



Indiana State Department of Health

Indiana Health Alert Network Notification – March 29, 2019

UPDATE: Epidemiology, Diagnosis, and Management of Tick-borne Diseases in Indiana

The Indiana State Department of Health (ISDH) was notified of more than 300 cases of tick-borne disease in 2018—more than any previous year. Cases of tick-borne disease begin to appear in Indiana in the spring and continue through the summer and early fall, typically peaking in June. This advisory provides information on the clinical presentation, diagnosis, and treatment of common tick-borne diseases in Indiana, along with some additional recommendations. This advisory also contains updated information on new Lyme disease tick infection maps.

UPDATE: Lyme disease tick infection maps

Recent field sampling by the ISDH has found adult and nymph *Ixodes scapularis* ticks (black-legged ticks) infected with *Borrelia burgdorferi* in a number of counties, particularly in the northwest and west central parts of the state. Maps displaying the tick infection data are available at <https://www.in.gov/isdh/28130.htm>. These maps provide information on where ticks infected with *B. burgdorferi* have been detected in Indiana and may help guide decisions for use of antimicrobial prophylaxis in patients with a recognized tick bite.

UPDATE: Recommendations for antimicrobial prophylaxis after tick bites

The Infectious Disease Society of America (IDSA) does not recommend routine antimicrobial prophylaxis or serologic testing for Lyme disease after a recognized tick bite. A single dose of doxycycline may be offered to adult patients (200 mg dose) and to children ≥ 8 years of age (4 mg/kg up to a maximum dose of 200 mg) when **all** of the following are true:

- The attached tick can be reliably identified as an adult or nymph *I. scapularis* tick that is estimated to have been attached for ≥ 36 hours, based on the degree of engorgement of the tick with blood or certainty about the time of exposure to the tick. Healthcare providers may seek assistance with tick identification from local health departments, Purdue University extension agents, or the ISDH Entomology Laboratory (317-351-7190).
- Prophylaxis can be started within 72 hours of the time that the tick was removed;
- The patient acquired the tick in a state with a [high incidence of Lyme disease](#) (CT, DE, MA, MD, ME, MN, NH, NJ, NY, PA, RI, VA, VT, or WI) or an area where the local rate of infection of *I. scapularis* ticks with *B. burgdorferi* is $\geq 20\%$ (see <https://www.in.gov/isdh/28130.htm>);
- Doxycycline treatment is not contraindicated.

Healthcare providers, particularly those in areas with $\geq 20\%$ tick infection rates, should become familiar with the appearance and life stages of *I. scapularis* ticks as well as clinical manifestations and recommended practices for diagnosing and treating Lyme disease. People who have removed attached ticks from themselves, including those who have received antibiotic prophylaxis, should be monitored closely for signs and symptoms of tick-borne disease for up to 30 days.

Please note that ISDH does not offer tick testing for the purpose of patient clinical management.

While some commercial laboratories offer this testing, ISDH does not recommend it. A positive tick test does not necessarily mean that the patient was infected, and a negative tick test does not rule out the possibility of tick-borne disease, since the patient may have acquired infection from a different tick that was not presented for testing.

Epidemiology

The most common tick-borne diseases reported in Indiana are [Lyme disease](#), [spotted fever rickettsioses \(e.g., Rocky Mountain spotted fever\)](#), and [ehrlichiosis](#). Cases have been reported year-round, although most cases are reported during the spring and summer months. Ticks that can transmit disease are present throughout the state of Indiana. The distribution of tick-borne diseases varies geographically in the state, with increased prevalence of [Lyme disease](#) in northwest Indiana and increased prevalence of [spotted fever rickettsioses](#) and [ehrlichiosis](#) in southern Indiana. However, healthcare providers are encouraged to consider tick-borne disease in patients throughout the state.

Obtaining a thorough clinical history that includes questions about recent tick exposure, recreational or occupational exposure to tick habitats, and travel to areas where tick-borne diseases are endemic can provide critical information to make a presumptive diagnosis of tick-borne illness. However, the absence of one or more of these factors does not exclude a diagnosis of tick-borne disease. Absence of a reported tick bite is common and has been associated with delays in treatment. Activities such as playing in a backyard, visiting a park, and gardening should be considered to be potential tick exposures.

Clinical presentation

Many cases of tick-borne disease begin with non-specific flu-like symptoms, including fever, headache, chills, and myalgia. The table below lists signs and symptoms commonly seen with tick-borne diseases in Indiana. However, it is important to note that few people will develop all signs and symptoms, and the number and combination of symptoms varies greatly from person to person. **Due to the life-threatening nature of these infections, treatment should always be initiated upon first suspicion of ehrlichiosis or Rocky Mountain spotted fever.**

| Condition | Incubation Period | Signs and Symptoms | Cutaneous Signs | Laboratory Findings |
|---|-------------------|--|---|--|
| Ehrlichiosis <i>Ehrlichia chaffeensis</i> <i>Ehrlichia ewingii</i> | 1 – 2 weeks | <ul style="list-style-type: none"> • Fever • Headache • Chills • Malaise • Muscle pain • Nausea • Vomiting • Diarrhea • Confusion | <ul style="list-style-type: none"> • Rash – More commonly reported in children | <ul style="list-style-type: none"> • Thrombocytopenia • Leukopenia • Anemia • Mild to moderate elevations in hepatic transaminases |
| Lyme disease | 3 – 30 days | <ul style="list-style-type: none"> • Malaise • Headache • Fever | <ul style="list-style-type: none"> • Erythema migrans (EM) – red ring-like | <ul style="list-style-type: none"> • Elevated erythrocyte sedimentation rate |

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|---|-------------|--|--|---|
| <i>Borrelia burgdorferi</i> | | <ul style="list-style-type: none"> • Myalgia • Arthralgia • Lymphadenopathy • Transient arthritis and effusion in one or multiple joints • Cardiac and neurologic manifestations | <ul style="list-style-type: none"> • or homogenous expanding rash • Not present in all cases | <ul style="list-style-type: none"> • Mildly elevated hepatic transaminases • Microscopic hematuria or proteinuria |
| Rocky Mountain spotted fever <i>Rickettsia rickettsii</i> | 2 – 14 days | <ul style="list-style-type: none"> • Fever • Chills • Severe headache • Malaise • Myalgia • Nausea • Vomiting • Anorexia • Abdominal pain • Diarrhea • Photophobia • Focal neurologic deficits | <ul style="list-style-type: none"> • Maculopapular rash – initially appears on the wrists, forearms, and ankles and spreads to trunk. Not present in all cases. • Petechial rash – considered a sign of progression to severe disease. | <ul style="list-style-type: none"> • Thrombocytopenia • Mildly elevated hepatic transaminase levels • Hyponatremia |

Diagnosis

The diagnosis of ehrlichiosis and Rocky Mountain spotted fever must be made based on clinical signs and symptoms and can later be confirmed using laboratory tests. **Treatment should never be delayed pending the receipt of laboratory test results, or be withheld on the basis of initial negative findings.** For information on diagnostic tests for Lyme disease and other tick-borne illnesses, please refer to the [Tick-borne Diseases of the United States Reference Manual for Healthcare Providers](#).

Treatment

Doxycycline is the first line of treatment for adults and children of all ages with suspected ehrlichiosis or Rocky Mountain spotted fever and should be initiated immediately upon suspicion of illness. The use of doxycycline to treat suspected tick-borne illness in children is standard practice recommended by both the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) Committee on Infectious Diseases. Unlike older tetracyclines, the recommended dose and duration of doxycycline needed to treat tick-borne illness has not been shown to cause staining of permanent teeth. Treatment is most effective at preventing death from Rocky Mountain spotted fever if doxycycline is started in the first five days of symptoms. For information on treatment of Lyme disease and other tick-borne illnesses, please refer to the [Tick-borne Diseases of the United States Reference Manual for Healthcare Providers](#).

Recommendations

- Healthcare providers should ask about outdoor exposure in the history, including location and dates of exposure.
- Healthcare providers should still consider tick-borne diseases in the differential even if other diagnoses are identified.
- Health care providers should not rule out tick-borne disease if there was no recognized tick exposure.
- Health care providers should use doxycycline as the first-line treatment for suspected ehrlichiosis and Rocky Mountain spotted fever in patients of all ages.
- Tick-borne diseases are reportable within 72 hours to the local health department of the county where the patient resides (410 IAC 1-2.5-75).

For more information

- Tick-borne Diseases of the United States: A reference manual for healthcare providers: <https://www.cdc.gov/ticks/tickbornediseases/index.html>
- The Clinical Assessment, Treatment, and Prevention of Lyme Disease, Human Granulocytic Anaplasmosis, and Babesiosis: Clinical Practice Guidelines by the Infectious Diseases Society of America: <https://academic.oup.com/cid/article/43/9/1089/422463>
- Diagnosis and Management of Tick-borne Rickettsial Diseases: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichioses, and Anaplasmosis – United States, A Practical Guide for Health Care and Public Health Professionals: https://www.cdc.gov/mmwr/volumes/65/rr/rr6502a1.htm?s_cid=rr6502a1_w
- Lyme disease — Healthcare Providers: <https://www.cdc.gov/lyme/healthcare/index.html>
- Rocky Mountain spotted fever (RMSF) — Healthcare Providers: <https://www.cdc.gov/rmsf/healthcare-providers/index.html>
- Indiana Communicable Disease Rule: http://www.in.gov/isdh/files/Final_Rule_LSA_.pdf

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