

# Tick-Transmitted Disease in North Carolina

Besides being a nuisance, ticks can transmit several diseases in North Carolina.

Rocky Mountain spotted fever, ehrlichiosis and Lyme disease are the three most common diseases carried by ticks in North Carolina. All three are caused by bacteria and are treatable with antibiotics.

Southern tick associated rash illness (STARI) is also another illness transmitted by ticks. Avoiding tick bites and proper removal of ticks are the keys to preventing tick-transmitted diseases.

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## Rocky Mountain spotted fever

Rocky Mountain spotted fever (RMSF) was first discovered in the western United States but is now more commonly reported from North Carolina and other eastern states. Initial symptoms may include high fever, nausea, vomiting, severe headache, muscle pain and loss of appetite. A rash may appear two to five days after the onset of fever. Usually, it begins as small, flat, pink, non-itchy spots on the wrists, forearms and ankles, and may be very faint. By the sixth day or later, the spots become more pronounced and widespread. Up to 15 percent of people with RMSF may never develop a rash. RMSF can be a very serious illness if not treated. Before the availability of antibiotics, almost 40 percent of RMSF cases were fatal. The American dog tick, *Dermacentor variabilis*, transmits RMSF in North Carolina.

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## Ehrlichiosis

Ehrlichiosis is another disease caused by bacteria. The lone star tick, *Amblyomma americanum*, spreads ehrlichiosis in North Carolina. Symptoms usually begin about five to 10 days after being bitten by a tick. Early symptoms include fever, headache, malaise and muscle aches. Other symptoms may include nausea, vomiting, diarrhea, cough, joint pains, confusion and, occasionally, a rash. Fever is usually milder and the rash is less common than with RMSF. Antibiotics are used to treat ehrlichiosis.

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## Lyme disease

Lyme disease has been found in most states and many foreign countries. The bacteria are carried by the black-legged tick, *Ixodes scapularis*, (formerly called the deer tick).

The first sign of infection is usually a circular rash at the bite site. This rash occurs in about 60 to 70 percent of infected people. The rash may appear from three to 30 days after a tick bite. Starting from where the tick was attached, the rash gradually expands over several days, reaching up to 12 inches across. The center of the rash may clear as it enlarges, creating a bull's-eye appearance. Other early symptoms of Lyme disease include fatigue, chills, fever, headache, muscle and joint aches, and swollen lymph nodes. In some cases, these may be the only symptoms of infection.

If untreated, the bacteria may spread to other parts of the body causing a variety of symptoms during the next few weeks. These symptoms include loss of muscle tone on the side of the face (called facial or Bell's palsy), severe headaches, neck stiffness, joint pain, heart palpitations and dizziness. Often these symptoms will clear, even without treatment.

After several months, about 60 percent of patients with untreated infections will begin to have bouts of arthritis with severe joint pain and swelling. Large joints, like the knees, are most often affected. In addition, up to 5 percent of untreated patients may develop chronic nervous system problems including shooting pains, numbness or tingling in the hands or feet and problems with concentration and short term memory. Lyme disease is also treated with antibiotics

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## STARI

The main symptom of STARI is a Lyme-like rash that follows the bite of a lone star tick. Other flu-like symptoms may occur such as fatigue, fever, headache, muscle and joint pains. Long-term symptoms are not clear. STARI was thought to be caused by a bacteria related to the bacteria that causes Lyme disease, but this has not been confirmed. The cause is still being studied.

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## Preventing tick-transmitted disease

Not all ticks carry disease. In fact, tests show that only about one percent, or one in 100 ticks, are likely to be infected with the bacteria that cause RMSF, ehrlichiosis or Lyme disease. That means every tick bite does not cause disease. The chance of being infected is decreased when you limit the number of tick bites you get and the amount of time a tick is attached to your skin.

**Avoid ticks when possible.** It is nice to be outdoors during the summer, but that is prime tick season. If possible avoid places where ticks are likely to be active, like tall grass or scrubby vegetation, especially along the edges of woods. Stay on paths, and try to avoid brushing against vegetation. Ticks do not drop from trees onto people or animals, but some will climb upwards toward the head.

**Dress appropriately.** Once it is on you, a tick will move around looking for a good spot to attach. Wearing long-legged pants and a long-sleeved shirt tucked into the pants helps to prevent ticks from reaching the skin. Tuck the pants cuffs into your socks or wear a tall pair of hiking boots over the cuffs. Wear clothing that is light colored to make spotting ticks easier.

**Use repellent.** Repellents containing either DEET or permethrin can be used for ticks. Permethrin is best where ticks are very abundant or when recreational or occupational activity takes you into tick habitats. Permethrin is applied only to the clothing. Read and follow the label directions when using repellents.

**Check frequently for ticks on yourself and children.** Unlike mosquitoes, ticks are slow feeders. They take time to find a good place to attach and then slowly begin to feed. Adult ticks will remain on a person or animal for as long as seven days if given the chance. During that time, they may begin to inject disease-causing bacteria. The sooner you can find a tick and remove it, the less chance that it will have had time to feed.

**Treat pets for ticks.** A common source for ticks around the home are pets, especially dogs. Ticks feed on animals and then lay eggs that produce many more ticks. Pets should be treated with a product to control ticks. Treatments that are spotted onto the animal's skin or given as a pill are the most effective. Dips, collars and shampoos are also available but may not work as well and need to be repeated.

### **Make your property less suitable for ticks.**

Sunlight and hot air are stressful to ticks. Keeping your grass trimmed, cutting back brush and removing leaf litter makes a yard less suitable to ticks and the wild animals they might feed on. Insecticides may be helpful in some situations but will not give long-lasting control.

**Remove ticks promptly and properly.** A key to preventing disease is the quick and proper removal of the tick. The mouthparts of ticks have barbs like a fish hook. This helps the tick hold itself in place. Tick mouthparts are not shaped like a corkscrew, so twisting the ticks will cause the mouthparts to break off in the skin. Once a tick has attached itself, tests have shown that hot matches, kerosene, nail polish or petroleum jelly will not make it let go. To properly remove a tick, follow these steps:

- Cover the fingers with tissue or use tweezers.
- Grasp the tick as close as possible to where it is attached to the skin.
- Pull straight back with a slow and steady motion.
- Wash the bite area and your hands with soap and water.

You can save the tick in rubbing alcohol for identification. Make a note of the date that the tick was removed and watch for any unusual symptoms during the next three weeks. Fever, headache or rash could be symptoms of a tick-transmitted disease. If you think you may have become sick from a tick bite, see a physician.

Enjoy being outdoors,  
but please don't feed the ticks.

## How can I get more information about ticks?



Contact your local health department or the  
Public Health Pest Management Section at  
(919) 733-6407.

N.C. Department of Environment and Natural Resources

Division of Environmental Health

Public Health Pest Management Section

<http://www.deh.enr.state.nc.us/phpm/index.htm>