

# Tick-borne Diseases

## **Lyme Disease**

**What is Lyme disease?** Lyme disease is caused by bacteria that are spread by tiny, infected deer ticks. Both people and animals can have Lyme disease.

**Where do cases of Lyme disease occur?** In the United States, Lyme disease most commonly occurs in the Northeast and mid-Atlantic regions and in the upper Midwest. In Massachusetts, Lyme disease occurs throughout the state.

**How is Lyme disease spread?** Lyme disease is spread by the bite of an infected deer tick. The tick usually must be attached to a person for at least 24 hours before it can spread the germ. Deer ticks in Massachusetts can also carry the germs that cause babesiosis and human granulocytic anaplasmosis (also known as human granulocytic ehrlichiosis). Deer ticks are capable of spreading more than one type of germ in a single bite.

### **What are the symptoms?**

*Early Lyme disease (days to weeks):* characteristic rash, fatigue, chills and fever, headache, muscle and joint pain, swollen lymph nodes.

*Late Lyme disease (weeks to years):* The joints, nervous system and heart are most commonly affected. Arthritis (pain and swelling in one or more large joints, especially the knees), nervous system symptoms can include numbness, pain, nerve paralysis (often of the facial muscles, usually on one side), and meningitis (fever, stiff neck, and severe headache). The complications from Lyme Disease can be long-lasting and permanent.

## **Babesiosis**

**What is babesiosis?** Babesiosis is a disease caused by a microscopic parasite (a type of germ similar to those that cause malaria) that infects red blood cells.

**Where do cases of babesiosis occur?** Babesiosis occurs in coastal areas in the northeastern United States. In Massachusetts, the disease occurs most frequently on Cape Cod and the islands of Martha's Vineyard and Nantucket, but it can occur anywhere in the state.

**How is babesiosis spread?** Babesiosis is spread by the bite of an infected deer tick; it can also be passed through a blood transfusion. The longer a tick remains attached and feeding, the higher the likelihood that it may spread the parasite. The tick must generally be attached to a person for at least 24-36 hours before it can spread the germ. Deer ticks in Massachusetts can also carry the germs that cause Lyme disease and human granulocytic anaplasmosis (also known as human granulocytic ehrlichiosis). Deer ticks are capable of spreading more than one type of germ in a single bite.

**What are the symptoms?** Symptoms of babesiosis usually begin to appear from 1 to 8 weeks after being bitten by an infected tick. Most people who are infected by the parasite will show very mild signs of illness or no signs at all. If symptoms occur, they may include fever, chills, headache, achy joints and muscles, fatigue, nausea, vomiting, abdominal pain and dark urine.

## **Human Granulocytic Anaplasmosis (HGA)**

**What is human granulocytic anaplasmosis (HGA)?** HGA is caused by bacteria (germs) that attack certain types of white blood cells called granulocytes. HGA is also known as human granulocytic ehrlichiosis.

**Where do cases of HGA occur?** In the United States, HGA is most commonly found in the Northeast, mid-Atlantic and upper Midwest. In Massachusetts, the highest rates of disease occur on the islands of Nantucket and Martha's Vineyard and in Barnstable and Berkshire counties, but it can occur anywhere in the state.

**How is HGA spread?** HGA is one of the diseases that can be spread by the bite of an infected deer tick. The longer a tick remains attached and feeding, the higher the likelihood that it may spread the bacteria. Deer ticks in Massachusetts can also carry the germs that cause Lyme disease and babesiosis. Deer ticks are capable of spreading more than one type of germ in a single bite.

**What are the symptoms?** Symptoms of HGA usually begin to appear 7 to 14 days after being bitten by an infected tick. Symptoms of HGA generally include fever, headache (that often doesn't get better with over-the-counter medicine), chills, muscle ache, and fatigue. Less commonly, people may have abdominal pain, nausea, vomiting, diarrhea, cough and joint aches. The elderly and people without a healthy spleen or immune system are more likely to develop serious symptoms.

### **Human monocytic ehrlichiosis (HME)**

**What is human monocytic ehrlichiosis (HME)?** HME is caused by the bacterium *Ehrlichia chaffeensis*, from the bite of an infected lone star tick.

**Where do cases of HME occur?** The lone star tick is predominantly found in the southeastern U.S. Lone star ticks infected with *E. chaffeensis* have been found in Connecticut and Rhode Island. Lone star ticks are not established in Massachusetts; however, there have been sporadic reports of lone star ticks found on Cape Cod

**How is HME spread?** The primary vector of HME is the lone star tick, *Amblyoma americanum*. This tick is named for the prominent white spot or "star" on the back of the adult female. White-tailed deer are a major host of lone star ticks and appear to represent a natural reservoir for *E. chaffeensis*. Another important reservoir appears to be dogs.

**What are the symptoms?** Typical symptoms include: fever, headache, fatigue, and muscle aches. Usually, these symptoms occur within 1-2 weeks following a tick bite.

### **Tularemia**

**What is tularemia?** Tularemia is a disease caused by the bacteria (germ) *Francisella tularensis*. It is a disease that occurs in both animals and humans.

**Where do cases of tularemia occur?** It is relatively rare in most of Massachusetts. However, there have been tularemia cases on Martha's Vineyard since 2000 and, during that time, over 85% of cases in Massachusetts have occurred in people who either have lived or worked on Martha's Vineyard. The majority of cases have been people who work outdoors, particularly landscapers.

**How is tularemia spread?** In Massachusetts, the type of tick most likely to carry the tularemia germ is the common dog tick, also called the wood tick. People can also get it after touching, handling or eating an infected animal, having contact with water or soil that has been contaminated by an infected animal or being bitten by an infected animal. Animals most likely to be infected include rabbits and rodents such as voles, squirrels, muskrats and beavers. Although uncommon in other places, the most common source of infection on Martha's Vineyard is breathing in contaminated particles during outdoor landscaping activities.

**What are the symptoms?** Symptoms usually appear between 3 and 5 days after an exposure. It can take as long as 21 days. Symptoms will be different depending on how the germs get into your body. If the germs are spread by an infected tick bite or by touching an infected animal, symptoms may include a skin sore (ulcer) and/or swollen glands (lymph nodes). Eating food or drinking water that has been contaminated with the germs

may cause throat or intestinal pain, diarrhea and vomiting. Breathing in the germs will cause fever and a pneumonia-like illness with coughing, chest pain and/or shortness of breath.

### **Rocky Mountain Spotted Fever**

**What is Rocky Mountain Spotted Fever (RMSF)?** RMSF is a disease caused by the bacteria *Rickettsia rickettsia*.

**Where do cases of RMSF occur?** RMSF is a rare disease in Massachusetts. Between 1995-2011, seven cases were reported. The disease is most often reported from the southeastern part of the state, Cape Cod and Martha's Vineyard.

**How is RMSF spread?** In the Northeast, RMSF is spread by the bite of an infected dog tick, also called the eastern wood tick. The longer a tick remains attached and feeding, the higher the likelihood that it may spread the bacteria. However, unlike for other tick-borne diseases, the bacteria that causes RMSF often spreads within 24 hours of the tick attaching.

**What are the symptoms?** Symptoms usually start to appear about 7 days after the bite of an infected tick, but can begin anywhere between 3 and 14 days. Symptoms usually begin with a sudden onset of fever and severe headache, and may also include deep muscle pain, nausea and vomiting, and less frequently stomach pain and cough. Most people develop a rash on their arms and legs about 3 to 5 days after the fever starts. This rash often spreads to the palms, soles, and over the rest of the body.