



## NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Date: 5 May 2025  
To: North Carolina Clinicians  
From: Emily Herring, DVM, PhD, Public Health Veterinarian  
Subject: Annual Update on Diagnosis and Surveillance of Tickborne Diseases

### Introduction

Lyme disease, spotted fever rickettsiosis, and ehrlichiosis are the three most common tickborne diseases reported in North Carolina. In 2024, over 700 cases of these three conditions were reported in NC.

### Surveillance for Tickborne Illnesses

Per North Carolina law ([10A NCAC 41A .0101](#)), clinicians are required to report confirmed or suspected tickborne illness cases to their local health department. Laboratory diagnostic tests demonstrating isolation or identification of the pathogens are also reportable by laboratories to the Division of Public Health. North Carolina adheres to [CDC](#) case definitions for each of the tickborne infections, which establish uniform criteria for disease reporting to accurately monitor trends, take action to reduce disease, and protect public health. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient's health needs.

### Actions for North Carolina Clinicians

- Report cases of tickborne infections to your local health department within 7 days of when the condition is reasonably suspected to exist.
- Remind patients to take preventive measures including:
  - recognizing and avoiding tick habitats;
  - using [CDC-recommended](#) and [EPA-registered](#) insect repellents when outdoors;
  - showering immediately after returning indoors;
  - [removing attached ticks promptly](#);
  - using permethrin treated clothing;
  - and creating tick-safe zones in their yard.

### Lyme disease (LD)

LD is now considered endemic to Northwest NC. Public health surveillance has indicated a [substantial increase](#) in the reported cases of LD in this region over the last decade. Testing of *Ixodes* ticks demonstrates an infection rate with *Borrelia burgdorferi* of over 20% in several counties. As such the NC DPH recommends [post-exposure prophylaxis](#) for LD in accordance with CDC recommendations for persons residing or traveling in counties that have had a [high incidence of LD](#) ( $\geq 16$  cases per 100,000 residents) within the previous 5 years or are geographically positioned between two high-incidence counties. These counties include: Buncombe, Madison, Yancey, Mitchell, Avery, Watauga, Ashe, Alleghany, Surry and Stokes (**Figure 1**).

Most cases of LD reported in NC are now confirmed due to the widespread adoption of [modified Two Tier Testing](#) (mTTT). The NC DPH recommends the use of mTTT when there is a clinical and epidemiologic

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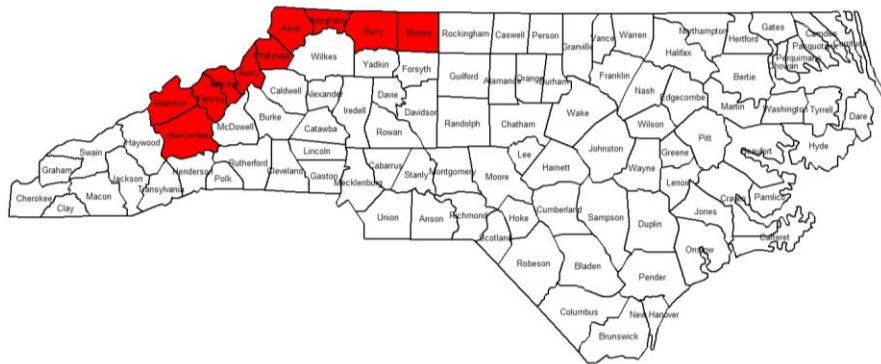
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suspicion of infection. Standard Two-Tier Testing using western blotting is still available but is more difficult to interpret. In either case, remember to utilize testing in which there is an automatic reflex to the second-tier test if the first is equivocal or positive. Diagnostic testing is commercially available. Comprehensive information on the clinical care, testing and diagnosis of LD is available from the CDC [here](#).

Lyme disease post-exposure  
prophylaxis recommended

☐ No ☒ Yes



**Figure 1.** Map of NC counties where Lyme disease post-exposure prophylaxis is recommended

### Ehrlichiosis and Spotted Fever Rickettsiosis (SFR)

Ehrlichiosis is now the most reported tickborne illness in NC. However, most cases are [not confirmed](#) due to the lack of convalescent serology or the failure to utilize PCR testing. Ehrlichiosis is transmitted statewide by infected Lone Star ticks (*Amblyomma americanum*). Diagnostic testing is commercially available and should be considered when there is a clinical and epidemiologic suspicion of infection. PCR testing can provide confirmatory results and is preferred, if available.

SFR comprises illness caused by several related pathogens in the Genus *Rickettsia*. This includes the causative agent of Rocky Mountain Spotted Fever (*Rickettsia rickettsii*) as well as other rickettsial pathogens that may cause a milder illness such as *R. parkeri* and *R. amblyommii*. Reported cases of SFR, like ehrlichiosis, have statewide distribution. Also similar to ehrlichiosis, most cases are not confirmed due to the lack of convalescent serology. Diagnostic testing is commercially available and should be considered when there is a clinical and epidemiologic suspicion of infection.

Prompt treatment (in the first five days of illness) with an appropriate antibiotic (doxycycline) will minimize the chances of severe illness development and usually results in a rapidly effective cure. **Ehrlichiosis and SFR can be severe or fatal illnesses, so treatment should be given based on suspicion of illness and not be delayed until laboratory results are complete.** [Short courses of doxycycline \(such as those used to treat rickettsial diseases\) do not cause dental staining when given to children under 8 years old and should be used.](#)

### Other tickborne illnesses

In NC cases of **Anaplasmosis**, **Babesiosis**, and **Powassan virus** have been reported, but are generally travel-associated. In contrast, while rare, [Heartland](#) and [Bourbon](#) viruses may be transmitted to people in NC. While not infectious, [Alpha-gal syndrome](#) is an allergic reaction which may occur following the bite of a Lone Star tick.

### For more information

Please contact the NC Communicable Disease Branch epidemiologist on call at 919-733-3419 for any additional questions.

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