

Lyme Disease

Course:	FAW-F and EFAW-F (Forestry courses)
Materials:	Audio visual
Instructor:	Introduce, use PowerPoint, discussion, demonstrate, evaluate and summary
Practical:	None
Objective:	To understand what Lyme Disease is and what action needs to be taken.
Value:	Knowing what Lyme Disease is and how it's transferred will help in reduction of risk, identification and treatment
Assessment:	Observation of students and ask students questions

Teaching points:

Lyme disease is a bacterial infection transmitted by a tick. Lyme disease was first recognised in 1975, after researchers investigated why unusually large numbers of children were being diagnosed with juvenile rheumatoid arthritis.

The investigators discovered that most of the affected children lived near wooded areas likely to harbor ticks. They also found that the children's first symptoms typically started in the summer months coinciding with the height of the tick season.



Several of the patients reported having a peculiar skin rash just before developing arthritis symptoms, and many also recalled being bitten by a tick at the rash site.

Further investigations resulted in the discovery that tiny deer ticks infected with a spiral-shaped bacterium or spirochete (which was later named *Borrelia burgdorferi*) were responsible for the outbreak of arthritis in Lyme. Ordinary "wood ticks" and "dog ticks" do not carry the infection.

The ticks most commonly infected with *B. burgdorferi* usually feed and mate on deer during part of their life cycle. The recent growth of the deer population in the northeast and the building of suburban developments in rural areas where deer ticks are commonly found have probably contributed to the increasing number of people with the disease.

The number of reported cases of Lyme disease, as well as the number of geographic areas in which it is found, has been increasing. In addition to causing arthritis, Lyme disease can also cause heart, brain, and nerve problems.

How Is Lyme Disease Diagnosed?

Lyme disease may be difficult to diagnose because many of its symptoms mimic those of other disorders. Although a tick bite is an important clue for diagnosis, many patients cannot recall having been bitten by a tick. This is not surprising because the tick is tiny, and a tick bite is usually painless.

The easiest way for a doctor to diagnose Lyme disease is to see the unique bull's-eye rash. If there is no visible rash (as is the case in about one-fourth of those infected), the doctor might order a blood test three to four weeks after the onset of the suspected infection to look for antibodies against the bacteria. Unfortunately, the Lyme disease bacterium itself is difficult to isolate or culture from body tissues or fluids. These blood tests are:

- **ELISA.** This blood test measures the levels of antibodies against the Lyme disease bacteria that are present in the body. Antibodies are molecules or small substances tailor-made by the immune system to lock onto and destroy specific microbial invaders.
- **Western blot.** This blood test identifies antibodies directed against a panel of proteins found on the Lyme bacteria. The test is ordered when the ELISA result is either positive or uncertain.

The presence of antibodies, however, does not prove that the bacterium is the cause of a patient's symptoms. The presence of specific antibodies suggests a prior infection, which may or may not still be active.

Note: In the first few weeks following infection (when the rash first appears), antibody tests are not reliable because a patient's immune system has not produced enough antibodies to be detected. Antibiotics given to a patient early during infection may also prevent antibodies from reaching detectable levels, even though the Lyme disease bacterium is the cause of the patient's symptoms.

Other tests. Some patients experiencing nervous system symptoms may also undergo a spinal tap. A spinal tap is a procedure in which spinal fluid is removed from the spinal canal for the purpose of diagnosis in a laboratory. Through this procedure, doctors can detect brain and spinal cord inflammation and can look for antibodies against the Lyme disease bacterium in the spinal fluid.

How Can I Prevent Getting Lyme Disease?

Fortunately, the cause of Lyme disease is known and the disease can be prevented. Essential to prevention is the avoidance of deer ticks. Although generally only about one percent of all deer ticks are infected with the Lyme disease bacterium, in some areas more than half of them harbor the microbe.

Most people with Lyme disease become infected during the late spring, summer, and early fall when immature ticks are out looking for their meal. Except in warm climates, few people are bitten by deer ticks during winter months.

Deer ticks are most often found in wooded areas and nearby grasslands, and are especially common where the two areas merge, including neighborhood yards where deer occasionally roam. Ticks do not survive long on sunny lawns, they dry out quickly and die.

Try these tips to prevent tick bites:

- Wear long sleeves and tightly woven clothing that is light in color when walking in

wooded areas so the ticks can be seen more easily.

- Wear your shirt tucked into your trousers, and your trousers tucked into your socks or boots.
- Walk in the center of trails through the woods to avoid picking up ticks from overhanging grass and brush.
- Keep grass trimmed as short as possible.
- Apply tick repellents with DEET to your clothing, shoes and socks before going out. Another tick repellent called permethrin, designed to be placed on the clothing can be used alone or in combination with DEET. (Although highly effective, these repellents can cause some serious side effects, particularly when high concentrations are used repeatedly on the skin. Infants and children may be especially at risk for adverse reactions.)
- Check yourself, your family, and your pets routinely for ticks, especially after a trip outdoors.
- Shower and shampoo your hair if you think you may have been exposed to ticks. Check your clothes for ticks and wash them immediately in order to remove any ticks.

If an infected tick bites, it will not transmit the infection until it has had the opportunity to have its blood meal. This takes time, thus there is value in inspecting your body after outdoor activities in areas where Lyme disease is known to occur. Newly attached ticks can be easily removed before they transmit the infection.

Pregnant women should be especially careful to avoid ticks in Lyme disease areas because the infection can be transferred to the unborn child. Such a prenatal infection can make the woman more likely to miscarry. Preventative antibiotics are not generally used following all tick bites, but may be used in some special circumstances; a recent study showed that such preventive use of antibiotics is very effective.

If you are bitten by a tick, the best way to remove it is by taking the following steps:

- Tug gently but firmly with blunt tweezers near the "head" of the tick until it releases its hold on the skin
- To lessen the chance of contact with the bacterium, try not to crush the tick's body or handle the tick with bare fingers
- Swab the bite area thoroughly with an antiseptic to prevent infection
- DO NOT use kerosene, Vaseline, fingernail polish, or a cigarette butt
- DO NOT squeeze the tick's body with your fingers or tweezers.

What Is the Outlook for People With Lyme Disease?

Most people with Lyme disease respond well to antibiotic therapy and recover fully. Some people may have persistent symptoms or symptoms that recur, making further antibiotic treatment necessary. If left untreated, Lyme disease can cause permanent damage to the heart, nervous system, and joints.

A bout with Lyme disease and successful treatment are no guarantee that the illness will be prevented in the future. The disease can strike more than once in the same individual if he or she is bitten by another tick and re-infected with the Lyme disease bacterium. The antibody test usually remains positive for months to many years after an infection. The presence of antibodies in the blood is not sufficient reason for continued or retreatment with antibiotics.