infected dog ticks
  - About 20-30 cases reported in Pennsylvania each year

Mosquito-borne Diseases

In 1999, West Nile virus (WNV), an arbovirus transmitted by *Culex* mosquito species, was detected in New York City resulting in the first ever domestically acquired human cases of WNV disease in the Western Hemisphere, which rapidly spread to surrounding states. Since 2000, WNV has been and continues to be the most frequently reported arbovirus in Pennsylvania. In recent years, other locally acquired arboviruses (e.g., Jamestown Canyon, Powassan, Eastern equine encephalitis, etc.) have also been identified in Pennsylvania. Additionally, cases of imported arboviruses (e.g., dengue, chikungunya, Zika, etc.) are detected annually in Pennsylvania residents returning from travel to impacted regions.

Precautions

The risk of being bitten by an infected tick or mosquito can be decreased by using the following precautions:

Insect Repellent (repels ticks and mosquitoes)

- Use EPA approved insect repellent on clothing and exposed skin
    - Apply insect repellent according to label directions on exposed skin. Avoid applying to areas around the eyes and mouth. Do not use under clothing.
    - Do not use insect repellent on the hands of young children.
    - Do not use insect repellent over cuts, wounds or irritated skin. Wash treated skin with soap and water after returning indoors, and wash treated clothing.
    - Avoid spraying in enclosed areas. Do not use insect repellent near food.
- We encourage camps to have campers bring insect repellent to camp with them and to give campers time to apply insect repellent each day

Permethrin (kills ticks and mosquitoes on contact)

- Apply permethrin to clothes, shoes, sleeping bags, tents, etc.
    - Permethrin is an insecticide that can be applied to clothing, shoes and gear.
    - Permethrin may be applied to camper's clothing, shoes and gear before coming to camp and protection will last up to 6 weeks.
    - More information on permethrin and a video on how to use it can be found here: https://www.cdc.gov/mosquitoes/mosquito-bites/how-to-use-permethrin.html
- We strongly encourage camps to send instructions to campers' homes on applying permethrin to clothing, shoes and gear before coming to camp.

Tick Habitat Avoidance

- Avoid tick-infested areas
    - Overgrown shrubs, grasses and weeds
    - Leaf litter
    - Banks of streams, rivers, lakes, ponds
- Walk in the center of trails to avoid overhanging brush
- We encourage camps to maintain grounds to decrease ticks in areas campers will be using
- The Connecticut Agriculture Experiment Station's publication Tick Management Handbook provides information on managing tick populations in outdoor spaces. Tick Management Handbook (ct.gov)

Clothing

- Wear light colored clothing so ticks can be spotted more easily
- Tuck pant legs into socks or boots, and shirts into pants
- Tape the areas where pants and socks meet
- Wear a hat, long sleeved shirt, and long pants for added protection

Tick Checks

- Instruct campers to conduct regular tick checks when participating in outdoor activities
- Once campers come in, encourage and provide time for thorough tick checks. Allow campers to have tick check buddies if they need help with checking for ticks on backs or scalps.
- We also encourage time to allow campers to shower after participating in outdoor activities to remove ticks that have not yet bitten.

Tick Removal

- We encourage campers to come with tweezers or tick removal tools or for the camp to have these devices readily available.
- If you find a tick attached to your skin, there is no need to panic. There are several tick removal devices on the market, but a plain set of fine-tipped tweezers will remove a tick quite effectively. Prompt and proper tick removal is very important for preventing possible disease transmission.
    - Use fine-tipped tweezers and protect your fingers with a tissue, paper towel, or latex gloves. Avoid removing ticks with your bare hands.
    - Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
    - After removing the tick, thoroughly disinfect the bite and your hands with rubbing alcohol, an iodine scrub, or soap and water.
    - Avoid folklore remedies such as "painting" the tick with nail polish or petroleum jelly or using heat to make the tick detach from the skin. Your goal is to remove the tick as quickly as possible; do not wait for it to detach.
- We have included a sample Tick Attachment Report Form for the camp to complete when a tick must be removed to send home. This will provide the parents/guardians with information on the tick bite and where to watch for a Lyme rash.

Mosquito Control

- Eliminate standing water at your camp site to prevent mosquitoes by:
    - Dumping or draining all containers that might be collecting rain water.
    - Treating puddles and other water that can't be eliminated with *Bacillus thuringiensis israelensis* (Bti) or *Bacillus sphaericus* (Bsp) tablets; available at any lawn and garden store. The bacteria will infect and kill any mosquito larvae present, but the water will remain safe for people, pets, aquatic life and plants.

Watch for Signs and Symptoms of Tick and Mosquito-borne Diseases

- Most tick and mosquito borne diseases initially feel like the flu with fevers, body aches, headaches and fatigue. However, most of these diseases are transmitted in the summer, when the flu does not circulate, so if you develop these symptoms in warm months, always follow up with a healthcare provider.
- Keep in mind that many people don't know that they've been bitten by a tick since a tick bite is not painful. If even a person does not recall being bitten by a tick, if they develop symptoms consistent with a tickborne illness, follow up with a healthcare provider.

What are the symptoms of tick and mosquito borne diseases?

Most tick and mosquito-borne diseases initially present with flu-like symptoms. People may have fevers, feel fatigued, have headaches, body and joint aches. Since most vectorborne diseases occur in the summer, when flu is not circulating, one should not assume it's the flu and not seek treatment. We encourage anyone who has flu-like symptoms in the summer to seek care from a healthcare provider. In addition, many vectorborne diseases include a rash. Lyme disease has a distinctive rash that can be the size of a dinner plate and may look like a bull's eye. Any bacterial and parasitic vectorborne diseases can be treated with medications.

Why do we want to educate children on ticks and Lyme disease?

Children under the age of 15 have a very high incidence of Lyme disease. There are several factors that may contribute to the increased incidence rate. Children often spend more time playing outside and due to their size, are closer to the ground. Outdoor activities, like laying on the grass, exploring in woods and tall grasses, playing in leaf piles, or even cuddling pets who have carried in ticks on their fur may be contributing actions. Additionally, underdeveloped hygiene practices and limited awareness increase the risk of ticks going unnoticed.

Currently, we do not have a vaccine against Lyme disease, so the best method of prevention is to avoid ticks and tick bites and checking for ticks regularly in case you have been bitten by a tick.

If campers find a tick, is testing the tick recommended?

Individual tick testing is not recommended by the Department of Health or the CDC. Laboratories that perform tick testing are not designed for clinical diagnostic specimens. Positive results in a tick do not necessarily mean there was disease transmission to the person who was bitten. For Lyme disease, ticks must be attached for at least 24 hours to transmit disease. Even ticks that are positive for Lyme and engorged may not transmit Lyme. Therefore, positive results from a tick do not necessarily mean that the human will test positive for the same disease. If the tick tests negative, this may lead to false assurance as the person may have been bitten by another positive tick that wasn't discovered. If Lyme disease is transmitted, a person may develop symptoms before the tick testing results are available. If a patient does become ill, he/she should not wait for tick testing results before beginning appropriate treatment.

Patients should not be treated for Lyme based on the results of tick testing. Treatment should be dependent on the patient's presentation only. Tick testing and identification resources for informational or educational only purposes can be found on the DOH website: https://www.health.pa.gov/topics/disease/Vectorborne%20Diseases/Pages/Tick-Testing.aspx.

The Pennsylvania Department of Environmental Protection does tick surveillance and testing for pathogens. The ticks are pooled from large tick collections to estimate the prevalence of disease among ticks in Pennsylvania.

More Information

For more information on vectorborne diseases and educational materials, please visit the Pennsylvania Department of Health Vectorborne Disease website.

https://www.health.pa.gov/topics/disease/Vectorborne%20Diseases/Pages/Vectorborne%20Diseases.aspx