



# Preventing Lyme Disease

## The More You Know The Easier It Is

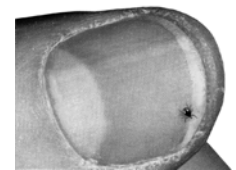
### What is Lyme Disease?

Lyme Disease is a bacterial infection which acquired its name from Lyme, Connecticut, where the first cases were diagnosed in 1975. The Centers for Disease Control currently lists Lyme Disease as the most common tick-borne illness. Although reported throughout the United States and Europe, in the United States it is most prevalent in the Northeast and mid-Atlantic states.

Caused by the bacterium *Borrelia burgdorferi*, Lyme Disease is most commonly transmitted to humans through the bite of the deer tick or black legged tick (*Ixodes scapularis*, formerly *Ixodes dammini*). The tick becomes infected when it takes a first blood meal from the white-footed mouse, its primary host.

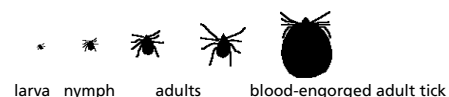
### Recognizing the Deer Tick

Deer ticks often go unobserved because of their small size compared to the common dog tick (which also may transmit Lyme Disease). There are three stages in the life cycle of the deer tick: larva, nymph, and adult. During the larval stage it is the size of the head of a pin. The adult reaches the size of a sesame seed unless it has just fed, then it may grow up to four times normal size.



*Ixodes scapularis* nymph  
compared to a human thumb

These deer ticks are shown actual size:



### How and Where the Tick Lives

In the Northeast, larval deer ticks hatch and take a first blood meal in August, often from the white-footed mouse – the carrier of the Lyme Disease bacterium. This is usually when ticks become infected with Lyme Disease. Fully engorged larvae drop to the ground then emerge as nymphs the following Spring.

Nymphs (and in Fall the adult ticks), then transfer to a larger host. Lyme Disease can be transmitted to humans if they encounter a tick at this time and become the secondary host. It is common for nymphal and adult ticks to attach to dogs, cats, birds, squirrels, raccoons, foxes, mice, deer, etc.

The primary role that deer and other wildlife such as birds play in the spread of Lyme Disease is in the transport of potentially infected ticks into the home environment. Additionally, abundant hosts may support a higher than normal tick population compared to areas with fewer host species.

Ticks spend most of their lives in moist, humid areas with abundant host species. Although found in all natural environments at Valley Forge National Historical Park, research indicates that the highest tick densities are in wooded areas. Ticks can be found on shrubby vegetation less than 3 feet in height, the undersides of leaves, logs, and in leaf litter. Structures such as stone walls, particularly when located within wooded areas of the park, are also favored locations for ticks.



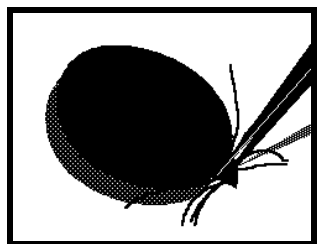
Student collecting ticks using a drag cloth

## Transmitting Lyme Disease to Humans

Although tick larvae do bite humans, they are unlikely to be a carrier of the Lyme Disease because they have not yet been infected. The most dangerous period for transmission of Lyme Disease to humans is during the nymphal stage because nymphs are most likely to feed on a person and are still small enough to be difficult to detect.

The adult tick transmits the disease, but they are usually large enough to see and are often spotted and removed quickly. Peak months for nymphal and adult deer ticks in this area are May, June, July, and October.

*If a tick is attached to your skin for less than 24 hours your chance of getting Lyme Disease is very small.* Prompt removal of ticks may substantially reduce the probability of acquiring Lyme Disease from a tick bite.



### How to Remove a Tick

The more quickly you remove a tick from your body, the better your chances of avoiding infection. **To safely remove a tick, grasp it firmly with fine-point tweezers where the mouthparts enter the skin. Without squeezing the body of the tick, tug gently until it releases its hold and then wipe the bite area with antiseptic or wash with soap and water.**

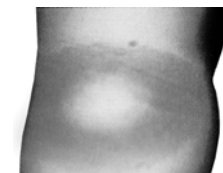
## Lyme Disease Symptoms

The majority of Lyme Disease cases are reported in June, July, and August. Early symptoms usually occur from a few days to a few weeks after infection, although it could be up to one a month. If recognized early it is easily treated with antibiotics. A vaccine is also available. Ask your doctor about this option.

### Early Symptoms

The onset of Lyme Disease is usually accompanied by **flu-like symptoms** that include one or more of the following: fatigue, chills and fever, headache, muscle and joint pain and/or stiffness, stiff neck, discomfort in the jaw area, red eyes, and swollen glands.

As many as 50% of the people who are infected with Lyme Disease also develop a **RED RASH** at the site of the initial bite. The rash is often round and may expand up to 18 inches in diameter over a number of weeks. The center of the rash may clear as it expands creating a “bulls-eye” effect. The rash can have several shapes and multiple, secondary rashes may appear on other parts of the body. Shown here is the most typical rash.



Swollen knee with “bulls-eye” effect rash

## Late Symptoms

If left untreated, Lyme Disease can cause serious problems and be difficult to treat. Late symptoms may include: severe, chronic arthritis; meningitis; neurological disorders causing numbness, tingling in the extremities, loss of concentration, and memory retention, lethargy, Bell's Palsy (loss of control on one side of the face), and cardiac symptoms such as heart palpitations or heart block.

## **The Best Treatment is PREVENTION**

You can enjoy the natural beauty of the outdoors and the history and heritage of Valley Forge National Historical Park by following these simple precautions:

1. Exercise caution about visiting heavily wooded areas with dense underbrush. Be especially careful during the months of May, June, July, and October. If you hike through woodlands or tall grass meadows, stay on designated trails and avoid vegetation along the path.
2. Avoid stone walls, logs, and other structures that may potentially harbor ticks and mice.
3. Dress appropriately. Cover your hair with a hat. Wear a long-sleeved shirt and long pants with the bottoms tucked into your socks. Clothes should be a light color to make the ticks easier to see. Protect your feet by wearing shoes and socks instead of sandals.
4. Use tick repellent containing Permethrin on the outside of your clothes and one containing no more than 30% DEET on exposed skin.
5. Remove, wash, and dry clothing when you come in from the outdoors.
6. Check yourself, your family members, and your pet for ticks when you come in from outdoors and remove ticks as soon as possible.

## **Additional Suggestions to Protect Yourself at Home**

1. Cut back the brush and long grass bordering your home. Remove yard waste, brush piles, leaf litter, and wood piles that are favorite spots for ticks and mice.
2. Place bird feeders away from heavily used areas and exclude or discourage animals such as deer from entering the yard.
3. As a last resort you may research which pesticides are appropriate to use to reduce tick populations and find the one that is safest for your pets, family, and the environment.

## **For Further Information Contact:**

The PA Department of Health at 1-877-PA-HEALTH (1-877-724-3258)

Centers for Disease Control and Prevention, National Center for Zoonotic, Vector-borne and Enteric Diseases (NCZVED), *Division of Vector Borne Infectious Diseases*, 3150 Rampart Road Fort Collins, CO 80521 OR 1 (800) CDC-INFO (232-4636) OR visit their website at [www.cdc.gov](http://www.cdc.gov)