LYME DISEASE

WHAT IS IT?
Lyme disease is a bacterial illness transmitted by deer ticks. It was first discovered in Lyme, Connecticut, in the 1970s. It is caused by a type of bacteria called a spirochete. In the United States, the most common cause of Lyme disease is the spirochete *Borrelia burgdorferi*.

HOW COMMON IS IT?
Lyme disease is the most common tick-borne disease in the United States and Europe. In 2012, the Virginia Department of Health reported 1,110 confirmed or probable cases of Lyme disease in Virginia.

HOW IS IT TRANSMITTED?
Lyme disease is transmitted by deer ticks that harbor the Lyme disease bacteria in their stomachs. The deer tick is the size of a pinhead, much smaller than the common dog tick. Deer ticks can pass the bacteria to humans when they bite our skin. The tick needs to remain attached to the skin for at least 36 hours in order to transmit the bacteria.

While animals can become infected in the same manner, the disease cannot be transmitted from human to human or from animal to human.

WHAT ARE THE SYMPTOMS?
Lyme disease affects different areas of the body in varying degrees as the infection progresses. The site where the tick bites the body is where the bacteria enter through the skin. As the bacteria spread in the skin away from the tick bite, the infection causes an expanding reddish rash that is often accompanied by “flu-like” symptoms. If left untreated, the infection can spread to the heart, the nervous system, and the joints. There are 3 phases of Lyme disease:

- **Early localized disease** is characterized by a classic rash called erythema migrans (EM) in up to 80% of cases.
  - The rash develops at the site of the tick bite and is often described as a “bull’s eye” lesion because it begins as a flat, red circle that expands in size, with an outer ring of redness and a central area of clearing.
  - EM usually occurs 7-14 days after a tick bite but can appear anywhere from 3-32 days later.
  - Associated “flu-like” symptoms can include fatigue, fever, chills, muscle aches, and lymph node swelling in the area of the bite.
- **Early disseminated disease** develops if no treatment is given during the first phase of illness. It occurs weeks to months following a tick bite.
  - Patients may develop multiple areas of EM.
  - They may continue to have “flu-like” symptoms and develop conjunctivitis (pink eye).
  - The infection may affect the nervous system, causing facial muscle paralysis (Bell’s palsy) and severe headaches and neck stiffness due to meningitis (inflammation of the lining of the brain and spinal cord).
  - It may also affect the heart, leading to irregular heartbeats and dizziness.
  - Patients may also experience joint pain that moves from joint to joint.
- **Late disease**, which occurs months to years after a tick bite, is characterized by arthritis and rare neurologic problems.
  - After several months, 60% of those left untreated can experience episodes of severe joint pain and swelling, most commonly in the knee.
  - Up to 5% of those left untreated can develop chronic neurologic complications, including numbness or tingling in the hands or feet and problems with short-term memory and concentration.
**HOW IS IT DIAGNOSED?**
Diagnosis is usually based on clinical presentation and the likelihood of a tick bite. Laboratory tests are not recommended if the patient’s symptoms are not typical for Lyme disease. Blood tests for antibodies made in response to the infection are negative early in the disease course. These tests are more useful in the later stages of disease.

**WHAT IS THE TREATMENT?**
■ In the early stages of illness, antibiotics taken by mouth for a few weeks can cure the infection. If the disease has progressed to a later stage (with involvement of the heart or nervous system), antibiotics administered intravenously are necessary.

Doxycycline is the antibiotic most commonly used for treatment.
- It is taken as 100mg twice a day for 10-21 days.
- To avoid injury to the esophagus, this medication should be taken with a full glass of water. Also avoid lying down for 30 minutes after taking the medication.
- You can get sunburned more easily while taking doxycycline, so limit your time outdoors and wear sunscreen with an SPF of 30 or more to protect your skin.

■ Most patients respond quickly and completely to treatment if given early during the illness. However, a small percentage of patients may have symptoms (such as muscle pain, arthritis, fatigue, and cognitive deficits) that last months to years after treatment. This may be due to an autoimmune response, in which the patient’s immune system continues to respond even after the infection has cleared.

**HOW IS IT PREVENTED?**
The following precautions can greatly reduce your chances of getting Lyme disease:
- Stay on trails when hiking. Avoid walking through low bushes and tall grass.
- Wear long sleeves and tuck pants into your socks when in wooded areas.
- Use products containing DEET (such as Off! Deep Woods or Backwoods Cutter) or permethrin to prevent tick bites. Follow directions on the product label for safe use.
- Thoroughly check yourself and your pets after leaving wooded areas. Look carefully as deer ticks are very small and may be easily overlooked.
- If you find a tick, remove it gently with tweezers, grasping it as close to the skin as possible. Pull upward firmly without twisting or jerking. The body of the tick contains the infectious material, not the head. Therefore, do not crush or squeeze the body of the tick. If the head or mouth is still attached to the skin, leave it alone as it will typically fall off on its own. Wash the area well, and apply an antiseptic. Also remember to wash your hands afterwards.

**WHAT IF I HAVE A TICK BITE BUT NO OTHER SYMPTOMS?**
Antibiotic prophylaxis with a single dose of doxycycline 200mg can be given to prevent Lyme disease if ALL of the following criteria are met:
1. The tick is identified as an adult or nymphal deer tick.
2. The tick has been attached for ≥ 36 hours.
3. Prophylaxis is started within 72 hours of tick removal.
4. The local rate of infection of ticks with *B. burgdorferi* is ≥ 20%.
5. Doxycycline is not contraindicated.

**RECOMMENDED WEBSITES:**
- www.cdc.gov
- www.mayoclinic.com