



North Carolina Department of Health and Human Services  
Division of Public Health

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Date: 11 May 2018  
To: NC Clinicians  
From: Carl Williams, DVM, DACVPM, State Public Health Veterinarian  
Through: Jean-Marie Maillard, MD, MSc, Medical Director  
Subject: Annual Update on Diagnosis and Surveillance for Tickborne disease

### Introduction

Tickborne illnesses continue to cause significant morbidity in North Carolina. This update is intended to encourage patient education about prevention of tickborne illness, as well as to provide a reminder about diagnosis, treatment and reporting.

### Surveillance for Tickborne Illnesses

Per North Carolina law (10A NCAC 41A .0101), clinicians are required to report confirmed or suspected cases of spotted fever group rickettsiosis (including RMSF), ehrlichiosis, anaplasmosis and Lyme disease to their local health department. Laboratory diagnostic tests demonstrating isolation or identification of the etiologic agents are also reportable by laboratories to the Division of Public Health. North Carolina uses nationally agreed-upon case definitions for each of the tickborne infections, which establish uniform criteria for disease reporting in order to accurately monitor trends, take action to reduce disease, and improve public health.

### Actions for North Carolina Clinicians

- Report cases of tickborne infections to your local health department promptly.
- Remind patients to take preventive steps, including recognizing and avoiding tick habitats; using insect repellent in likely tick habitats; removing attached ticks promptly; and creating tick-safe zones in their yard.
- Ask about tick exposure when evaluating patients with febrile illness with or without a rash.
- Familiarize yourself with the laboratory assays available to diagnose tickborne illness.
  - Indirect immunofluorescence antibody (IFA) testing of at least two serum samples collected 2–4 weeks apart during acute and convalescent phases of illness is recommended for serologic confirmation of spotted fever group rickettsiosis, ehrlichiosis and anaplasmosis.
  - Over 95% of reported spotted fever group rickettsiosis cases are not confirmed due to the absence of convalescent serum collection. This trend is mirrored nationally. Collection of convalescent sera would aid in better characterization of illness.
  - PCR amplification of DNA extracted from whole blood specimens collected during the acute stage of illness is particularly useful for confirming infection with *Ehrlichia spp.*
  - A two-tier approach for *Borrelia burgdorferi* infection using a sensitive ELISA followed by a Western immunoblot is recommended. All specimens positive or equivocal by ELISA should be reflexed for a Western immunoblot. Specimens negative by ELISA need not be tested further.
  - As autochthonous transmission of Lyme disease continues to expand throughout Virginia we expect to see increased transmission in portions of northern North Carolina. Many cases continue to be travel associated, consider LD in persons with a travel history to high incidence states (CT, DE, ME, MD, MA, MN, NH, NJ, NY, PA, RI, VT, VA, WI).

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- Serologic sensitivity is poor early in the course of infection. If serology is negative in patients with possible early infection, repeat serology 3 to 4 weeks later may demonstrate seroconversion.

### Treatment for Tickborne Illness

Regardless of the ultimate cause of infection, if ehrlichiosis, anaplasmosis or spotted fever group rickettsiosis is suspected, patients of all ages, including children, should be treated promptly and appropriately with doxycycline. Ehrlichiosis, anaplasmosis and spotted fever group rickettsioses are potentially fatal. Since laboratory confirmation of infection may take weeks, therapy should not be delayed pending diagnosis.

### Additional Information

- CDC guide for health care professionals: <https://www.cdc.gov/mmwr/volumes/65/rr/rr6502a1.htm>
- IDSA Lyme disease guidelines: <https://academic.oup.com/cid/article/43/9/1089/422463>
- Research on doxycycline and tooth staining: <https://www.cdc.gov/rmsf/doxycycline/index.html>

Summary data for all reportable condition is available here: <http://epi.publichealth.nc.gov/cd/figures.html>

